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HISTORIC LANDFILL AT GORT, CO. GALWAY

ENVIRONMENTAL REPORT

Prepared for:
Galway County Council



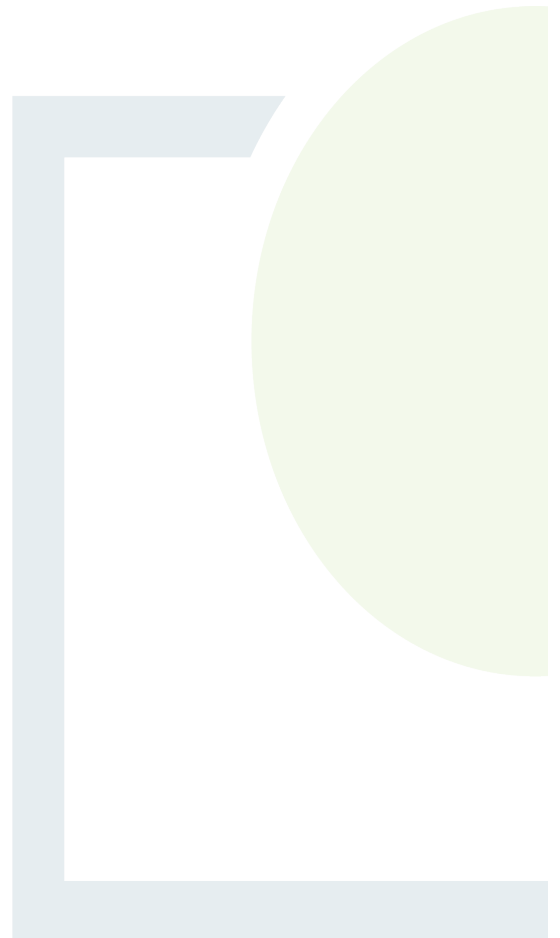
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HISTORIC LANDFILL AT GORT, CO. GALWAY ENVIRONMENTAL REPORT

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Abstract: This report represents the findings of additional environmental monitoring carried out at Gort Historic Landfill, Co. Galway. The monitoring was undertaken to determine the extent of the potential environmental impact of historic landfilling at the site.

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1. INTRODUCTION

1.1 Background

Galway County Council (GCC) appointed Fehily Timoney and Company (FT) to undertake a Tier 2 & 3 Environmental Risk Assessment and prepare a Certificate of Authorisation application of a historic landfill in Gort, Co. Galway. Gort Historic Landfill is located in the immediate urban environs of Gort town Co. Galway, and the site is currently utilised for rough unorganised grazing. The historic landfill site covers an area of c.2ha located to the west of the L85075 road. The site is bound along its western and northern boundary by the Gort River and the L85075 local road runs along the eastern boundary of the site.

As part of the assessment works between 2020 and 2021, FT conducted groundwater, leachate, and surface water monitoring at Gort historic landfill. The monitoring comprised sampling and analysis of groundwater at all existing wells previously established at the site, two new groundwater and one new leachate well and surface water sampling at two locations along the Gort River.

Galway County Council requested one additional round of monitoring be undertaken in 2022. For continuity, GCC requested that the monitoring locations and parameters remain the same as the monitoring carried out at Gort historic landfill in 2020 and 2021.

1.2 Scope of Works

FT's scope of work was to undertake one additional round of groundwater, surface water and leachate sampling. Sampling was undertaken at Gort historic landfill on the 1st June 2022.

Laboratory analysis of surface water, leachate and groundwater samples was conducted to assess and quantify any potential or ongoing environmental impacts. Laboratory analytical reports for surface water, leachate and groundwater is presented in Appendix 1.

This report presents the findings of the assessment.



2. ENVIRONMENTAL ASSESSMENT

The results of the environmental assessment at the Gort historic landfill site are presented in the following sections.

The surface water, leachate and groundwater results were compared to relevant environmental quality standards to identify the potential and magnitude of any impacts on receiving surface water and groundwater.

2.1 Chemical Assessment Criteria

- European Communities, Environmental Objectives (Groundwater)(Amendment) Regulations, 2016 (S.I. No. 366 of 2016).
- Interim Guideline Values (IGV) set out in the EPAs Groundwater Towards Setting the Guideline Values for the Protection of Groundwater in Ireland.
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009), as amended 2012 (S.I. No. 327 of 2012), 2015 (S.I. No. 386 of 2015), 2019 (S.I. No. 77 of 2019)
- European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations, 1989 (S.I. No. 294/1989).

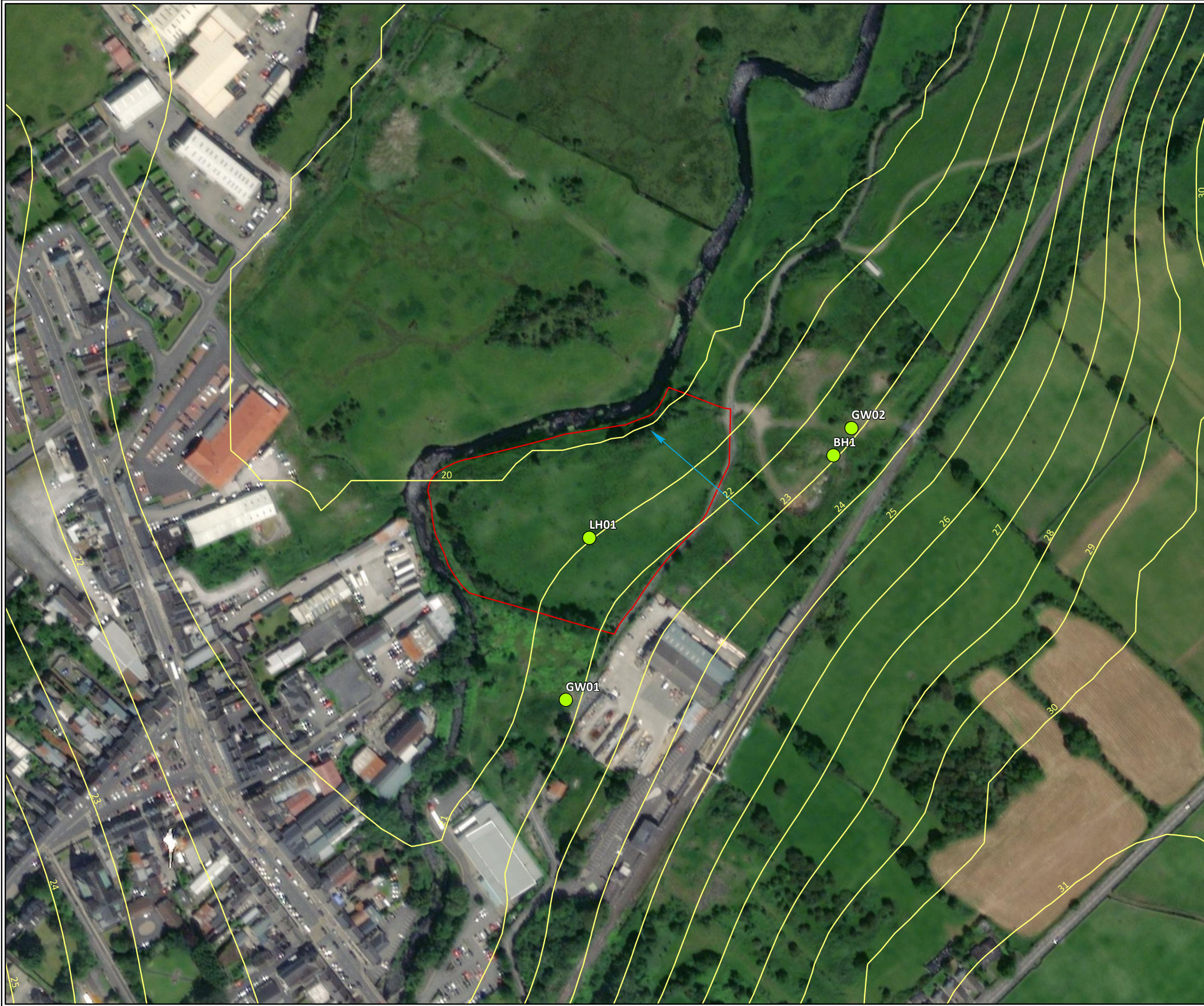
2.2 Groundwater Monitoring

Four groundwater monitoring events have been undertaken since 2020; two rounds of monitoring were undertaken on the 30th July 2020 and 25th August 2020; another round on 14th July 2021 and one additional round on 1st June 2022. The findings from the monitoring and an interpretation of the results are presented in the following sections.

2.2.1 Groundwater Quality Monitoring

The results of groundwater samples analysed from the 3 No. groundwater monitoring wells (BH01, GW01 and GW02) at the site have been assessed against the EPAs Interim Guideline Values (IGVs) and S.I No. 9 of the European Communities Environmental Objectives (Groundwater) Regulations 2010 (amended) threshold values. A summary of the results reported for each parameter for the monitoring rounds is outlined in Table 2.1, while the laboratory reports for the 2022 round are presented in Appendix 1.

The groundwater sampling locations are presented in Figure 2.1.



- Site Boundary
- Borehole Locations
- 1m Ground Elevation Contours
- ➔ Indicative Groundwater Flow Direction

TITLE:	Groundwater Flow Direction		
PROJECT:	Gort Historic Landfill ERA		
FIGURE NO:	2.1		
CLIENT:	Galway County Council		
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Table 2-1: Groundwater Sampling Results

Parameter	Units	S.I. No. 9 of 2010 Standards ¹	EPA IGV Standards ²	Round 1 (30/07/2020)			Round 2 (25/08/2020)			Round 3 (14/07/2021)		Round 4 (01/06/2022)	
				BH01	GW01	GW02	BH01	GW01	GW02	BH01	GW01	BH01	GW01
				UG	UG	UG	UG	UG	UG	UG	UG	UG	UG
Inorganics													
Conductivity @ 20 deg.C	mS/cm	0.8 - 1.875		0.62	0.623	0.593	0.664	0.699	0.609	0.659	0.737	0.702	0.715
Fluoride	mg/l	1	1	<0.5	<0.5	<0.5	0.972	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Oxygen, dissolved	mg/l		NAC	9.4	9.5	9.12	9.71	-	-	10.6	11	5.77	6.02
pH	pH Units			7.55	7.76	7.59	7.24	7.45	7.29	7.33	7.45	7.21	7.5
Sulphate	mg/l	187.5	200	12.9	39.8	49.8	8.1	31.2	13.5	11.8	26.8	13	23.2
Chloride	mg/l	24	30	20.2	45.7	20.7	21.4	58.6	19.4	16.6	48.5	19.3	40.4
COD, unfiltered	mg/l			94.5	116	412	150	25.6	135	64.2	14.2	73.2	18.8
Ammoniacal Nitrogen as N (low level)	mg/l	0.065	0.15	0.0297	0.0331	0.0627	0.0572	0.0516	0.0745	0.029	0.021	0.0148	0.0222
Cyanide, Total	mg/l	0.0375	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Oxidised Nitrogen as N	mg/l		NAC	1.86	1.76	1.35	1.78	1.76	1.92	1.57	2.21	<0.1	4.16
Alkalinity, Total as HCO ₃	mg/l		NAC	952	744	1710	1050	382	1180	511	439	479	427
Filtered (Dissolved) Metals													
Mercury	µg/l	0.75	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.022	<0.02	<0.01	<0.01
Arsenic	µg/l	7.5	10	0.532	0.642	0.754	0.982	1.6	0.939	6.04	<2	<0.5	0.563
Barium	µg/l		100	20.3	22.7	38.4	23.2	20	28.9	30.3	15.6	14.6	11.5
Boron	µg/l	750	1000	12.5	21.9	25.1	33.4	22.9	17.4	76.3	74	14.9	13.6
Cadmium	µg/l	3.75	5	<0.08	<0.08	<0.08	<0.08	0.0863	<0.08	<0.5	<0.5	<0.08	<0.08
Chromium	µg/l	37.5	30	<1	<1	<1	<1	<1	<1	4.44	<3	<1	<1
Copper	µg/l	1500	30	1.46	0.926	3.77	<0.3	0.895	0.932	16.7	1.33	0.551	0.79
Lead	µg/l	7.5	10	<0.2	<0.2	<0.2	<0.2	1.01	<0.2	16.2	5.83	<0.2	<0.2
Manganese	µg/l		50	<3	<3	5.72	15.2	30.3	13.8	263	178	<3	<3
Nickel	µg/l	15	20	1.78	3.64	7.68	1.39	15	4.78	12	9.31	0.962	2.41
Zinc	µg/l	75	100	1.52	1.49	2.6	1.03	10.8	2.69	23.4	10.1	1.04	3.51
Sodium	mg/l	150	150	9.71	33.9	17.2	9.23	39.5	9.51	12.1	29.1	10.2	22.1
Magnesium	mg/l		50	7.69	12.8	9.62	7.72	15.4	8.09	14.8	18.7	8.74	14.8
Potassium	mg/l		5	1.83	4.19	2.43	1.77	4.38	1.94	2.31	3.81	2.02	4.3
Calcium	mg/l		200	130	91	112	129	102	128	326	228	148	133
Iron	mg/l		0.2	<0.019	<0.019	<0.019	<0.019	0.0433	<0.019	5	1.23	<0.019	<0.019



Parameter	Units	S.I. No. 9 of 2010 Standards ¹	EPA IGTV Standards ²	Round 1 (30/07/2020)			Round 2 (25/08/2020)			Round 3 (14/07/2021)		Round 4 (01/06/2022)	
				BH01	GW01	GW02	BH01	GW01	GW02	BH01	GW01	BH01	GW01
				UG	UG	UG	UG	UG	UG	UG	UG	UG	
Semi-volatile Organic Compounds													
Chloroform	µg/l			<1	8.44	7.39	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/l			<1	4.04	3.94	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	µg/l			<1	1.31	1.04	<1	<1	<1	<1	<1	<1	<1
Altrazine	µg/l	0.075	1	0.0305	0.0605	<0.01	<0.02	0.0233	0.0125	<0.01	0.0211	<0.01	<0.01
Simazine	µg/l	0.075	1	<0.01	0.0362	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Microbiological													
Coliforms, Total*	MPN/100ml		0	-	-	-	345	425	146	-	-	-	-
Coliforms, Faecal*	CFU/100ml		0	-	-	-	47	2	21	-	-	-	-
Miscellaneous Organics													
MCPA	µg/l	0.075		<0.05	<0.25	<0.25	<0.05	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05
Mecoprop	µg/l	0.075	10	<0.04	<0.2	<0.2	<0.08	<0.08	<0.04	<0.08	<0.08	<0.08	<0.04
Dichlorprop	µg/l		100	<0.1	<0.5	<0.5	<0.1	<0.2	<0.1	<0.2	<0.2	<0.2	<0.1
2,4-Dichlorophenoxyacetic acid	µg/l	0.075		<0.05	<0.25	<0.25	<0.05	<0.1	<0.05	<0.1	<0.1	<0.1	<0.05
Bromoxynil	µg/l		5	<0.04	<0.2	<0.2	<0.04	<0.08	<0.04	<0.08	<0.08	<0.08	<0.04
Pentachlorophenol	µg/l		2	<0.04	<0.2	<0.2	<0.08	<0.08	<0.04	<0.08	<0.08	<0.08	<0.04

¹ OTV-Overall threshold value, European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010) as amended in 2011, 2012, 2016.

