FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 3

Soil Sampling Analysis Results

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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 ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

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Location:	Cartron Big	**Order Number:**		**Superseded Report:**	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) : **13.6**

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.

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.

Validated

CERTIFICATE OF ANALYSIS

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Location:	Cartron Big	**Order Number:**		**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18060638			
Customer Sample Reference			TP11			
AGS Reference						
Depth (m)			0.90 - 0.90			
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	
Sample Type			S	S	S	
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1		X		
Anions by Kone (w)	All	NDPs: 0 Tests: 1	X			
CEN Readings	All	NDPs: 0 Tests: 1	X			
Coronene	All	NDPs: 0 Tests: 1		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1	X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1	X			
Fluoride	All	NDPs: 0 Tests: 1	X			
Loss on Ignition in soils	All	NDPs: 0 Tests: 1		X		
Mercury Dissolved	All	NDPs: 0 Tests: 1	X			
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		X		
PCBs by GCMS	All	NDPs: 0 Tests: 1		X		
pH	All	NDPs: 0 Tests: 1		X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1	X			

Validated

CERTIFICATE OF ANALYSIS

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Location:	Cartron Big	**Order Number:**		**Superseded Report:**	

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
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DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18060638		
Customer Sample Reference			TP11		
AGS Reference					
Depth (m)			0.90 - 0.90		
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S
Sample description	All	NDPs: 0 Tests: 1		X	
Total Dissolved Solids	All	NDPs: 0 Tests: 1	X		
Total Organic Carbon	All	NDPs: 0 Tests: 1		X	
VOC MS (S)	All	NDPs: 0 Tests: 1			X

CERTIFICATE OF ANALYSIS

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

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	Inclusions	Inclusions 2
18060638	TP11	0.90 - 0.90	Dark Brown	Silt Loam	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.

Validated

CERTIFICATE OF ANALYSIS

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

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			TP11	0.90 - 0.90	Soil/Solid (S)	03/08/2018	.	04/08/2018	180804-62	18060638	
Moisture Content Ratio (% of as received sample)	%	PM024	18								
Loss on ignition	<0.7 %	TM018	3.58 M								
Mineral oil >C10-C40	<1 mg/kg	TM061	50.3								
Mineral Oil Surrogate % recovery**	%	TM061	75.1								
Organic Carbon, Total	<0.2 %	TM132	0.948 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 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	<21 µg/kg	TM168	<21								
ANC @ pH 4	<0.03 mol/kg	TM182	0.555								
ANC @ pH 6	<0.03 mol/kg	TM182	0.0721								
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410	<10								
Coronene	<200 µg/kg	TM410	<200								

Validated

CERTIFICATE OF ANALYSIS

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

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			TP11	0.90 - 0.90	Soil/Solid (S)	03/08/2018	.	04/08/2018	180804-62	18060638	
WAC	mg/kg	TM218	10								

Validated

CERTIFICATE OF ANALYSIS

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

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	**LOD/Units**	**Method**	**Customer Sample Ref.**					
			TP11					
			Depth (m)	0.90 - 0.90				
			Sample Type	Soil/Solid (S)				
			Date Sampled	03/08/2018				
			Sample Time	.				
			Date Received	04/08/2018				
			SDG Ref	180804-62				
			Lab Sample No.(s)	18060638				
			AGS Reference					
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 M					

Validated

CERTIFICATE OF ANALYSIS

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

REF : BS EN 12457/2

Client Reference		**Site Location**	Cartron Big
Mass Sample taken (kg)	0.110	**Natural Moisture Content (%)**	22
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	82
Particle Size <4mm	>95%		

Case	
SDG	180804-62
Lab Sample Number(s)	18060638
Sampled Date	03-Aug-2018
Customer Sample Ref.	TP11
Depth (m)	0.90 - 0.90

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	0.948	3	5	6
Loss on Ignition (%)	3.58	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	50.3	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.86	-	>6	-
ANC to pH 6 (mol/kg)	0.0721	-	-	-
ANC to pH 4 (mol/kg)	0.555	-	-	-

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.00214	<0.0005	0.0214	<0.005	0.5	2	25
Barium	0.0655	<0.0002	0.655	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.0034	<0.0003	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

16:16:21 12/08/2018

CERTIFICATE OF ANALYSIS

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

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 soils by GCMS

NA = not applicable.

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

CERTIFICATE OF ANALYSIS

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

Test Completion Dates

Lab Sample No(s)	18060638
Customer Sample Ref.	TP11
AGS Ref.	
Depth	0.90 - 0.90
Type	Soil/Solid (S)
ANC at pH4 and ANC at pH 6	08-Aug-2018
Anions by Kone (w)	09-Aug-2018
CEN 10:1 Leachate (1 Stage)	07-Aug-2018
CEN Readings	08-Aug-2018
Coronene	09-Aug-2018
Dissolved Metals by ICP-MS	10-Aug-2018
Dissolved Organic/Inorganic Carbon	10-Aug-2018
Fluoride	10-Aug-2018
Loss on Ignition in soils	10-Aug-2018
Mercury Dissolved	10-Aug-2018
Mineral Oil	10-Aug-2018
PAH 16 & 17 Calc	09-Aug-2018
PAH by GCMS	09-Aug-2018
PCBs by GCMS	08-Aug-2018
pH	07-Aug-2018
Phenols by HPLC (W)	10-Aug-2018
Sample description	06-Aug-2018
Total Dissolved Solids	09-Aug-2018
Total Organic Carbon	12-Aug-2018
VOC MS (S)	09-Aug-2018

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	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: - 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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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 ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

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) : **19.8**

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.

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.

Validated

CERTIFICATE OF ANALYSIS

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

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18053550			18053555			18053560			18053565	
Customer Sample Reference			TP1			TP3			TP4			TP5	
AGS Reference													
Depth (m)			1.80 - 1.80			2.50 - 2.50			1.20 - 1.20			1.80 - 1.80	
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	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			X			X	
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X			X			X			X		
CEN Readings	All	NDPs: 0 Tests: 4	X			X			X			X		
Coronene	All	NDPs: 0 Tests: 4		X			X			X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4	X			X			X			X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 4	X			X			X			X		
Fluoride	All	NDPs: 0 Tests: 4	X			X			X			X		
Loss on Ignition in soils	All	NDPs: 0 Tests: 4		X			X			X			X	
Mercury Dissolved	All	NDPs: 0 Tests: 4	X			X			X			X		
Mineral Oil	All	NDPs: 0 Tests: 4		X			X			X			X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 4		X			X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 4		X			X			X			X	
PCBs by GCMS	All	NDPs: 0 Tests: 4		X			X			X			X	
pH	All	NDPs: 0 Tests: 4		X			X			X			X	
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4	X			X			X			X		

Validated

CERTIFICATE OF ANALYSIS

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

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18053550			18053555			18053560			18053565	
Customer Sample Reference			TP1			TP3			TP4			TP5	
AGS Reference													
Depth (m)			1.80 - 1.80			2.50 - 2.50			1.20 - 1.20			1.80 - 1.80	
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S
Sample description	All	NDPs: 0 Tests: 4		X			X			X			X	
Total Dissolved Solids	All	NDPs: 0 Tests: 4	X			X			X			X		
Total Organic Carbon	All	NDPs: 0 Tests: 4		X			X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 4			X			X			X			X

CERTIFICATE OF ANALYSIS

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

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	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.

Validated

CERTIFICATE OF ANALYSIS

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

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	TP3	TP4	TP5		
			Depth (m)	1.80 - 1.80	2.50 - 2.50	1.20 - 1.20	1.80 - 1.80		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	31/07/2018	31/07/2018	31/07/2018	31/07/2018		
			Sample Time	.	.	.	.		
			Date Received	03/08/2018	03/08/2018	03/08/2018	03/08/2018		
			SDG Ref	180803-55	180803-55	180803-55	180803-55		
			Lab Sample No.(s)	18053550	18053555	18053560	18053565		
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		35	44	56	50		
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		
Mineral Oil Surrogate % recovery**	%	TM061		76.4	80.7	77.8	71.4		
Organic Carbon, Total	<0.2 %	TM132		4.13 #	7.08 M	10.7 M	7.17 M		
pH	1 pH Units	TM133		8.68 #	7.02 M	7.77 M	7.67 M		
PCB congener 28	<3 µg/kg	TM168		<15 #	<3 M	<3 M	<15 M		
PCB congener 52	<3 µg/kg	TM168		<15 #	<3 M	<3 M	<15 M		
PCB congener 101	<3 µg/kg	TM168		<15 #	<3 M	<3 M	<15 M		
PCB congener 118	<3 µg/kg	TM168		<15 #	<3 M	<3 M	<15 M		
PCB congener 138	<3 µg/kg	TM168		<15 #	<3 M	<3 M	<15 M		
PCB congener 153	<3 µg/kg	TM168		<15 #	<3 M	<3 M	<15 M		
PCB congener 180	<3 µg/kg	TM168		<15 #	<3 M	<3 M	<15 M		
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<105	<21	<21	<105		
ANC @ pH 4	<0.03 mol/kg	TM182		2.01	1.57	1.3	0.837		
ANC @ pH 6	<0.03 mol/kg	TM182		0.235	0.0936	0.154	0.192		
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410		<10	<10	<10	<10		
Coronene	<200 µg/kg	TM410		<200	<200	<200	<200		

Validated

CERTIFICATE OF ANALYSIS

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

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	TP3	TP4	TP5		
			Depth (m)	1.80 - 1.80	2.50 - 2.50	1.20 - 1.20	1.80 - 1.80		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	31/07/2018	31/07/2018	31/07/2018	31/07/2018		
			Sample Time	.	.	.	.		
			Date Received	03/08/2018	03/08/2018	03/08/2018	03/08/2018		
			SDG Ref	180803-55	180803-55	180803-55	180803-55		
			Lab Sample No.(s)	18053550	18053555	18053560	18053565		
			AGS Reference						
WAC	mg/kg	TM218		10	10	10	10		

Validated

CERTIFICATE OF ANALYSIS

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

VOC MS (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP1	TP3	TP4	TP5		
			Depth (m)	1.80 - 1.80	2.50 - 2.50	1.20 - 1.20	1.80 - 1.80		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	31/07/2018	31/07/2018	31/07/2018	31/07/2018		
			Sample Time	.	.	.	.		
			Date Received	03/08/2018	03/08/2018	03/08/2018	03/08/2018		
			SDG Ref	180803-55	180803-55	180803-55	180803-55		
			Lab Sample No.(s)	18053550	18053555	18053560	18053565		
			AGS Reference						
Dibromofluoromethane**	%	TM116		102	105	102	99.7		
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 M	<100 M	<100 M		
Benzene	<9 µg/kg	TM116		<90 #	<90 M	<90 M	<90 M		
Toluene	<7 µg/kg	TM116		<70 #	<70 M	<70 M	<70 M		
Ethylbenzene	<4 µg/kg	TM116		117 #	<40 M	<40 M	<40 M		
p/m-Xylene	<10 µg/kg	TM116		<100 #	<100 #	<100 #	<100 #		
o-Xylene	<10 µg/kg	TM116		<100 #	<100 M	<100 M	<100 M		

Validated

CERTIFICATE OF ANALYSIS

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

REF : BS EN 12457/2

Client Reference		**Site Location**	Cartron Big
Mass Sample taken (kg)	0.138	**Natural Moisture Content (%)**	53.8
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	65
Particle Size <4mm	>95%		

Case	
SDG	180803-55
Lab Sample Number(s)	18053550
Sampled Date	31-Jul-2018
Customer Sample Ref.	TP1
Depth (m)	1.80 - 1.80

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	4.13	3	5	6
Loss on Ignition (%)	15.7	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.105	1	-	-
Mineral Oil (mg/kg)	898	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.68	-	>6	-
ANC to pH 6 (mol/kg)	0.235	-	-	-
ANC to pH 4 (mol/kg)	2.01	-	-	-

Eluate Analysis	**C_2 Concⁿ in 10:1 eluate (mg/l)**		**A_2 10:1 concⁿ 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	0.0371	<0.0005	0.371	<0.005	0.5	2	25
Barium	0.0244	<0.0002	0.244	<0.002	20	100	300
Cadmium	0.000431	<0.00008	0.00431	<0.0008	0.04	1	5
Chromium	0.541	<0.001	5.41	<0.01	0.5	10	70
Copper	0.0213	<0.0003	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
13/08/2018 08:51:34

08:51:25 13/08/2018

Validated

CERTIFICATE OF ANALYSIS

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

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	**Dry Matter Content (%)**	56
Particle Size <4mm	>95%		

Case	
SDG	180803-55
Lab Sample Number(s)	18053555
Sampled Date	31-Jul-2018
Customer Sample Ref.	TP3
Depth (m)	2.50 - 2.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	7.08	3	5	6
Loss on Ignition (%)	18.9	-	-	10
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	-	>6	-
ANC to pH 6 (mol/kg)	0.0936	-	-	-
ANC to pH 4 (mol/kg)	1.57	-	-	-

Eluate Analysis	**C_2 Concⁿ in 10:1 eluate (mg/l)**		**A_2 10:1 concⁿ 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	0.00665	<0.0005	0.0665	<0.005	0.5	2	25
Barium	0.0657	<0.0002	0.657	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<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	<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

Validated

CERTIFICATE OF ANALYSIS

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

REF : BS EN 12457/2

Client Reference		**Site Location**	Cartron Big
Mass Sample taken (kg)	0.205	**Natural Moisture Content (%)**	127
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	44
Particle Size <4mm	>95%		

Case	
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**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	10.7	3	5	6
Loss on Ignition (%)	36.7	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	1160	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.77	-	>6	-
ANC to pH 6 (mol/kg)	0.154	-	-	-
ANC to pH 4 (mol/kg)	1.3	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.00705	<0.0005	0.0705	<0.005	0.5	2	25
Barium	0.0935	<0.0002	0.935	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<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
13/08/2018 08:51:34

Validated

CERTIFICATE OF ANALYSIS

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

REF : BS EN 12457/2

Client Reference		**Site Location**	Cartron Big
Mass Sample taken (kg)	0.180	**Natural Moisture Content (%)**	100
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	50
Particle Size <4mm	>95%		

Case	
SDG	180803-55
Lab Sample Number(s)	18053565
Sampled Date	31-Jul-2018
Customer Sample Ref.	TP5
Depth (m)	1.80 - 1.80

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	7.17	3	5	6
Loss on Ignition (%)	22.4	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.105	1	-	-
Mineral Oil (mg/kg)	2390	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.67	-	>6	-
ANC to pH 6 (mol/kg)	0.192	-	-	-
ANC to pH 4 (mol/kg)	0.837	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.00382	<0.0005	0.0382	<0.005	0.5	2	25
Barium	0.0249	<0.0002	0.249	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<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	<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
13/08/2018 08:51:34

CERTIFICATE OF ANALYSIS

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

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 soils by GCMS

NA = not applicable.

