FEHILY TIMONEY
30 YEARS

CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE & PLANNING

APPENDIX 6

Groundwater and Surface Water Sampling Analysis Results

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Fehily Timoney
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Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

Date of report Generation:	10 July 2020
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	200702-49
Your Reference:	P2282
Location:	Tuam Landfill
Report No:	558533

This report has been revised and directly supersedes 558532 in its entirety.

We received 4 samples on Thursday July 02, 2020 and 4 of these samples were scheduled for analysis which was completed on Friday July 10, 2020. 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).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22408403	SW1		0.00 - 0.00	01/07/2020
22408424	SW2		0.00 - 0.00	01/07/2020
22408437	SW3		0.00 - 0.00	01/07/2020
22408448	SW4		0.00 - 0.00	01/07/2020

Maximum Sample/Coolbox Temperature (°C) : **15.2**

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:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

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)							22408403						22408424						22408437				22408448
Customer Sample Reference							SW1						SW2						SW3				SW4
AGS Reference																							
Depth (m)							0.00 - 0.00						0.00 - 0.00						0.00 - 0.00				0.00 - 0.00
Container							0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)
Sample Type							SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 4					X						X						X						X
Ammonium Low	All	NDPs: 0 Tests: 4				X										X						X			
Anions by Kone (w)	All	NDPs: 0 Tests: 4	X										X						X						X
BOD True Total	All	NDPs: 0 Tests: 4		X										X						X					
COD Unfiltered	All	NDPs: 0 Tests: 4		X										X						X					
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 4			X										X						X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4					X										X						X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4			X										X				X						
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 4			X										X						X				
Fluoride	All	NDPs: 0 Tests: 4			X										X						X				
Mercury Dissolved	All	NDPs: 0 Tests: 4			X										X				X						
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 4			X										X						X				
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 4			X										X						X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 4	X										X						X						X
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 4	X										X						X						X

22408448	SW4		0.00 - 0.00	Vial (ALE297)	SW																
				NaOH (ALE245)	SW							X									
				H2SO4 (ALE244)	SW		X														
				500ml Plastic (ALE208)	SW						X		X		X		X		X		X		
				250ml BOD (ALE212)	SW				X		X												

Validated

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Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

Results Legend

X Test

N No Determination Possible

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UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
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PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
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UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)								22408403							22408424							22408437			22408448
Customer Sample Reference								SW1							SW2							SW3			SW4
AGS Reference																									
Depth (m)								0.00 - 0.00							0.00 - 0.00							0.00 - 0.00			0.00 - 0.00
Container								0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)
Sample Type								SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 4						X						X						X						X
pH Value	All	NDPs: 0 Tests: 4								X						X						X				
Phosphate by Kone (w)	All	NDPs: 0 Tests: 4						X						X						X						X
Suspended Solids	All	NDPs: 0 Tests: 4								X						X						X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 4						X						X						X						X
VOC MS (W)	All	NDPs: 0 Tests: 4											X						X						X	

					22408448
				SW4	
			0.00 - 0.00		
Vial (ALE297)	NaOH (ALE245)	H2SO4 (ALE244)	500ml Plastic (ALE208)	250ml BOD (ALE212)	
SW	SW	SW	SW	SW	
			X		
				X	
X					

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SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
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Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		24.8 #	6.27 #	5.94 #	9.4 #		
BOD, unfiltered	<1 mg/l	TM045		2.25 #	<1 #	<1 #	1.9 #		
Oxygen, dissolved	<0.3 mg/l	TM046		8.26	10.1	9.93	9.99		
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		1.86 #	0.174 #	0.123 #	0.16 #		
Fluoride	<0.5 mg/l	TM104		<0.5	<0.5	<0.5	<0.5		
COD, unfiltered	<7 mg/l	TM107		40.5 #	60.9 #	76.5 #	52.2 #		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120		0.714 #	0.951 #	1.07 #	0.581 #		
Arsenic (diss.filt)	<0.5 µg/l	TM152		1.4 2 #	1.35 2 #	1.28 2 #	2.14 2 #		
Barium (diss.filt)	<0.2 µg/l	TM152		26 2 #	75.4 2 #	64.8 2 #	35.8 2 #		
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #	<0.08 2 #	<0.08 2 #		
Chromium (diss.filt)	<1 µg/l	TM152		1.94 2 #	6.63 2 #	6.74 2 #	7.33 2 #		
Copper (diss.filt)	<0.3 µg/l	TM152		1.96 2 #	3.9 2 #	3.7 2 #	3.71 2 #		
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	<0.2 2 #	<0.2 2 #		
Manganese (diss.filt)	<3 µg/l	TM152		132 2 #	122 2 #	132 2 #	11.2 2 #		
Nickel (diss.filt)	<0.4 µg/l	TM152		3.64 2 #	4.33 2 #	3.88 2 #	6.18 2 #		
Phosphorus (diss.filt)	<10 µg/l	TM152		371 2 #	34.4 2 #	27.7 2 #	30.9 2 #		
Selenium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #	<1 2 #	<1 2 #		
Thallium (diss.filt)	<2 µg/l	TM152		<2 2 #	<2 2 #	<2 2 #	<2 2 #		
Zinc (diss.filt)	<1 µg/l	TM152		1.88 2 #	5.54 2 #	6.44 2 #	8.16 2 #		
Sodium (Dis.Filt)	<0.076 mg/l	TM152		12.6 2 #	44.5 2 #	38.3 2 #	22.3 2 #		
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		8.03 2 #	18.5 2 #	16.5 2 #	9.37 2 #		
Potassium (Dis.Filt)	<0.2 mg/l	TM152		8.94 2 #	18.8 2 #	15.5 2 #	6.99 2 #		
Calcium (Dis.Filt)	<0.2 mg/l	TM152		157 2 #	135 2 #	132 2 #	128 2 #		
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.186 2 #	0.149 2 #	0.143 2 #	0.287 2 #		
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172		<100	<100	<100	<100		
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2	0.0131 2	<0.01 2	<0.01 2		
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		1.01 #	<0.05 #	<0.05 #	<0.05 #		
Sulphate	<2 mg/l	TM184		14.8 #	52.8 #	56.9 #	76.8 #		
Chloride	<2 mg/l	TM184		29.1 #	65.4 #	55.9 #	37.7 #		
PCB congener 28	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 52	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 101	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 118	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		

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Results Legend

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1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
PCB congener 138	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 153	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 180	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105	<0.105	<0.105	<0.105		
Cyanide, Total	<0.05 mg/l	TM227		<0.05 ♦	<0.05 ♦	<0.05	<0.05 ♦		
pH	<1 pH Units	TM256		7.59 #	7.99 #	8.08 #	7.85 #		
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
p,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.04	<0.04	<0.04	<0.04		
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		

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			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Dichlobenil	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Mevinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Tecnazene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Hexachlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Phorate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Diazinon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Triallate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Atrazine	<0.01 µg/l	TM344		0.0139	<0.01	<0.01	<0.01		
Simazine	<0.01 µg/l	TM344		<0.01	<0.01	0.026	<0.01		
Disulfoton	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Chlorpyriphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Malathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Fenthion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Parathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Chlorfenvinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Ethion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Carbophenothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		
Triazophos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.01		

CERTIFICATE OF ANALYSIS

SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
Phosalone	<0.01 µg/l	TM344		<0.02	<0.02	<0.02	<0.02		
Azinphos methyl	<0.02 µg/l	TM344		<0.04	<0.04	<0.04	<0.04		
Azinphos ethyl	<0.02 µg/l	TM344		<0.02	<0.02	<0.02	<0.02		
Etridiazole	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Pentachlorobenzene	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Propachlor	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Quintozene (PCNB)	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Omethoate	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Propazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Propyzamide	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Alachlor	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Prometryn	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Telodrin	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Terbutryn	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Chlorothalonil	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Etrimphos	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Metazachlor	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Cyanazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Trietazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Coumaphos	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Phosphamidon I	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Phosphamidon II	<0.01 µg/l	TM345		<0.01	<0.01	<0.01	<0.01		
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.2	<0.1	<0.1	0.285		
Clopyralid	<0.04 µg/l	TM411		0.44	0.0453	<0.04	<0.04		
MCPA	<0.05 µg/l	TM411		<0.1	<0.05	<0.05	0.0855		
Mecoprop	<0.04 µg/l	TM411		<0.08	0.0627	0.0588	<0.04		
Dicamba	<0.04 µg/l	TM411		<0.08	<0.04	<0.04	<0.04		
MCPB	<0.05 µg/l	TM411		<0.1	<0.05	<0.05	<0.05		
2,4-DB	<0.1 µg/l	TM411		<0.2	<0.1	<0.1	<0.1		
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.1	<0.05	<0.05	<0.05		
Dichlorprop	<0.1 µg/l	TM411		<0.2	<0.1	<0.1	<0.1		
Triclopyr	<0.05 µg/l	TM411		<0.75	<0.05	<0.05	<0.75		
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.2	<0.1	<0.1	<0.1		