² IGTV-Interim Guideline Values, from EPA, Towards Setting Guideline Values for the Protection of Groundwater in Ireland, 2003.

* Items shaded in orange are in exceedance of the Drinking Water Regulations

* Items shaded in bold are in exceedance of the EPA IGTV Standards

* Sampling from GW02 not possible in 2021 and 2022 due to the well becoming lost / damaged in 2021.

* UG = upgradient



2.2.2 Groundwater Analysis Discussion

The results of the groundwater monitoring from BH01, GW01 and GW02 have reported some exceedances of the IGVs and European Groundwater limit values.

Samples recovered from monitoring well GW02 reported an ammoniacal nitrogen concentration of 0.0745 mg/l, which exceed groundwater regulations limit value. Based on the estimated groundwater flow direction GW02 is upgradient of the historic landfill. Ammoniacal nitrogen concentration at upgradient borehole could be considered representative of background levels possibly due to agricultural activities or septic tanks. The ammonia concentration differences between upgradient and downgradient monitoring locations are not that significant to consider that the historic landfill could be impacting water quality.

Elevated concentrations of chloride, above the OTV and EPA IGV are observed in borehole GW01 during each monitoring event. Chloride concentrations ranged from 40.7 – 58.6 mg/l during the monitoring period. Landfill leachate has the potential to contain high concentrations of chloride ions however the location of GW01 upgradient of the site, and its distance from the landfill means that it is unlikely that the elevated chloride concentration recorded are attributed to the migration of leachate from the historic landfill to this location.

Sampling in July 2021 detected iron levels above the IGV limit at upgradient monitoring wells BH01 (5 mg/l) and GW01 (1.23 mg/l). Iron levels broadly remained below the limit of detection (LOD) during the other monitoring events. Other metal compounds detected above the IGV at BH01 during the July 2021 monitoring event included lead (16.2 mg/l), manganese (263 µg/l) and calcium (326 mg/l). Trace levels of heavy metals arsenic, barium and boron were detected below the respective IGV/OTV limit, however concentrations were notably higher during the July 2021 sampling event compared to other rounds.

Faecal and total coliforms were detected in all three boreholes on the second monitoring round in August 2020. However, the presence of this pollutant in the upgradient monitoring wells is not likely attributed to the historic landfill, but more likely present due to agricultural or domestic sources i.e. human/animal waste, slurry, septic tanks etc.

The results of groundwater monitoring are below groundwater threshold values for List 1 and List 2 substances (SVOCs, pesticides, herbicides, organics).

Groundwater monitoring wells BH01, GW01 and GW02 are upgradient of the landfill site with respect to groundwater flow direction, therefore it is not expected that leachate migration from the site would impact groundwater quality at these locations or influence the characteristics of the groundwater.

2.3 Leachate Monitoring

Four rounds of leachate monitoring were undertaken at the site on the 30th July 2020, 25th August 2020, 14th July 2021 and 1st June 2022 at borehole LH01.

A summary of the findings from the monitoring can be found in Table 2.2 below and the laboratory reports for the 2022 monitoring round can be found in Appendix 1.

Note Manhole MH-1 was inaccessible during the monitoring events in July 2021 and June 2022 due to extensive overgrowth.



Table 2-2: Leachate Sampling Results

Parameter	Units	LH01	LH01	MH-1	MH-1	LH01	LH01
		30/07/2020	25/08/2020	30/07/2020	25/08/2020	14/07/2021	01/06/2022
Carbon							
Organic Carbon, Total	mg/l	26.6	28.4	5.71	6.67	32.3	31
Inorganics							
Conductivity @ 20 deg.C	mS/cm	1.87	1.77	0.624	0.603	2.68	2.38
Fluoride	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Oxygen, dissolved	mg/l	7.64	6.13	9.64	9.33	6.96	4.96
pH	pH Units	7.06	7.1	7.75	7.41	7.1	7.01
Phosphate (Ortho as PO4)	mg/l	<0.05	<0.05	0.095	0.2	<0.05	<0.05
Sulphate	mg/l	223	128	22.5	18.3	<2	<2
Chloride	mg/l	95.1	49	24.5	22.3	137	104
COD, unfiltered	mg/l	640	143	16.8	25.8	1640	684
Ammoniacal Nitrogen as N (low level)	mg/l	59.2	42	0.573	0.63	159	122
BOD, unfiltered	mg/l	61.9	7.95	<1	2.18	6.48	8.79
Total Oxidised Nitrogen as N	mg/l	0.558	<0.1	4.37	4.69	0.175	<0.1
Alkalinity, Total as HCO3	mg/l	-	-	-	-	3600	2300
Filtered (Dissolved) Metals							
Mercury	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	µg/l	3.16	2.14	<0.5	<0.5	9.58	19.5
Cadmium	µg/l	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08



Parameter	Units	LH01	LH01	MH-1	MH-1	LH01	LH01
		30/07/2020	25/08/2020	30/07/2020	25/08/2020	14/07/2021	01/06/2022
Chromium	µg/l	<1	<1	<1	<1	1.37	1.7
Copper	µg/l	1.19	3.02	1.09	1.3	34.1	0.584
Lead	µg/l	0.308	<0.2	<0.2	<0.2	1.49	0.413
Manganese	µg/l	1920	4310	32.7	19.2	676	1030
Nickel	µg/l	16.3	13.7	1.35	1.73	8.34	3.64
Phosphorus	µg/l	30.9	23.6	67.9	82.3	13.6	337
Selenium	µg/l	1.12	<1	<1	<1	<1	<1
Zinc	µg/l	11.3	19	22.9	26.3	7.99	3.43
Sodium	mg/l	69.5	37.3	18.7	16.8	116	85.8
Magnesium	mg/l	44.7	27.1	10.9	9.92	60.2	52.1
Potassium	mg/l	53.1	36.4	7.65	6.97	109	85.7
Iron	mg/l	0.0299	0.0492	0.0943	0.0494	0.0502	27.8



2.3.1 Leachate Analysis Discussion

Leachate monitoring results from 2021 and 2022 were similar to 2020 levels and the concentrations of pollutant parameters detected at typical of leachate quality encountered within MSW landfills (i.e. ammoniacal nitrogen, chloride and COD). The results shown are typical of MSW landfill leachate.

2.4 Landfill Gas Monitoring

FT carried out monitoring of landfill gas (LFG) parameters at each monitoring borehole location BH01, GW01, GW02 and LH01 inclusive. Methane, carbon dioxide, oxygen and atmospheric pressure were analysed at the 3 No. groundwater monitoring wells located outside the waste body and 1 No. leachate monitoring well (LH01) located within the waste body using a Landfill Gas analyser.

2.4.1 Monitoring Results

The EPA Landfill Manuals - Landfill Monitoring 2nd Edition specifies trigger values for landfill gas monitoring at offsite monitoring locations. The trigger level for methane outside the waste body is 1% v/v and for carbon dioxide is 1.5% v/v. The monitoring results for methane, carbon dioxide and oxygen levels for the perimeter borehole are summarised in Table 2.3:

Table 2-3: Perimeter Well Monitoring Results

Date: 29/07/2020						
Sample Station	CH ₄	CO ₂	O ₂	Atmospheric Pressure	Staff Member	Weather
	(% v/v)	(% v/v)	(% v/v)	(mbar)		
Perimeter Monitoring Wells				1008	Daniel Hayden	Overcast, Light Rain, Warm, 18-20°C
BH01	0	0.4	20.7			
GW01	0	0.3	20.8			
GW02	0	0.2	21.1			
In-Waste Monitoring Well						
LH01	19.8	7.1	12.1			
Date: 24/08/2020						
Sample Station	CH ₄	CO ₂	O ₂	Atmospheric Pressure	Staff Member	Weather
	(% v/v)	(% v/v)	(% v/v)	(mbar)		
Perimeter Monitoring Wells				1009	Daniel Hayden	Overcast, Light Rain, Warm, 16-18°C
BH01	0	0.7	19.9			
GW01	0	0.4	20.3			
GW02	0	0.1	21			



In-Waste Monitoring Well						
LH01	51	16	0.5			
Date: 14/07/2021						
Sample Station	CH ₄	CO ₂	O ₂	Atmospheric Pressure	Staff Member	Weather
	(% v/v)	(% v/v)	(% v/v)	(mbar)		
Perimeter Monitoring Wells				1028	Daniel Hayden	Clear, Sunny, Light Wind, 16 - 18°C
BH01	0	0.6	20.2			
GW01	0	0.4	20.5			
In-Waste Monitoring Well						
LH01	26.8	13.6	4.5			

Note – GW02 lost during 2021 and no monitoring possible at this location.

As can be seen in Table 2.3, concentrations of both methane and carbon dioxide at all offsite monitoring boreholes were below the threshold values during both monitoring rounds. Monitoring results for BH01, GW01 and GW02 indicate that lateral migration of landfill gas to these locations is not occurring.

The methane and carbon dioxide concentrations measured at in-waste well LH01 indicate that the site is still biologically active and landfill gas is still being produced.

2.5 Surface Water Monitoring

2.5.1 Monitoring Locations

The surface water monitoring locations were selected upstream and downstream of the landfill footprint, as shown on Figure 2.2. Monitoring location SW1 was selected as the upstream location on Gort river to the south of the landfill. Monitoring location SW2 samples the Gort River downstream of the landfill.

The surface water sampling locations at the site are presented in Figure 2.2.

Four rounds of surface water monitoring were carried out on the 1st and 30th of July 2020, 14th July 2021 and 1st June 2022.

2.5.2 Monitoring Parameters

The results of surface water sampling analysed from the 2 No. sampling locations (SW1 and SW2) have been assessed against the Maximum Admissible Concentration (MAC) and the Environmental Quality Standard (EQS) as per S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 where applicable.

A summary of results for each parameter from the monitoring round is outlined in Table 2.4, while the laboratory reports are presented in Appendix 1.



- Site Boundary
- Surface Water Monitoring Locations

TITLE:	
Surface Water Sampling Locations	
PROJECT:	
Gort Historic Landfill ERA	
FIGURE NO: 22	
CLIENT: Galway County Council	
SCALE: 1:2,500	REVISION: 0
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Table 2-4: Surface Water Sampling Results

Parameter	Units	EQS ¹	MAC ²	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
				SW01	SW02	SW01	SW02	SW01	SW02	SW01	SW02
				01/07/2020	01/07/2020	30/07/2020	30/07/2020	14/07/2021	14/07/2021	01/06/2022	01/06/2022
Inorganics											
Fluoride	mg/l	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
pH	-	6.0<pH<9.0		7.52	7.52	7.37	7.54	7.85	7.99	8.06	8.17
Orthophosphate (as PO ₄)	mg/l	≤0.075 (95%ile)		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammoniacal Nitrogen as N (low level)	mg/l	≤0.140 (95%ile)		0.03	0.0653	0.0229	0.0246	0.023	0.036	0.0314	0.0347
Cyanide, Total	mg/l	0.01		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Filtered (Dissolved) Metals											
Mercury	µg/l		0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	µg/l	25		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/l	0.15	0.9	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium	µg/l	4.7	32	<1	<1	<1	<1	<1	<1	<1	<1
Copper	µg/l	30		1.11	0.699	0.92	1.14	18.9	12.7	0.531	0.418
Lead	µg/l	1.2	14	0.483	0.268	<0.2	0.442	0.891	0.251	<0.2	<0.2
Nickel	µg/l	4	34	1.24	0.795	1.09	1.03	0.709	0.801	0.581	0.538
Zinc	µg/l	100		6.61	8.97	1.7	2.81	21.4	41.5	4.56	2.03



Parameter	Units	EQS ¹	MAC ²	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
				SW01	SW02	SW01	SW02	SW01	SW02	SW01	SW02
				01/07/2020	01/07/2020	30/07/2020	30/07/2020	14/07/2021	14/07/2021	01/06/2022	01/06/2022
Semi-Volatile Organic Compounds (SVOCs)											
1,2,4-Trichlorobenzene	µg/l	0.4	not applicable	<1	<1	<8	<10	<1	<1	<1	<1
Anthracene	µg/l	0.1	0.1	<1	<1	<8	<10	<1	<1	<1	<1
bis(2-Ethylhexyl) phthalate	µg/l	1.3	not applicable	<2	<2	<16	<20	<2	<2	<2	<2
Benzo(b)fluoranthene	µg/l		0.017	<1	<1	<8	<10	<1	<1	<1	<1
Benzo(k)fluoranthene	µg/l		0.017	<1	<1	<8	<10	<1	<1	<1	<1
Benzo(a)pyrene	µg/l	0.00017	0.27	<1	<1	<8	<10	<1	<1	<1	<1
Benzo(g,h,i)perylene	µg/l		0.0082	<1	<1	<8	<10	<1	<1	<1	<1
Diethyl phthalate	µg/l	1.3	not applicable	<1	<1	<8	<10	<1	<1	<1	<1
Fluoranthene	µg/l	0.0063	0.12	<1	<1	<8	<10	<1	<1	<1	<1
Hexachlorobenzene	µg/l		0.05	<1	<1	<8	<10	<1	<1	<1	<1
Hexachlorobutadiene	µg/l		0.6	<1	<1	<8	<10	<1	<1	<1	<1
Pentachlorophenol	µg/l	0.4	1	<1	<1	<8	<10	<1	<1	<1	<1
Phenol	µg/l	8	46	<1	<1	<8	<10	<1	<1	<1	<1
Naphthalene	µg/l	2	130	<1	<1	<8	<10	<1	<1	<1	<1
Indeno(1,2,3-cd) pyrene	µg/l		not applicable	<1	<1	<8	<10	<1	<1	<1	<1



Notes:

1. Environmental Quality Standard (EQS) as per European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009). Refers to Annual-Average (AA) EQS for relevant parameters.
 2. Maximum Admissible Concentration (MAC), as classified by European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009).
- *** NAC – no abnormal change



2.5.3 Surface Water Analysis Discussion

The results of the surface water laboratory analysis as presented in Table 2.4, when assessed against the MAC and EQS quality standards show no exceedances of the EQS and MAC quality threshold values.

Results show little variation in parameter concentrations between upstream and downstream sampling locations during each monitoring event since July 2020. These results indicate that the landfill is not having a deleterious effect on downstream water quality in the Gort River.



3. CONCLUSION

Galway County Council requested FT to undertake one additional round of environmental monitoring at Gort Historic Landfill in 2022. The results of this sampling served as a continuation of the monitoring assessments carried out in 2020 and 2021 as part of the Tier 2 environmental risk assessment for the site.

Analysis of groundwater samples recovered from the monitoring wells BH01, GW01 and GW02 have reported one sample with ammoniacal nitrogen concentrations exceeding the OTV limit on the second round (August 2020). Results from 2021 and 2022 showed ammoniacal N levels remained below the OTV. Previous site investigations showed that wells BH01, GW01 and GW02 are upgradient of the site are not likely to be impacted by leachate migration from the site. Ammoniacal nitrogen concentrations at upgradient boreholes could be considered representative of background levels possibly due to agricultural activities.

Elevated chloride concentrations were also measured at well GW01 during each of the four monitoring rounds, however, due to its location with respect to the landfill these concentrations are not expected to be attributed to leachate migration.