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

CERTIFICATE OF ANALYSIS

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

Test Completion Dates

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
Type	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

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	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: - 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.

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 4

Groundwater and Surface Water Sampling Analysis Results

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:	09 October 2018
Customer:	D_FTIM_DUB
Sample Delivery Group (SDG):	180927-86
Your Reference:	P1444
Location:	Cartron Big
Report No:	475903

We received 9 samples on Thursday September 27, 2018 and 9 of these samples were scheduled for analysis which was completed on Tuesday October 09, 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 ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18414731	GW01		0.00 - 0.00	26/09/2018
18414743	GW02		0.00 - 0.00	26/09/2018
18414752	GW03		0.00 - 0.00	26/09/2018
18414765	LH01		0.00 - 0.00	26/09/2018
18414784	LH02		0.00 - 0.00	26/09/2018
18414804	SW1		0.00 - 0.00	26/09/2018
18414814	SW2		0.00 - 0.00	26/09/2018
18414821	SW3		0.00 - 0.00	26/09/2018
18414830	SW4		0.00 - 0.00	26/09/2018

Maximum Sample/Coolbox Temperature (°C) : **15.8**

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.

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.

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
			18414731	GW01		0.00 - 0.00	250ml BOD (ALE212)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Filtered (ALE204)	GW
							NaOH (ALE245)	GW
			18414743	GW02		0.00 - 0.00	250ml BOD (ALE212)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Filtered (ALE204)	GW
							NaOH (ALE245)	GW
			18414752	GW03		0.00 - 0.00	250ml BOD (ALE212)	GW
							500ml Plastic (ALE208)	GW
							H2SO4 (ALE244)	GW
							HNO3 Filtered (ALE204)	GW
							NaOH (ALE245)	GW
			18414765	LH01		0.00 - 0.00	1000ml glass bottle (ALE220)	LE
							250ml BOD (ALE212)	LE
							500ml Plastic (ALE208)	LE
							H2SO4 (ALE244)	LE
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5		X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	LE
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 9			X		H2SO4 (ALE244)	GW
					X		H2SO4 (ALE244)	GW
					X		H2SO4 (ALE244)	GW
					X		H2SO4 (ALE244)	LE
Anions by Kone (w)	All	NDPs: 0 Tests: 9		X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	LE
BOD True Filtered	All	NDPs: 0 Tests: 6					250ml BOD (ALE212)	LE
COD Unfiltered	All	NDPs: 0 Tests: 2					250ml BOD (ALE212)	LE
Coliforms (W)	All	NDPs: 0 Tests: 3	X			X	250ml BOD (ALE212)	GW
						X	250ml BOD (ALE212)	GW
						X	250ml BOD (ALE212)	GW
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 9		X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	LE
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5					NaOH (ALE245)	GW
							NaOH (ALE245)	GW
							NaOH (ALE245)	GW
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 9			X		HNO3 Filtered (ALE204)	GW
					X		HNO3 Filtered (ALE204)	GW
					X		HNO3 Filtered (ALE204)	GW
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 9		X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	LE
Fluoride	All	NDPs: 0 Tests: 5		X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	GW
				X			500ml Plastic (ALE208)	LE
Mercury Dissolved	All	NDPs: 0 Tests: 5			X		HNO3 Filtered (ALE204)	GW
					X		HNO3 Filtered (ALE204)	GW
					X		HNO3 Filtered (ALE204)	GW
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2					1000ml glass bottle (ALE220)	LE
Nitrite by Kone (w)	All	NDPs: 0 Tests: 2						
Organotins in Aqueous Samples	All	NDPs: 0 Tests: 2					1000ml glass bottle (ALE220)	LE

18414821	SW3		0.00 - 0.00	H2SO4 (ALE244)	SW		X																
				500ml Plastic (ALE208)	SW			X				X			X								
				250ml BOD (ALE212)	SW				X														
18414814	SW2		0.00 - 0.00	HNO3 Filtered (ALE204)	SW									X									
				H2SO4 (ALE244)	SW		X																
				500ml Plastic (ALE208)	SW			X				X			X								
				250ml BOD (ALE212)	SW				X														
18414804	SW1		0.00 - 0.00	HNO3 Filtered (ALE204)	SW									X									
				H2SO4 (ALE244)	SW		X																
				500ml Plastic (ALE208)	SW			X				X			X								
				250ml BOD (ALE212)	SW				X														
18414784	LH02		0.00 - 0.00	Vial (ALE297)	LE																		
				NaOH (ALE245)	LE								X								X		
				HNO3 Filtered (ALE204)	LE									X				X					
				H2SO4 (ALE244)	LE		X																
				500ml Plastic (ALE208)	LE	X		X				X			X	X							
				250ml BOD (ALE212)	LE				X	X													
				1000ml glass bottle (ALE220)	LE															X		X	
18414765	LH01		0.00 - 0.00	Vial (ALE297)	LE																		
				NaOH (ALE245)	LE								X								X		
				HNO3 Filtered (ALE204)	LE									X				X					

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)						18414731					18414743					18414752				18414765
Customer Sample Reference						GW01					GW02					GW03				LH01
AGS Reference																				
Depth (m)						0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
Container						250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1000ml glass bottle (ALE220)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Sample Type						GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	LE	LE	LE	LE
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2																			X			
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2																			X			
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2																			X			
pH Value	All	NDPs: 0 Tests: 9					X					X					X						X	
Phosphate by Kone (w)	All	NDPs: 0 Tests: 2																					X	
Silicon Dissolved by ICP-OES	All	NDPs: 0 Tests: 2																						
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2																			X			
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 5						X					X					X						X
VOC MS (W)	All	NDPs: 0 Tests: 2																						

18414821	SW3		0.00 - 0.00	H2SO4 (ALE244)	SW	
				500ml Plastic (ALE208)	SW	
				250ml BOD (ALE212)	SW	
18414814	SW2		0.00 - 0.00	HNO3 Filtered (ALE204)	SW	
				H2SO4 (ALE244)	SW	
				500ml Plastic (ALE208)	SW	X
				250ml BOD (ALE212)	SW	
18414804	SW1		0.00 - 0.00	HNO3 Filtered (ALE204)	SW	
				H2SO4 (ALE244)	SW	
				500ml Plastic (ALE208)	SW	X
				250ml BOD (ALE212)	SW	
18414784	LH02		0.00 - 0.00	Vial (ALE297)	LE	X
				NaOH (ALE245)	LE	
				HNO3 Filtered (ALE204)	LE	X
				H2SO4 (ALE244)	LE	X
				500ml Plastic (ALE208)	LE	X
				250ml BOD (ALE212)	LE	
				1000ml glass bottle (ALE220)	LE	X
				Vial (ALE297)	LE	X
				NaOH (ALE245)	LE	
18414765	LH01		0.00 - 0.00	HNO3 Filtered (ALE204)	LE	X

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend

X **Test**

N **No Determination Possible**

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			18414821					18414830
Customer Sample Reference			SW3					SW4
AGS Reference								
Depth (m)			0.00 - 0.00					0.00 - 0.00
Container			HNO3 Filtered (ALE204)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	
Sample Type			SW	SW	SW	SW	SW	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 9				X		
Anions by Kone (w)	All	NDPs: 0 Tests: 9			X			
BOD True Filtered	All	NDPs: 0 Tests: 6		X				
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 9			X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 9	X				X	
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 9			X			
pH Value	All	NDPs: 0 Tests: 9			X			

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)	Surface Water (SW)
			Date Sampled	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
			Sample Time	.	.	.	.	.	.
			Date Received	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
			SDG Ref	180927-86	180927-86	180927-86	180927-86	180927-86	180927-86
			Lab Sample No.(s)	18414731	18414743	18414752	18414765	18414784	18414804
			AGS Reference						
Coliforms, Total*	CFU/100ml	SUB		921	1610	2180			
Alkalinity, Total as CaCO3	<2 mg/l	TM043		415 #	473 #	942 #	1680 #	9500 #	
BOD, filtered	<1 mg/l	TM045					3.5	>1310	<1
Oxygen, dissolved	<0.3 mg/l	TM046		9.02	8.69	7.5	4.35	0.35	12.6
Organic Carbon, Total	<3 mg/l	TM090		<3 #	3.98 #	18.9 #	55.9	6400	
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		0.401 #	0.423 #	29.3 #	223	3080	<0.2 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5	<2.5	
COD, unfiltered	<7 mg/l	TM107					178 #	19800 #	
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.74 #	0.711 #	0.902 #	4.38 #	47.6 #	0.6 #
Antimony (diss.filt)	<1 µg/l	TM152					<1	<6	
Arsenic (diss.filt)	<0.5 µg/l	TM152		2.86 #	1.98 #	3.15 #	4.3 #	33 #	
Barium (diss.filt)	<0.2 µg/l	TM152					651 #	675 #	
Beryllium (diss.filt)	<0.1 µg/l	TM152					<0.1 #	<0.6 #	
Boron (diss.filt)	<10 µg/l	TM152		83.7 #	12.5 #	214 #	644 #	164 #	
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #	<0.08 #	0.0828 #	<0.08 #	<0.48 #	
Chromium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #	<1 #	2.1 #	150 #	
Cobalt (diss.filt)	<0.5 µg/l	TM152					8.82 #	26.2 #	
Copper (diss.filt)	<0.3 µg/l	TM152		0.858 #	<0.3 #	7.67 #	1.16 #	<1.8 #	
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 #	<0.2 #	<0.2 #	0.377 #	1.46 #	
Manganese (diss.filt)	<3 µg/l	TM152		60.2 #	398 #	157 #	958 #	2300 #	
Molybdenum (diss.filt)	<3 µg/l	TM152					<3 #	<18 #	
Nickel (diss.filt)	<0.4 µg/l	TM152		16.8 #	3.31 #	36.5 #	29.8 #	132 #	
Phosphorus (diss.filt)	<10 µg/l	TM152		10.3 #	10.3 #	31.6 #	484 #	12400 #	
Selenium (diss.filt)	<1 µg/l	TM152					<1 #	<6 #	
Tellurium (diss.filt)	<2 µg/l	TM152					<2	<12	
Thallium (diss.filt)	<2 µg/l	TM152					<2 #	<12 #	
Titanium (diss.filt)	<1 µg/l	TM152					17.9 #	222 #	
Uranium (diss.filt)	<0.5 µg/l	TM152					0.93 #	7.96 #	
Vanadium (diss.filt)	<1 µg/l	TM152					<1 #	15.9 #	
Zinc (diss.filt)	<1 µg/l	TM152		4.65 #	3.18 #	19.9 #	8.41 #	46.4 #	
Tin (Diss.Filt)	<1 µg/l	TM152					1.35 #	38.9 #	
Silver (diss.filt)	<0.5 µg/l	TM152					<0.5 #	<3 #	
Sodium (Dis.Filt)	<0.076 mg/l	TM152		18.8 #	11.2 #	166 #	329 #	6690 #	15.3 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)	Surface Water (SW)
			Date Sampled	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
			Sample Time	-	-	-	-	-	-
			Date Received	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
			SDG Ref	180927-86	180927-86	180927-86	180927-86	180927-86	180927-86
			Lab Sample No.(s)	18414731	18414743	18414752	18414765	18414784	18414804
			AGS Reference						
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		30.6 #	10.5 #	57.8 #	58.9 #	95.5 #	
Potassium (Dis.Filt)	<0.2 mg/l	TM152		6.05 #	1.65 #	33.1 #	82.4 #	197 #	3.17 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		114 #	160 #	174 #	188 #	303 #	
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.0277 #	<0.019 #	<0.019 #	34.7 #	23.4 #	
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172					1310	721	
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #	
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184					<0.05	30.7	
Sulphate	<2 mg/l	TM184		32 #	26.9 #	124 #	25.5	130	32.3 #
Chloride	<2 mg/l	TM184		15.1 #	24 #	66.3 #	613	14500	27.3 #
Nitrite as N	<0.0152 mg/l	TM184					<0.0152	<0.0152	
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		0.556 #	<0.1 #	0.114 #	<0.1	0.125	
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	
Cyanide, Free	<0.05 mg/l	TM227					<0.05 #	<0.05 #	
pH	<1 pH Units	TM256		7.6 #	7.27 #	7.37 #	7.14 #	7.52 #	8.08 #
Silicon (diss.filt)	<0.05 mg/l	TM284					13.2	3.73	
Dibutyl tin	<5 ng/l	TM328					<5	<5	
Tributyl tin	<1 ng/l	TM328					<1	<1	
Tetrabutyl tin	<2 ng/l	TM328					<2	<2	
Triphenyl tin	<1 ng/l	TM328					<1	<1	
Surrogate	%	TM328					80.2	61.3	
Trifluralin	<0.01 µg/l	TM343					<0.02	<0.02	
alpha-HCH	<0.01 µg/l	TM343					<0.02	<0.02	
gamma-HCH (Lindane)	<0.01 µg/l	TM343					<0.02	<0.02	
Heptachlor	<0.01 µg/l	TM343					<0.03	<0.03	
Aldrin	<0.01 µg/l	TM343					<0.03	<0.03	
beta-HCH	<0.01 µg/l	TM343					<0.01	<0.01	
Isodrin	<0.01 µg/l	TM343					<0.02	<0.02	
Heptachlor epoxide	<0.01 µg/l	TM343					<0.02	<0.02	
o,p'-DDE	<0.01 µg/l	TM343					<0.02	<0.02	
Endosulphan I	<0.01 µg/l	TM343					<0.02	<0.02	
trans-Chlordane	<0.01 µg/l	TM343					<0.02	<0.02	
cis-Chlordane	<0.01 µg/l	TM343					<0.02	<0.02	