CERTIFICATE OF ANALYSIS

SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

Results Legend

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1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.05	<0.05	<0.05		
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.1	<0.05	<0.05	<0.05		
Bromoxynil	<0.04 µg/l	TM411		<0.08	<0.04	<0.04	<0.08		
Benazolin	<0.04 µg/l	TM411		<0.08	<0.04	<0.04	<0.08		
Ioxynil	<0.05 µg/l	TM411		<0.1	<0.1	<0.1	<0.1		
Pentachlorophenol	<0.04 µg/l	TM411		<0.08	<0.04	<0.04	<0.08		
Fluoroxypyr	<0.1 µg/l	TM411		<0.2	<0.1	<0.1	<0.2		

CERTIFICATE OF ANALYSIS

SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2-Chlorophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
2-Nitrophenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
3-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1		
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
4-Methylphenol (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
4-Nitroaniline (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1		
Azobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Acenaphthylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Acenaphthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2 #	<2 #	<2 #	<2 #		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		

CERTIFICATE OF ANALYSIS

SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

SVOC MS (W) - Aqueous

Results Legend

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			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Carbazole (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Chrysene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Dibenzofuran (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Diethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5 #	<5 #	<5 #	<5 #		
Fluoranthene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Fluorene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1		
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1		
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Hexachloroethane (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Nitrobenzene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Naphthalene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Isophorone (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1		
Phenanthrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		
Pyrene (aq)	<1 µg/l	TM176		<1 #	<1 #	<1 #	<1 #		

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VOC MS (W)

Results Legend

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			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
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			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
Dibromofluoromethane**	%	TM208		113	114	111	112		
Toluene-d8**	%	TM208		100	100	99	100		
4-Bromofluorobenzene**	%	TM208		95	95.2	93.2	97.9		
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		

CERTIFICATE OF ANALYSIS

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Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

VOC MS (W)

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			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	00:00:00	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-49	200702-49	200702-49	200702-49		
			Lab Sample No.(s)	22408403	22408424	22408437	22408448		
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1		

CERTIFICATE OF ANALYSIS

SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
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
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
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
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
TM411	Acid_Herbs_GCMS	Acid Herbs in Water 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:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

Test Completion Dates

Lab Sample No(s)	22408403	22408424	22408437	22408448
Customer Sample Ref.	SW1	SW2	SW3	SW4
AGS Ref.				
Depth	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
Acid Herbicides by GCMS	07-Jul-2020	10-Jul-2020	10-Jul-2020	07-Jul-2020
Ammonium Low	06-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Anions by Kone (w)	05-Jul-2020	05-Jul-2020	05-Jul-2020	05-Jul-2020
BOD True Total	08-Jul-2020	08-Jul-2020	08-Jul-2020	08-Jul-2020
COD Unfiltered	06-Jul-2020	06-Jul-2020	06-Jul-2020	06-Jul-2020
Conductivity (at 20 deg.C)	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
Cyanide Comp/Free/Total/Thiocyanate	07-Jul-2020	07-Jul-2020	10-Jul-2020	07-Jul-2020
Dissolved Metals by ICP-MS	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Dissolved Oxygen by Probe	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
Fluoride	03-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Mercury Dissolved	08-Jul-2020	08-Jul-2020	08-Jul-2020	08-Jul-2020
Mineral Oil C10-40 Aqueous (W)	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
PCB Congeners - Aqueous (W)	09-Jul-2020	08-Jul-2020	08-Jul-2020	09-Jul-2020
Pesticides (Suite I) by GCMS	09-Jul-2020	09-Jul-2020	09-Jul-2020	09-Jul-2020
Pesticides (Suite II) by GCMS	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Pesticides (Suite III) by GCMS	09-Jul-2020	09-Jul-2020	09-Jul-2020	09-Jul-2020
pH Value	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
Phosphate by Kone (w)	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
Suspended Solids	08-Jul-2020	08-Jul-2020	08-Jul-2020	08-Jul-2020
SVOC MS (W) - Aqueous	05-Jul-2020	05-Jul-2020	05-Jul-2020	08-Jul-2020
VOC MS (W)	06-Jul-2020	06-Jul-2020	06-Jul-2020	06-Jul-2020

SDG:	200702-49	**Client Reference:**	P2282	**Report Number:**	558533
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558532

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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

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

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

14. 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.

15. 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.

16. 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.

17. **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.

18. **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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

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

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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017).*

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 of report Generation:	15 September 2020
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	200828-75
Your Reference:	P2282
Location:	Tuam Landfill
Report No:	567304

This report has been revised and directly supersedes 566281 in its entirety.

We received 6 samples on Friday August 28, 2020 and 4 of these samples were scheduled for analysis which was completed on Tuesday September 15, 2020. 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).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22736783	SW1		0.00 - 0.00	26/08/2020
22736793	SW2		0.00 - 0.00	26/08/2020
22736803	SW3		0.00 - 0.00	26/08/2020
22736823	SW4		0.00 - 0.00	26/08/2020
22736838	SW5			
22736845	SW6			

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

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)									22736783							22736793						22736803
Customer Sample Reference									SW1							SW2						SW3
AGS Reference																						
Depth (m)									0.00 - 0.00							0.00 - 0.00						0.00 - 0.00
Container									0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)
Sample Type									SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 4							X							X							X				
Ammonium Low	All	NDPs: 0 Tests: 4										X							X							X	
Anions by Kone (w)	All	NDPs: 0 Tests: 4									X							X							X		
BOD True Total	All	NDPs: 0 Tests: 4								X							X							X			
COD Unfiltered	All	NDPs: 0 Tests: 4								X							X							X			
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 4									X							X							X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4												X								X					
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4											X							X							X
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 4									X							X							X		
Fluoride	All	NDPs: 0 Tests: 4									X							X							X		
Mercury Dissolved	All	NDPs: 0 Tests: 4											X							X							X
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 4							X							X							X				
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 4							X							X							X				
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 4							X							X							X				
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 4							X							X							X				

22736823	SW4		0.00 - 0.00	Vial (ALE297)	SW															
				NaOH (ALE245)	SW							X								
				HNO3 Filtered (ALE204)	SW								X			X				
				H2SO4 (ALE244)	SW		X													
				500ml Plastic (ALE208)	SW			X			X			X	X					
				250ml BOD (ALE212)	SW				X	X										
				0.5l glass bottle (ALE227)	SW	X											X	X	X	X
22736803	SW3		0.00 - 0.00	Vial (ALE297)	SW															
				NaOH (ALE245)	SW							X								

Validated

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

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)									22736783							22736793							22736803		
Customer Sample Reference									SW1							SW2							SW3		
AGS Reference																									
Depth (m)									0.00 - 0.00							0.00 - 0.00							0.00 - 0.00		
Container									0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)
Sample Type									SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 4							X							X							X				
pH Value	All	NDPs: 0 Tests: 4									X							X							X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 4									X							X							X		
Suspended Solids	All	NDPs: 0 Tests: 4									X							X							X		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 4									X							X					X				
VOC MS (W)	All	NDPs: 0 Tests: 4							X							X											

									22736823
								SW4	
							0.00 - 0.00		
							Vial (ALE297)	SW	
							NaOH (ALE245)	SW	X
							HNO3 Filtered (ALE204)	SW	
							H2SO4 (ALE244)	SW	
							500ml Plastic (ALE208)	SW	X
							250ml BOD (ALE212)	SW	X
							0.5l glass bottle (ALE227)	SW	X
							Vial (ALE297)	SW	X
							NaOH (ALE245)	SW	
						0.00 - 0.00			
						SW3			
									22736803