Landfill gas monitoring carried out at groundwater monitoring wells BH01, GW01 and GW02 at the site indicates gas concentrations detected are below threshold levels for offsite boreholes and monitoring locations as set by the EPA Landfill Manuals - Landfill Monitoring (2nd Edition). The results at LH01 (in waste borehole) indicate that the site remains biologically active with landfill gas remaining, however results at offsite wells indicate that there is no lateral landfill gas migration to these locations.

Leachate monitoring results from 2021 and 2022 were similar to 2020 levels and the concentrations of pollutant parameters detected at typical of leachate quality encountered within MSW landfills.

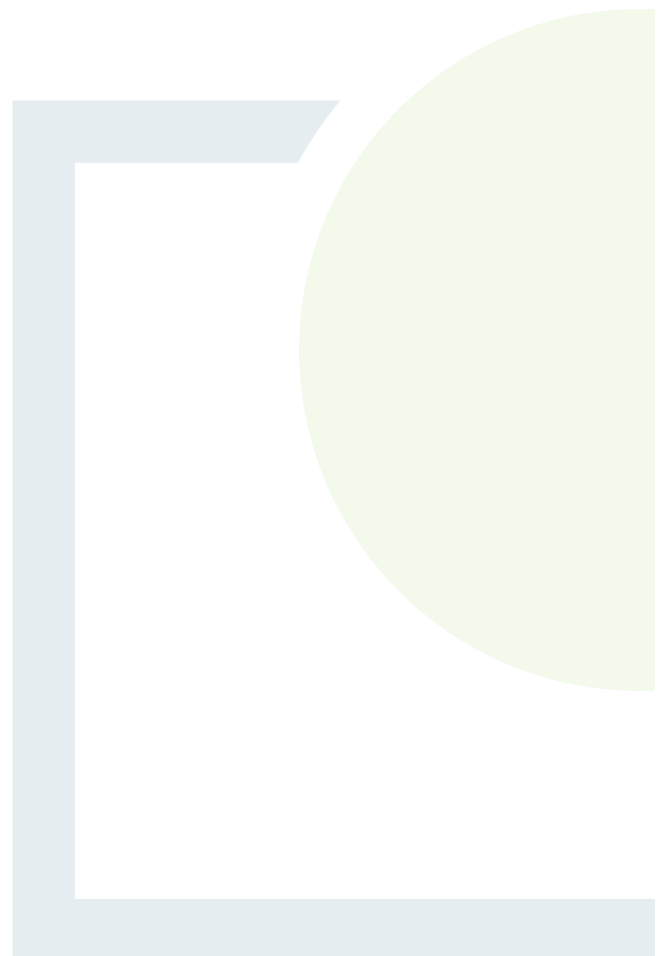
Analysis of surface water samples from the Gort River found all results to be below the MAC and EQS guideline limit values in all assessments between 2020 and 2022. The results indicate the landfill is not having a measurable impact on surface water quality.



CONSULTANTS IN ENGINEERING,
ENVIRONMENTAL SCIENCE
& PLANNING

APPENDIX 1

Groundwater, Leachate and
Surface Water Sampling
Analysis Results





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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: 07 August 2020
Customer: Fehily Timoney
Sample Delivery Group (SDG): 200731-87
Your Reference: P2282
Location: Gort Landfill
Report No: 562220

We received 2 samples on Friday July 31, 2020 and 2 of these samples were scheduled for analysis which was completed on Friday August 07, 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

Validated

SDG: 200731-87	Client Reference: P2282	Report Number: 562220
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22583355	LH01		0.00 - 0.00	30/07/2020
22583349	MH-1		0.00 - 0.00	30/07/2020

Maximum Sample/Coolbox Temperature (°C) :

16.2

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.



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-87
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 562220
Superseded Report:

Results Legend

- X Test
- N No Determination Possible

Sample Types -

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

Lab Sample No(s)	22583355	22583349
Customer Sample Reference	LH01	MH-1
AGS Reference		
Depth (m)	0.00 - 0.00	0.00 - 0.00
Container	0.5l glass bottle (ALE227)	H2SO4 (ALE244)
Sample Type	LE	LE

Parameter	All	NDPs: 0 Tests: 2					
Ammonium Low	All	NDPs: 0 Tests: 2		X			X
Anions by Kone (w)	All	NDPs: 0 Tests: 2	X			X	
BOD True Total	All	NDPs: 0 Tests: 2	X		X		
COD Unfiltered	All	NDPs: 0 Tests: 2		X		X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2		X		X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2		X		X	
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2		X		X	
Fluoride	All	NDPs: 0 Tests: 2		X		X	
Mercury Dissolved	All	NDPs: 0 Tests: 2		X		X	
pH Value	All	NDPs: 0 Tests: 2		X		X	
Phosphate by Kone (w)	All	NDPs: 0 Tests: 2		X		X	
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 2			X		X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-87
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 562220
Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
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
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
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

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

Validated

SDG: 200731-87
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 562220
Superseded Report:

Test Completion Dates

Lab Sample No(s)	22583355	22583349
Customer Sample Ref.	LH01	MH-1
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Land Leachate	Land Leachate

Ammonium Low	06-Aug-2020	06-Aug-2020
Anions by Kone (w)	04-Aug-2020	04-Aug-2020
BOD True Total	06-Aug-2020	06-Aug-2020
COD Unfiltered	04-Aug-2020	04-Aug-2020
Conductivity (at 20 deg.C)	05-Aug-2020	05-Aug-2020
Dissolved Metals by ICP-MS	07-Aug-2020	07-Aug-2020
Dissolved Oxygen by Probe	04-Aug-2020	02-Aug-2020
Fluoride	04-Aug-2020	04-Aug-2020
Mercury Dissolved	05-Aug-2020	05-Aug-2020
pH Value	04-Aug-2020	04-Aug-2020
Phosphate by Kone (w)	04-Aug-2020	04-Aug-2020
Total Organic and Inorganic Carbon	06-Aug-2020	06-Aug-2020



CERTIFICATE OF ANALYSIS

SDG: 200731-87	Client Reference: P2282	Report Number: 562220
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. 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: 03 September 2020
Customer: Fehily Timoney
Sample Delivery Group (SDG): 200826-93
Your Reference: P2282
Location: Gort Landfill
Report No: 565742

We received 1 sample on Wednesday August 26, 2020 and 1 of these samples were scheduled for analysis which was completed on Thursday September 03, 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

Validated

SDG: 200826-93 **Client Reference:** P2282 **Report Number:** 565742
Location: Gort Landfill **Order Number:** Z2189 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22723140	LH01		0.00 - 0.00	25/08/2020

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 200826-93	Client Reference: P2282	Report Number: 565742
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

Results Legend <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; background-color: yellow; margin-right: 5px;"></div> X Test </div> <div style="display: flex; align-items: center; margin-bottom: 5px;"> <div style="border: 1px solid black; width: 20px; height: 20px; background-color: red; color: white; margin-right: 5px;"></div> N No Determination Possible </div> 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)	22723140		
	Customer Sample Reference	LH01		
	AGS Reference			
	Depth (m)	0.00 - 0.00		
	Container	<div style="display: flex; justify-content: space-around; font-size: small;"> 250ml BOD (ALE212) 500ml Plastic (ALE208) H2SO4 (ALE244) </div>		
	Sample Type	LE	LE	LE

Ammonium Low	All	NDPs: 0 Tests: 1				X
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X		
BOD True Total	All	NDPs: 0 Tests: 1	X			
COD Unfiltered	All	NDPs: 0 Tests: 1	X			
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1		X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1		X		
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 1		X		
Fluoride	All	NDPs: 0 Tests: 1		X		
Mercury Dissolved	All	NDPs: 0 Tests: 1		X		
pH Value	All	NDPs: 0 Tests: 1		X		
Phosphate by Kone (w)	All	NDPs: 0 Tests: 1		X		
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 1				X



CERTIFICATE OF ANALYSIS

Validated

SDG: 200826-93
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 565742
Superseded Report:

Table of Results - Appendix

Method No	Reference	Description
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
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
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

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

Validated

SDG: 200826-93
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 565742
Superseded Report:

Test Completion Dates

Lab Sample No(s)	22723140
Customer Sample Ref.	LH01
AGS Ref.	
Depth	0.00 - 0.00
Type	Land Leachate

Ammonium Low	02-Sep-2020
Anions by Kone (w)	31-Aug-2020
BOD True Total	01-Sep-2020
COD Unfiltered	28-Aug-2020
Conductivity (at 20 deg.C)	27-Aug-2020
Dissolved Metals by ICP-MS	01-Sep-2020
Dissolved Oxygen by Probe	28-Aug-2020
Fluoride	01-Sep-2020
Mercury Dissolved	03-Sep-2020
pH Value	27-Aug-2020
Phosphate by Kone (w)	27-Aug-2020
Total Organic and Inorganic Carbon	30-Aug-2020



CERTIFICATE OF ANALYSIS

SDG: 200826-93	Client Reference: P2282	Report Number: 565742
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. 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: 26 July 2021
Customer: Fehily Timoney
Sample Delivery Group (SDG): 210715-111
Your Reference: P2282
Location: Gort Landfill
Report No: 607016

We received 1 sample on Thursday July 15, 2021 and 1 of these samples were scheduled for analysis which was completed on Monday July 26, 2021. 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

Validated

SDG: 210715-111 **Client Reference:** P2282 **Report Number:** 607016
Location: Gort Landfill **Order Number:** Z2798 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24638580	LH01		0.00 - 0.00	14/07/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

Results Legend

- X Test
- N No Determination Possible

Sample Types -

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

Lab Sample No(s)		24638580							
Customer Sample Reference		LH01							
AGS Reference									
Depth (m)		0.00 - 0.00							
Container	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;"></td> <td style="width: 10%;">0.5l glass bottle (ALE227)</td> <td style="width: 10%;">250ml BOD (ALE212)</td> <td style="width: 10%;">500ml Plastic (ALE208)</td> <td style="width: 10%;">H2SO4 (ALE244)</td> <td style="width: 10%;">NaOH (ALE245)</td> <td style="width: 10%;">Vial (ALE297)</td> </tr> </table>		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)			
Sample Type		SW							

Parameter	All	NDPs: 0 Tests: 1	0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 1	X					
Alkalinity as CaCO3	All	NDPs: 0 Tests: 1			X			
Ammonium Low	All	NDPs: 0 Tests: 1				X		
Anions by Kone (w)	All	NDPs: 0 Tests: 1			X			
BOD True Total	All	NDPs: 1 Tests: 0		N				
COD Unfiltered	All	NDPs: 0 Tests: 1	X					
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 1			X			
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1					X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1			X			
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 1			X			
Fluoride	All	NDPs: 0 Tests: 1			X			
Mercury Dissolved	All	NDPs: 0 Tests: 1			X			
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 1	X					
PCB Congeners - Aqueous (W)	All	NDPs: 0 Tests: 1	X					
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 1	X					



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111	Client Reference: P2282	Report Number: 607016
Location: Gort Landfill	Order Number: Z2798	Superseded Report:

Results Legend								
<p>X Test</p> <p>N No Determination Possible</p> <p>Sample Types -</p> <p>S - Soil/Solid</p> <p>UNS - Unspecified Solid</p> <p>GW - Ground Water</p> <p>SW - Surface Water</p> <p>LE - Land Leachate</p> <p>PL - Prepared Leachate</p> <p>PR - Process Water</p> <p>SA - Saline Water</p> <p>TE - Trade Effluent</p> <p>TS - Treated Sewage</p> <p>US - Untreated Sewage</p> <p>RE - Recreational Water</p> <p>DW - Drinking Water Non-regulatory</p> <p>UNL - Unspecified Liquid</p> <p>SL - Sludge</p> <p>G - Gas</p> <p>OTH - Other</p>	Lab Sample No(s)		24638580					
	Customer Sample Reference		LH01					
	AGS Reference							
	Depth (m)		0.00 - 0.00					
	Container		0.5l glass bottle (ALE227)	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	NaOH (ALE245)	Vial (ALE297)
	Sample Type		SW	SW	SW	SW	SW	SW
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 1	X					
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 1	X					
pH Value	All	NDPs: 0 Tests: 1		X				
Suspended Solids	All	NDPs: 0 Tests: 1		X				
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 1		X				
Total Organic and Inorganic Carbon	All	NDPs: 0 Tests: 1			X			
VOC MS (W)	All	NDPs: 0 Tests: 1					X	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

Results Legend		Customer Sample Ref.				
#	ISO17025 accredited.	LH01				
M	mCERTS accredited.					
aq	Aqueous / settled sample.	Depth (m)	0.00 - 0.00			
diss.filt	Dissolved / filtered sample.	Sample Type	Surface Water (SW)			
tot.unfilt	Total / unfiltered sample.	Date Sampled	14/07/2021			
*	Subcontracted - refer to subcontractor report for accreditation status.	Sample Time				
**	% 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	Date Received	15/07/2021			
(F)	Trigger breach confirmed	SDG Ref	210715-111			
1-4*\$@	Sample deviation (see appendix)	Lab Sample No.(s)	24638580			
		AGS Reference				
Component	LOD/Units	Method				
Suspended solids, Total	<2 mg/l	TM022	5610	#		
Alkalinity, Total as HCO3	<2 mg/l	TM043	3600			
Oxygen, dissolved	<0.3 mg/l	TM046	6.96			
Organic Carbon, Total	<3 mg/l	TM090	32.3	◆ #		
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	159	#		
Fluoride	<0.5 mg/l	TM104	<0.5			
COD, unfiltered	<7 mg/l	TM107	1640	#		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	2.68	#		
Arsenic (diss.filt)	<0.5 µg/l	TM152	9.58	2 #		
Barium (diss.filt)	<0.2 µg/l	TM152	105	2 #		
Boron (diss.filt)	<10 µg/l	TM152	614	2 #		
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	2 #		
Chromium (diss.filt)	<1 µg/l	TM152	1.37	2 #		
Copper (diss.filt)	<0.3 µg/l	TM152	34.1	2 #		
Lead (diss.filt)	<0.2 µg/l	TM152	1.49	2 #		
Manganese (diss.filt)	<3 µg/l	TM152	676	2 #		
Nickel (diss.filt)	<0.4 µg/l	TM152	8.34	2 #		
Phosphorus (diss.filt)	<10 µg/l	TM152	13.6	2 #		
Selenium (diss.filt)	<1 µg/l	TM152	<1	2 #		
Thallium (diss.filt)	<2 µg/l	TM152	<2	2 #		
Zinc (diss.filt)	<1 µg/l	TM152	7.99	2 #		
Sodium (Dis.Filt)	<0.076 mg/l	TM152	116	2 #		
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	60.2	2 #		
Potassium (Dis.Filt)	<0.2 mg/l	TM152	109	2 #		
Calcium (Dis.Filt)	<0.2 mg/l	TM152	160	2 #		
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.0502	2 #		
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	2090			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	2		
Sulphate	<2 mg/l	TM184	<2	#		
Chloride	<2 mg/l	TM184	137	#		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.175	#		
PCB congener 28	<0.015 µg/l	TM197	<0.015			
PCB congener 52	<0.015 µg/l	TM197	<0.015			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