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)	Surface Water (SW)
			Date Sampled	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
			Sample Time	-	-	-	-	-	-
			Date Received	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
			SDG Ref	180927-86	180927-86	180927-86	180927-86	180927-86	180927-86
			Lab Sample No.(s)	18414731	18414743	18414752	18414765	18414784	18414804
			AGS Reference						
p,p'-DDE	<0.01 µg/l	TM343					<0.02	<0.02	
Dieldrin	<0.01 µg/l	TM343					<0.02	<0.02	
o,p'-DDD (TDE)	<0.01 µg/l	TM343					<0.02	<0.02	
Endrin	<0.01 µg/l	TM343					<0.02	<0.02	
o,p'-DDT	<0.01 µg/l	TM343					<0.04	<0.04	
p,p'-DDD (TDE)	<0.01 µg/l	TM343					<0.02	<0.02	
Endosulphan II	<0.02 µg/l	TM343					<0.04	<0.04	
p,p'-DDT	<0.01 µg/l	TM343					<0.04	<0.04	
p,p'-Methoxychlor	<0.01 µg/l	TM343					<0.04	<0.04	
Endosulphan Sulphate	<0.02 µg/l	TM343					<0.02	<0.02	
Permethrin I	<0.01 µg/l	TM343					<0.01	<0.01	
Permethrin II	<0.01 µg/l	TM343					<0.01	<0.01	
Dichlorvos	<0.01 µg/l	TM344					<0.01	<0.01	
Mevinphos	<0.01 µg/l	TM344					<0.01	<0.01	
Tecnazene	<0.01 µg/l	TM344					<0.01	<0.01	
Hexachlorobenzene	<0.01 µg/l	TM344					<0.01	<0.01	
Diazinon	<0.01 µg/l	TM344					<0.01	<0.01	
Triallate	<0.01 µg/l	TM344					<0.01	<0.01	
Atrazine	<0.01 µg/l	TM344					<0.01	<0.01	
Simazine	<0.01 µg/l	TM344					<0.01	<0.01	
Disulfoton	<0.01 µg/l	TM344					<0.01	<0.01	
Propetamphos	<0.01 µg/l	TM344					<0.01	<0.01	
Chlorpyriphos-methyl	<0.01 µg/l	TM344					<0.01	<0.01	
Dimethoate	<0.01 µg/l	TM344					<0.01	<0.01	
Pirimiphos-methyl	<0.01 µg/l	TM344					<0.01	<0.01	
Chlorpyriphos	<0.01 µg/l	TM344					<0.01	<0.01	
Methyl Parathion	<0.01 µg/l	TM344					<0.01	<0.01	
Malathion	<0.01 µg/l	TM344					<0.01	<0.01	
Fenthion	<0.01 µg/l	TM344					<0.01	<0.01	
Fenitrothion	<0.01 µg/l	TM344					<0.01	<0.01	
Triadimefon	<0.01 µg/l	TM344					<0.01	<0.01	
Pendimethalin	<0.01 µg/l	TM344					<0.01	<0.01	

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)	Surface Water (SW)
			Date Sampled	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018	26/09/2018
			Sample Time	-	-	-	-	-	-
			Date Received	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
			SDG Ref	180927-86	180927-86	180927-86	180927-86	180927-86	180927-86
			Lab Sample No.(s)	18414731	18414743	18414752	18414765	18414784	18414804
			AGS Reference						
Parathion	<0.01 µg/l	TM344					<0.01	<0.01	
Chlorfenvinphos	<0.01 µg/l	TM344					<0.01	<0.01	
Ethion	<0.01 µg/l	TM344					<0.01	<0.01	
Carbophenothion	<0.01 µg/l	TM344					<0.01	<0.01	
Triazophos	<0.01 µg/l	TM344					<0.01	<0.01	
Phosalone	<0.01 µg/l	TM344					<0.01	<0.01	
Azinphos methyl	<0.02 µg/l	TM344					<0.02	<0.02	
Azinphos ethyl	<0.02 µg/l	TM344					<0.02	<0.02	
Quintozene (PCNB)	<0.01 µg/l	TM345					<0.01	<0.01	
Telodrin	<0.01 µg/l	TM345					<0.01	<0.01	
Chlorothalonil	<0.01 µg/l	TM345					<0.01	<0.01	
Etrimphos	<0.01 µg/l	TM345					<0.01	<0.01	

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW2	SW3	SW4			
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)			
			Date Sampled	26/09/2018	26/09/2018	26/09/2018			
			Sample Time	.	.	.			
			Date Received	27/09/2018	27/09/2018	27/09/2018			
			SDG Ref	180927-86	180927-86	180927-86			
			Lab Sample No.(s)	18414814	18414821	18414830			
			AGS Reference						
BOD, filtered	<1 mg/l	TM045		<1	<1	<1			
Oxygen, dissolved	<0.3 mg/l	TM046		12.1	11.9	9.69			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2 #	<0.2 #	0.842 #			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.613 #	0.605 #	0.615 #			
Sodium (Dis.Filt)	<0.076 mg/l	TM152		16 #	20 #	19.4 #			
Potassium (Dis.Filt)	<0.2 mg/l	TM152		3.14 #	3.16 #	3.43 #			
Sulphate	<2 mg/l	TM184		31.9 #	32 #	32.1 #			
Chloride	<2 mg/l	TM184		27.4 #	27.4 #	29.7 #			
pH	<1 pH Units	TM256		8.17 #	8.24 #	8.05 #			

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Land Leachate (LE)	Land Leachate (LE)				
			Date Sampled	26/09/2018	26/09/2018				
			Sample Time	.	.				
			Date Received	27/09/2018	27/09/2018				
			SDG Ref	180927-86	180927-86				
			Lab Sample No.(s)	18414765	18414784				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<800				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<800				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<800				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<800				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<800				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<800				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<800				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<800				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<800				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<800				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<800				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<800				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<800				
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<800				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<800				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<800				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<800				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<800				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<800				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<800				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<800				
4-Methylphenol (aq)	<1 µg/l	TM176		<1	11400				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<800				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<800				
Azobenzene (aq)	<1 µg/l	TM176		<1	<800				
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<800				
Acenaphthene (aq)	<1 µg/l	TM176		<1	<800				
Anthracene (aq)	<1 µg/l	TM176		<1	<800				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<800				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<800				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		13.9	<1600				
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<800				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<800				

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Land Leachate (LE)	Land Leachate (LE)				
			Date Sampled	26/09/2018	26/09/2018				
			Sample Time	-	-				
			Date Received	27/09/2018	27/09/2018				
			SDG Ref	180927-86	180927-86				
			Lab Sample No.(s)	18414765	18414784				
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<800				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<800				
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<800				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<800				
Carbazole (aq)	<1 µg/l	TM176		<1	<800				
Chrysene (aq)	<1 µg/l	TM176		<1	<800				
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<800				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<800				
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<800				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<800				
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<800				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<4000				
Fluoranthene (aq)	<1 µg/l	TM176		<1	<800				
Fluorene (aq)	<1 µg/l	TM176		<1	<800				
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<800				
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<800				
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<800				
Phenol (aq)	<1 µg/l	TM176		<1	11200				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<800				
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<800				
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<800				
Naphthalene (aq)	<1 µg/l	TM176		<1	<800				
Isophorone (aq)	<1 µg/l	TM176		<1	<800				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<800				
Phenanthrene (aq)	<1 µg/l	TM176		<1	<800				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<800				
Pyrene (aq)	<1 µg/l	TM176		<1	<800				

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Land Leachate (LE)	Land Leachate (LE)			
			Date Sampled	26/09/2018	26/09/2018			
			Sample Time	.	.			
			Date Received	27/09/2018	27/09/2018			
			SDG Ref	180927-86	180927-86			
			Lab Sample No.(s)	18414765	18414784			
			AGS Reference					
Dibromofluoromethane**	%	TM208		101	94.7			
Toluene-d8**	%	TM208		99.5	100			
4-Bromofluorobenzene**	%	TM208		96	91.4			
Dichlorodifluoromethane	<1 µg/l	TM208		13.2 #	18.2 #			
Chloromethane	<1 µg/l	TM208		<1 #	<1 #			
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #			
Bromomethane	<1 µg/l	TM208		<1 #	<1 #			
Chloroethane	<1 µg/l	TM208		2.11 #	<1 #			
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #			
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #			
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #			
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #			
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #			
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	7.07 #			
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1			
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #			
Chloroform	<1 µg/l	TM208		<1 #	<1 #			
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #			
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #			
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #			
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #			
Benzene	<1 µg/l	TM208		2.5 #	4.3 #			
Trichloroethene	<1 µg/l	TM208		<1 #	2.04 #			
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #			
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #			
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #			
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #			
Toluene	<1 µg/l	TM208		<1 #	23.1 #			
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #			
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #			
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #			

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Customer Sample Ref.			LH01	LH02					
Depth (m)			0.00 - 0.00	0.00 - 0.00					
Sample Type			Land Leachate (LE)	Land Leachate (LE)					
Date Sampled			26/09/2018	26/09/2018					
Sample Time			-	-					
Date Received			27/09/2018	27/09/2018					
SDG Ref			180927-86	180927-86					
Lab Sample No.(s)			18414765	18414784					
AGS Reference									
Component	**LOD/Units**	**Method**							
Tetrachloroethene	<1 µg/l	TM208	<1 #	4.98 #					
Dibromochloromethane	<1 µg/l	TM208	<1 #	<1 #					
1,2-Dibromoethane	<1 µg/l	TM208	<1 #	<1 #					
Chlorobenzene	<1 µg/l	TM208	1.92 #	1.4 #					
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #					
Ethylbenzene	<1 µg/l	TM208	2.28 1 #	3.67 1 #					
m,p-Xylene	<1 µg/l	TM208	8.52 #	8.58 #					
o-Xylene	<1 µg/l	TM208	2.81 #	3.1 #					
Styrene	<1 µg/l	TM208	<1 #	<1 #					
Bromoform	<1 µg/l	TM208	<1 #	<1 #					
Isopropylbenzene	<1 µg/l	TM208	2.62 #	<1 #					
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1 #					
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1 #					
Bromobenzene	<1 µg/l	TM208	<1 #	<1 #					
Propylbenzene	<1 µg/l	TM208	<1 #	<1 #					
2-Chlorotoluene	<1 µg/l	TM208	<1 #	<1 #					
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 #	<1 #					
4-Chlorotoluene	<1 µg/l	TM208	<1 #	<1 #					
tert-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #					
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1 #	1.77 #					
sec-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #					
4-iso-Propyltoluene	<1 µg/l	TM208	<1 #	4.48 #					
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #					
1,4-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #					
n-Butylbenzene	<1 µg/l	TM208	<1 #	<1 #					
1,2-Dichlorobenzene	<1 µg/l	TM208	<1 #	1.57 #					
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1					
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1 #					
Hexachlorobutadiene	<1 µg/l	TM208	<1 #	<1 #					
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1 #					
Naphthalene	<1 µg/l	TM208	<1 #	3.58 1 #					
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1 #	<1 #					

Validated

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02
			Depth (m)	0.00 - 0.00	0.00 - 0.00
			Sample Type	Land Leachate (LE)	Land Leachate (LE)
			Date Sampled	26/09/2018	26/09/2018
			Sample Time	-	-
			Date Received	27/09/2018	27/09/2018
			SDG Ref	180927-86	180927-86
			Lab Sample No.(s)	18414765	18414784
			AGS Reference		
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description
SUB		Subcontracted Test
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
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
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
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
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
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
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
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
TM284		
TM328		
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) by GCMS

NA = not applicable.