Validated

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
Suspended solids, Total	<2 mg/l	TM022		13.5 #	18.3 #	<6 ♦#	5.85 #		
BOD, unfiltered	<1 mg/l	TM045		59.9 #	2.88 #	<1 #	<1 #		
Oxygen, dissolved	<0.3 mg/l	TM046		0.74	7.95	10	11.5		
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		3.42 #	4.79 #	0.0873 #	0.0791 #		
Fluoride	<0.5 mg/l	TM104		0.562	<0.5	<0.5	<0.5		
COD, unfiltered	<7 mg/l	TM107		119 #	128 #	87.8 #	107 #		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120		0.619 #	0.678 #	0.376 #	0.396 #		
Arsenic (diss.filt)	<0.5 µg/l	TM152		2.63 #	2.75 #	1.32 #	2.07 #		
Barium (diss.filt)	<0.2 µg/l	TM152		25.8 #	63.5 #	14.2 #	16.4 #		
Cadmium (diss.filt)	<0.08 µg/l	TM152		0.448 #	<0.08 #	0.136 #	0.476 #		
Chromium (diss.filt)	<1 µg/l	TM152		1.39 #	1.27 #	1.18 #	2.13 #		
Copper (diss.filt)	<0.3 µg/l	TM152		3.32 #	5.26 #	2.47 #	4.8 #		
Lead (diss.filt)	<0.2 µg/l	TM152		0.223 #	0.681 #	0.231 #	0.65 #		
Manganese (diss.filt)	<3 µg/l	TM152		208 #	483 #	34.9 #	30 #		
Nickel (diss.filt)	<0.4 µg/l	TM152		7.04 #	3.4 #	4.36 #	9.3 #		
Phosphorus (diss.filt)	<10 µg/l	TM152		1010 #	191 #	58.1 #	233 #		
Selenium (diss.filt)	<1 µg/l	TM152		<1 #	<1 #	<1 #	<1 #		
Thallium (diss.filt)	<2 µg/l	TM152		<2 #	<2 #	<2 #	<2 #		
Zinc (diss.filt)	<1 µg/l	TM152		9.81 #	16.6 #	10.8 #	20.9 #		
Sodium (Dis.Filt)	<0.076 mg/l	TM152		11.4 #	40.6 #	9.96 #	8.85 #		
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		6.89 #	16.4 #	3.71 #	3.33 #		
Potassium (Dis.Filt)	<0.2 mg/l	TM152		13.8 #	20.8 #	1.45 #	2.25 #		
Calcium (Dis.Filt)	<0.2 mg/l	TM152		129 #	87.5 #	71.8 #	90.4 #		
Iron (Dis.Filt)	<0.019 mg/l	TM152		1.79 #	1.43 #	0.439 #	0.767 #		
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172		<100	<100	<100	<100		
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01	0.114	<0.01	0.0178		
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184		2.18 #	0.169 #	0.074 #	0.374 #		
Sulphate	<2 mg/l	TM184		<10 #	<10 #	2.5 #	<2 #		
Chloride	<2 mg/l	TM184		25.8 #	55.9 #	15 #	15.1 #		
PCB congener 28	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 52	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 101	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 118	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
PCB congener 138	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 153	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
PCB congener 180	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015		
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105	<0.105	<0.105	<0.105		
Cyanide, Total	<0.05 mg/l	TM227		<0.05	<0.05	<0.05	<0.05		
pH	<1 pH Units	TM256		6.94 #	7.37 #	7.12 #	7.23 #		
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM343		<0.02	<0.01	<0.02	<0.01		
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDT	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
p,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.01	<0.02	<0.01		
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.01	<0.02	<0.01		
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.04	<0.02	<0.04	<0.02		
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Dichlobenil	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Mevinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Tecnazene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Hexachlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Phorate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Diazinon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Triallate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Atrazine	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Simazine	<0.01 µg/l	TM344		0.0981	<0.01	0.0458	<0.02		
Disulfoton	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Chlorpyriphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Malathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Fenthion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Pendimethalin	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Parathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Chlorfenvinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
trans-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
cis-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Ethion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Carbophenothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Triazophos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
Phosalone	<0.01 µg/l	TM344		<0.01	<0.01	<0.01	<0.02		
Azinphos methyl	<0.02 µg/l	TM344		<0.04	<0.04	<0.04	<0.04		
Azinphos ethyl	<0.02 µg/l	TM344		<0.02	<0.02	<0.02	<0.04		
Etridiazole	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Pentachlorobenzene	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Tributylphosphate	<0.01 µg/l	TM345					<0.15		
Propachlor	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Quintozene (PCNB)	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Omethoate	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Propazine	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Propyzamide	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Alachlor	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Prometryn	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Telodrin	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Terbutryn	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Chlorothalonil	<0.01 µg/l	TM345		<0.04	<0.04	<0.04	<0.04		
Etrimphos	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Metazachlor	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Cyanazine	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Trietazine	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Coumaphos	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Phosphamidon I	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Phosphamidon II	<0.01 µg/l	TM345		<0.02	<0.02	<0.02	<0.02		
Dinitro-o-cresol	<0.1 µg/l	TM411		0.274	<0.5	<0.1	<1		
Clopyralid	<0.04 µg/l	TM411		0.387	<0.2	<0.04	<0.4		
MCPA	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.5		
Mecoprop	<0.04 µg/l	TM411		<0.04	0.791	<0.04	<0.4		
Dicamba	<0.04 µg/l	TM411		0.0459	<0.2	<0.04	<0.4		
MCPB	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.5		
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<1		
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.5		
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<1		
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.5		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.5	<0.1	<1		
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.5		
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.5		
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.4		
Benazolin	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.4		
Ioxynil	<0.05 µg/l	TM411		<0.05	<0.25	<0.05	<0.5		
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.2	<0.04	<0.4		
Fluoroxypyr	<0.1 µg/l	TM411		0.376	<0.5	<0.1	<1		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
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1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2-Chlorophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2-Methylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
2-Nitrophenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
3-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
4-Chloroaniline (aq)	<1 µg/l	TM176		<4	<8	<10	<4		
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
4-Methylphenol (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
4-Nitroaniline (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
4-Nitrophenol (aq)	<1 µg/l	TM176		<4	<8	<10	<4		
Azobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Acenaphthylene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Acenaphthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Anthracene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<8 #	<16 #	<20 #	<8 #		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Carbazole (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Chrysene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Dibenzofuran (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Diethyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Dimethyl phthalate (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<20 #	<40 #	<50 #	<20 #		
Fluoranthene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Fluorene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Hexachlorobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<8	<10	<4		
Phenol (aq)	<1 µg/l	TM176		<4	<8	<10	<4		
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Hexachloroethane (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Nitrobenzene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Naphthalene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Isophorone (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<4	<8	<10	<4		
Phenanthrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		
Pyrene (aq)	<1 µg/l	TM176		<4 #	<8 #	<10 #	<4 #		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
Dibromofluoromethane**	%	TM208		114	112	113	113		
Toluene-d8**	%	TM208		100	100	100	100		
4-Bromofluorobenzene**	%	TM208		96	97.6	95.9	97.5		
Dichlorodifluoromethane	<1 µg/l	TM208		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #		
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Toluene	<1 µg/l	TM208		2.1 #	<1 #	<1 #	<1 #		
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

VOC MS (W)

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	SW1	SW2	SW3	SW4		
			Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
			Sample Type	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)		
			Date Sampled	26/08/2020	26/08/2020	26/08/2020	26/08/2020		
			Sample Time	.	.	.	.		
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020		
			SDG Ref	200828-75	200828-75	200828-75	200828-75		
			Lab Sample No.(s)	22736783	22736793	22736803	22736823		
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1		

CERTIFICATE OF ANALYSIS

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Table of Results - Appendix

Method No	Reference	Description
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
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
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
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
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
TM411	Acid_Herbs_GCMS	Acid Herbs in Water 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:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

Test Completion Dates

Lab Sample No(s)	22736783	22736793	22736803	22736823
Customer Sample Ref.	SW1	SW2	SW3	SW4
AGS Ref.				
Depth	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
Acid Herbicides by GCMS	05-Sep-2020	05-Sep-2020	05-Sep-2020	05-Sep-2020
Ammonium Low	03-Sep-2020	04-Sep-2020	15-Sep-2020	07-Sep-2020
Anions by Kone (w)	04-Sep-2020	04-Sep-2020	09-Sep-2020	04-Sep-2020
BOD True Total	02-Sep-2020	03-Sep-2020	02-Sep-2020	03-Sep-2020
COD Unfiltered	30-Aug-2020	30-Aug-2020	30-Aug-2020	30-Aug-2020
Conductivity (at 20 deg.C)	02-Sep-2020	02-Sep-2020	11-Sep-2020	02-Sep-2020
Cyanide Comp/Free/Total/Thiocyanate	07-Sep-2020	07-Sep-2020	07-Sep-2020	07-Sep-2020
Dissolved Metals by ICP-MS	03-Sep-2020	05-Sep-2020	10-Sep-2020	05-Sep-2020
Dissolved Oxygen by Probe	03-Sep-2020	03-Sep-2020	10-Sep-2020	03-Sep-2020
Fluoride	01-Sep-2020	01-Sep-2020	10-Sep-2020	01-Sep-2020
Mercury Dissolved	07-Sep-2020	04-Sep-2020	09-Sep-2020	04-Sep-2020
Mineral Oil C10-40 Aqueous (W)	07-Sep-2020	07-Sep-2020	07-Sep-2020	07-Sep-2020
PCB Congeners - Aqueous (W)	06-Sep-2020	06-Sep-2020	06-Sep-2020	06-Sep-2020
Pesticides (Suite I) by GCMS	03-Sep-2020	02-Sep-2020	03-Sep-2020	04-Sep-2020
Pesticides (Suite II) by GCMS	02-Sep-2020	02-Sep-2020	02-Sep-2020	03-Sep-2020
Pesticides (Suite III) by GCMS	07-Sep-2020	07-Sep-2020	07-Sep-2020	07-Sep-2020
pH Value	02-Sep-2020	02-Sep-2020	08-Sep-2020	02-Sep-2020
Phosphate by Kone (w)	01-Sep-2020	01-Sep-2020	09-Sep-2020	01-Sep-2020
Suspended Solids	01-Sep-2020	01-Sep-2020	15-Sep-2020	01-Sep-2020
SVOC MS (W) - Aqueous	02-Sep-2020	02-Sep-2020	01-Sep-2020	02-Sep-2020
VOC MS (W)	07-Sep-2020	07-Sep-2020	07-Sep-2020	07-Sep-2020

SDG:	200828-75	**Client Reference:**	P2282	**Report Number:**	567304
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566281

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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

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

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

14. 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.

15. 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.

16. 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.

17. **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.

18. **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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

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

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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017).*

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 of report Generation:	10 July 2020
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	200702-48
Your Reference:	Galway Historic Landfills
Location:	Tuam Landfill
Report No:	558588

This report has been revised and directly supersedes 558045 in its entirety.