Results Legend		Customer Sample Ref.	LH01				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
dis.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						
1-4*#@	Sample deviation (see appendix)						
Component	LOD/Units	Method	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received
							SDG Ref
							Lab Sample No.(s)
							AGS Reference
PCB congener 101	<0.015 µg/l	TM197	0.00 - 0.00	Surface Water (SW)	14/07/2021		210715-111
PCB congener 118	<0.015 µg/l	TM197					24638580
PCB congener 138	<0.015 µg/l	TM197					
PCB congener 153	<0.015 µg/l	TM197					
PCB congener 180	<0.015 µg/l	TM197					
Sum of detected EC7 PCB's	<0.105 µg/l	TM197					
Cyanide, Total	<0.05 mg/l	TM227					
pH	<1 pH Units	TM256	7.1				
Trifluralin	<0.01 µg/l	TM343					
alpha-HCH	<0.01 µg/l	TM343					
gamma-HCH (Lindane)	<0.01 µg/l	TM343					
Heptachlor	<0.01 µg/l	TM343					
Aldrin	<0.01 µg/l	TM343					
beta-HCH	<0.01 µg/l	TM343					
Isodrin	<0.01 µg/l	TM343					
delta-HCH	<0.01 µg/l	TM343					
Heptachlor epoxide	<0.01 µg/l	TM343					
o,p'-DDE	<0.01 µg/l	TM343					
Endosulphan I	<0.01 µg/l	TM343					
trans-Chlordane	<0.01 µg/l	TM343					
cis-Chlordane	<0.01 µg/l	TM343					
p,p'-DDE	<0.01 µg/l	TM343					
Dieldrin	<0.01 µg/l	TM343					
o,p'-DDD (TDE)	<0.01 µg/l	TM343					
Endrin	<0.01 µg/l	TM343					
o,p'-DDT	<0.01 µg/l	TM343					
p,p'-DDD (TDE)	<0.01 µg/l	TM343					
Endosulphan II	<0.02 µg/l	TM343					
p,p'-DDT	<0.01 µg/l	TM343					
o,p'-Methoxychlor	<0.01 µg/l	TM343					
p,p'-Methoxychlor	<0.01 µg/l	TM343					
Endosulphan Sulphate	<0.02 µg/l	TM343					
Permethrin I	<0.01 µg/l	TM343					



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	LH01			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00			
M	mCERTS accredited.		Surface Water (SW)			
aq	Aqueous / settled sample.		14/07/2021			
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					
1-4*#@	Sample deviation (see appendix)					
Component	LOD/Units		Method			
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<8	#		
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<8	#		
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<8	#		
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<8	#		
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<8	#		
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<8	#		
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<8	#		
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<8	#		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<8	#		
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<8	#		
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<8	#		
2-Chlorophenol (aq)	<1 µg/l	TM176	<8	#		
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<8	#		
2-Methylphenol (aq)	<1 µg/l	TM176	<8	#		
2-Nitroaniline (aq)	<1 µg/l	TM176	<8	#		
2-Nitrophenol (aq)	<1 µg/l	TM176	<8	#		
3-Nitroaniline (aq)	<1 µg/l	TM176	<8	#		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<8	#		
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<8	#		
4-Chloroaniline (aq)	<1 µg/l	TM176	<8	#		
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<8	#		
4-Methylphenol (aq)	<1 µg/l	TM176	<8	#		
4-Nitroaniline (aq)	<1 µg/l	TM176	<8	#		
4-Nitrophenol (aq)	<1 µg/l	TM176	<8	#		
Azobenzene (aq)	<1 µg/l	TM176	<8	#		
Acenaphthylene (aq)	<1 µg/l	TM176	<8	#		
Acenaphthene (aq)	<1 µg/l	TM176	<8	#		
Anthracene (aq)	<1 µg/l	TM176	<8	#		
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<8	#		
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<8	#		
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<16	#		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<8	#		
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<8	#		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

SVOC MS (W) - Aqueous

Table with columns: Component, LOD/Units, Method, and results for various SVOCs like Benzo(b)fluoranthene, Benzo(k)fluoranthene, etc. Includes a Results Legend and Customer Sample Ref. section.



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.				
#	ISO17025 accredited.	LH01				
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.		Depth (m)	0.00 - 0.00		
**	% 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		Sample Type	Surface Water (SW)		
(F)	Trigger breach confirmed		Date Sampled	14/07/2021		
1-4*\$@	Sample deviation (see appendix)		Sample Time			
			Date Received	15/07/2021		
		SDG Ref	210715-111			
		Lab Sample No.(s)	24638580			
		AGS Reference				
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM208	110			
Toluene-d8**	%	TM208	101			
4-Bromofluorobenzene**	%	TM208	101			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	#		
Chloromethane	<1 µg/l	TM208	<1	#		
Vinyl chloride	<1 µg/l	TM208	<1	#		
Bromomethane	<1 µg/l	TM208	<1	#		
Chloroethane	<1 µg/l	TM208	<1	#		
Trichlorofluoromethane	<1 µg/l	TM208	<1	#		
1,1-Dichloroethene	<1 µg/l	TM208	<1	#		
Carbon disulphide	<1 µg/l	TM208	<1	#		
Dichloromethane	<3 µg/l	TM208	<3	#		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	#		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	#		
1,1-Dichloroethane	<1 µg/l	TM208	<1	#		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	#		
2,2-Dichloropropane	<1 µg/l	TM208	<1	#		
Bromochloromethane	<1 µg/l	TM208	<1	#		
Chloroform	<1 µg/l	TM208	<1	#		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	#		
1,1-Dichloropropene	<1 µg/l	TM208	<1	#		
Carbontetrachloride	<1 µg/l	TM208	<1	#		
1,2-Dichloroethane	<1 µg/l	TM208	<1	#		
Benzene	<1 µg/l	TM208	<1	#		
Trichloroethene	<1 µg/l	TM208	<1	#		
1,2-Dichloropropane	<1 µg/l	TM208	<1	#		
Dibromomethane	<1 µg/l	TM208	<1	#		
Bromodichloromethane	<1 µg/l	TM208	<1	#		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	#		
Toluene	<1 µg/l	TM208	<1	#		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	#		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	#		
1,3-Dichloropropane	<1 µg/l	TM208	<1	#		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	LH01			
#	ISO17025 accredited.					
M	mCERTS accredited.					
sq	Aqueous / settled sample.					
dis.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					
1-4*§@	Sample deviation (see appendix)					
Component	LOD/Units	Method	Depth (m)	Sample Type	Date Sampled	Sample Time
Tetrachloroethene	<1 µg/l	TM208	0.00 - 0.00	Surface Water (SW)	14/07/2021	
Dibromochloromethane	<1 µg/l	TM208				
1,2-Dibromoethane	<1 µg/l	TM208				
Chlorobenzene	<1 µg/l	TM208				
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208				
Ethylbenzene	<1 µg/l	TM208				
m,p-Xylene	<1 µg/l	TM208				
o-Xylene	<1 µg/l	TM208				
Styrene	<1 µg/l	TM208				
Bromoform	<1 µg/l	TM208				
Isopropylbenzene	<1 µg/l	TM208				
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208				
1,2,3-Trichloropropane	<1 µg/l	TM208				
Bromobenzene	<1 µg/l	TM208				
Propylbenzene	<1 µg/l	TM208				
2-Chlorotoluene	<1 µg/l	TM208				
1,3,5-Trimethylbenzene	<1 µg/l	TM208				
4-Chlorotoluene	<1 µg/l	TM208				
tert-Butylbenzene	<1 µg/l	TM208				
1,2,4-Trimethylbenzene	<1 µg/l	TM208				
sec-Butylbenzene	<1 µg/l	TM208				
4-iso-Propyltoluene	<1 µg/l	TM208				
1,3-Dichlorobenzene	<1 µg/l	TM208				
1,4-Dichlorobenzene	<1 µg/l	TM208				
n-Butylbenzene	<1 µg/l	TM208				
1,2-Dichlorobenzene	<1 µg/l	TM208				
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208				
1,2,4-Trichlorobenzene	<1 µg/l	TM208				
Hexachlorobutadiene	<1 µg/l	TM208				
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208				
Naphthalene	<1 µg/l	TM208				
1,2,3-Trichlorobenzene	<1 µg/l	TM208				
1,3,5-Trichlorobenzene	<1 µg/l	TM208				



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111 **Client Reference:** P2282 **Report Number:** 607016
Location: Gort Landfill **Order Number:** Z2798 **Superseded Report:**

Notification of NDPs (No determination possible)

Date Received : 15/07/2021 12:37:25

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
24638580	LH01	0.00 - 0.00	BOD True Total	Unable to confirm result



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

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
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
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
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

Validated

SDG: 210715-111
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607016
Superseded Report:

Test Completion Dates

Lab Sample No(s)	24638580
Customer Sample Ref.	LH01
AGS Ref.	
Depth	0.00 - 0.00
Type	Surface Water

Acid Herbicides by GCMS	22-Jul-2021
Alkalinity as CaCO3	20-Jul-2021
Ammonium Low	20-Jul-2021
Anions by Kone (w)	21-Jul-2021
COD Unfiltered	18-Jul-2021
Conductivity (at 20 deg.C)	21-Jul-2021
Cyanide Comp/Free/Total/Thiocyanate	21-Jul-2021
Dissolved Metals by ICP-MS	21-Jul-2021
Dissolved Oxygen by Probe	16-Jul-2021
Fluoride	16-Jul-2021
Mercury Dissolved	20-Jul-2021
Mineral Oil C10-40 Aqueous (W)	21-Jul-2021
PCB Congeners - Aqueous (W)	20-Jul-2021
Pesticides (Suite I) by GCMS	20-Jul-2021
Pesticides (Suite II) by GCMS	22-Jul-2021
Pesticides (Suite III) by GCMS	26-Jul-2021
pH Value	19-Jul-2021
Suspended Solids	19-Jul-2021
SVOC MS (W) - Aqueous	19-Jul-2021
Total Organic and Inorganic Carbon	25-Jul-2021
VOC MS (W)	18-Jul-2021



CERTIFICATE OF ANALYSIS

SDG: 210715-111	Client Reference: P2282	Report Number: 607016
Location: Gort Landfill	Order Number: Z2798	Superseded Report:

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. 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
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

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 asbestos present is not determined unless specifically requested.

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: 27 August 2020
Customer: Fehily Timoney
Sample Delivery Group (SDG): 200731-86
Your Reference: Galway Historic Landfills
Location: Gort Landfill
Report No: 564885

This report has been revised and directly supersedes 562437 in its entirety.

We received 3 samples on Friday July 31, 2020 and 3 of these samples were scheduled for analysis which was completed on Monday August 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

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22583337	BH1		0.00 - 0.00	30/07/2020
22583320	GW01		0.00 - 0.00	30/07/2020
22583328	GW02		0.00 - 0.00	30/07/2020

Maximum Sample/Coolbox Temperature (°C) :

16.2

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.



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

Results Legend <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: yellow; border: 1px solid black; margin-right: 5px;"></div> Test </div> <div style="display: flex; align-items: center;"> <div style="width: 15px; height: 15px; background-color: red; border: 1px solid black; margin-right: 5px;"></div> No Determination Possible </div> </div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	
		22583337	BH1		0.00 - 0.00	Via1 (ALE297)	GW
		22583320	GW01		0.00 - 0.00	Via1 (ALE297)	GW
		22583328	GW02		0.00 - 0.00	Via1 (ALE297)	GW
						NaOH (ALE245)	GW
						H2SO4 (ALE244)	GW
						500ml Plastic (ALE208)	GW
					0.5l glass bottle (ALE227)	GW	
					500ml Plastic (ALE208)	GW	
					H2SO4 (ALE244)	GW	
					NaOH (ALE245)	GW	
					Via1 (ALE297)	GW	
					0.5l glass bottle (ALE227)	GW	
					500ml Plastic (ALE208)	GW	
					H2SO4 (ALE244)	GW	
					NaOH (ALE245)	GW	
					Via1 (ALE297)	GW	
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					NaOH (ALE245)	GW	
					Via1 (ALE297)	GW	
					0.5l glass bottle (ALE227)	GW	
					500ml Plastic (ALE208)	GW	
					H2SO4 (ALE244)	GW	
					NaOH (ALE245)	GW	
					Via1 (ALE297)	GW	
					0.5l glass bottle (ALE227)	GW	
					500ml Plastic (ALE208)	GW	
					H2SO4 (ALE244)	GW	
					NaOH (ALE245)	GW	
					Via1 (ALE297)	GW	
					0.5l glass bottle (ALE227)	GW	
					500ml Plastic (ALE208)	GW	
					H2SO4 (ALE244)	GW	
					NaOH (ALE245)	GW	
					Via1 (ALE297)	GW	
					0.5l glass bottle (ALE227)	GW	
					500ml Plastic		



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-86	Client Reference: Galway Historic Landfills	Report Number: 564885	
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562437	

Results Legend

- X Test
- N No Determination Possible

Sample Types -

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

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type
22583337	BH1		0.00 - 0.00	Vial (ALE297)	GW
22583320	GW01		0.00 - 0.00	Vial (ALE297)	GW
22583328	GW02		0.00 - 0.00	Vial (ALE297)	GW

Test Name	All	NDPs: 0 Tests: 3	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)			
Pesticides (Suite II) by GCMS			X			X					X				
Pesticides (Suite III) by GCMS			X			X					X				
pH Value				X			X					X			
SVOC MS (W) - Aqueous						X					X				X
Total Coliforms(W)*				X			X								
Total Organic and Inorganic Carbon					X			X				X			
VOC MS (W)							X				X				X



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

Results Legend		Customer Sample Ref.		BH1	GW01	GW02		
# ISO17025 accredited.		Depth (m)		0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
M mCERTS accredited.		Sample Type		Ground Water (GW)	Ground Water (GW)	Ground Water (GW)		
aq Aqueous / settled sample.		Date Sampled		30/07/2020	30/07/2020	30/07/2020		
diss.filt Dissolved / filtered sample.		Sample Time						
tot.unfilt Total / unfiltered sample.		Date Received		31/07/2020	31/07/2020	31/07/2020		
-		SDG Ref		200731-86	200731-86	200731-86		
*		Lab Sample No.(s)		22583337	22583320	22583328		
**		AGS Reference						
-		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*5@		Sample deviation (see appendix)						
Component	LOD/Units	Method						
Faecal coliforms confirmed (M7M)*	0 CFU/100ml	SUB	4	19	620			
Total Coliform Presumptive (M16)*	CFU/100ml	SUB	>100	>100				
Total Coliform Confirmed (M14)*	CFU/100ml	SUB	>100	>100				
Alkalinity, Total as HCO3	<2 mg/l	TM043	952	744	1710			
BOD, unfiltered	<1 mg/l	TM045	<1	<1	4.52			
Oxygen, dissolved	<0.3 mg/l	TM046	9.4	9.5	9.12			
Organic Carbon, Total	<3 mg/l	TM090	<3	<3	<3			
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.0297	0.0331	0.0627			
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5			
COD, unfiltered	<7 mg/l	TM107	94.5	116	412			
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.62	0.623	0.593			
Arsenic (diss.filt)	<0.5 µg/l	TM152	0.532	0.642	0.754			
Barium (diss.filt)	<0.2 µg/l	TM152	20.3	22.7	38.4			
Boron (diss.filt)	<10 µg/l	TM152	12.5	21.9	25.1			
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08			
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	<1			
Copper (diss.filt)	<0.3 µg/l	TM152	1.46	0.926	3.77			
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	<0.2	<0.2			
Manganese (diss.filt)	<3 µg/l	TM152	<3	<3	5.72			
Nickel (diss.filt)	<0.4 µg/l	TM152	1.78	3.64	7.68			
Phosphorus (diss.filt)	<10 µg/l	TM152	18	11.2	<10			
Selenium (diss.filt)	<1 µg/l	TM152	1.42	2.33	3.64			
Thallium (diss.filt)	<2 µg/l	TM152	<2	<2	<2			
Zinc (diss.filt)	<1 µg/l	TM152	1.52	1.49	2.6			
Sodium (Dis.Filt)	<0.076 mg/l	TM152	9.71	33.9	17.2			
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	7.69	12.8	9.62			
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.83	4.19	2.43			
Calcium (Dis.Filt)	<0.2 mg/l	TM152	130	91	112			
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	<0.019	<0.019			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01			
Sulphate	<2 mg/l	TM184	12.9	39.8	49.8			
Chloride	<2 mg/l	TM184	20.2	45.7	20.7			
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	1.86	1.76	1.35			