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

CERTIFICATE OF ANALYSIS

SDG:	180927-86	**Client Reference:**	P1444	**Report Number:**	475903
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18414731	18414743	18414752	18414765	18414784	18414804	18414814	18414821	18414830
Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	SW1	SW2	SW3	SW4
AGS Ref.									
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Land Leachate	Land Leachate	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	04-Oct-2018	05-Oct-2018	05-Oct-2018	04-Oct-2018	05-Oct-2018				
Ammoniacal Nitrogen	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018
Anions by Kone (w)	05-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018	05-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
BOD True Filtered				03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
COD Unfiltered				04-Oct-2018	04-Oct-2018				
Coliforms (W)	05-Oct-2018	05-Oct-2018	05-Oct-2018						
Conductivity (at 20 deg.C)	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018	03-Oct-2018
Cyanide Comp/Free/Total/Thiocyanate	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018				
Dissolved Metals by ICP-MS	05-Oct-2018	04-Oct-2018	04-Oct-2018	05-Oct-2018	09-Oct-2018	08-Oct-2018	08-Oct-2018	08-Oct-2018	08-Oct-2018
Dissolved Oxygen by Probe	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018	01-Oct-2018
Fluoride	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018	04-Oct-2018				
Mercury Dissolved	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018				
Mineral Oil C10-40 Aqueous (W)				02-Oct-2018	02-Oct-2018				
Nitrite by Kone (w)				05-Oct-2018	05-Oct-2018				
Organotins in Aqueous Samples				04-Oct-2018	04-Oct-2018				
Pesticides (Suite I) by GCMS				04-Oct-2018	04-Oct-2018				
Pesticides (Suite II) by GCMS				05-Oct-2018	05-Oct-2018				
Pesticides (Suite III) by GCMS				03-Oct-2018	03-Oct-2018				
pH Value	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018	02-Oct-2018
Phosphate by Kone (w)				05-Oct-2018	05-Oct-2018				
Silicon Dissolved by ICP-OES				04-Oct-2018	04-Oct-2018				
SVOC MS (W) - Aqueous				03-Oct-2018	05-Oct-2018				
Total Organic and Inorganic Carbon	01-Oct-2018	01-Oct-2018	02-Oct-2018	01-Oct-2018	02-Oct-2018				
VOC MS (W)				05-Oct-2018	05-Oct-2018				

City Analysts Limited,
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Customer

Customer Services

ALS Environmental Ltd
Hawarden Business Park
Manor Land
Hawarden, Deeside
UK
CH5 3US

Certificate Of Analysis

Job Number: 18-47798
Issue Number: 2
Report Date: 5 October 2018

Reason for re-issuing report: Edited invoice to split job. SR

Site: 180927-86
PO Number: Not Supplied
Date Samples Received: 27/09/2018

Please find attached the results for the samples received at our laboratory on 27/09/2018.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By: S. Reynolds

Shane Reynolds
Laboratory Manager

Authorised Date: 2 October 2018

Notes:

Results relate only to the items tested.
Information on methods of analysis and performance characteristics is available on request.
Any opinions or interpretations indicated are outside the scope of our INAB accreditation.
This test report shall not be reproduced except in full or with written approval of City Analysts Limited.

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Ringsend,
Dublin 4.

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Certificate Of Analysis

Customer

Customer Services

ALS Environmental Ltd
Hawarden Business Park
Manor Land
Hawarden, Deeside
UK
CH5 3US

Report Reference: 18-47798

Report Version: 2

Site: 180927-86

Sample Description: Cartron GW1

Sample Type: Ground

Lab Reference Number: 412662

Date of Sampling: 27/09/2018

Date Sample Received: 27/09/2018

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	920.8	MPN/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

City Analysts Limited
Environmental Laboratories

City Analysts Limited,
Pigeon House Road,
Ringsend,
Dublin 4.

Tel: (01) 613 6003
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www.cityanalysts.ie

Certificate Of Analysis

Customer

Customer Services

ALS Environmental Ltd
Hawarden Business Park
Manor Land
Hawarden, Deeside
UK
CH5 3US

Report Reference: 18-47798

Report Version: 2

Site: 180927-86

Sample Description: Cartron GW2

Sample Type: Ground

Lab Reference Number: 412663

Date of Sampling: 27/09/2018

Date Sample Received: 27/09/2018

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	1610.0	MPN/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

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Certificate Of Analysis

Customer

Customer Services

ALS Environmental Ltd
Hawarden Business Park
Manor Land
Hawarden, Deeside
UK
CH5 3US

Report Reference: 18-47798

Report Version: 2

Site: 180927-86

Sample Description: Cartron GW3

Sample Type: Ground

Lab Reference Number: 412664

Date of Sampling: 27/09/2018

Date Sample Received: 27/09/2018

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/09/2018	Coliforms	2180.0	MPN/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	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: - 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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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:	17 October 2018
Customer:	D_FTIM_DUB
Sample Delivery Group (SDG):	181009-33
Your Reference:	P1444
Location:	Cartron Big
Report No:	477260

We received 5 samples on Tuesday October 09, 2018 and 5 of these samples were scheduled for analysis which was completed on Wednesday October 17, 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 ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18487365	GW01		0.00 - 0.00	08/10/2018
18487373	GW02		0.00 - 0.00	08/10/2018
18487380	GW03		0.00 - 0.00	08/10/2018
18487390	LH01		0.00 - 0.00	08/10/2018
18487400	LH02		0.00 - 0.00	08/10/2018

Maximum Sample/Coolbox Temperature (°C) : **10**

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.

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.

Validated

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)						18487365					18487373					18487380				18487390
Customer Sample Reference						GW01					GW02					GW03				LH01
AGS Reference																				
Depth (m)						0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
Container						250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Sample Type						GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	LE	LE	LE	LE
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5					X					X					X						X	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 5						X					X					X						X
Anions by Kone (w)	All	NDPs: 0 Tests: 5					X					X					X						X	
BOD True Total	All	NDPs: 0 Tests: 2																				X		
COD Unfiltered	All	NDPs: 0 Tests: 2																				X		
Coliforms (W)	All	NDPs: 0 Tests: 3	X								X					X								
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 5		X								X					X						X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5								X					X					X				
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5							X					X					X					
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 5		X								X					X						X	
Fluoride	All	NDPs: 0 Tests: 5		X								X					X						X	
Mercury Dissolved	All	NDPs: 0 Tests: 5						X					X					X						
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2																			X			
Nitrite by Kone (w)	All	NDPs: 0 Tests: 2																						
Organotins in Aqueous Samples	All	NDPs: 0 Tests: 2																			X			

18487400	LH02		0.00 - 0.00	Vial (ALE297)	LE																														
				NaOH (ALE245)	LE																X												X		
				HNO3 Filtered (ALE204)	LE																		X						X						
				H2SO4 (ALE244)	LE				X																										
				500ml Plastic (ALE208)	LE		X				X								X						X		X								
				250ml BOD (ALE212)	LE								X		X																				
				0.5l glass bottle (ALE227)	LE																										X				X
18487390	LH01		0.00 - 0.00	Vial (ALE297)	LE																														
				NaOH (ALE245)	LE																X												X		
				HNO3 Filtered (ALE204)	LE																		X						X						

Validated

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)						18487365					18487373					18487380					18487390
Customer Sample Reference						GW01					GW02					GW03					LH01
AGS Reference																					
Depth (m)						0.00 - 0.00					0.00 - 0.00					0.00 - 0.00					0.00 - 0.00
Container						250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Sample Type						GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	LE	LE	LE	LE
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2																					X	
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2																					X	
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2																					X	
pH Value	All	NDPs: 0 Tests: 5					X					X					X						X	
Phosphate by Kone (w)	All	NDPs: 0 Tests: 2																					X	
Silicon Dissolved by ICP-OES	All	NDPs: 0 Tests: 2																						
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 2																					X	
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 5						X					X					X						X
VOC MS (W)	All	NDPs: 0 Tests: 2																						

18487400	LH02		0.00 - 0.00	Vial (ALE297)	LE																		X
				NaOH (ALE245)	LE																		
				HNO3 Filtered (ALE204)	LE												X						
				H2SO4 (ALE244)	LE																X		
				500ml Plastic (ALE208)	LE		X		X		X		X		X				X				
				250ml BOD (ALE212)	LE																		
				0.5l glass bottle (ALE227)	LE																		
18487390	LH01		0.00 - 0.00	Vial (ALE297)	LE																		X
				NaOH (ALE245)	LE																		
				HNO3 Filtered (ALE204)	LE												X						

Validated

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)
			Date Sampled	08/10/2018	08/10/2018	08/10/2018	08/10/2018	08/10/2018
			Sample Time	.	.	.	.	.
			Date Received	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018
			SDG Ref	181009-33	181009-33	181009-33	181009-33	181009-33
			Lab Sample No.(s)	18487365	18487373	18487380	18487390	18487400
			AGS Reference					
Coliforms, Total*	CFU/100ml	SUB		19700	7680	1990		
Alkalinity, Total as CaCO3	<2 mg/l	TM043		410 #	630 #	895 #	1520 #	15200 #
BOD, unfiltered	<1 mg/l	TM045					7.89 #	>4990 #
Oxygen, dissolved	<0.3 mg/l	TM046		6.93	7.76	6.02	6.07	1.05
Organic Carbon, Total	<3 mg/l	TM090		<3 #	4.46 #	22.2 #	44.1	9960
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		<0.2 #	<0.2 #	43.5 #	203	5170
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5	4.2
COD, unfiltered	<7 mg/l	TM107					181 #	32300 #
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		0.781 #	0.695 #	1.69 #	3.7 #	72.4 #
Antimony (diss.filt)	<1 µg/l	TM152					<1	<6
Arsenic (diss.filt)	<0.5 µg/l	TM152		4.57 #	1.52 #	7.9 #	4.96 #	<3 #
Barium (diss.filt)	<0.2 µg/l	TM152					681 #	4.23 #
Beryllium (diss.filt)	<0.1 µg/l	TM152					<0.1 #	<0.6 #
Boron (diss.filt)	<10 µg/l	TM152		58.2 #	16.8 #	204 #	750 #	<60 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 #	<0.08 #	<0.08 #	0.175 #	<0.48 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #	1.7 #	4.72 #	<6 #
Cobalt (diss.filt)	<0.5 µg/l	TM152					9.48 #	<3 #
Copper (diss.filt)	<0.3 µg/l	TM152		2.69 #	<0.3 #	5.96 #	4.44 #	<1.8 #
Lead (diss.filt)	<0.2 µg/l	TM152		4.21 #	<0.2 #	1.36 #	19.6 #	<1.2 #
Manganese (diss.filt)	<3 µg/l	TM152		122 #	404 #	989 #	1400 #	<18 #
Molybdenum (diss.filt)	<3 µg/l	TM152					<3 #	<18 #
Nickel (diss.filt)	<0.4 µg/l	TM152		11.3 #	2.9 #	34.3 #	25.7 #	<2.4 #
Phosphorus (diss.filt)	<10 µg/l	TM152		72.5 #	<10 #	31.1 #	808 #	<60 #
Selenium (diss.filt)	<1 µg/l	TM152					<1 #	<6 #
Tellurium (diss.filt)	<2 µg/l	TM152					<2	<12
Thallium (diss.filt)	<2 µg/l	TM152					<2 #	<12 #
Titanium (diss.filt)	<1 µg/l	TM152					51.9 #	43.9 #
Uranium (diss.filt)	<0.5 µg/l	TM152					0.939 #	<3 #
Vanadium (diss.filt)	<1 µg/l	TM152					2.28 #	<6 #
Zinc (diss.filt)	<1 µg/l	TM152		23.7 #	2.67 #	30.4 #	98.2 #	<6 #
Tin (Diss.Filt)	<1 µg/l	TM152					3.98 #	<6 #
Silver (diss.filt)	<0.5 µg/l	TM152					<0.5 #	<3 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		13.9 #	8.24 #	39.4 #	256 #	76.4 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)
			Date Sampled	08/10/2018	08/10/2018	08/10/2018	08/10/2018	08/10/2018
			Sample Time	-	-	-	-	-
			Date Received	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018
			SDG Ref	181009-33	181009-33	181009-33	181009-33	181009-33
			Lab Sample No.(s)	18487365	18487373	18487380	18487390	18487400
			AGS Reference					
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		32.5 #	9.59 #	52.3 #	60.6 #	0.431 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		3.56 #	0.936 #	35.4 #	78.6 #	2.08 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		179 #	165 #	246 #	213 #	<1.2 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.963 #	0.054 #	2.31 #	37.4 #	0.128 #
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172					<100	<100
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 #	<0.01 #	<0.01 #	0.0231 #	<0.01 #
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184					<0.05	32.9
Chloride	<2 mg/l	TM184		11.2 #	26.3 #	44.8 #	453	24700
Nitrite as N	<0.0152 mg/l	TM184					<0.0152	<0.0152
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		<0.1 #	0.144 #	<0.1 #	<0.1	1.24
Sulphate (soluble) as S	<1 mg/l	TM184		6.73 #	10.4 #	34 #	9.23	<10
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
Cyanide, Free	<0.05 mg/l	TM227					<0.05 #	<0.05 #
pH	<1 pH Units	TM256		7.24 #	7.31 #	7.03 #	7.18 #	7.79 #
Silicon (diss.filt)	<0.05 mg/l	TM284					11.5	2.64
Dibutyl tin	<5 ng/l	TM328					<15	<30
Tributyl tin	<1 ng/l	TM328					<3	<6
Tetrabutyl tin	<2 ng/l	TM328					<6	<12
Triphenyl tin	<1 ng/l	TM328					<3	<6
Surrogate	%	TM328					92.3	71.1
Trifluralin	<0.01 µg/l	TM343					<0.1	<0.01
alpha-HCH	<0.01 µg/l	TM343					<0.1	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343					<0.1	<0.01
Heptachlor	<0.01 µg/l	TM343					<0.1	<0.01
Aldrin	<0.01 µg/l	TM343					<0.1	<0.01
beta-HCH	<0.01 µg/l	TM343					<0.1	<0.01
Isodrin	<0.01 µg/l	TM343					<0.1	<0.01
Heptachlor epoxide	<0.01 µg/l	TM343					<0.1	<0.01
o,p'-DDE	<0.01 µg/l	TM343					<0.1	<0.01
Endosulphan I	<0.01 µg/l	TM343					<0.1	<0.01
trans-Chlordane	<0.01 µg/l	TM343					<0.1	<0.01
cis-Chlordane	<0.01 µg/l	TM343					<0.1	<0.01