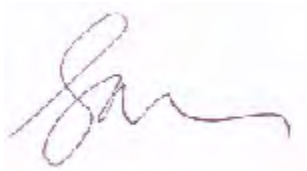
We received 4 samples on Thursday July 02, 2020 and 4 of these samples were scheduled for analysis which was completed on Friday July 10, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 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).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22408325	5A		0.00 - 0.00	01/07/2020
22408337	8A		0.00 - 0.00	01/07/2020
22408350	RC2		0.00 - 0.00	01/07/2020
22408370	RC3		0.00 - 0.00	01/07/2020

Maximum Sample/Coolbox Temperature (°C) : **15.2**

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:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

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)							22408325							22408337							22408350							22408370						
Customer Sample Reference							5A							8A							RC2							RC3						
AGS Reference																																	
Depth (m)							0.00 - 0.00							0.00 - 0.00							0.00 - 0.00							0.00 - 0.00						
Container							0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	STL 19 (ALS)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Sample Type							GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 4					X					X						X					X		
Alkalinity as CaCO3	All	NDPs: 0 Tests: 4					X					X						X					X		
Ammonium Low	All	NDPs: 0 Tests: 4			X									X						X					X
Anions by Kone (w)	All	NDPs: 0 Tests: 4					X					X						X					X		
BOD True Total	All	NDPs: 0 Tests: 4		X					X										X					X	
COD Unfiltered	All	NDPs: 0 Tests: 4					X					X						X					X		
Coliforms (W)	All	NDPs: 0 Tests: 3		X															X					X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 4		X					X										X					X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 4				X									X						X				
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4		X					X										X					X	
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 4		X					X										X					X	
Faecal Coliforms (W)*	All	NDPs: 0 Tests: 1														X									
Fluoride	All	NDPs: 0 Tests: 4		X					X										X					X	
Mercury Dissolved	All	NDPs: 0 Tests: 4		X					X										X					X	
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 4		X					X										X					X	

22408370	RC3		0.00 - 0.00	Vial (ALE297)	GW																														
				NaOH (ALE245)	GW																		X												

Validated

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

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)						22408325						22408337						22408350				22408370
Customer Sample Reference						5A						8A						RC2				RC3
AGS Reference																						
Depth (m)						0.00 - 0.00						0.00 - 0.00						0.00 - 0.00				0.00 - 0.00
Container						0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)		0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	STL 19 (ALS)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Sample Type						GW	GW	GW	GW	GW		GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 4				X						X						X					X		
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 4				X						X						X					X		
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 4				X						X						X					X		
pH Value	All	NDPs: 0 Tests: 4					X						X						X					X	
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 4				X						X						X					X		
Total Coliforms(W)*	All	NDPs: 0 Tests: 1														X									
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 4						X						X						X					X
VOC MS (W)	All	NDPs: 0 Tests: 4								X							X					X			

22408370	RC3		0.00 - 0.00	Vial (ALE297)	GW									x
				NaOH (ALE245)	GW									

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
Faecal coliforms confirmed (M7M)*	0 CFU/100ml	SUB			0				
Coliforms, Total*	MPN/100ml	SUB		914		>2420	>2420		
Total Coliform Presumptive (M16)*	CFU/100ml	SUB			0				
Coliforms, Faecal*	CFU/100ml	SUB		12		<1	<100		
Total Coliform Confirmed (M14)*	CFU/100ml	SUB			0				
Alkalinity, Total as HCO3	<2 mg/l	TM043		967	485	783	641		
BOD, unfiltered	<1 mg/l	TM045		<1 #	<1 #	1.91 #	4.89 #		
Oxygen, dissolved	<0.3 mg/l	TM046		7.57	6.76	5.98	8.56		
Organic Carbon, Total	<3 mg/l	TM090		15.5 #	10.6 #	26.7 #	37.8 #		
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		1.31 #	1.8 #	3.48 #	1.62 #		
Fluoride	<0.5 mg/l	TM104		<0.5 #	0.693 #	<0.5 #	<0.5 #		
COD, unfiltered	<7 mg/l	TM107		217 #	51.5 #	213 #	4660 #		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120		0.666 #	0.87 #	0.769 #	0.423 #		
Arsenic (diss.filt)	<0.5 µg/l	TM152		2.84 2 #	4.88 2 #	2.58 2 #	5.08 2 #		
Barium (diss.filt)	<0.2 µg/l	TM152		53.1 2 #	51.5 2 #	59 2 #	29.1 2 #		
Boron (diss.filt)	<10 µg/l	TM152		<10 2 #	11.2 2 #	17.1 2 #	<10 2 #		
Cadmium (diss.filt)	<0.08 µg/l	TM152		<0.08 2 #	<0.08 2 #	<0.08 2 #	0.103 2 #		
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #	2.29 2 #	1.17 2 #		
Copper (diss.filt)	<0.3 µg/l	TM152		0.357 2 #	<0.3 2 #	0.579 2 #	6.59 2 #		
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	<0.2 2 #	0.584 2 #	1.52 2 #		
Manganese (diss.filt)	<3 µg/l	TM152		91.9 2 #	231 2 #	128 2 #	34.3 2 #		
Nickel (diss.filt)	<0.4 µg/l	TM152		7.98 2 #	19.4 2 #	11.7 2 #	15.3 2 #		
Phosphorus (diss.filt)	<10 µg/l	TM152		<10 2 #	<10 2 #	12.1 2 #	37.2 2 #		
Selenium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #	<1 2 #	<1 2 #		
Thallium (diss.filt)	<2 µg/l	TM152		<2 2 #	<2 2 #	<2 2 #	<2 2 #		
Zinc (diss.filt)	<1 µg/l	TM152		2.38 2 #	2.81 2 #	2.53 2 #	8.86 2 #		
Sodium (Dis.Filt)	<0.076 mg/l	TM152		10.4 2 #	27.2 2 #	13.3 2 #	8.34 2 #		
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		4.92 2 #	9.41 2 #	8.65 2 #	3.64 2 #		
Potassium (Dis.Filt)	<0.2 mg/l	TM152		0.865 2 #	1.56 2 #	2.99 2 #	1.13 2 #		
Calcium (Dis.Filt)	<0.2 mg/l	TM152		160 2 #	187 2 #	177 2 #	97 2 #		
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.33 2 #	1.32 2 #	1.87 2 #	3.04 2 #		
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2 #	<0.01 2 #	<0.01 2 #	<0.01 2 #		
Sulphate	<2 mg/l	TM184		<2 #	18.2 #	<2 #	<4 #		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
Chloride	<2 mg/l	TM184		12.5 #	57.3 #	20.1 #	17.2 #		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		<0.1 #	<0.1 #	<0.1 #	<0.1 #		
PCB congener 28	<0.015 µg/l	TM197		<0.015	<0.03	<0.03	<0.03		
PCB congener 52	<0.015 µg/l	TM197		<0.015	<0.03	<0.03	<0.03		
PCB congener 101	<0.015 µg/l	TM197		<0.015	<0.03	<0.03	<0.03		
PCB congener 118	<0.015 µg/l	TM197		<0.015	<0.03	<0.03	<0.03		
PCB congener 138	<0.015 µg/l	TM197		<0.015	<0.03	<0.03	<0.03		
PCB congener 153	<0.015 µg/l	TM197		<0.015	<0.03	<0.03	<0.03		
PCB congener 180	<0.015 µg/l	TM197		<0.015	<0.03	<0.03	<0.03		
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105	<0.21	<0.21	<0.21		
Cyanide, Total	<0.05 mg/l	TM227		<0.05 ♦ #	<0.05 ♦ #	<0.05 ♦ #	<0.05 ♦ #		
pH	<1 pH Units	TM256		7.22 #	6.93 #	6.86 #	6.99 #		
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
o,p'-DDT	<0.01 µg/l	TM343		<0.03	<0.03	<0.03	<0.03		
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
p,p'-DDT	<0.01 µg/l	TM343		<0.05	<0.05	<0.05	<0.05		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
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**	% 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
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1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.03	<0.03	<0.03	<0.03		
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.05	<0.05	<0.05	<0.05		
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02		
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01		
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Dichlorvos	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Dichlobenil	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Mevinphos	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Tecnazene	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Hexachlorobenzene	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Demeton-S-methyl	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Phorate	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Diazinon	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Triallate	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Atrazine	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Simazine	<0.01 µg/l	TM344		0.082	<0.01	0.132	0.133		
Disulfoton	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Propetamphos	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Dimethoate	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Chlorpyriphos	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Methyl Parathion	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Malathion	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Fenthion	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Fenitrothion	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Parathion	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
Chlorfenvinphos	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Ethion	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Carbophenothion	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Triazophos	<0.01 µg/l	TM344		<0.05	<0.01	<0.01	<0.01		
Phosalone	<0.01 µg/l	TM344		<0.1	<0.02	<0.01	<0.01		
Azinphos methyl	<0.02 µg/l	TM344		<0.2	<0.04	<0.02	<0.02		
Azinphos ethyl	<0.02 µg/l	TM344		<0.1	<0.02	<0.02	<0.02		
Etridiazole	<0.01 µg/l	TM345		<0.2	<0.02	<0.1	<0.4		
Pentachlorobenzene	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Propachlor	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Quintozene (PCNB)	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Omethoate	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Propazine	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Propyzamide	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Alachlor	<0.01 µg/l	TM345		<0.2	<0.02	<0.05	<0.4		
Prometryn	<0.01 µg/l	TM345		<0.1	<0.01	<0.1	<0.2		
Telodrin	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Terbutryn	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Chlorothalonil	<0.01 µg/l	TM345		<10	<1	<5	<20		
Etrimphos	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Metazachlor	<0.01 µg/l	TM345		<0.2	<0.02	<0.05	<0.4		
Cyanazine	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Trietazine	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Coumaphos	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Phosphamidon I	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Phosphamidon II	<0.01 µg/l	TM345		<0.1	<0.01	<0.05	<0.2		
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.2	<0.2	<0.1	<0.1		
Clopyralid	<0.04 µg/l	TM411		<0.04	<0.08	<0.04	<0.04		
MCPA	<0.05 µg/l	TM411		<0.05	<0.1	<0.05	<0.05		
Mecoprop	<0.04 µg/l	TM411		<0.04	<0.08	<0.04	<0.04		
Dicamba	<0.04 µg/l	TM411		<0.04	<0.08	<0.04	<0.04		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