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

Results Legend		Customer Sample Ref.	BH1	GW01	GW02		
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis. 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)						
		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
		Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)		
		Date Sampled	30/07/2020	30/07/2020	30/07/2020		
		Sample Time					
		Date Received	31/07/2020	31/07/2020	31/07/2020		
		SDG Ref	200731-86	200731-86	200731-86		
		Lab Sample No.(s)	22583337	22583320	22583328		
		AGS Reference					
Component	LOD/Units	Method					
PCB congener 28	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		
PCB congener 52	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		
PCB congener 101	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		
PCB congener 118	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		
PCB congener 138	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		
PCB congener 153	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		
PCB congener 180	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		
Sum of detected EC7 PCB's	<0.105 µg/l	TM197	<0.105	<0.105	<0.105		
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05	<0.05	#	#
pH	<1 pH Units	TM256	7.55	7.76	7.59	#	#
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
delta-HCH	<0.01 µg/l	TM343	<0.02	<0.02	<0.02		
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
o,p'-DDT	<0.01 µg/l	TM343	<0.04	<0.04	<0.04		
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01	<0.01		
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02	<0.02		
p,p'-DDT	<0.01 µg/l	TM343	<0.07	<0.07	<0.07		
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.04	<0.04	<0.04		
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.07	<0.07	<0.07		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited. M mCERTS accredited. sq 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)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 30/07/2020	0.00 - 0.00 Ground Water (GW) 30/07/2020	0.00 - 0.00 Ground Water (GW) 30/07/2020		
Component	LOD/Units	Method						
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.04	<0.04	<0.04		
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Dichlorvos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Dichlobenil	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Mevinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Tecnazene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Hexachlorobenzene	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Demeton-S-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Phorate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Diazinon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Triallate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Atrazine	<0.01 µg/l	TM344		0.0305	0.0605	<0.01		
Simazine	<0.01 µg/l	TM344		<0.01	0.0362	<0.01		
Disulfoton	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Propetamphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Chlorpyrifos-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Dimethoate	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Chlorpyrifos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Methyl Parathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Malathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Fenthion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Fenitrothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Parathion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Chlorfenvinphos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited. M mCERTS accredited. sq 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)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 30/07/2020	0.00 - 0.00 Ground Water (GW) 30/07/2020	0.00 - 0.00 Ground Water (GW) 30/07/2020		
Component	LOD/Units	Method						
cis-Chlordane	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Ethion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Carbophenothion	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Triazophos	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Phosalone	<0.01 µg/l	TM344		<0.01	<0.01	<0.01		
Azinphos methyl	<0.02 µg/l	TM344		<0.02	<0.02	<0.02		
Azinphos ethyl	<0.02 µg/l	TM344		<0.02	<0.02	<0.02		
Etridiazole	<0.01 µg/l	TM345		<0.02	<0.02	<0.02		
Pentachlorobenzene	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Propachlor	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Quintozene (PCNB)	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Omethoate	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Propazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Propyzamide	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Alachlor	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Prometryn	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Telodrin	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Terbutryn	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Chlorothalonil	<0.01 µg/l	TM345		<0.03	<0.03	<0.03		
Etrimphos	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Metazachlor	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Cyanazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Trietazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Coumaphos	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Phosphamidon I	<0.01 µg/l	TM345		<0.02	<0.02	<0.02		
Phosphamidon II	<0.01 µg/l	TM345		<0.02	<0.02	<0.02		
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.1	<0.5	<0.5		
Clopyralid	<0.04 µg/l	TM411		<0.04	<0.2	<0.2		
MCPA	<0.05 µg/l	TM411		<0.05	<0.25	<0.25		
Mecoprop	<0.04 µg/l	TM411		<0.04	<0.2	<0.2		
Dicamba	<0.04 µg/l	TM411		<0.04	<0.2	<0.2		
MCPB	<0.05 µg/l	TM411		<0.05	<0.25	<0.25		
2,4-DB	<0.1 µg/l	TM411		<0.1	<0.5	<0.5		



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-86	Client Reference: Galway Historic Landfills	Report Number: 564885
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562437

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BH1	GW01	GW02		
#	ISO17025 accredited.	Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
M	mCERTS accredited.	Sample Type	Ground Water (GW)	Ground Water (GW)	Ground Water (GW)		
aq	Aqueous / settled sample.	Date Sampled	30/07/2020	30/07/2020	30/07/2020		
diss.filt	Dissolved / filtered sample.	Sample Time					
tot.unfilt	Total / unfiltered sample.	Date Received	31/07/2020	31/07/2020	31/07/2020		
-	Subcontracted - refer to subcontractor report for accreditation status.	SDG Ref	200731-86	200731-86	200731-86		
-	% 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	Lab Sample No.(s)	22583337	22583320	22583328		
(F)	Trigger breach confirmed	AGS Reference					
1-3*5@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2-Chlorophenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2-Methylphenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2-Nitroaniline (aq)	<1 µg/l	TM176	<10	<10	<20	#	
2-Nitrophenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
3-Nitroaniline (aq)	<1 µg/l	TM176	<10	<10	<20	#	
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<10	<10	<20	#	
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
4-Chloroaniline (aq)	<1 µg/l	TM176	<10	<10	<20	#	
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<10	<10	<20	#	
4-Methylphenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
4-Nitroaniline (aq)	<1 µg/l	TM176	<10	<10	<20	#	
4-Nitrophenol (aq)	<1 µg/l	TM176	<10	<10	<20	#	
Azobenzene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
Acenaphthylene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
Acenaphthene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
Anthracene (aq)	<1 µg/l	TM176	<10	<10	<20	#	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<10	<10	<20	#	
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<10	<10	<20	#	
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<20	<20	<40	#	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<10	<10	<20	#	
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<10	<10	<20	#	



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

VOC MS (W)

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited.			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
M mCERTS accredited.				Ground Water (GW)	Ground Water (GW)	Ground Water (GW)		
aq Aqueous / settled sample.				30/07/2020	30/07/2020	30/07/2020		
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				31/07/2020	31/07/2020	31/07/2020		
1-3*5@ Sample deviation (see appendix)				200731-86	200731-86	200731-86		
				22583337	22583320	22583328		
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	108	105	107			
Toluene-d8**	%	TM208	96.9	97.2	96.8			
4-Bromofluorobenzene**	%	TM208	99.5	101	99.5			
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1			
Chloromethane	<1 µg/l	TM208	<1	<1	<1			
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1			
Bromomethane	<1 µg/l	TM208	<1	<1	<1			
Chloroethane	<1 µg/l	TM208	<1	<1	<1			
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1			
Dichloromethane	<3 µg/l	TM208	<3	<3	<3			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1			
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1			
Chloroform	<1 µg/l	TM208	<1	8.44	7.39			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1			
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1			
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1			
Benzene	<1 µg/l	TM208	<1	<1	<1			
Trichloroethene	<1 µg/l	TM208	<1	<1	<1			
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			
Dibromomethane	<1 µg/l	TM208	<1	<1	<1			
Bromodichloromethane	<1 µg/l	TM208	<1	4.04	3.94			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
Toluene	<1 µg/l	TM208	<1	<1	<1			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1			
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1			



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-86	Client Reference:	Galway Historic Landfills	Report Number:	564885
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562437

VOC MS (W)

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited. M mCERTS accredited. sq 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)	Depth (m)	Sample Type						
	Date Sampled	Sample Time						
	Date Received	SDG Ref						
	Lab Sample No.(s)	AGS Reference						
Component	LOD/Units	Method						
Tetrachloroethene	<1 µg/l	TM208	<1	<1	<1	#	#	#
Dibromochloromethane	<1 µg/l	TM208	<1	1.31	1.04	#	#	#
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	<1	#	#	#
Chlorobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1	#	#	#
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
m,p-Xylene	<1 µg/l	TM208	<1	<1	<1	#	#	#
o-Xylene	<1 µg/l	TM208	<1	<1	<1	#	#	#
Styrene	<1 µg/l	TM208	<1	<1	<1	#	#	#
Bromoform	<1 µg/l	TM208	<1	<1	<1	#	#	#
Isopropylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	<1	#	#	#
Bromobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
Propylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1	#	#	#
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
n-Butylbenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	<1	#	#	#
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1	#	#	#
Naphthalene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1	#	#	#



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-86	Client Reference: Galway Historic Landfills	Report Number: 564885
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562437

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

Validated

SDG: 200731-86 **Client Reference:** Galway Historic Landfills **Report Number:** 564885
Location: Gort Landfill **Order Number:** Z2189 **Superseded Report:** 562437

Test Completion Dates

Lab Sample No(s)	22583337	22583320	22583328
Customer Sample Ref.	BH1	GW01	GW02
AGS Ref.			
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water

	07-Aug-2020	07-Aug-2020	07-Aug-2020
Acid Herbicides by GCMS	07-Aug-2020	07-Aug-2020	07-Aug-2020
Alkalinity as CaCO3	06-Aug-2020	06-Aug-2020	05-Aug-2020
Ammonium Low	06-Aug-2020	06-Aug-2020	06-Aug-2020
Anions by Kone (w)	04-Aug-2020	04-Aug-2020	04-Aug-2020
BOD True Total	06-Aug-2020	06-Aug-2020	06-Aug-2020
COD Unfiltered	04-Aug-2020	04-Aug-2020	04-Aug-2020
Conductivity (at 20 deg.C)	05-Aug-2020	05-Aug-2020	05-Aug-2020
Cyanide Comp/Free/Total/Thiocyanate	07-Aug-2020	07-Aug-2020	07-Aug-2020
Dissolved Metals by ICP-MS	07-Aug-2020	07-Aug-2020	07-Aug-2020
Dissolved Oxygen by Probe	02-Aug-2020	02-Aug-2020	02-Aug-2020
Faecal Coliforms (W)*	10-Aug-2020	10-Aug-2020	10-Aug-2020
Fluoride	04-Aug-2020	04-Aug-2020	04-Aug-2020
Mercury Dissolved	05-Aug-2020	05-Aug-2020	05-Aug-2020
PCB Congeners - Aqueous (W)	10-Aug-2020	10-Aug-2020	10-Aug-2020
Pesticides (Suite I) by GCMS	06-Aug-2020	06-Aug-2020	06-Aug-2020
Pesticides (Suite II) by GCMS	07-Aug-2020	07-Aug-2020	07-Aug-2020
Pesticides (Suite III) by GCMS	05-Aug-2020	05-Aug-2020	05-Aug-2020
pH Value	04-Aug-2020	04-Aug-2020	04-Aug-2020
SVOC MS (W) - Aqueous	09-Aug-2020	09-Aug-2020	10-Aug-2020
Total Coliforms(W)*	10-Aug-2020	10-Aug-2020	
Total Organic and Inorganic Carbon	06-Aug-2020	06-Aug-2020	06-Aug-2020
VOC MS (W)	05-Aug-2020	05-Aug-2020	05-Aug-2020



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

08 August 2020

Test Report: COV/1904555/2020

Dear Subcon Results

Analysis of your sample(s) received on 01 August 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: 

Name: B. Paige

Title: Microbiology Team Leader



EMS 675527

OHS 542058

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No.02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

Report Summary

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



ANALYSED BY



Date of Issue: **08 August 2020**

Report Number: **COV/1904555/2020**

Issue **1**

This issue replaces
all previous issues

Job Description: 2020 Analysis

Job Location: 200731-86

Number of Samples
included in this report **5**

Job Received: **01 August 2020**

Number of Test Results
included in this report **7**

Analysis Commenced: **01 August 2020**

Signed:

Name: **B. Paige**

Date: **08 August 2020**

Title: **Microbiology 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.

This communication has been sent to you by ALS Environmental Ltd. Registered in England and Wales. Registration No. 02148934. Registered Office: ALS Environmental Limited, Torrington Avenue, Coventry, CV4 9GU.

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Certificate of Analysis

ANALYSED BY



Report Number: **COV/1904555/2020**
Laboratory Number: **19545528**
Sample Source: **ALS Life Sciences Limited**
Sample Point Description:
Sample Description: **22584567 BH1**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 July 2020**
Sample Received: **01 August 2020**
Analysis Complete: **08 August 2020**
SDG: **200731-86**
Sample Reference: **BH1**

Issue **1**
Sample **1** of **5**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Faecal coliforms confirmed	4	cfu/100ml	08/08/2020	N Cov	W57

Analyst Comments for 19545528:

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: *B. Paige*

Name: **B. Paige**

Date: **08 August 2020**

Title: **Microbiology Team Leader**

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Page 2 of 9

Certificate of Analysis

ANALYSED BY



Report Number: **COV/1904555/2020**
Laboratory Number: **19545529**
Sample Source: **ALS Life Sciences Limited**
Sample Point Description:
Sample Description: **22584568 BH1**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 July 2020**
Sample Received: **01 August 2020**
Analysis Complete: **08 August 2020**
SDG: **200731-86**
Sample Reference: **BH1**

Issue **1**
Sample **2** of **5**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Total Coliform presumpt	>100	cfu/100ml	02/08/2020	Y Cov	W10
Total Coliforms confirmed	>100	cfu/100ml	02/08/2020	Y Cov	W10

Analyst Comments for 19545529:

This sample has been analysed for Total Coliforms confirmed, Total Coliform presumpt outside recommended stability times. It is therefore possible that the results provided may be compromised. Confirmation process not been carried out for coliforms due to nature of the sample.