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)
			Date Sampled	08/10/2018	08/10/2018	08/10/2018	08/10/2018	08/10/2018
			Sample Time	-	-	-	-	-
			Date Received	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018
			SDG Ref	181009-33	181009-33	181009-33	181009-33	181009-33
			Lab Sample No.(s)	18487365	18487373	18487380	18487390	18487400
			AGS Reference					
p,p'-DDE	<0.01 µg/l	TM343					<0.1	<0.01
Dieldrin	<0.01 µg/l	TM343					<0.1	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343					<0.1	0.0399
Endrin	<0.01 µg/l	TM343					<0.1	<0.01
o,p'-DDT	<0.01 µg/l	TM343					<0.1	<0.01
p,p'-DDD (TDE)	<0.01 µg/l	TM343					<0.1	<0.01
Endosulphan II	<0.02 µg/l	TM343					<0.2	<0.02
p,p'-DDT	<0.01 µg/l	TM343					<0.1	<0.01
p,p'-Methoxychlor	<0.01 µg/l	TM343					<0.1	<0.01
Endosulphan Sulphate	<0.02 µg/l	TM343					<0.2	<0.02
Permethrin I	<0.01 µg/l	TM343					<0.1	<0.01
Permethrin II	<0.01 µg/l	TM343					<0.1	<0.01
Dichlorvos	<0.01 µg/l	TM344					<0.01	<0.01
Mevinphos	<0.01 µg/l	TM344					<0.01	<0.01
Tecnazene	<0.01 µg/l	TM344					<0.01	<0.01
Hexachlorobenzene	<0.01 µg/l	TM344					<0.01	<0.01
Diazinon	<0.01 µg/l	TM344					<0.01	<0.01
Triallate	<0.01 µg/l	TM344					<0.01	<0.01
Atrazine	<0.01 µg/l	TM344					<0.01	<0.01
Simazine	<0.01 µg/l	TM344					<0.01	<0.01
Disulfoton	<0.01 µg/l	TM344					<0.01	<0.01
Propetamphos	<0.01 µg/l	TM344					<0.01	<0.01
Chlorpyriphos-methyl	<0.01 µg/l	TM344					<0.01	<0.01
Dimethoate	<0.01 µg/l	TM344					<0.01	<0.01
Pirimiphos-methyl	<0.01 µg/l	TM344					<0.01	<0.01
Chlorpyriphos	<0.01 µg/l	TM344					<0.01	<0.01
Methyl Parathion	<0.01 µg/l	TM344					<0.01	<0.01
Malathion	<0.01 µg/l	TM344					<0.01	<0.01
Fenthion	<0.01 µg/l	TM344					<0.01	<0.01
Fenitrothion	<0.01 µg/l	TM344					<0.01	<0.01
Triadimefon	<0.01 µg/l	TM344					<0.01	<0.01
Pendimethalin	<0.01 µg/l	TM344					<0.01	<0.01

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02	
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
			Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Land Leachate (LE)	
			Date Sampled	08/10/2018	08/10/2018	08/10/2018	08/10/2018	08/10/2018	
			Sample Time	-	-	-	-	-	
			Date Received	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018	
			SDG Ref	181009-33	181009-33	181009-33	181009-33	181009-33	
			Lab Sample No.(s)	18487365	18487373	18487380	18487390	18487400	
			AGS Reference						
Parathion	<0.01 µg/l	TM344					<0.01	<0.01	
Chlorfenvinphos	<0.01 µg/l	TM344					<0.01	<0.01	
Ethion	<0.01 µg/l	TM344					<0.01	<0.01	
Carbophenothion	<0.01 µg/l	TM344					<0.01	<0.01	
Triazophos	<0.01 µg/l	TM344					<0.01	<0.01	
Phosalone	<0.01 µg/l	TM344					<0.01	<0.01	
Azinphos methyl	<0.02 µg/l	TM344					<0.02	<0.02	
Azinphos ethyl	<0.02 µg/l	TM344					<0.02	<0.02	
Quintozene (PCNB)	<0.01 µg/l	TM345					<0.01	<0.01	
Telodrin	<0.01 µg/l	TM345					<0.01	<0.01	
Chlorothalonil	<0.01 µg/l	TM345					<0.01	<0.01	
Etrimphos	<0.01 µg/l	TM345					<0.01	<0.01	

Validated

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Land Leachate (LE)	Land Leachate (LE)				
			Date Sampled	08/10/2018	08/10/2018				
			Sample Time	.	.				
			Date Received	09/10/2018	09/10/2018				
			SDG Ref	181009-33	181009-33				
			Lab Sample No.(s)	18487390	18487400				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1000				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1000				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1000				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1000				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1000				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1000				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1000				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1000				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1000				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1000				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1000				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1000				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1000				
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1000				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1000				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1000				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1000				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1000				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1000				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1000				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1000				
4-Methylphenol (aq)	<1 µg/l	TM176		<1	14000				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1000				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1000				
Azobenzene (aq)	<1 µg/l	TM176		<1	<1000				
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1000				
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1000				
Anthracene (aq)	<1 µg/l	TM176		<1	<1000				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1000				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1000				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		4.92	<2000				
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1000				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1000				

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Land Leachate (LE)	Land Leachate (LE)				
			Date Sampled	08/10/2018	08/10/2018				
			Sample Time	-	-				
			Date Received	09/10/2018	09/10/2018				
			SDG Ref	181009-33	181009-33				
			Lab Sample No.(s)	18487390	18487400				
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1000				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1000				
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1000				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1000				
Carbazole (aq)	<1 µg/l	TM176		<1	<1000				
Chrysene (aq)	<1 µg/l	TM176		<1	<1000				
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1000				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1000				
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1000				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1000				
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1000				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5000				
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1000				
Fluorene (aq)	<1 µg/l	TM176		<1	<1000				
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1000				
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1000				
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1000				
Phenol (aq)	<1 µg/l	TM176		<1	12800				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1000				
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1000				
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1000				
Naphthalene (aq)	<1 µg/l	TM176		<1	<1000				
Isophorone (aq)	<1 µg/l	TM176		<1	<1000				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1000				
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1000				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1000				
Pyrene (aq)	<1 µg/l	TM176		<1	<1000				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02			
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Land Leachate (LE)	Land Leachate (LE)			
			Date Sampled	08/10/2018	08/10/2018			
			Sample Time	.	.			
			Date Received	09/10/2018	09/10/2018			
			SDG Ref	181009-33	181009-33			
			Lab Sample No.(s)	18487390	18487400			
			AGS Reference					
Dibromofluoromethane**	%	TM208		113	98.6			
Toluene-d8**	%	TM208		100	104			
4-Bromofluorobenzene**	%	TM208		97.7	94.9			
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	18.9 #			
Chloromethane	<1 µg/l	TM208		<1 #	<1 #			
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #			
Bromomethane	<1 µg/l	TM208		<1 #	<1 #			
Chloroethane	<1 µg/l	TM208		1.56 #	<1 #			
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #			
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #			
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #			
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #			
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #			
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	7.98 #			
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1			
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #			
Chloroform	<1 µg/l	TM208		<1 #	<1 #			
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #			
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #			
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #			
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #			
Benzene	<1 µg/l	TM208		1.8 #	3.3 #			
Trichloroethene	<1 µg/l	TM208		<1 #	1.24 #			
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #			
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #			
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #			
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #			
Toluene	<1 µg/l	TM208		<1 #	13.3 #			
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #			
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #			
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #			

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CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02				
			Depth (m)	0.00 - 0.00	0.00 - 0.00				
			Sample Type	Land Leachate (LE)	Land Leachate (LE)				
			Date Sampled	08/10/2018	08/10/2018				
			Sample Time	-	-				
			Date Received	09/10/2018	09/10/2018				
			SDG Ref	181009-33	181009-33				
			Lab Sample No.(s)	18487390	18487400				
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	3.14 #				
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #				
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #				
Chlorobenzene	<1 µg/l	TM208		1.13 #	<1 #				
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #				
Ethylbenzene	<1 µg/l	TM208		1.17 #	2.66 #				
m,p-Xylene	<1 µg/l	TM208		2.78 #	5.23 #				
o-Xylene	<1 µg/l	TM208		2.07 #	2.65 #				
Styrene	<1 µg/l	TM208		<1 #	<1 #				
Bromoform	<1 µg/l	TM208		<1 #	<1 #				
Isopropylbenzene	<1 µg/l	TM208		1.52 #	<1 #				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #				
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #				
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #				
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #				
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #				
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #				
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #				
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #				
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	1.2 #				
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #				
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	3.2 #				
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #				
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #				
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #				
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #				
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1				
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #				
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #				
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #				
Naphthalene	<1 µg/l	TM208		<1 #	2.64 #				
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #				

Validated

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	LH01	LH02
			Depth (m)	0.00 - 0.00	0.00 - 0.00
			Sample Type	Land Leachate (LE)	Land Leachate (LE)
			Date Sampled	08/10/2018	08/10/2018
			Sample Time	-	-
			Date Received	09/10/2018	09/10/2018
			SDG Ref	181009-33	181009-33
			Lab Sample No.(s)	18487390	18487400
			AGS Reference		
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description
SUB		Subcontracted Test
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
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
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
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM107	ISO 6060-1989	Determination of Chemical Oxygen Demand using COD Dr Lange Kit
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
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
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
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
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
TM284		
TM328		
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) by GCMS

NA = not applicable.