Results Legend	
#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
MCPB	<0.05 µg/l	TM411		<0.05	<0.1	<0.05	<0.05		
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.2	<0.1	<0.1		
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.1	<0.05	<0.05		
Dichlorprop	<0.1 µg/l	TM411		<0.1	<0.2	<0.1	<0.1		
Triclopyr	<0.05 µg/l	TM411		<0.05	<0.1	<0.05	<0.05		
Fenoprop (Silvex)	<0.1 µg/l	TM411		<0.1	<0.2	<0.1	<0.1		
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.1	<0.05	<0.05		
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.05	<0.1	<0.05	<0.05		
Bromoxynil	<0.04 µg/l	TM411		<0.04	<0.08	<0.04	<0.04		
Benazolin	<0.04 µg/l	TM411		<0.04	<0.08	<0.04	<0.04		
Ioxynil	<0.05 µg/l	TM411		<0.1	<0.1	<0.1	<0.1		
Pentachlorophenol	<0.04 µg/l	TM411		<0.04	<0.08	<0.04	<0.04		
Fluoroxypyr	<0.1 µg/l	TM411		<0.1	<0.2	<0.1	<0.1		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2-Chlorophenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2-Methylphenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2-Nitroaniline (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
2-Nitrophenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
3-Nitroaniline (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
4-Chloroaniline (aq)	<1 µg/l	TM176		<50	<2	<10	<100		
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
4-Methylphenol (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
4-Nitroaniline (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
4-Nitrophenol (aq)	<1 µg/l	TM176		<50	<2	<10	<100		
Azobenzene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Acenaphthylene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Acenaphthene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Anthracene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<100 #	<4 #	<20 #	<200 #		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Carbazole (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Chrysene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Dibenzofuran (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Diethyl phthalate (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Dimethyl phthalate (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<250 #	<10 #	<50 #	<500 #		
Fluoranthene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Fluorene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Hexachlorobenzene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Pentachlorophenol (aq)	<1 µg/l	TM176		<50	<2	<10	<100		
Phenol (aq)	<1 µg/l	TM176		<50	<2	<10	<100		
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Hexachloroethane (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Nitrobenzene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Naphthalene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Isophorone (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<50	<2	<10	<100		
Phenanthrene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		
Pyrene (aq)	<1 µg/l	TM176		<50 #	<2 #	<10 #	<100 #		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
Dibromofluoromethane**	%	TM208		113	112	112	113		
Toluene-d8**	%	TM208		100	99.8	100	101		
4-Bromofluorobenzene**	%	TM208		95.7	95	93.7	94		
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		

CERTIFICATE OF ANALYSIS

SDG:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	5A	8A	RC2	RC3		
			Depth (m)	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)	Ground Water (GW)		
			Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
			Sample Time	.	.	.	.		
			Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
			SDG Ref	200702-48	200702-48	200702-48	200702-48		
			Lab Sample No.(s)	22408325	22408337	22408350	22408370		
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1		
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #		
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1		

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
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
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
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
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
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
TM411	Acid_Herbs_GCMS	Acid Herbs in Water 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:	200702-48	**Client Reference:**	Galway Historic Landfills	**Report Number:**	558588
Location:	Tuam Landfill	**Order Number:**		**Superseded Report:**	558045

Test Completion Dates

Lab Sample No(s)	22408325	22408337	22408350	22408370
Customer Sample Ref.	5A	8A	RC2	RC3
AGS Ref.				
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	10-Jul-2020	10-Jul-2020	10-Jul-2020	10-Jul-2020
Alkalinity as CaCO3	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Ammonium Low	06-Jul-2020	06-Jul-2020	06-Jul-2020	06-Jul-2020
Anions by Kone (w)	04-Jul-2020	04-Jul-2020	04-Jul-2020	04-Jul-2020
BOD True Total	08-Jul-2020	08-Jul-2020	08-Jul-2020	08-Jul-2020
COD Unfiltered	06-Jul-2020	06-Jul-2020	06-Jul-2020	06-Jul-2020
Coliforms (W)	06-Jul-2020		06-Jul-2020	06-Jul-2020
Conductivity (at 20 deg.C)	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
Cyanide Comp/Free/Total/Thiocyanate	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Dissolved Metals by ICP-MS	08-Jul-2020	08-Jul-2020	08-Jul-2020	08-Jul-2020
Dissolved Oxygen by Probe	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
Faecal Coliforms (W)*		07-Jul-2020		
Fluoride	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Mercury Dissolved	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
PCB Congeners - Aqueous (W)	09-Jul-2020	09-Jul-2020	09-Jul-2020	09-Jul-2020
Pesticides (Suite I) by GCMS	09-Jul-2020	09-Jul-2020	09-Jul-2020	09-Jul-2020
Pesticides (Suite II) by GCMS	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Pesticides (Suite III) by GCMS	10-Jul-2020	10-Jul-2020	10-Jul-2020	10-Jul-2020
pH Value	09-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
SVOC MS (W) - Aqueous	05-Jul-2020	05-Jul-2020	05-Jul-2020	05-Jul-2020
Total Coliforms(W)*		07-Jul-2020		
Total Organic and Inorganic Carbon	04-Jul-2020	06-Jul-2020	04-Jul-2020	04-Jul-2020
VOC MS (W)	06-Jul-2020	06-Jul-2020	06-Jul-2020	06-Jul-2020

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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: 20-79340
Issue Number: 1
Report Date: 2 July 2020

Site: Galway Historic Landfills
PO Number: Not Supplied
Date Samples Received: 01/07/2020

Please find attached the results for the samples received at our laboratory on 01/07/2020.

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: Debbie Kelly
Laboratory Supervisor

Authorised Date: 2 July 2020

Notes are not INAB accredited

Results relate only to the items tested.
Information on methods of analysis and uncertainty of measurement 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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Certificate Of Analysis

Customer

Customer Services

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

Report Reference: 20-79340

Report Version: 1

Site: Galway Historic Landfills

Sample Description: 5A Tuam

Sample Type: Ground

Lab Reference Number: 517821

Date of Sampling: 01/07/2020

Date Sample Received: 01/07/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	01/07/2020	Coliforms	**913.9**	MPN/100ml	-
D/D3221#	01/07/2020	Faecal Coliforms	**12**	cfu/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: 20-79340

Report Version: 1

Site: Galway Historic Landfills

Sample Description: RC2 Tuam

Sample Type: Ground

Lab Reference Number: 517822

Date of Sampling: 01/07/2020

Date Sample Received: 01/07/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	01/07/2020	Coliforms	> 2419.6	MPN/100ml	-
D/D3221#	01/07/2020	Faecal Coliforms	< 1	cfu/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.
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Certificate Of Analysis

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

Report Reference: 20-79340

Report Version: 1

Site: Galway Historic Landfills

Sample Description: RC3 Tuam

Sample Type: Ground

Lab Reference Number: 517823

Date of Sampling: 01/07/2020

Date Sample Received: 01/07/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	01/07/2020	Coliforms	> 2419.6	MPN/100ml	-
D/D3221#	01/07/2020	Faecal Coliforms	< 100	cfu/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.
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Customer

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Hawarden Business Park
Manor Lane
Hawarden, Deeside
UK
CH5 3US

Report Reference: 20-79340

Report Version: 1

Site: Galway Historic Landfills

Sample Description: Holywell Gort

Sample Type: Ground

Lab Reference Number: 517824

Date of Sampling: 01/07/2020

Date Sample Received: 01/07/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	01/07/2020	Coliforms	> 2419.6	MPN/100ml	-
D/D3221#	01/07/2020	Faecal Coliforms	10	cfu/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

ALS Environmental Ltd
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CV4 9GU

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F: +44 (0)24 7685 6575
www.alsenvironmental.co.uk

Subcon Results
ALS Life Sciences Limited
Torrington Avenue
Tile Hill CV4 9GU

07 July 2020

Test Report: COV/1891189/2020

Dear Subcon Results

Analysis of your sample(s) received on 04 July 2020 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: Elizabeth Parker.