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:

Name: **B. Paige**

Date: **08 August 2020**

Title: **Microbiology Team Leader**

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Certificate of Analysis

ANALYSED BY



Report Number: **COV/1904555/2020**
Laboratory Number: **19545530**
Sample Source: **ALS Life Sciences Limited**
Sample Point Description:
Sample Description: **22584558 GW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 July 2020**
Sample Received: **01 August 2020**
Analysis Complete: **08 August 2020**
SDG: **200731-86**
Sample Reference: **GW01**

Issue **1**
Sample **3** of **5**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Faecal coliforms confirmed	19	cfu/100ml	08/08/2020	N Cov	W57

Analyst Comments for 19545530:

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: *B. Paige*

Name: **B. Paige**

Date: **08 August 2020**

Title: **Microbiology Team Leader**

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Certificate of Analysis

ANALYSED BY



Report Number: **COV/1904555/2020**
Laboratory Number: **19545531**
Sample Source: **ALS Life Sciences Limited**
Sample Point Description:
Sample Description: **22584559 GW01**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 July 2020**
Sample Received: **01 August 2020**
Analysis Complete: **08 August 2020**
SDG: **200731-86**
Sample Reference: **GW01**

Issue **1**
Sample **4** of **5**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Total Coliform presumpt	>100	cfu/100ml	02/08/2020	Y Cov	W10
Total Coliforms confirmed	>100	cfu/100ml	02/08/2020	Y Cov	W10

Analyst Comments for 19545531:

This sample has been analysed for Total Coliforms confirmed, Total Coliform presumpt outside recommended stability times. It is therefore possible that the results provided may be compromised. Confirmation process not been carried out for coliforms due to nature of the sample.

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:

Name: **B. Paige**

Date: **08 August 2020**

Title: **Microbiology Team Leader**

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Certificate of Analysis

ANALYSED BY



Report Number: **COV/1904555/2020**
Laboratory Number: **19545532**
Sample Source: **ALS Life Sciences Limited**
Sample Point Description:
Sample Description: **22584565 GW02**
Sample Matrix: **Ground Water**
Sample Date/Time: **30 July 2020**
Sample Received: **01 August 2020**
Analysis Complete: **08 August 2020**
SDG: **200731-86**
Sample Reference: **GW02**

Issue **1**
Sample **5** of **5**

Test Description	Result	Units	Analysis Date	Accreditation	Method
Faecal coliforms confirmed	620	cfu/100ml	08/08/2020	N Cov	W57

Analyst Comments for 19545532:

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: *B. Paige*

Name: **B. Paige**

Date: **08 August 2020**

Title: **Microbiology Team Leader**

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ANALYST COMMENTS FOR REPORT COV/1904555/2020

Issue 1

This issue replaces all previous issues

Date of Issue: 08 August 2020

Sample No	Analysis Comments
19545528	This sample has been analysed for Faecal coliforms confirmed outside recommended stability times. It is therefore possible that the results provided may be compromised.
19545529	This sample has been analysed for Total Coliforms confirmed, Total Coliform presumpt outside recommended stability times. It is therefore possible that the results provided may be compromised. Confirmation process not been carried out for coliforms due to nature of the sample.
19545530	This sample has been analysed for Faecal coliforms confirmed outside recommended stability times. It is therefore possible that the results provided may be compromised.
19545531	This sample has been analysed for Total Coliforms confirmed, Total Coliform presumpt outside recommended stability times. It is therefore possible that the results provided may be compromised. Confirmation process not been carried out for coliforms due to nature of the sample.
19545532	This sample has been analysed for Faecal coliforms confirmed outside recommended stability times. It is therefore possible that the results provided may be compromised.

Signed:

Name: **B. Paige**

Date: **08 August 2020**

Title: **Microbiology Team Leader**




DETERMINAND COMMENTS FOR REPORT COV/1904555/2020

ISSUE 1

Date of Issue: 08 August 2020

This issue replaces all previous issues

Sample No	Description	Determinand	Comments
19545529	22584568 BH1	Total Coliform presump	Confirmation process not been carried out for coliforms due to nature of the sample.
19545531	22584559 GW01	Total Coliform presump	Confirmation process not been carried out for coliforms due to nature of the sample.

Signed: 	Name: B. Paige	Date: 08 August 2020
	Title: Microbiology Team Leader	

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CERTIFICATE OF ANALYSIS

SDG: 200731-86	Client Reference: Galway Historic Landfills	Report Number: 564885
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562437

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. 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: 03 September 2020
Customer: Fehily Timoney
Sample Delivery Group (SDG): 200826-91
Your Reference: Galway Historic Landfills
Location: Gort Landfill
Report No: 565822

This report has been revised and directly supersedes 565524 in its entirety.

We received 3 samples on Wednesday August 26, 2020 and 3 of these samples were scheduled for analysis which was completed on Thursday September 03, 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

Validated

SDG: 200826-91 **Client Reference:** Galway Historic Landfills **Report Number:** 565822
Location: Gort Landfill **Order Number:** Z2189 **Superseded Report:** 565524

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22723066	BH1		0.00 - 0.00	25/08/2020
22723048	GW01		0.00 - 0.00	25/08/2020
22723058	GW02		0.00 - 0.00	25/08/2020

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



CERTIFICATE OF ANALYSIS

Validated

SDG:	200826-91	Client Reference:	Galway Historic Landfills	Report Number:	565822
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	565524

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)	22723066	22723048	22723058
Customer Sample Reference	BH1	GW01	GW02
AGS Reference			
Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Container	Vial (ALE297)	Vial (ALE297)	Vial (ALE297)
Sample Type	GW	GW	GW

Test Name	All	NDPs: 0 Tests: 3	Container														
			Vial (ALE297)	Vial (ALE297)	0.5l glass bottle (ALE227)	0.5l glass bottle (ALE208)	500ml Plastic (ALE208)	500ml Plastic (ALE244)	NaOH (ALE245)	NaOH (ALE245)	H2SO4 (ALE244)	H2SO4 (ALE244)					
Pesticides (Suite II) by GCMS			X				X						X				
Pesticides (Suite III) by GCMS			X				X						X				
pH Value				X				X						X			
SVOC MS (W) - Aqueous				X				X						X			
Total Organic and Inorganic Carbon					X					X					X		
VOC MS (W)								X						X			X



CERTIFICATE OF ANALYSIS

Validated

SDG:	200826-91	Client Reference:	Galway Historic Landfills	Report Number:	565822
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	565524

Results Legend		Customer Sample Ref.	BH1	GW01	GW02		
# 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*5@ Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020		
Component	LOD/Units	Method					
Coliforms, Total*	MPN/100ml	SUB	345	425	146		
Coliforms, Faecal*	CFU/100ml	SUB	47	2	21		
Alkalinity, Total as HCO3	<2 mg/l	TM043	1050	382	1180		
BOD, unfiltered	<1 mg/l	TM045	<1	7	2.45		
Oxygen, dissolved	<0.3 mg/l	TM046	9.71				
Organic Carbon, Total	<3 mg/l	TM090	3.29	<3	3.33		
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.0572	0.0516	0.0745		
Fluoride	<0.5 mg/l	TM104	0.972	<0.5	<0.5		
COD, unfiltered	<7 mg/l	TM107	150	25.6	135		
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.664	0.699	0.609		
Arsenic (diss.filt)	<0.5 µg/l	TM152	0.982	1.6	0.939		
Barium (diss.filt)	<0.2 µg/l	TM152	23.2	20	28.9		
Boron (diss.filt)	<10 µg/l	TM152	33.4	22.9	17.4		
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	0.0863	<0.08		
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	<1		
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3	0.895	0.932		
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	1.01	<0.2		
Manganese (diss.filt)	<3 µg/l	TM152	15.2	30.3	13.8		
Nickel (diss.filt)	<0.4 µg/l	TM152	1.39	15	4.78		
Phosphorus (diss.filt)	<10 µg/l	TM152	19.4	<10	<10		
Selenium (diss.filt)	<1 µg/l	TM152	<1	1.4	1.07		
Thallium (diss.filt)	<2 µg/l	TM152	<2	<2	<2		
Zinc (diss.filt)	<1 µg/l	TM152	1.03	10.8	2.69		
Sodium (Dis.Filt)	<0.076 mg/l	TM152	9.23	39.5	9.51		
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	7.72	15.4	8.09		
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.77	4.38	1.94		
Calcium (Dis.Filt)	<0.2 mg/l	TM152	129	102	128		
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	0.0433	<0.019		
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01		
Sulphate	<2 mg/l	TM184	8.1	31.2	13.5		
Chloride	<2 mg/l	TM184	21.4	58.6	19.4		
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	1.78	1.76	1.92		
PCB congener 28	<0.015 µg/l	TM197	<0.015	<0.015	<0.015		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200826-91	Client Reference:	Galway Historic Landfills	Report Number:	565822
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	565524

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited. M mCERTS accredited. sq 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)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
Component	LOD/Units	Method						
PCB congener 52	<0.015 µg/l	TM197	0.00 - 0.00 Ground Water (GW) 25/08/2020	<0.015	0.00 - 0.00 Ground Water (GW) 25/08/2020	<0.015		
PCB congener 101	<0.015 µg/l	TM197		<0.015	<0.015	<0.015		
PCB congener 118	<0.015 µg/l	TM197		<0.015	<0.015	<0.015		
PCB congener 138	<0.015 µg/l	TM197		<0.015	<0.015	<0.015		
PCB congener 153	<0.015 µg/l	TM197		<0.015	<0.015	<0.015		
PCB congener 180	<0.015 µg/l	TM197		<0.015	<0.015	<0.015		
Sum of detected EC7 PCB's	<0.105 µg/l	TM197		<0.105	<0.105	<0.105		
Cyanide, Total	<0.05 mg/l	TM227		<0.05 #	<0.05 #	<0.05 #		
pH	<1 pH Units	TM256		7.24 #	7.45 #	7.29 #		
Trifluralin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
alpha-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
gamma-HCH (Lindane)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
beta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
delta-HCH	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
o,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
p,p'-DDE	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
o,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
o,p'-DDT	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
p,p'-DDD (TDE)	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Endosulphan II	<0.02 µg/l	TM343		<0.02	<0.02	<0.02		
p,p'-DDT	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
o,p'-Methoxychlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
p,p'-Methoxychlor	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Endosulphan Sulphate	<0.02 µg/l	TM343		<0.02	<0.02	<0.02		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200826-91	Client Reference:	Galway Historic Landfills	Report Number:	565822
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	565524

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited. M mCERTS accredited. sq 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)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020		
Component	LOD/Units	Method						
Permethrin I	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
Permethrin II	<0.01 µg/l	TM343		<0.01	<0.01	<0.01		
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Hexachlorobutadiene	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Dichlorvos	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Dichlobenil	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Mevinphos	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Tecnazene	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Hexachlorobenzene	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Demeton-S-methyl	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Phorate	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Diazinon	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Triallate	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Atrazine	<0.01 µg/l	TM344		<0.02	0.0233	0.0125		
Simazine	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Disulfoton	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Propetamphos	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Chlorpyrifos-methyl	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Dimethoate	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Pirimiphos-methyl	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Chlorpyrifos	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Methyl Parathion	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Malathion	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Fenthion	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Fenitrothion	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Parathion	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Chlorfenvinphos	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200826-91	Client Reference:	Galway Historic Landfills	Report Number:	565822
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	565524

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited. M mCERTS accredited. sq 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)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020		
Component	LOD/Units	Method						
Ethion	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Carbophenothion	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Triazophos	<0.01 µg/l	TM344		<0.02	<0.01	<0.01		
Phosalone	<0.01 µg/l	TM344		<0.04	<0.01	<0.01		
Azinphos methyl	<0.02 µg/l	TM344		<0.12	<0.04	<0.04		
Azinphos ethyl	<0.02 µg/l	TM344		<0.08	<0.02	<0.02		
Etridiazole	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Pentachlorobenzene	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Propachlor	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Quintozene (PCNB)	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Omethoate	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Propazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Propyzamide	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Alachlor	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Prometryn	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Telodrin	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Terbutryn	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Chlorothalonil	<0.01 µg/l	TM345		<0.02	<0.02	<0.02		
Etrimphos	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Metazachlor	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Cyanazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Trietazine	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Coumaphos	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Phosphamidon I	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Phosphamidon II	<0.01 µg/l	TM345		<0.01	<0.01	<0.01		
Dinitro-o-cresol	<0.1 µg/l	TM411		<0.1	<0.2	0.283		
Clopyralid	<0.04 µg/l	TM411		<0.04	<0.08	<0.04		
MCPA	<0.05 µg/l	TM411		<0.05	<0.1	<0.05		
Mecoprop	<0.04 µg/l	TM411		<0.08	<0.08	<0.04		
Dicamba	<0.04 µg/l	TM411		<0.08	<0.08	<0.04		
MCPB	<0.05 µg/l	TM411		<0.1	<0.1	<0.05		
2,4-DB	<0.1 µg/l	TM411		<0.2	<0.2	<0.1		
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411		<0.05	<0.1	<0.05		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200826-91	Client Reference:	Galway Historic Landfills	Report Number:	565822
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	565524

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BH1	GW01	GW02		
# 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*5@ Sample deviation (see appendix)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020		
Component	LOD/Units	Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2-Chlorophenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2-Methylphenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2-Nitroaniline (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
2-Nitrophenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
3-Nitroaniline (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
4-Chloroaniline (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
4-Methylphenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
4-Nitroaniline (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
4-Nitrophenol (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
Azobenzene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
Acenaphthylene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
Acenaphthene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
Anthracene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<20 #	<2 #	<20 #		
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<10 #	<1 #	<10 #		



CERTIFICATE OF ANALYSIS

Validated

SDG: 200826-91 **Client Reference:** Galway Historic Landfills **Report Number:** 565822
Location: Gort Landfill **Order Number:** Z2189 **Superseded Report:** 565524

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BH1	GW01	GW02					
#	ISO17025 accredited.									
M	mCERTS accredited.									
aq	Aqueous / settled sample.									
dis.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	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	0.00 - 0.00	Ground Water (GW)	25/08/2020		25/08/2020		22723066	
										#
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	0.00 - 0.00	Ground Water (GW)	25/08/2020		25/08/2020		22723048	
										#
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<10							#
										#
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<10							#
										#
Carbazole (aq)	<1 µg/l	TM176	<10							#
										#
Chrysene (aq)	<1 µg/l	TM176	<10							#
										#
Dibenzofuran (aq)	<1 µg/l	TM176	<10							#
										#
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<10							#
										#
Diethyl phthalate (aq)	<1 µg/l	TM176	<10							#
										#
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<10							#
										#
Dimethyl phthalate (aq)	<1 µg/l	TM176	<10							#
										#
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<50							#
										#
Fluoranthene (aq)	<1 µg/l	TM176	<10							#
										#
Fluorene (aq)	<1 µg/l	TM176	<10							#
										#
Hexachlorobenzene (aq)	<1 µg/l	TM176	<10							#
										#
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<10							#
										#
Pentachlorophenol (aq)	<1 µg/l	TM176	<10							#
										#
Phenol (aq)	<1 µg/l	TM176	<10							#
										#
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<10							#
										#
Hexachloroethane (aq)	<1 µg/l	TM176	<10							#
										#
Nitrobenzene (aq)	<1 µg/l	TM176	<10							#
										#
Naphthalene (aq)	<1 µg/l	TM176	<10							#
										#
Isophorone (aq)	<1 µg/l	TM176	<10							#
										#
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<10							#
										#
Phenanthrene (aq)	<1 µg/l	TM176	<10							#
										#
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<10							#
										#
Pyrene (aq)	<1 µg/l	TM176	<10							#
										#



CERTIFICATE OF ANALYSIS

Validated

SDG: 200826-91 **Client Reference:** Galway Historic Landfills **Report Number:** 565822
Location: Gort Landfill **Order Number:** Z2189 **Superseded Report:** 565524

VOC MS (W)