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

CERTIFICATE OF ANALYSIS

SDG:	181009-33	**Client Reference:**	P1444	**Report Number:**	477260
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18487365	18487373	18487380	18487390	18487400
Customer Sample Ref.	GW01	GW02	GW03	LH01	LH02
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Land Leachate	Land Leachate
Alkalinity as CaCO3	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018	16-Oct-2018
Ammoniacal Nitrogen	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018
Anions by Kone (w)	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018	15-Oct-2018
BOD True Total				15-Oct-2018	14-Oct-2018
COD Unfiltered				12-Oct-2018	12-Oct-2018
Coliforms (W)	11-Oct-2018	11-Oct-2018	11-Oct-2018		
Conductivity (at 20 deg.C)	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018
Cyanide Comp/Free/Total/Thiocyanate	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018
Dissolved Metals by ICP-MS	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018	12-Oct-2018
Dissolved Oxygen by Probe	10-Oct-2018	10-Oct-2018	10-Oct-2018	12-Oct-2018	10-Oct-2018
Fluoride	16-Oct-2018	16-Oct-2018	16-Oct-2018	16-Oct-2018	16-Oct-2018
Mercury Dissolved	12-Oct-2018	11-Oct-2018	11-Oct-2018	11-Oct-2018	12-Oct-2018
Mineral Oil C10-40 Aqueous (W)				16-Oct-2018	16-Oct-2018
Nitrite by Kone (w)				15-Oct-2018	15-Oct-2018
Organotins in Aqueous Samples				12-Oct-2018	12-Oct-2018
Pesticides (Suite I) by GCMS				15-Oct-2018	15-Oct-2018
Pesticides (Suite II) by GCMS				15-Oct-2018	15-Oct-2018
Pesticides (Suite III) by GCMS				17-Oct-2018	16-Oct-2018
pH Value	15-Oct-2018	15-Oct-2018	15-Oct-2018	12-Oct-2018	15-Oct-2018
Phosphate by Kone (w)				15-Oct-2018	15-Oct-2018
Silicon Dissolved by ICP-OES				16-Oct-2018	16-Oct-2018
SVOC MS (W) - Aqueous				15-Oct-2018	12-Oct-2018
Total Organic and Inorganic Carbon	11-Oct-2018	10-Oct-2018	12-Oct-2018	12-Oct-2018	11-Oct-2018
VOC MS (W)				11-Oct-2018	11-Oct-2018

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Customer

Customer Services

ALS Life Sciences
Hawarden Business Park
Manor Lane
Hawarden, Deeside
UK
CH5 3US

Certificate Of Analysis

Job Number: 18-47924
Issue Number: 1
Report Date: 11 October 2018

Site: Cartron Big
PO Number: 181009-33
Date Samples Received: 09/10/2018

Please find attached the results for the samples received at our laboratory on 09/10/2018.

Should you have any queries regarding the report or require any further services, we would be happy to discuss your requirements. For additional information about the company please log-on to our website at the above address.

Thank you for choosing City Analysts Limited. We look forward to assisting you again.

Authorised By: Caitlin Quinn **Authorised Date:** 11 October 2018

Caitlin Quinn
Deputy Quality Manager

Notes:

Results relate only to the items tested.
Information on methods of analysis and performance characteristics is available on request.
Any opinions or interpretations indicated are outside the scope of our INAB accreditation.

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Certificate Of Analysis

Customer

Customer Services

ALS Life Sciences
Hawarden Business Park
Manor Lane
Hawarden, Deeside
UK
CH5 3US

Report Reference: 18-47924

Report Version: 1

Site: Cartron Big

Sample Description: GW01

Sample Type: Ground

Lab Reference Number: 414098

Date of Sampling: 09/10/2018

Date Sample Received: 09/10/2018

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	09/10/2018	Coliforms	19680.0	MPN/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

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Certificate Of Analysis

Customer

Customer Services

ALS Life Sciences
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Hawarden, Deeside
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CH5 3US

Report Reference: 18-47924

Report Version: 1

Site: Cartron Big

Sample Description: GW02

Sample Type: Ground

Lab Reference Number: 414099

Date of Sampling: 09/10/2018

Date Sample Received: 09/10/2018

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	09/10/2018	Coliforms	7680.0	MPN/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

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Certificate Of Analysis

Customer

Customer Services

ALS Life Sciences
Hawarden Business Park
Manor Lane
Hawarden, Deeside
UK
CH5 3US

Report Reference: 18-47924

Report Version: 1

Site: Cartron Big

Sample Description: GW03

Sample Type: Ground

Lab Reference Number: 414100

Date of Sampling: 09/10/2018

Date Sample Received: 09/10/2018

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	09/10/2018	Coliforms	1986.3	MPN/100ml	-

= INAB Accredited, U = UKAS Accredited, * = Subcontracted

Note:
PV Value is the parametric value, taken from European Communities, (Drinking Water) Regulations, 2014. S.I. No. 122 of 2014 and relates only to drinking water samples.
For queries on results, please contact us within two weeks of the report date to ensure that we can accommodate your query as samples cannot be stored indefinitely.
NAC & ATC - No abnormal change and acceptable to customers.
TVC - Total viable count
Site D = Analysed at City Analysts Dublin. Site S = Analysed at City Analysts Shannon

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	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: - 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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Fehily Timoney
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North Park Offices
North Park Business Park
North Road
Dublin
Dublin 11

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

Date:	17 September 2018
Customer:	D_FTIM_DUB
Sample Delivery Group (SDG):	180907-68
Your Reference:	P1444
Location:	Cartron Big
Report No:	472688

We received 7 samples on Friday September 07, 2018 and 7 of these samples were scheduled for analysis which was completed on Monday September 17, 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 ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	180907-68	**Client Reference:**	P1444	**Report Number:**	472688
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18279869	Ballymulvey BH5		0.00 - 0.00	06/09/2018
18279875	Ballymulvey BH6		0.00 - 0.00	06/09/2018
18279808	Ballymulvey - G		0.00 - 0.00	06/09/2018
18279819	Cartron SW1		0.00 - 0.00	06/09/2018
18279837	Cartron SW2		0.00 - 0.00	06/09/2018
18279849	Cartron SW3		0.00 - 0.00	06/09/2018
18279858	Cartron SW4		0.00 - 0.00	06/09/2018

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.

13.4

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.

Validated

CERTIFICATE OF ANALYSIS

SDG:	180907-68	**Client Reference:**	P1444	**Report Number:**	472688
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)					18279808				18279819				18279837				18279849				18279858			
Customer Sample Reference					Ballymulvey - G				Cartron SW1				Cartron SW2				Cartron SW3				Cartron SW4			
AGS Reference																								
Depth (m)					0.00 - 0.00				0.00 - 0.00				0.00 - 0.00				0.00 - 0.00				0.00 - 0.00			
Container					1plastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1plastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1plastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1plastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	NaOH (ALE245)	1plastic (ALE221)	250ml BOD (ALE212)	HNO3 Filtered (ALE204)	
Sample Type					SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	
Alkalinity as CaCO3	All	NDPs: 0 Tests: 5			X				X				X				X				X			
Anions by Kone (w)	All	NDPs: 0 Tests: 5			X				X				X				X				X			
BOD True Total	All	NDPs: 0 Tests: 5				X				X				X				X				X		
COD Unfiltered	All	NDPs: 0 Tests: 5				X				X				X				X				X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5						X				X				X				X				
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 5					X				X				X				X					X

18279858	Cartron SW4		0.00 - 0.00	NaOH (ALE245)	SW
X					

Validated

CERTIFICATE OF ANALYSIS

SDG:	180907-68	**Client Reference:**	P1444	**Report Number:**	472688
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.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
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			Ballymulvey - G	0.00 - 0.00	Surface Water (SW)	06/09/2018	.	07/09/2018	180907-68	18279808	
			Cartron SW1	0.00 - 0.00	Surface Water (SW)	06/09/2018	.	07/09/2018	180907-68	18279819	
			Cartron SW2	0.00 - 0.00	Surface Water (SW)	06/09/2018	.	07/09/2018	180907-68	18279837	
			Cartron SW3	0.00 - 0.00	Surface Water (SW)	06/09/2018	.	07/09/2018	180907-68	18279849	
			Cartron SW4	0.00 - 0.00	Surface Water (SW)	06/09/2018	.	07/09/2018	180907-68	18279858	
Alkalinity, Total as CaCO3	<2 mg/l	TM043	322 #	293 #	290 #	286 #	302 #				
BOD, unfiltered	<1 mg/l	TM045	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #				
COD, unfiltered	<7 mg/l	TM107	<7 #	12.8 #	24.4 #	<7 #	16.3 #				
Arsenic (diss.filt)	<0.5 µg/l	TM152	1.29 #	1.1 #	1.04 #	1.15 #	1.24 #				
Boron (diss.filt)	<10 µg/l	TM152	12.7 #	16.6 #	21.1 #	18.4 #	25.8 #				
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #	<0.08 #	<0.08 #	<0.08 #				
Calcium (Dis.Filt)	<0.2 mg/l	TM152	115 #	113 #	111 #	109 #	109 #				
Chloride	<2 mg/l	TM184	20.2 #	25.1 #	25.6 #	25.9 #	32.8 #				
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	<0.05	<0.05	<0.05				

CERTIFICATE OF ANALYSIS

SDG:	180907-68	**Client Reference:**	P1444	**Report Number:**	472688
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
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
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
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
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

NA = not applicable.

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	180907-68	**Client Reference:**	P1444	**Report Number:**	472688
Location:	Cartron Big	**Order Number:**	Z1162	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	18279808	18279819	18279837	18279849	18279858
Customer Sample Ref.	Ballymulvey - G	Cartron SW1	Cartron SW2	Cartron SW3	Cartron SW4
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Alkalinity as CaCO3	14-Sep-2018	14-Sep-2018	14-Sep-2018	13-Sep-2018	13-Sep-2018
Anions by Kone (w)	17-Sep-2018	17-Sep-2018	17-Sep-2018	08-Sep-2018	08-Sep-2018
BOD True Total	17-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018
COD Unfiltered	17-Sep-2018	16-Sep-2018	17-Sep-2018	17-Sep-2018	17-Sep-2018
Cyanide Comp/Free/Total/Thiocyanate	14-Sep-2018	13-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018
Dissolved Metals by ICP-MS	14-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018	14-Sep-2018

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) 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.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

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, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

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**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using 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).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	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: - 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.

FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 5

Site Walkover Checklist & Photographs

Cartron Big Walkover Survey Checklist – 26th June 2018

Information	Checked	Comment (include distances from site boundary)
1. What is the current land use?	√	The site is vegetated with grassland is currently under agricultural use.
2. What are the neighbouring land uses?	√	**North:** The L1071 road and an agricultural field bound the north of the site. **South:** Agricultural fields. **East:** Clooncoose Stream **West:** The L3538 road to N4 and agricultural fields.
3. What is the size of the site?	√	The site occupies approximately 4.0 hectares.
4. What is the topography?	√	The countryside surrounding the site is gently undulating. There is a gentle gradient across the site from southeast to the north/northwest toward the Clooncoose stream.
5. Are there potential receptors (if yes, give details)?	√	The Clooncoose stream forms the eastern site boundary, seepage of leachate into the stream was observed. There are houses within 200m of the site. Bedrock Aquifer is classified as a locally important aquifer which is moderately productive and highly to extremely vulnerable to contamination.
Houses	√	There are no houses within 200m of the site boundary.
Surface water features (if yes, distance and direction of flow)	√	The Clooncoose stream forms the eastern site boundary and flows from southeast to northwest.
Any wetland or protected areas	√	None.
Public water supplies	√	A public water supply borehole is located approximately 1 km to the east of the site.
Private wells	√	There are no private wells located with 1km of the site.
Services	√	None identified.
Other buildings	√	Two derelict buildings exist onsite. A small security/weighbridge hut and a derelict farm house.
Other	√	N/A
6. Are there any potential sources of contamination (if yes, give details)?	√	Leachate seepage from shallow waste body into the Clooncoose stream.

Information	Checked	Comment (include distances from site boundary)
Surface waste (if yes, what type?)	√	No
Surface ponding of leachate	√	The site is known for becoming waterlogged in many places, but no ponding was observed during this visit.
Leachate seepage	√	Possible leachate seepage into the Clooncoose stream was observed i.e. red oxide staining to stream bed at two locations
Landfill gas odours	√	No
7. Are there any outfalls to surface water? (If yes, are there discharges and what is the nature of discharge?)	√	Possible leachate seepage into the Clooncoose stream was observed i.e. red oxide staining to stream bed at two locations
8. Are there any signs of impact on the environment? (If yes, take photographic evidence)	√	See Photographic Log
Vegetation die off, bare ground	√	No
Leachate seepages	√	Red oxide staining to stream bed at two locations. See Photographic Log
Odours	√	No
Litter	√	No
Gas bubbling through water	√	No
Signs of settlement	√	Yes, signs of settlement and subsidence were evident, in particular close to the southern site boundary.
Subsidence, water logged areas	√	Within the site, localised subsidence has occurred where waste has settled over time. Areas prone to waterlogging across the site, mainly along the eastern site boundary.
Drainage or hydraulic issues	√	Evidence of localised areas of waterlogging and poor drainage.
Downstream water quality appears poorer than upstream water quality	√	Red oxide staining to stream bed at two locations
9. Are there any indications of remedial measures? (Provide details)	√	Surface water biological quality is monitored at the north-eastern site corner – Cartron Bridge – by the EPA and its status is classified as Good. It is also classified as Good at the next monitoring point 2.5 km downstream.
Capping	√	Yes, the waste body is reported to have been capped with bark, shale and a soil cap.

Information	Checked	Comment (include distances from site boundary)
Landfill gas collection	√	Yes, there are a series of landfill gas vents across the site which appear to be passive. There does not appear to be a landfill gas collection system in place.
Leachate collection	√	No.
10. Describe fences and security features (if any)	√	The eastern site boundary is formed by the Clooncoose stream, with brambles and small beech trees on the opposite bank. Along the northern site boundary with the L1071 the site boundary is formed by an open hedgerow of small trees and brambles with a drainage ditch running from west to east toward the Clooncoose stream. The western site boundary with the L3538 roadway is dense bramble, elder and hawthorn hedge. Access gates from the L3538 are padlocked. Along the southern site boundary is a 2 m chain link fence with concrete posts.
Any other relevant information?	√	No.