Name: E. Parker

Title: Potable Micro Team Leader

Report Summary

ANALYSED BY

Hawarden Subcon Results
ALS Life Sciences Limited
Torrington Avenue
Tile Hill
CV4 9GU

Date of Issue: **07 July 2020**

Report Number: **COV/1891189/2020** Issue **1**

This issue replaces all previous issues

Job Description: 2017-2018 Analysis

Number of Samples included in this report **2**

Number of Test Results included in this report **3**

Job Received: **04 July 2020**

Analysis Commenced: **04 July 2020**

Signed: Elizabeth Parker.

Name: **E. Parker** Date: **07 July 2020**

Title: **Potable Micro Team Leader**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested and where relevant sampled.
Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.
This test report is not a statement of conformity to any specification or standard.

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

ALS

Report Number:	**COV/1891189/2020**	Issue	**1**
Laboratory Number:	**19450519**	Sample	**1** of **2**

Sample Source:	**ALS Life Sciences Limited**
Sample Point Description:	
Sample Description:	**22416094**
Sample Matrix:	**Ground Water**
Sample Date/Time:	**01 July 2020**
Sample Received:	**04 July 2020**
Analysis Complete:	**07 July 2020**
SDG:	**200702-48**
Sample Reference:	**8A**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Faecal coliforms confirmed	0	cfu/100ml	07/07/2020	N Cov	W57

Analyst Comments for 19450519: This sample has been analysed for Faecal coliforms confirmed outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), OTT = Otterbourne(SO21 2SW), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG), F = Data supplied by customer.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Elizabeth Parker.

Name: **E. Parker** Date: **07 July 2020**

Title: **Potable Micro Team Leader**

ALS Environmental Ltd
Torrington Avenue, Coventry, CV4 9GU
Tel:+44 (0)24 7642 1213 Fax:+44 (0)24 7685 6575

Certificate of Analysis

ANALYSED BY

UKAS TESTING 1314

Report Number:	**COV/1891189/2020**	Issue	**1**
Laboratory Number:	**19450520**	Sample	**2** of **2**
Sample Source:	**ALS Life Sciences Limited**		
Sample Point Description:			
Sample Description:	**22416095**		
Sample Matrix:	**Ground Water**		
Sample Date/Time:	**01 July 2020**		
Sample Received:	**04 July 2020**		
Analysis Complete:	**07 July 2020**		
SDG:	**200702-48**		
Sample Reference:	**8A**		

Test Description	Result	Units	Analysis Date	Accreditation	Method
Total Coliform presump	0	cfu/100ml	05/07/2020	Y Cov	W10
Total Coliforms confirmed	0	cfu/100ml	05/07/2020	Y Cov	W10

Analyst Comments for 19450520: This sample has been analysed for Total Coliforms confirmed, Total Coliform presump outside recommended stability times. It is therefore possible that the results provided may be compromised.

This issue replaces all previous issues
Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.
Analysed at: CHE = Chester(CH5 3US), COV = Coventry(CV4 9GU), OTT = Otterbourne(SO21 2SW), S = Subcontracted, TRB = Subcontracted to Trowbridge(BA14 0XD), WAK = Wakefield(WF5 9TG), F = Data supplied by customer.
For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered.
I/S=Insufficient sample For soil/sludge samples: AR=As received, DW=Dry weight.

Signed: Elizabeth Parker.

Name: **E. Parker** Date: **07 July 2020**

Title: **Potable Micro Team Leader**

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ANALYST COMMENTS FOR REPORT COV/1891189/2020 Issue 1

This issue replaces all previous issues

Date of Issue: **07 July 2020**

Sample No	Analysis Comments
19450519	This sample has been analysed for Faecal coliforms confirmed outside recommended stability times. It is therefore possible that the results provided may be compromised.
19450520	This sample has been analysed for Total Coliforms confirmed, Total Coliform presump outside recommended stability times. It is therefore possible that the results provided may be compromised.

Signed: Elizabeth Parker.

Name: **E. Parker** Date: **07 July 2020**

Title: **Potable Micro Team Leader**

DETERMINAND COMMENTS FOR REPORT COV/1891189/2020

ISSUE 1

This issue replaces all previous issues

Date of Issue: 07 July 2020

Sample No	Description	Determinand	Comments

Signed: Elizabeth Parker.

Name: **E. Parker** Date: **07 July 2020**

Title: **Potable Micro Team Leader**

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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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

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

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

14. 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.

15. 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.

16. 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.

17. **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.

18. **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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

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

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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017).*

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

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

Date of report Generation:	10 September 2020
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	200828-74
Your Reference:	Galway Historic Landfills
Location:	Tuam Landfill
Report No:	566861

This report has been revised and directly supersedes 566323 in its entirety.

We received 6 samples on Friday August 28, 2020 and 6 of these samples were scheduled for analysis which was completed on Thursday September 10, 2020. 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).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22736761	3AP		0.00 - 0.00	27/08/2020
22736754	4AP		0.00 - 0.00	27/08/2020
22736713	5AP		0.00 - 0.00	27/08/2020
22736728	8AP		0.00 - 0.00	27/08/2020
22736738	RC2		0.00 - 0.00	27/08/2020
22736745	RC3		0.00 - 0.00	27/08/2020

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

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)						22736761					22736754					22736713				22736728
Customer Sample Reference						3AP					4AP					5AP				8AP
AGS Reference																				
Depth (m)						0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
Container						0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)	HNO3 Filtered (ALE204)	NaOH (ALE245)	Vial (ALE297)	0.5l glass bottle (ALE227)	500ml Plastic (ALE208)	H2SO4 (ALE244)
Sample Type						GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 6				X					X					X						X		
Alkalinity as CaCO3	All	NDPs: 0 Tests: 6					X					X					X						X	
Ammonium Low	All	NDPs: 0 Tests: 6						X					X					X						X
Anions by Kone (w)	All	NDPs: 0 Tests: 6					X					X					X						X	
BOD True Total	All	NDPs: 0 Tests: 6					X					X					X						X	
COD Unfiltered	All	NDPs: 0 Tests: 6					X					X					X						X	
Coliforms (W)	All	NDPs: 0 Tests: 6					X					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: 6							X					X							X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 6					X					X							X					
Dissolved Oxygen by Probe	All	NDPs: 1 Tests: 5					X					X					X						X	
Fluoride	All	NDPs: 0 Tests: 6					X					X					X						X	
Mercury Dissolved	All	NDPs: 0 Tests: 6					X					X							X					
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 6				X					X					X						X		
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 6				X					X					X						X		

22736745	RC3		0.00 - 0.00	Vial (ALE297)	GW															
				NaOH (ALE245)	GW									X						
				HNO3 Filtered (ALE204)	GW										X			X		
				H2SO4 (ALE244)	GW			X												
				500ml Plastic (ALE208)	GW		X		X	X	X	X				N	X			
				0.5l glass bottle (ALE227)	GW	X													X	X
22736738	RC2		0.00 - 0.00	Vial (ALE297)	GW															
				NaOH (ALE245)	GW									X						
				HNO3 Filtered (ALE204)	GW										X			X		
				H2SO4 (ALE244)	GW			X												
				500ml Plastic (ALE208)	GW		X		X	X	X	X	X			X	X			
				0.5l glass bottle (ALE227)	GW	X													X	X
22736728	8AP		0.00 - 0.00	Vial (ALE297)	GW															
				NaOH (ALE245)	GW									X						
				HNO3 Filtered (ALE204)	GW										X			X		

Validated

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

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)						22736761					22736754					22736713				22736728
Customer Sample Reference						3AP					4AP					5AP				8AP
AGS Reference																				
Depth (m)						0.00 - 0.00					0.00 - 0.00					0.00 - 0.00				0.00 - 0.00
Container						Vial (ALE297)	NaOH (ALE245)	H2SO4 (ALE244)	500ml Plastic (ALE208)	0.5l glass bottle (ALE227)	Vial (ALE297)	NaOH (ALE245)	H2SO4 (ALE244)	500ml Plastic (ALE208)	0.5l glass bottle (ALE227)	Vial (ALE297)	NaOH (ALE245)	HNO3 Filtered (ALE204)	H2SO4 (ALE244)	500ml Plastic (ALE208)	0.5l glass bottle (ALE227)	H2SO4 (ALE244)
Sample Type						GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 6								X					X						X	
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 6								X					X						X	
pH Value	All	NDPs: 0 Tests: 6							X					X						X		
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6							X					X						X		
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 6						X					X					X				X
VOC MS (W)	All	NDPs: 0 Tests: 6				X					X					X						

22736745	RC3		0.00 - 0.00	Vial (ALE297)	GW												X
				NaOH (ALE245)	GW												
				HNO3 Filtered (ALE204)	GW												
				H2SO4 (ALE244)	GW										X		
				500ml Plastic (ALE208)	GW						X		X				
				0.5l glass bottle (ALE227)	GW		X		X								
22736738	RC2		0.00 - 0.00	Vial (ALE297)	GW												X
				NaOH (ALE245)	GW												
				HNO3 Filtered (ALE204)	GW												
				H2SO4 (ALE244)	GW										X		
				500ml Plastic (ALE208)	GW						X		X				
				0.5l glass bottle (ALE227)	GW		X		X								
22736728	8AP		0.00 - 0.00	Vial (ALE297)	GW												X
				NaOH (ALE245)	GW												
				HNO3 Filtered (ALE204)	GW												