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
M	mCERTS accredited.			Ground Water (GW)	Ground Water (GW)	Ground Water (GW)		
aq	Aqueous / settled sample.			25/08/2020	25/08/2020	25/08/2020		
diss.filt	Dissolved / filtered sample.			26/08/2020	26/08/2020	26/08/2020		
tot.unfilt	Total / unfiltered sample.			200826-91	200826-91	200826-91		
*	Subcontracted - refer to subcontractor report for accreditation status.			22723066	22723048	22723058		
**	% 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						
Dibromofluoromethane**	%	TM208	117	119	116			
Toluene-d8**	%	TM208	98.2	98.7	98.5			
4-Bromofluorobenzene**	%	TM208	97.2	97.1	97			
Dichlorodifluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Chloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Vinyl chloride	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Bromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Chloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Trichlorofluoromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #	<3 #			
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 #	<1 #			
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
2,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Bromochloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Chloroform	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1,1-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Carbontetrachloride	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,2-Dichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Benzene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Trichloroethene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,2-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Dibromomethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Bromodichloromethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
Toluene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,1,2-Trichloroethane	<1 µg/l	TM208	<1 #	<1 #	<1 #			
1,3-Dichloropropane	<1 µg/l	TM208	<1 #	<1 #	<1 #			



CERTIFICATE OF ANALYSIS

Validated

SDG:	200826-91	Client Reference:	Galway Historic Landfills	Report Number:	565822
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	565524

VOC MS (W)

Results Legend			Customer Sample Ref.	BH1	GW01	GW02		
# ISO17025 accredited. M mCERTS accredited. sq 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)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020	0.00 - 0.00 Ground Water (GW) 25/08/2020		
Component	LOD/Units	Method						
Tetrachloroethene	<1 µg/l	TM208	<1	<1	<1			
Dibromochloromethane	<1 µg/l	TM208	<1	<1	<1			
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	<1			
Chlorobenzene	<1 µg/l	TM208	<1	<1	<1			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1			
Ethylbenzene	<1 µg/l	TM208	<1	<1	<1			
m,p-Xylene	<1 µg/l	TM208	<1	<1	<1			
o-Xylene	<1 µg/l	TM208	<1	<1	<1			
Styrene	<1 µg/l	TM208	<1	<1	<1			
Bromoform	<1 µg/l	TM208	<1	<1	<1			
Isopropylbenzene	<1 µg/l	TM208	<1	<1	<1			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	<1			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	<1			
Bromobenzene	<1 µg/l	TM208	<1	<1	<1			
Propylbenzene	<1 µg/l	TM208	<1	<1	<1			
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1			
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	<1			
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	<1			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	<1			
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	<1			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	<1			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
n-Butylbenzene	<1 µg/l	TM208	<1	<1	<1			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	<1			
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	<1			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	<1			
Naphthalene	<1 µg/l	TM208	<1	<1	<1			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1			
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	<1			



CERTIFICATE OF ANALYSIS

Validated

SDG: 200826-91	Client Reference: Galway Historic Landfills	Report Number: 565822
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 565524

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

Validated

SDG: 200826-91	Client Reference: Galway Historic Landfills	Report Number: 565822	
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 565524	

Test Completion Dates

Lab Sample No(s)	22723066	22723048	22723058
Customer Sample Ref.	BH1	GW01	GW02
AGS Ref.			
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Ground Water

Acid Herbicides by GCMS	03-Sep-2020	03-Sep-2020	03-Sep-2020
Alkalinity as CaCO3	29-Aug-2020	29-Aug-2020	29-Aug-2020
Ammonium Low	03-Sep-2020	03-Sep-2020	03-Sep-2020
Anions by Kone (w)	31-Aug-2020	31-Aug-2020	31-Aug-2020
BOD True Total	01-Sep-2020	01-Sep-2020	01-Sep-2020
COD Unfiltered	28-Aug-2020	28-Aug-2020	30-Aug-2020
Coliforms (W)	02-Sep-2020	02-Sep-2020	02-Sep-2020
Conductivity (at 20 deg.C)	27-Aug-2020	27-Aug-2020	27-Aug-2020
Cyanide Comp/Free/Total/Thiocyanate	03-Sep-2020	03-Sep-2020	03-Sep-2020
Dissolved Metals by ICP-MS	02-Sep-2020	02-Sep-2020	02-Sep-2020
Dissolved Oxygen by Probe	28-Aug-2020		
Fluoride	01-Sep-2020	01-Sep-2020	28-Aug-2020
Mercury Dissolved	03-Sep-2020	03-Sep-2020	03-Sep-2020
PCB Congeners - Aqueous (W)	03-Sep-2020	03-Sep-2020	03-Sep-2020
Pesticides (Suite I) by GCMS	01-Sep-2020	01-Sep-2020	01-Sep-2020
Pesticides (Suite II) by GCMS	01-Sep-2020	01-Sep-2020	01-Sep-2020
Pesticides (Suite III) by GCMS	01-Sep-2020	01-Sep-2020	01-Sep-2020
pH Value	27-Aug-2020	27-Aug-2020	27-Aug-2020
SVOC MS (W) - Aqueous	30-Aug-2020	30-Aug-2020	30-Aug-2020
Total Organic and Inorganic Carbon	29-Aug-2020	29-Aug-2020	01-Sep-2020
VOC MS (W)	03-Sep-2020	03-Sep-2020	03-Sep-2020

Customer

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

Certificate Of Analysis

Job Number: 20-82835
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

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.

Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: GW01 - GORT

Date of Sampling: 26/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529041

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	424.5	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	2	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

Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: GW02 - GORT

Date of Sampling: 26/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529042

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	145.5	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	21	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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Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: BH01 - GORT

Date of Sampling: 26/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529043

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	344.8	MPN/100ml	-
D/D3221#	27/08/2020	Faecal Coliforms	47	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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Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: GW01 -NEW INN

Date of Sampling: 26/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529044

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	2.0	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.

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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Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: GW02 - NEW INN

Date of Sampling: 26/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529045

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	488.4	MPN/100ml	-
D/D3221#	27/08/2020	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.

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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: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: BH1 - NEW INN

Date of Sampling: 26/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529046

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	< 1.0	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.

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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Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: BH4 -NEW INN

Date of Sampling: 26/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529047

Site / Method Ref.	Analysis Start Date	Parameter	Result	Units	PV Value (Drinking Water Only)
D/D1201#	27/08/2020	Coliforms	< 1.0	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.

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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TVC - Total viable count

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: RC2 - TUAM

Date of Sampling: 27/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529048

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	-

= 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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Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: RC3- TUAM

Date of Sampling: 27/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529049

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	-

= 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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Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: 3AP-TUAM

Date of Sampling: 27/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529050

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	-

= 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

Certificate Of Analysis

Customer

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

Report Reference: 20-82835

Report Version: 1

Site: Fehily Timoney

Sample Description: 4AP- TUAM

Date of Sampling: 27/08/2020

Sample Type: Ground

Date Sample Received: 27/08/2020

Lab Reference Number: 529051

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.

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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CERTIFICATE OF ANALYSIS

SDG: 200826-91	Client Reference: Galway Historic Landfills	Report Number: 565822
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 565524

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. 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.



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

Tel: (01244) 528700

Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

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

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 July 2021
Customer: Fehily Timoney
Sample Delivery Group (SDG): 210715-112
Your Reference: P2282
Location: Gort Landfill
Report No: 607011

This report has been revised and directly supersedes 606861 in its entirety.

We received 2 samples on Thursday July 15, 2021 and 2 of these samples were scheduled for analysis which was completed on Monday July 26, 2021. 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

Validated

SDG: 210715-112 **Client Reference:** P2282 **Report Number:** 607011
Location: Gort Landfill **Order Number:** Z2798 **Superseded Report:** 606861

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24638645	BH1		0.00 - 0.00	14/07/2021
24638669	GW01		0.00 - 0.00	14/07/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112	Client Reference: P2282	Report Number: 607011
Location: Gort Landfill	Order Number: Z2798	Superseded Report: 606861

Results Legend	Lab Sample No(s)		24638645 - 24638669												
			BH1 - GW01												
		Customer Sample Reference													
		AGS Reference													
		Depth (m)		0.00 - 0.00											
		Container		Vial (ALE297)	NaOH (ALE245)	HNO3 Unfiltered (ALE204)	H2SO4 (ALE244)	500ml Plastic (ALE208)	0.5l glass bottle (ALE227)	Vial (ALE297)	NaOH (ALE245)	HNO3 Unfiltered (ALE204)	H2SO4 (ALE244)	500ml Plastic (ALE208)	0.5l glass bottle (ALE227)
		Sample Type		GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 2	X						X						
Alkalinity as CaCO3	All	NDPs: 0 Tests: 2		X									X		
Ammonium Low	All	NDPs: 0 Tests: 2			X								X		
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X									X		
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2		X									X		
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2							X						X
Dissolved Metals by ICP-MS	All	NDPs: 2 Tests: 0				N									N
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2		X									X		
Fluoride	All	NDPs: 0 Tests: 2		X									X		
Mercury Dissolved	All	NDPs: 2 Tests: 0				N									N
Mercury Unfiltered	All	NDPs: 0 Tests: 2				X									X
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2	X										X		
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2	X										X		
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2	X										X		
Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2	X										X		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112	Client Reference: P2282	Report Number: 607011
Location: Gort Landfill	Order Number: Z2798	Superseded Report: 606861

Results Legend		Customer Sample Ref.		BH1	GW01			
# ISO17025 accredited.		Depth (m)		0.00 - 0.00	0.00 - 0.00			
M mCERTS accredited.		Sample Type		Ground Water (GW)	Ground Water (GW)			
aq Aqueous / settled sample.		Date Sampled		14/07/2021	14/07/2021			
diss.filt Dissolved / filtered sample.		Sample Time		15/07/2021	15/07/2021			
tot.unfilt Total / unfiltered sample.		Date Received		210715-112	210715-112			
- Subcontracted - refer to subcontractor report for accreditation status.		SDG Ref		24638645	24638669			
- % 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		Lab Sample No.(s)						
(F) Trigger breach confirmed		AGS Reference						
1-4*#@ Sample deviation (see appendix)								
Component	LOD/Units	Method						
Alkalinity, Total as HCO3	<2 mg/l	TM043	511	439				
Oxygen, dissolved	<0.3 mg/l	TM046	10.6	11				
Organic Carbon, Total	<3 mg/l	TM090	<3	<3				
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.029	0.021				
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5				
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.659	0.737				
Arsenic (tot.unfilt)	<2 µg/l	TM152	6.04	<2				
Barium (tot.unfilt)	<0.5 µg/l	TM152	30.3	15.6				
Boron (tot.unfilt)	<20 µg/l	TM152	76.3	74				
Cadmium (tot.unfilt)	<0.5 µg/l	TM152	<0.5	<0.5				
Chromium (tot.unfilt)	<3 µg/l	TM152	4.44	<3				
Copper (tot.unfilt)	<1 µg/l	TM152	16.7	1.33				
Lead (tot.unfilt)	<1 µg/l	TM152	16.2	5.83				
Manganese (tot.unfilt)	<1 µg/l	TM152	263	178				
Nickel (tot.unfilt)	<1 µg/l	TM152	12	9.31				
Phosphorus (tot.unfilt)	<20 µg/l	TM152	567	155				
Selenium (tot.unfilt)	<1 µg/l	TM152	1.38	1.22				
Thallium (tot.unfilt)	<3 µg/l	TM152	<3	<3				
Zinc (tot.unfilt)	<5 µg/l	TM152	23.4	10.1				
Sodium (Tot. Unfilt.)	<0.047 mg/l	TM152	12.1	29.1				
Magnesium (Tot. Unfilt.)	<0.05 mg/l	TM152	14.8	18.7				
Potassium (Tot. Unfilt.)	<0.2 mg/l	TM152	2.31	3.81				
Calcium (Tot. Unfilt.)	<0.057 mg/l	TM152	326	228				
Iron (Tot. Unfilt.)	<0.024 mg/l	TM152	5	1.23				
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	<100	<100				
Mercury (tot.unfilt)	<0.02 µg/l	TM183	0.022	<0.02				
Sulphate	<2 mg/l	TM184	11.8	26.8				
Chloride	<2 mg/l	TM184	16.6	48.5				
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	1.57	2.21				
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05				
pH	<1 pH Units	TM256	7.33	7.45				
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01				
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01				



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607011
Superseded Report: 606861

Results Legend		Customer Sample Ref.	BH1	GW01			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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						
1-4*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01			
Heptachlor	<0.01 µg/l	TM343	<0.02	<0.02			
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01			
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01			
delta-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01			
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01			
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01			
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01			
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01			
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01			
Endrin	<0.01 µg/l	TM343	<0.02	<0.02			
o,p'-DDT	<0.01 µg/l	TM343	<0.05	<0.05			
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01			
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02			
p,p'-DDT	<0.01 µg/l	TM343	<0.08	<0.08			
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.04	<0.04			
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.08	<0.08			
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.04	<0.04			
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01			
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01			
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.01	<0.01			
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			
Dichlorvos	<0.01 µg/l	TM344	<0.01	<0.01			
Dichlobenil	<0.01 µg/l	TM344	<0.01	<0.01			
Mevinphos	<0.01 µg/l	TM344	<0.01	<0.01			
Tecnazene	<0.01 µg/l	TM344	<0.01	<0.01			
Hexachlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112	Client Reference: P2282	Report Number: 607011
Location: Gort Landfill	Order Number: Z2798	Superseded Report: 606861

#	Customer Sample Ref.	BH1	GW01			
<div style="font-size: small;"> Results Legend # ISO17025 accredited. M mCERTS accredited. sq 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 1-4*\$@ Sample deviation (see appendix) </div>						
Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference		0.00 - 0.00 Ground Water (GW) 14/07/2021 15/07/2021 210715-112 24638645	0.00 - 0.00 Ground Water (GW) 14/07/2021 15/07/2021 210715-112 24638669			
Component	LOD/Units	Method				
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01	<0.01		
Phorate	<0.01 µg/l	TM344	<0.03	<0.03		
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01		
Triallate	<0.01 µg/l	TM344	<0.01	<0.01		
Atrazine	<0.01 µg/l	TM344	<0.01	0.0211		
Simazine	<0.01 µg/l	TM344	<0.01	<0.01		
Disulfoton	<0.01 µg/l	TM344	<0.07	<0.07		
Propetamphos	<0.01 µg/l	TM344	<0.01	<0.01		
Chlorpyrifos-methyl	<0.01 µg/l	TM344	<0.01	<0.01		
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01		
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01		
Chlorpyrifos	<0.01 µg/l	TM344	<0.01	<0.01		
Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01		
Malathion	<0.01 µg/l	TM344	<0.01	<0.01		
Fenthion	<0.01 µg/l	TM344	<0.02	<0.02		
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01		
Parathion	<0.01 µg/l	TM344	<0.01	<0.01		
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01		
Ethion	<0.01 µg/l	TM344	<0.01	<0.01		
Carbophenothion	<0.01 µg/l	TM344	<0.01	<0.01		
Triazophos	<0.01 µg/l	TM344	<0.01	<0.01		
Phosalone	<0.01 µg/l	TM344	<0.01	<0.01		
Azinphos methyl	<0.02 µg/l	TM344	<0.02	<0.02		
Azinphos ethyl	<0.02 µg/l	TM344	<0.02	<0.02		
Etridiazole	<0.01 µg/l	TM345	<0.01	<0.01		
Pentachlorobenzene	<0.01 µg/l	TM345	<0.01	<0.01		
Propachlor	<0.01 µg/l	TM345	<0.01	<0.01		
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01		
Omethoate	<0.01 µg/l	TM345	<0.01	<0.01		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607011
Superseded Report: 606861