PHOTOGRAPHIC LOG

Consultants in Engineering and Environmental Sciences

www.fehilytimoney.ie

FEHILY TIMONEY & COMPANY

Client Name: Longford Co. Co.

Site Location: Cartron Big Landfill

Project Number: P1444

Photo No. 1

Date: 26-06-18

Description:

Main site entrance gates from L3538 road.

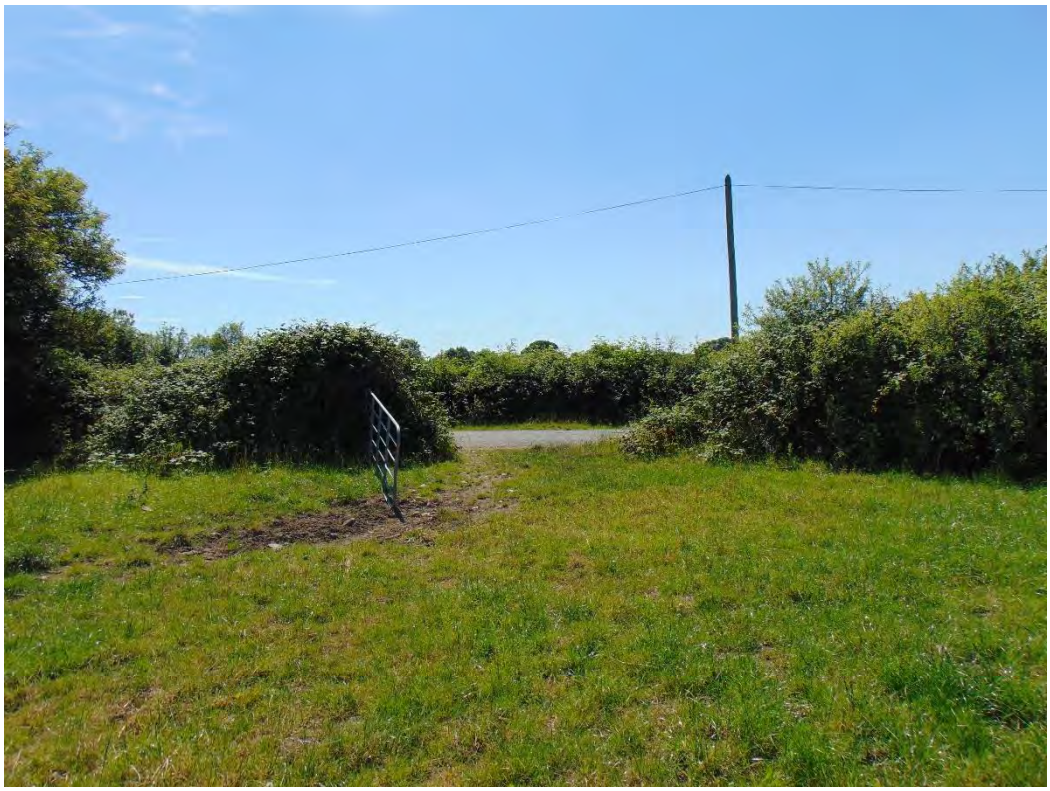
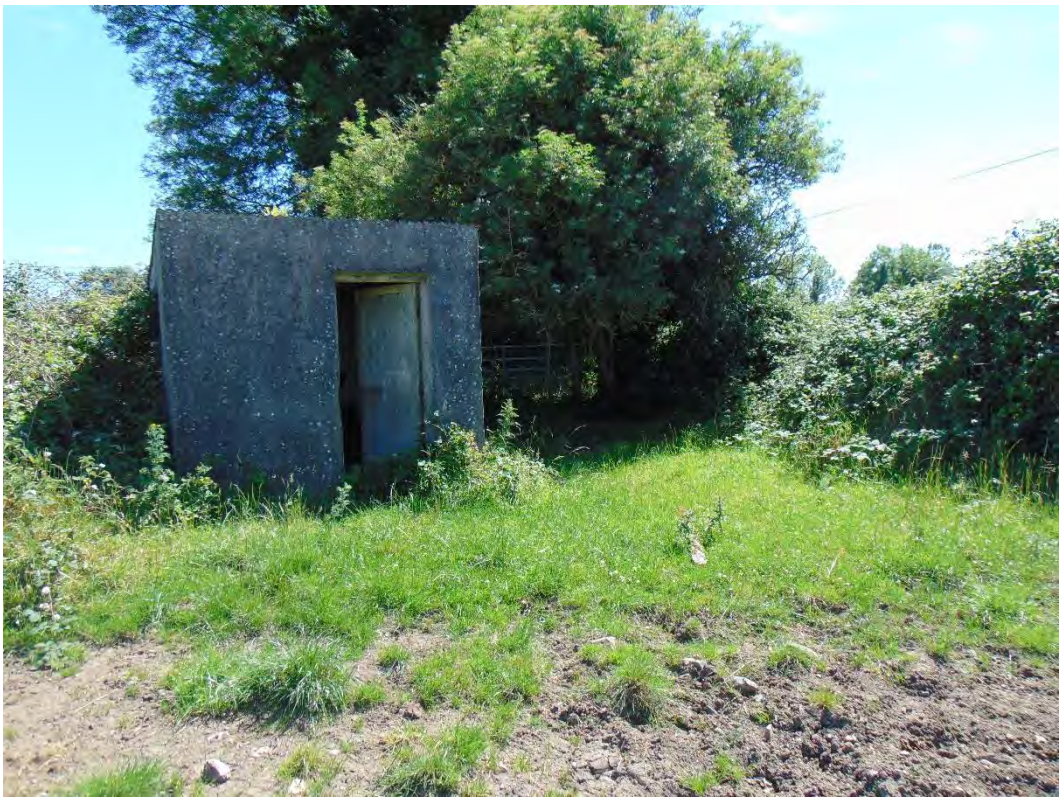


Photo No. 2

Date: 26-06-18

Description:

Derelict security hut near main entrance gates.



PHOTOGRAPHIC LOG

Consultants in Engineering and Environmental Sciences

www.fehilytimoney.ie

FEHILY TIMONEY & COMPANY

Client Name: Longford Co. Co.

Site Location: Cartron Big Landfill

Project Number: P1444

Photo No. 3

Date: 26-06-18

Description:

Derelict building along western boundary and near to concrete hardstand area.

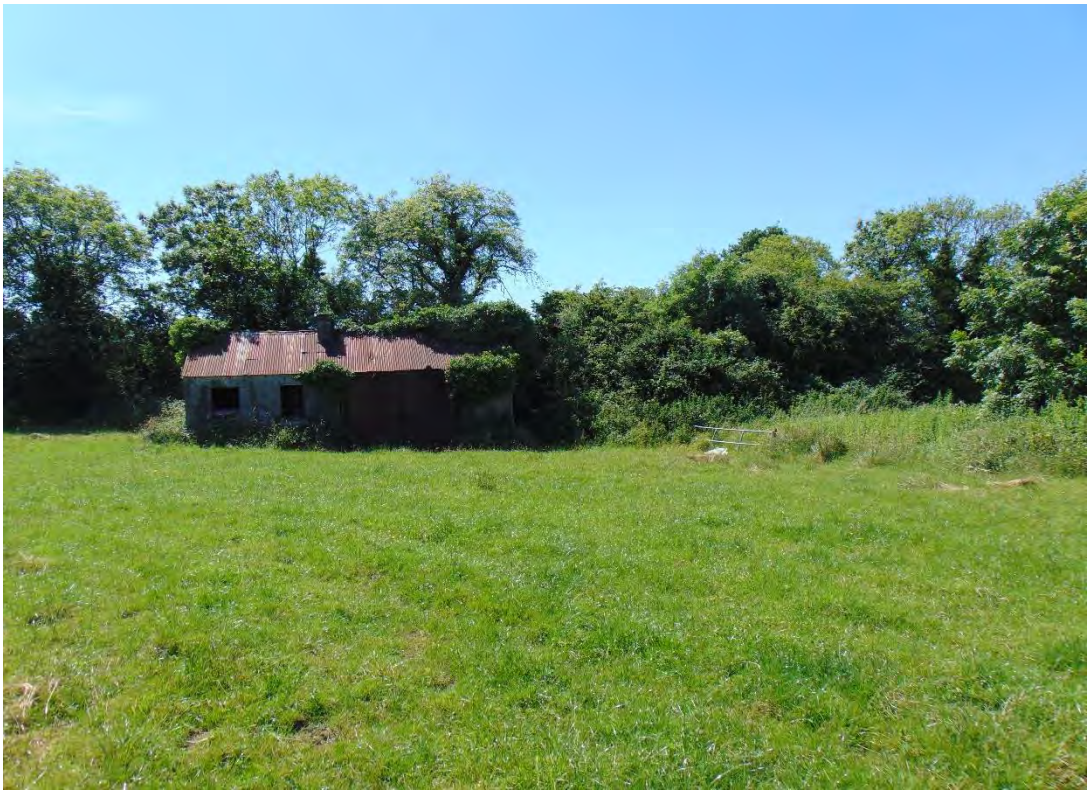
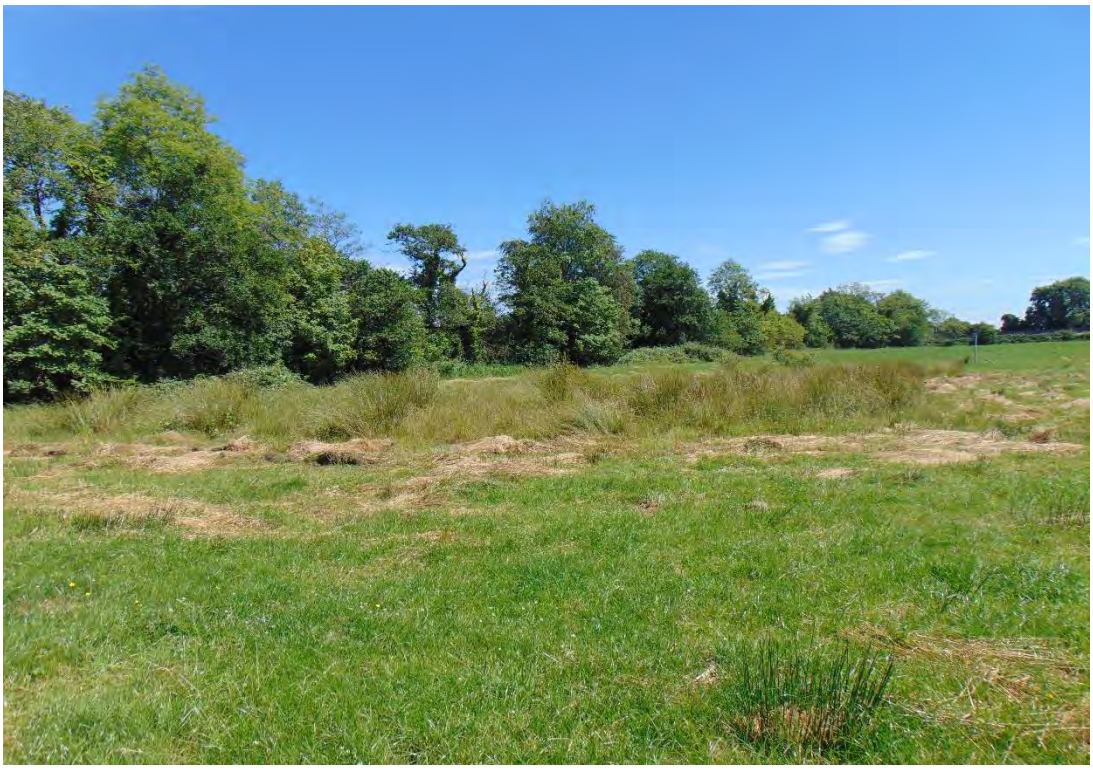


Photo No. 4

Date: 26-06-18

Description:

View showing poorly draining grassland conditions prone to waterlogging along the eastern side of the site.