Validated

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
Coliforms, Total*	MPN/100ml	SUB		17300	15.5	74.9	64.2	817	52000
Coliforms, Faecal*	CFU/100ml	SUB		740	1	7	4	9	2
Alkalinity, Total as HCO3	<2 mg/l	TM043		383	666	994	439	610	16.5
BOD, unfiltered	<1 mg/l	TM045		2.83 #	6.71 #	2.44 #	2.83 #	<1 #	3.26 #
Oxygen, dissolved	<0.3 mg/l	TM046		11.2	3.21	6.34	9.13	10.1	
Organic Carbon, Total	<3 mg/l	TM090		50.7 #	83 #	17.7 #	7.31 #	33.1 #	99.9 #
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099		0.361 #	2.04 #	1.24 #	0.854 #	3.56 #	0.1 #
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	0.768 #	<0.5 #	<1 #
COD, unfiltered	<7 mg/l	TM107		186 #	432 #	234 #	34.2 #	153 #	384 #
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120		0.525 #	0.966 #	0.568 #	0.866 #	0.762 #	
Arsenic (diss.filt)	<0.5 µg/l	TM152		1.02 2 #	4.33 2 #	4.35 #	31.2 #	2.74 #	2.88 #
Barium (diss.filt)	<0.2 µg/l	TM152		9.75 2 #	138 2 #	53.7 #	63.4 #	53.5 #	25.4 #
Boron (diss.filt)	<10 µg/l	TM152		<10 2 #	13.9 2 #	10.4 #	25.6 #	18 #	<10 #
Cadmium (diss.filt)	<0.08 µg/l	TM152		0.172 2 #	<0.08 2 #	0.115 #	0.17 #	0.519 #	1.68 #
Chromium (diss.filt)	<1 µg/l	TM152		<1 2 #	2.37 2 #	3.72 #	<1 #	5.33 #	1.3 #
Copper (diss.filt)	<0.3 µg/l	TM152		5.2 2 #	0.397 2 #	1.2 #	11.7 #	2.31 #	11.3 #
Lead (diss.filt)	<0.2 µg/l	TM152		<0.2 2 #	1.58 2 #	0.668 #	2.48 #	1.52 #	4.88 #
Manganese (diss.filt)	<3 µg/l	TM152		181 2 #	876 2 #	146 #	204 #	179 #	12.8 #
Nickel (diss.filt)	<0.4 µg/l	TM152		5.92 2 #	7.66 2 #	8.89 #	22.2 #	12 #	9.3 #
Phosphorus (diss.filt)	<10 µg/l	TM152		31.8 2 #	682 2 #	262 #	89 #	171 #	94.9 #
Selenium (diss.filt)	<1 µg/l	TM152		<1 2 #	<1 2 #	<1 #	<1 #	<1 #	<1 #
Thallium (diss.filt)	<2 µg/l	TM152		<2 2 #	<2 2 #	<2 #	<2 #	<2 #	<2 #
Zinc (diss.filt)	<1 µg/l	TM152		3.36 2 #	4.13 2 #	6.5 #	18.4 #	8.67 #	37.9 #
Sodium (Dis.Filt)	<0.076 mg/l	TM152		6.46 2 #	88 2 #	10.3 #	47.1 #	12.7 #	12.7 #
Magnesium (Dis.Filt)	<0.036 mg/l	TM152		4.37 2 #	11.9 2 #	5.26 #	9.1 #	11 #	3.25 #
Potassium (Dis.Filt)	<0.2 mg/l	TM152		0.466 2 #	53.7 2 #	0.916 #	1.64 #	3.12 #	0.237 #
Calcium (Dis.Filt)	<0.2 mg/l	TM152		107 2 #	91.4 2 #	169 #	154 #	355 #	35.9 #
Iron (Dis.Filt)	<0.019 mg/l	TM152		0.657 2 #	30.2 2 #	7.79 #	16.9 #	11.1 #	1.9 #
Mercury (diss.filt)	<0.01 µg/l	TM183		<0.01 2 #	<0.01 2 #	<0.01 #	<0.01 #	<0.01 #	<0.01 #
Sulphate	<2 mg/l	TM184		<10 #	<2 #	2.1 #	42.5 #	<2 #	<4 #
Chloride	<2 mg/l	TM184		14.7 #	48.5 #	13.1 #	90.2 #	21.8 #	14.8 #
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184		<0.5 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #
PCB congener 28	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015

Validated

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
PCB congener 52	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 101	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 118	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 138	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 153	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 180	<0.015 µg/l	TM197		<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105	<0.105	<0.105	<0.105	<0.105	<0.105
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #	<0.05 #
pH	<1 pH Units	TM256		7.11 #	6.69 #	7.16 #	7.17 #	6.9 #	5.68 #
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.02	<0.01	<0.01	<0.01	<0.02	<0.02
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.04	<0.02	<0.02	<0.02	<0.04	<0.04

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	0.113	<0.1	<0.01	<0.01	<0.05
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Dichlorvos	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Dichlobenil	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Mevinphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Tecnazene	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Hexachlorobenzene	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Demeton-S-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Phorate	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Diazinon	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Triallate	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Atrazine	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Simazine	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Disulfoton	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Propetamphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Dimethoate	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Chlorpyriphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Methyl Parathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Malathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Fenthion	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Fenitrothion	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Triadimefon	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Pendimethalin	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Parathion	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Chlorfenvinphos	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
trans-Chlordane	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
cis-Chlordane	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
Ethion	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Carbophenothion	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Triazophos	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Phosalone	<0.01 µg/l	TM344		<0.05	<0.1	<0.1	<0.01	<0.01	<0.05
Azinphos methyl	<0.02 µg/l	TM344		<0.1	<0.2	<0.2	<0.02	<0.04	<0.1
Azinphos ethyl	<0.02 µg/l	TM344		<0.1	<0.2	<0.2	<0.02	<0.02	<0.1
Etridiazole	<0.01 µg/l	TM345		<0.05	<0.04	<0.1	<0.01	<0.02	<0.1
Pentachlorobenzene	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Propachlor	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Quintozene (PCNB)	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Omethoate	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Propazine	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Propyzamide	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Alachlor	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Prometryn	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Telodrin	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Terbutryn	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Chlorothalonil	<0.01 µg/l	TM345		<0.1	<0.02	<0.2	<0.02	<0.04	<0.2
Etrimphos	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Metazachlor	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Cyanazine	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Trietazine	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Coumaphos	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Phosphamidon I	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Phosphamidon II	<0.01 µg/l	TM345		<0.05	<0.02	<0.1	<0.01	<0.02	<0.1
Dinitro-o-cresol	<0.1 µg/l	TM411		<1	<1	<1	<0.2	<1	<1
Clopyralid	<0.04 µg/l	TM411		<0.4	<0.4	<0.4	<0.08	<0.4	<0.4
MCPA	<0.05 µg/l	TM411		<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Mecoprop	<0.04 µg/l	TM411		<0.4	2.64	<0.2	<0.08	<0.4	<0.2
Dicamba	<0.04 µg/l	TM411		<0.4	<0.2	<0.2	<0.08	<0.4	<0.2
MCPB	<0.05 µg/l	TM411		<0.5	<0.25	<0.25	<0.1	<0.5	<0.25
2,4-DB	<0.1 µg/l	TM411		<1	<0.5	<0.5	<0.2	<1	<0.5
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.5	<0.25	<0.25	<0.1	<0.5	<0.25

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
Dichlorprop	<0.1 µg/l	TM411		<1	<0.5	<0.5	<0.2	<1	<0.5
Triclopyr	<0.05 µg/l	TM411		<0.5	<0.25	<0.25	<0.1	<0.5	<0.25
Fenoprop (Silvex)	<0.1 µg/l	TM411		<1	<0.5	<0.5	<0.2	<1	<0.5
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.5	<0.25	<0.25	<0.1	<0.5	<0.25
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411		<0.5	<0.25	<0.25	<0.1	<0.5	<0.25
Bromoxynil	<0.04 µg/l	TM411		<0.4	<0.2	<0.2	<0.08	<0.4	<0.2
Benazolin	<0.04 µg/l	TM411		<0.4	<0.2	<0.2	<0.08	<0.4	<0.2
Ioxynil	<0.05 µg/l	TM411		<0.5	<0.25	<0.25	<0.1	<0.5	<0.25
Pentachlorophenol	<0.04 µg/l	TM411		<0.4	<0.2	<0.2	<0.08	<0.4	<0.2
Fluoroxypyr	<0.1 µg/l	TM411		<1	<0.5	<0.5	<0.2	<1	<0.5

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2-Chlorophenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2-Methylphenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2-Nitroaniline (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
2-Nitrophenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
3-Nitroaniline (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
4-Chloroaniline (aq)	<1 µg/l	TM176		<20	<50	<10	<4	<4	<20
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
4-Methylphenol (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
4-Nitroaniline (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
4-Nitrophenol (aq)	<1 µg/l	TM176		<20	<50	<10	<4	<4	<20
Azobenzene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Acenaphthylene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Acenaphthene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Anthracene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<40 #	<100 #	<20 #	<8 #	<8 #	<40 #
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Carbazole (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Chrysene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Dibenzofuran (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Diethyl phthalate (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Dimethyl phthalate (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<100 #	<250 #	<50 #	<20 #	<20 #	<100 #
Fluoranthene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Fluorene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Hexachlorobenzene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Pentachlorophenol (aq)	<1 µg/l	TM176		<20	<50	<10	<4	<4	<20
Phenol (aq)	<1 µg/l	TM176		<20	<50	<10	<4	<4	<20
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Hexachloroethane (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Nitrobenzene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Naphthalene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Isophorone (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<20	<50	<10	<4	<4	<20
Phenanthrene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #
Pyrene (aq)	<1 µg/l	TM176		<20 #	<50 #	<10 #	<4 #	<4 #	<20 #

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+$@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
Dibromofluoromethane**	%	TM208		113	110	106	115	112	111
Toluene-d8**	%	TM208		102	102	104	99.7	100	101
4-Bromofluorobenzene**	%	TM208		101	96.8	98.8	95.6	94.9	94.6
Dichlorodifluoromethane	<1 µg/l	TM208		<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #	<1 ♦ #
Chloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Vinyl chloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichlorofluoromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbon disulphide	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dichloromethane	<3 µg/l	TM208		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2,2-Dichloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chloroform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Carbontetrachloride	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Benzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Trichloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromomethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromodichloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Toluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

VOC MS (W)

Results Legend

#	ISO17025 accredited.
M	mCERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted - refer to subcontractor report for accreditation status.
**	% 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
1-3+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
			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)	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)
			Date Sampled	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020	27/08/2020
			Sample Time	.	.	.	.	.	.
			Date Received	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020	28/08/2020
			SDG Ref	200828-74	200828-74	200828-74	200828-74	200828-74	200828-74
			Lab Sample No.(s)	22736761	22736754	22736713	22736728	22736738	22736745
			AGS Reference						
Tetrachloroethene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Dibromochloromethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromoethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Chlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Ethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
m,p-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
o-Xylene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Styrene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromoform	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Isopropylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichloropropane	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Bromobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Propylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
2-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-Chlorotoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,4-Trimethylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
sec-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
4-iso-Propyltoluene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,4-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
n-Butylbenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Hexachlorobutadiene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
Naphthalene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,2,3-Trichlorobenzene	<1 µg/l	TM208		<1 #	<1 #	<1 #	<1 #	<1 #	<1 #
1,3,5-Trichlorobenzene	<1 µg/l	TM208		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Notification of NDPs (No determination possible)

Date Received : 28/08/2020 11:22:32

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
22736745	RC3	0.00 - 0.00	Dissolved Oxygen by Probe	Insufficient Sample

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
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
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
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters
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
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
TM411	Acid_Herbs_GCMS	Acid Herbs in Water 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:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

Test Completion Dates

Lab Sample No(s)	22736761	22736754	22736713	22736728	22736738	22736745
Customer Sample Ref.	3AP	4AP	5AP	8AP	RC2	RC3
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
Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Acid Herbicides by GCMS	05-Sep-2020	05-Sep-2020	05-Sep-2020	05-Sep-2020	05-Sep-2020	05-Sep-2020
Alkalinity as CaCO3	03-Sep-2020	03-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	07-Sep-2020
Ammonium Low	07-Sep-2020	05-Sep-2020	04-Sep-2020	04-Sep-2020	04-Sep-2020	05-Sep-2020
Anions by Kone (w)	03-Sep-2020	03-Sep-2020	02-Sep-2020	02-Sep-2020	03-Sep-2020	07-Sep-2020
BOD True Total	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020	04-Sep-2020
COD Unfiltered	30-Aug-2020	30-Aug-2020	30-Aug-2020	30-Aug-2020	30-Aug-2020	05-Sep-2020
Coliforms (W)	04-Sep-2020	04-Sep-2020	01-Sep-2020	10-Sep-2020	04-Sep-2020	04-Sep-2020
Conductivity (at 20 deg.C)	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	
Cyanide Comp/Free/Total/Thiocyanate	03-Sep-2020	03-Sep-2020	03-Sep-2020	07-Sep-2020	03-Sep-2020	07-Sep-2020
Dissolved Metals by ICP-MS	04-Sep-2020	04-Sep-2020	04-Sep-2020	05-Sep-2020	04-Sep-2020	04-Sep-2020
Dissolved Oxygen by Probe	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020	03-Sep-2020	
Fluoride	04-Sep-2020	04-Sep-2020	03-Sep-2020	01-Sep-2020	01-Sep-2020	08-Sep-2020
Mercury Dissolved	04-Sep-2020	07-Sep-2020	07-Sep-2020	04-Sep-2020	07-Sep-2020	07-Sep-2020
PCB Congeners - Aqueous (W)	06-Sep-2020	06-Sep-2020	06-Sep-2020	07-Sep-2020	07-Sep-2020	06-Sep-2020
Pesticides (Suite I) by GCMS	03-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	03-Sep-2020	03-Sep-2020
Pesticides (Suite II) by GCMS	08-Sep-2020	08-Sep-2020	07-Sep-2020	03-Sep-2020	02-Sep-2020	03-Sep-2020
Pesticides (Suite III) by GCMS	07-Sep-2020	07-Sep-2020	07-Sep-2020	03-Sep-2020	07-Sep-2020	07-Sep-2020
pH Value	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	07-Sep-2020
SVOC MS (W) - Aqueous	01-Sep-2020	01-Sep-2020	02-Sep-2020	02-Sep-2020	02-Sep-2020	03-Sep-2020
Total Organic and Inorganic Carbon	30-Aug-2020	30-Aug-2020	30-Aug-2020	30-Aug-2020	02-Sep-2020	01-Sep-2020
VOC MS (W)	07-Sep-2020	07-Sep-2020	07-Sep-2020	07-Sep-2020	07-Sep-2020	07-Sep-2020

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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: 20-82837
Issue Number: 1
Report Date: 1 September 2020

Site: Fehily Timoney
PO Number: ALS GLOBAL
Date Samples Received: 27/08/2020

Please find attached the results for the samples received at our laboratory on 27/08/2020.

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: Louise Morrow **Authorised Date:** 1 September 2020

Louise Morrow

Notes are not INAB accredited

Results relate only to the items tested.
Information on methods of analysis and uncertainty of measurement is available on request.
Any opinions or interpretations indicated are outside the scope of our INAB accreditation.
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CH5 3US

Report Reference: 20-82837

Report Version: 1

Site: Fehily Timoney

Sample Description: 5AP

Sample Type: Ground

Lab Reference Number: 529056

Date of Sampling: 27/08/2020

Date Sample Received: 27/08/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	74.9	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	7	cfu/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
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Report Reference: 20-82837

Report Version: 1

Site: Fehily Timoney

Sample Description: 8AP

Sample Type: Ground

Lab Reference Number: 529057

Date of Sampling: 27/08/2020

Date Sample Received: 27/08/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	64.2	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	4	cfu/100ml	-

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Certificate Of Analysis

Job Number: 20-82835
Issue Number: 2
Report Date: 4 September 2020

Reason for re-issuing report: Final Report

Site: Fehily Timoney
PO Number: ALS GLOBAL
Date Samples Received: 27/08/2020

Please find attached the results for the samples received at our laboratory on 27/08/2020.

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: Louise Morrow **Authorised Date:** 1 September 2020

Louise Morrow

Notes are not INAB accredited

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Report Reference: 20-82835

Report Version: 2

Site: Fehily Timoney

Sample Description: RC2 - TUAM

Sample Type: Ground

Lab Reference Number: 529048

Date of Sampling: 27/08/2020

Date Sample Received: 27/08/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	817.0	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	9	cfu/100ml	-

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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.
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Report Reference: 20-82835

Report Version: 2

Site: Fehily Timoney

Sample Description: RC3- TUAM

Sample Type: Ground

Lab Reference Number: 529049

Date of Sampling: 27/08/2020

Date Sample Received: 27/08/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	52000.0	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	2	cfu/100ml	-

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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.
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Report Reference: 20-82835

Report Version: 2

Site: Fehily Timoney

Sample Description: 3AP-TUAM

Sample Type: Ground

Lab Reference Number: 529050

Date of Sampling: 27/08/2020

Date Sample Received: 27/08/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	17329.0	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	740	cfu/100ml	-

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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.
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Report Reference: 20-82835

Report Version: 2

Site: Fehily Timoney

Sample Description: 4AP- TUAM

Sample Type: Ground

Lab Reference Number: 529051

Date of Sampling: 27/08/2020

Date Sample Received: 27/08/2020

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	15.5	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	1	cfu/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.
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SDG:	200828-74	**Client Reference:**	Galway Historic Landfills	**Report Number:**	566861
Location:	Tuam Landfill	**Order Number:**	Z2189	**Superseded Report:**	566323

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. 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.

3. 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.

4. 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.

5. 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.

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

7. Results relate only to the items tested.

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

9. **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.

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

11. 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.

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

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

14. 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.

15. 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.

16. 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.

17. **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.

18. **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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **Asbestos**

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

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.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2017).*

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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30 YEARS

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