PHOTOGRAPHIC LOG

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Client Name: Longford Co. Co.	**Site Location:** Cartron Big Landfill	**Project Number:** P1444

Photo No.	**Date:**
5	26-06-18

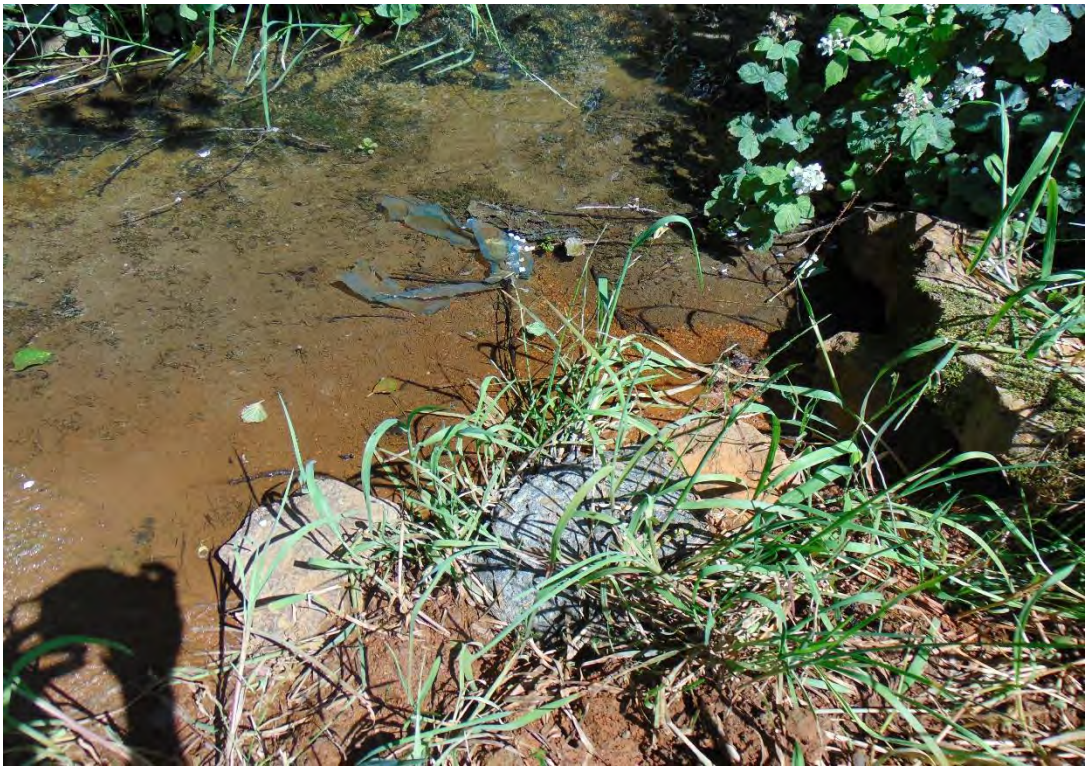
Description:

View showing discoloration to the Clooncoose Stream near the eastern portion of the landfill (possible evidence of leachate seepage from the landfill)

Photo No.	**Date:**
6	26-06-18

Description:

Another view discoloration (red staining) to the Clooncoose Stream near the eastern portion of the landfill (possible evidence of leachate seepage from the landfill)



PHOTOGRAPHIC LOG

Consultants in Engineering and Environmental Sciences

www.fehilytimoney.ie

FEHILY TIMONEY & COMPANY

Client Name: Longford Co. Co.

Site Location: Cartron Big Landfill

Project Number: P1444

Photo No. 7

Date: 26-06-18

Description:

View showing area of Clooncoose Stream in north-eastern corner of landfill.

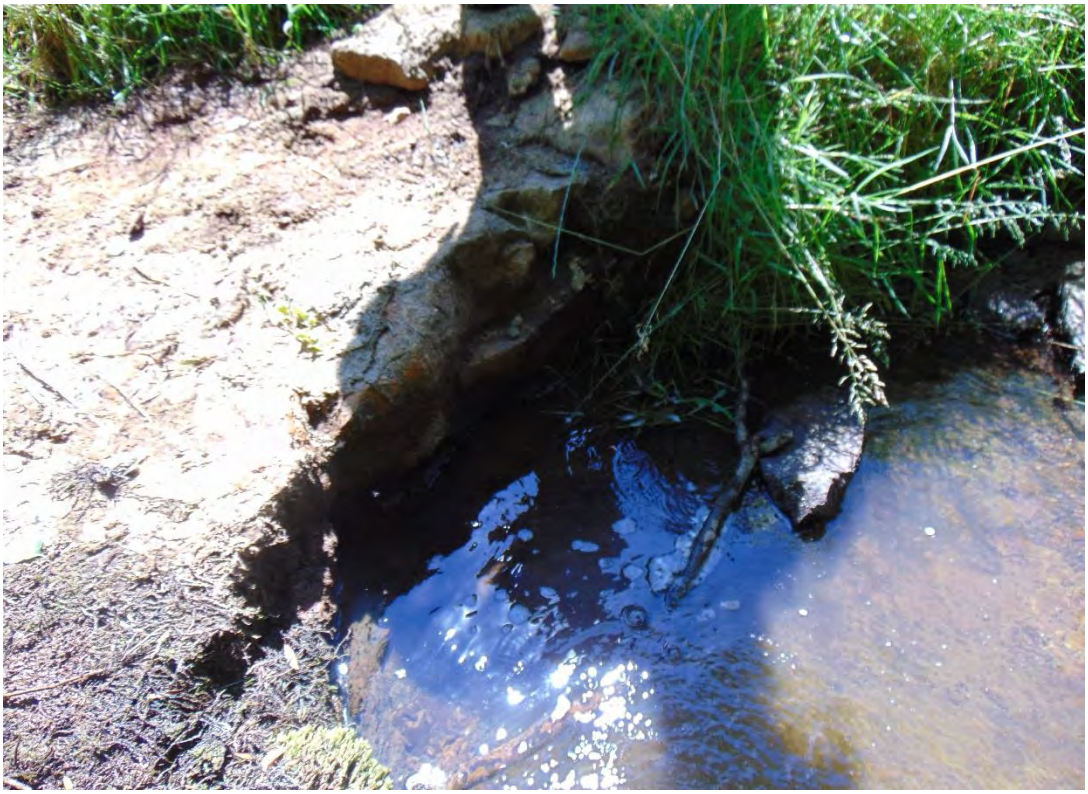
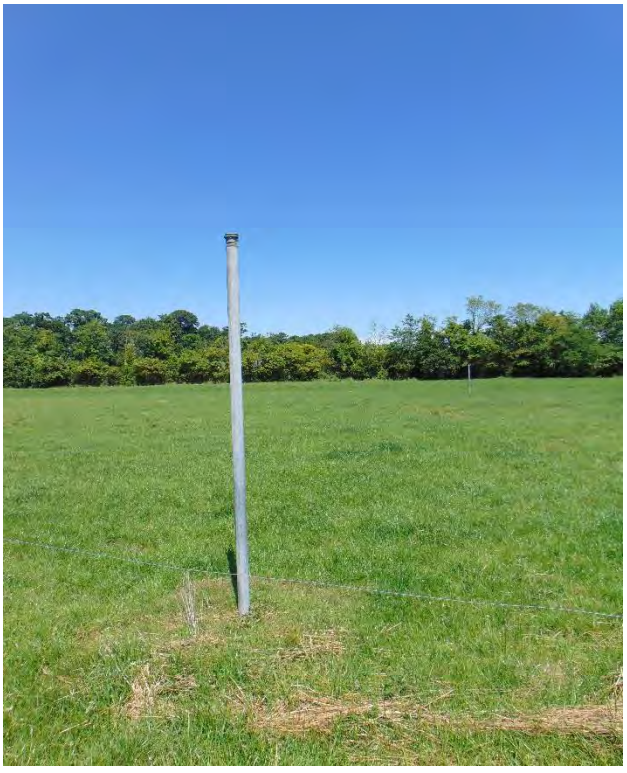


Photo No. 8

Date: 26-06-18

Description:

Existing gas venting system installed within landfill cap.



PHOTOGRAPHIC LOG

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Client Name: Longford Co. Co.	**Site Location:** Cartron Big Landfill	**Project Number:** P1444

Photo No.	**Date:**
9	26-06-18

Description:

View showing the discharge location of iron precipitate entering the Clooncoose Stream from the field north of the landfill. Possibly a preferential pathway to North-North East.

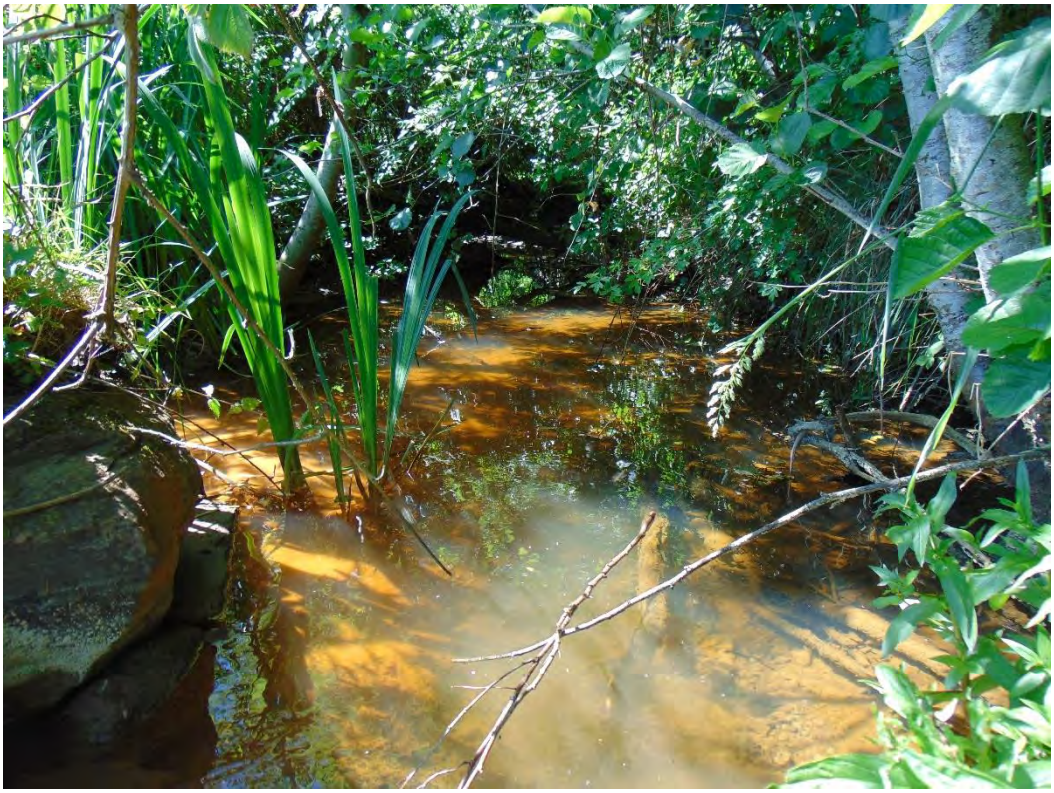
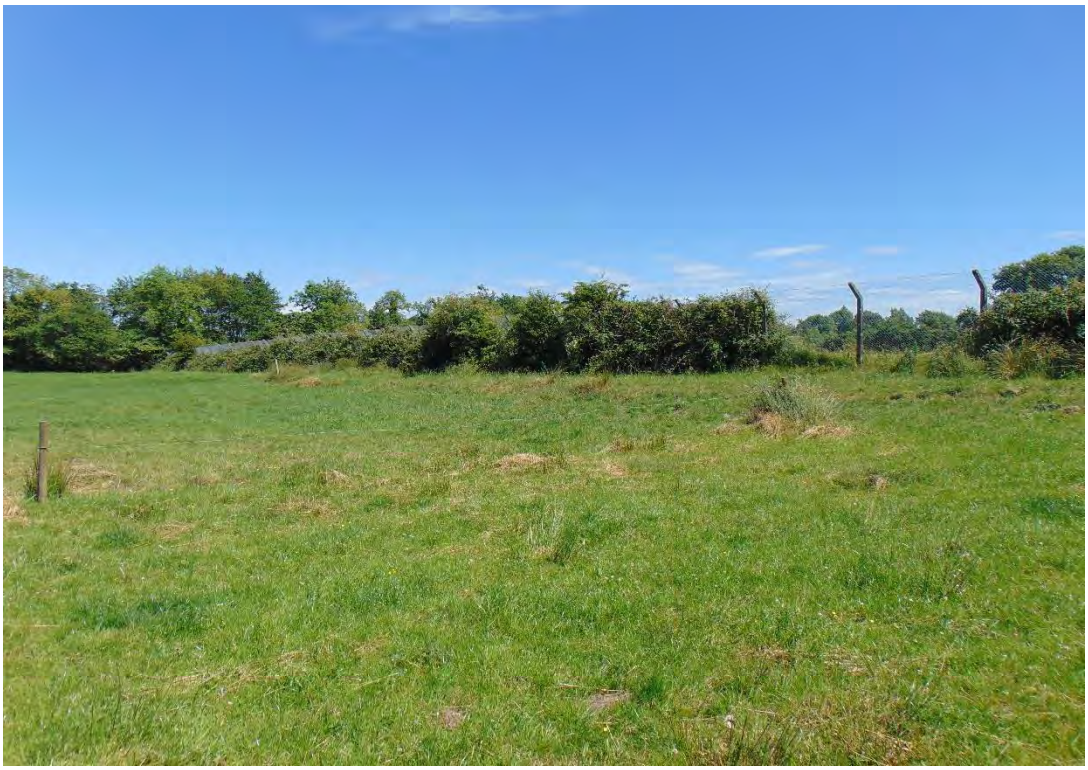


Photo No.	**Date:**
10	26-06-18

Description:

Evidence of land subsidence towards the southern site boundary



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