Results Legend		Customer Sample Ref.	BH1	GW01			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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						
1-4*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Propazine	<0.01 µg/l	TM345	<0.01	<0.01			
Propyzamide	<0.01 µg/l	TM345	<0.01	<0.01			
Alachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Prometryn	<0.01 µg/l	TM345	<0.01	<0.01			
Telodrin	<0.01 µg/l	TM345	<0.01	<0.01			
Terbutryn	<0.01 µg/l	TM345	<0.01	<0.01			
Chlorothalonil	<0.01 µg/l	TM345	<0.01	<0.02			
Etrimphos	<0.01 µg/l	TM345	<0.01	<0.01			
Metazachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Cyanazine	<0.01 µg/l	TM345	<0.01	<0.01			
Trietazine	<0.01 µg/l	TM345	<0.01	<0.01			
Coumaphos	<0.01 µg/l	TM345	<0.01	<0.01			
Phosphamidon I	<0.01 µg/l	TM345	<0.01	<0.01			
Phosphamidon II	<0.01 µg/l	TM345	<0.01	<0.01			
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.2	<0.1			
Clopyralid	<0.04 µg/l	TM411	<0.08	<0.04			
MCPA	<0.05 µg/l	TM411	<0.1	<0.05			
Mecoprop	<0.04 µg/l	TM411	<0.08	<0.04			
Dicamba	<0.04 µg/l	TM411	<0.08	<0.04			
MCPB	<0.05 µg/l	TM411	<0.1	<0.05			
2,4-DB	<0.1 µg/l	TM411	<0.2	<0.1			
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.1	<0.05			
Dichlorprop	<0.1 µg/l	TM411	<0.2	<0.1			
Triclopyr	<0.05 µg/l	TM411	<0.1	<0.05			
Fenoprop (Silvex)	<0.1 µg/l	TM411	<0.2	<0.1			
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.1	<0.05			
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.1	<0.05			
Bromoxynil	<0.04 µg/l	TM411	<0.08	<0.04			
Benazolin	<0.04 µg/l	TM411	<0.08	<0.04			
loxynil	<0.05 µg/l	TM411	<0.1	<0.05			
Pentachlorophenol	<0.04 µg/l	TM411	<0.08	<0.04			
Fluoroxypyr	<0.1 µg/l	TM411	<0.2	<0.1			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607011
Superseded Report: 606861

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	BH1	GW01			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00			
M	mCERTS accredited.		Ground Water (GW)	Ground Water (GW)			
aq	Aqueous / settled sample.		14/07/2021	14/07/2021			
diss.filt	Dissolved / filtered sample.		15/07/2021	15/07/2021			
tot.unfilt	Total / unfiltered sample.		210715-112	210715-112			
-	Subcontracted - refer to subcontractor report for accreditation status.		24638645	24638669			
**	% 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						
1-4*#@	Sample deviation (see appendix)						
Component	LOD/Units		Method				
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
Azobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1	#	#	
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1	#	#	
Anthracene (aq)	<1 µg/l	TM176	<1	<1	#	#	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1	#	#	
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1	#	#	
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2	#	#	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	#	#	
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1	#	#	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607011
Superseded Report: 606861

VOC MS (W)

Results Legend			Customer Sample Ref.					
#	ISO17025 accredited.		BH1	GW01				
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							
1-4*\$@	Sample deviation (see appendix)							
			Depth (m)	0.00 - 0.00	0.00 - 0.00			
			Sample Type	Ground Water (GW)	Ground Water (GW)			
			Date Sampled	14/07/2021	14/07/2021			
			Sample Time					
			Date Received	15/07/2021	15/07/2021			
			SDG Ref	210715-112	210715-112			
			Lab Sample No.(s)	24638645	24638669			
			AGS Reference					
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	110	113				
Toluene-d8**	%	TM208	101	99.8				
4-Bromofluorobenzene**	%	TM208	100	95.7				
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	#	#		
Chloromethane	<1 µg/l	TM208	<1	<1	#	#		
Vinyl chloride	<1 µg/l	TM208	<1	<1	#	#		
Bromomethane	<1 µg/l	TM208	<1	<1	#	#		
Chloroethane	<1 µg/l	TM208	<1	<1	#	#		
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	#	#		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#		
Carbon disulphide	<1 µg/l	TM208	<1	<1	#	#		
Dichloromethane	<3 µg/l	TM208	<3	<3	#	#		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	#	#		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#		
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#		
Bromochloromethane	<1 µg/l	TM208	<1	<1	#	#		
Chloroform	<1 µg/l	TM208	<1	<1	#	#		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#		
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#		
Carbontetrachloride	<1 µg/l	TM208	<1	<1	#	#		
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#		
Benzene	<1 µg/l	TM208	<1	<1	#	#		
Trichloroethene	<1 µg/l	TM208	<1	<1	#	#		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#		
Dibromomethane	<1 µg/l	TM208	<1	<1	#	#		
Bromodichloromethane	<1 µg/l	TM208	<1	<1	#	#		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#		
Toluene	<1 µg/l	TM208	<1	<1	#	#		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#		
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607011
Superseded Report: 606861

VOC MS (W)

Results Legend # ISO17025 accredited. M mCERTS accredited. sq 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 1-4\$\$\$@ Sample deviation (see appendix)		Customer Sample Ref.	BH1	GW01			
Component	LOD/Units	Method	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 14/07/2021 15/07/2021 210715-112 24638645	0.00 - 0.00 Ground Water (GW) 14/07/2021 15/07/2021 210715-112 24638669		
Tetrachloroethene	<1 µg/l	TM208	<1	<1	#	#	
Dibromochloromethane	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1	#	#	
Chlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	#	#	
Ethylbenzene	<1 µg/l	TM208	<1	<1	#	#	
m,p-Xylene	<1 µg/l	TM208	<1	<1	#	#	
o-Xylene	<1 µg/l	TM208	<1	<1	#	#	
Styrene	<1 µg/l	TM208	<1	<1	#	#	
Bromoform	<1 µg/l	TM208	<1	<1	#	#	
Isopropylbenzene	<1 µg/l	TM208	<1	<1	#	#	
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	#	#	
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1	#	#	
Bromobenzene	<1 µg/l	TM208	<1	<1	#	#	
Propylbenzene	<1 µg/l	TM208	<1	<1	#	#	
2-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#	
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1	#	#	
4-Chlorotoluene	<1 µg/l	TM208	<1	<1	#	#	
tert-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#	
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1	#	#	
sec-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#	
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1	#	#	
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
n-Butylbenzene	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1	#	#	
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1	#	#	
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1	#	#	
Naphthalene	<1 µg/l	TM208	<1	<1	#	#	
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1	#	#	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112 **Client Reference:** P2282 **Report Number:** 607011
Location: Gort Landfill **Order Number:** Z2798 **Superseded Report:** 606861

Notification of NDPs (No determination possible)

Date Received : 15/07/2021 12:40:25

Sample No	Customer Sample Ref.	Depth (m)	Test	Comment
24638645	BH1	0.00 - 0.00	Mercury Dissolved	Unsuitable for Analysis
24638645	BH1	0.00 - 0.00	Dissolved Metals by ICP-MS	Unsuitable for Analysis
24638669	GW01	0.00 - 0.00	Mercury Dissolved	Unsuitable for Analysis
24638669	GW01	0.00 - 0.00	Dissolved Metals by ICP-MS	Unsuitable for Analysis



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-112 **Client Reference:** P2282 **Report Number:** 607011
Location: Gort Landfill **Order Number:** Z2798 **Superseded Report:** 606861

Table of Results - Appendix

Method No	Reference	Description
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
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
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
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

Validated

SDG: 210715-112
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607011
Superseded Report: 606861

Test Completion Dates

Lab Sample No(s)	24638645	24638669
Customer Sample Ref.	BH1	GW01
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water

Acid Herbicides by GCMS	22-Jul-2021	22-Jul-2021
Alkalinity as CaCO3	21-Jul-2021	17-Jul-2021
Ammonium Low	20-Jul-2021	20-Jul-2021
Anions by Kone (w)	21-Jul-2021	21-Jul-2021
Conductivity (at 20 deg.C)	21-Jul-2021	20-Jul-2021
Cyanide Comp/Free/Total/Thiocyanate	21-Jul-2021	21-Jul-2021
Dissolved Oxygen by Probe	16-Jul-2021	16-Jul-2021
Fluoride	16-Jul-2021	16-Jul-2021
Mercury Unfiltered	23-Jul-2021	21-Jul-2021
Mineral Oil C10-40 Aqueous (W)	20-Jul-2021	20-Jul-2021
Pesticides (Suite I) by GCMS	20-Jul-2021	20-Jul-2021
Pesticides (Suite II) by GCMS	22-Jul-2021	22-Jul-2021
Pesticides (Suite III) by GCMS	26-Jul-2021	26-Jul-2021
pH Value	19-Jul-2021	19-Jul-2021
SVOC MS (W) - Aqueous	18-Jul-2021	18-Jul-2021
Total Metals by ICP-MS	23-Jul-2021	23-Jul-2021
Total Organic and Inorganic Carbon	24-Jul-2021	24-Jul-2021
VOC MS (W)	18-Jul-2021	16-Jul-2021



CERTIFICATE OF ANALYSIS

SDG: 210715-112	Client Reference: P2282	Report Number: 607011
Location: Gort Landfill	Order Number: Z2798	Superseded Report: 606861

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. 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
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

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 asbestos present is not determined unless specifically requested.

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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Dublin 11

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

Date of report Generation: 19 August 2020
Customer: Fehily Timoney
Sample Delivery Group (SDG): 200702-50
Your Reference: P2282
Location: Gort Landfill
Report No: 563812

This report has been revised and directly supersedes 562070 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 Wednesday August 19, 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

Validated

SDG:	200702-50	Client Reference:	P2282	Report Number:	563812
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562070

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22408528	Holy Well		0.00 - 0.00	01/07/2020
22408517	MH-1		0.00 - 0.00	01/07/2020
22408488	SW1		0.00 - 0.00	01/07/2020
22408504	SW2		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.



CERTIFICATE OF ANALYSIS

Validated

SDG: 200702-50	Client Reference: P2282	Report Number: 563812
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562070

Results Legend		Customer Sample Ref.		Holy Well	MH-1	SW1	SW2
# 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)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference					
Component	LOD/Units	Method					
Coliforms, Total*	MPN/100ml	SUB	>2420				
Coliforms, Faecal*	CFU/100ml	SUB	10				
Suspended solids, Total	<2 mg/l	TM022		<9	7.05		<4
Alkalinity, Total as HCO3	<2 mg/l	TM043	405				
BOD, unfiltered	<1 mg/l	TM045		<1		<1	<1
Oxygen, dissolved	<0.3 mg/l	TM046	9.28	9.64	9.69		10.4
Organic Carbon, Total	<3 mg/l	TM090	3.47	5.71			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099		0.573			<0.2
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	1.06	0.664	0.0296		0.0653
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5		<0.5
COD, unfiltered	<7 mg/l	TM107		16.8	18.3		23.5
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.692	0.624	0.169		0.167
Antimony (diss.filt)	<1 µg/l	TM152		<1			
Arsenic (diss.filt)	<0.5 µg/l	TM152	2.16	<0.5	<0.5		<0.5
Barium (diss.filt)	<0.2 µg/l	TM152	17.8	36.7	38.3		37.9
Beryllium (diss.filt)	<0.1 µg/l	TM152		<0.1			
Boron (diss.filt)	<10 µg/l	TM152	19.5	44.9			
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08		<0.08
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	<1		<1
Cobalt (diss.filt)	<0.5 µg/l	TM152		<0.5			
Copper (diss.filt)	<0.3 µg/l	TM152	1.33	1.09	1.11		0.699
Lead (diss.filt)	<0.2 µg/l	TM152	1.13	<0.2	0.483		0.268
Manganese (diss.filt)	<3 µg/l	TM152	58	32.7	50.9		38.9
Molybdenum (diss.filt)	<3 µg/l	TM152		<3			
Nickel (diss.filt)	<0.4 µg/l	TM152	1.31	1.35	1.24		0.795
Phosphorus (diss.filt)	<10 µg/l	TM152	206	67.9	21.3		12.4
Selenium (diss.filt)	<1 µg/l	TM152	<1	<1	<1		<1
Tellurium (diss.filt)	<2 µg/l	TM152		<2			
Thallium (diss.filt)	<2 µg/l	TM152	<2	<2	<2		<2
Titanium (diss.filt)	<1 µg/l	TM152		3.32			
Uranium (diss.filt)	<0.5 µg/l	TM152		1.05			
Vanadium (diss.filt)	<1 µg/l	TM152		<1			
Zinc (diss.filt)	<1 µg/l	TM152	3.85	22.9	6.61		8.97



CERTIFICATE OF ANALYSIS

Validated

SDG:	200702-50	Client Reference:	P2282	Report Number:	563812
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562070

Results Legend		Customer Sample Ref.	Holy Well	MH-1	SW1	SW2		
#	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						
Tin (Diss.Filt)	<1 µg/l	TM152		<1				#
Silver (diss.filt)	<0.5 µg/l	TM152		<0.5				#
Sodium (Dis.Filt)	<0.076 mg/l	TM152	22.6	18.7	10.8	10.9	#	#
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	13.3	10.9	2.81	2.83	#	#
Potassium (Dis.Filt)	<0.2 mg/l	TM152	4.89	7.65	1.27	1.24	#	#
Calcium (Dis.Filt)	<0.2 mg/l	TM152	132	124	21.5	22.2	#	#
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.258	0.0943	0.118	0.0749	#	#
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	<100	<100	<100	<100		
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01		
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	0.368	0.095	<0.05	<0.05	#	#
Sulphate	<2 mg/l	TM184	23.4	22.5	5.2	4.4	#	#
Chloride	<2 mg/l	TM184	44.1	24.5	21.7	21.8	#	#
Nitrite as N	<0.0152 mg/l	TM184		0.0201				
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	1.73	4.37				
Sulphate (soluble) as S	<1 mg/l	TM184	7.8	7.5	1.73	1.47	#	#
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		
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	◆ #	◆ #
Cyanide, Free	<0.05 mg/l	TM227		<0.05			◆ #	◆ #
pH	<1 pH Units	TM256	7.28	7.75	7.37	7.54	#	#
Silicon (diss.filt)	<0.05 mg/l	TM284		3.19				
Dibutyl tin	<5 ng/l	TM328		<5				
Tributyl tin	<1 ng/l	TM328		<1				
Tetrabutyl tin	<2 ng/l	TM328		<2				
Triphenyl tin	<1 ng/l	TM328		<1				
Surrogate	%	TM328		79.8				
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01	<0.01	<0.01		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200702-50	Client Reference:	P2282	Report Number:	563812
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562070

Results Legend			Customer Sample Ref.	Holy Well	MH-1	SW1	SW2		
#	ISO17025 accredited.								
M	mCERTS accredited.								
sq	Aqueous / settled sample.								
dis.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	Depth (m)	Ground Water (GW)	Land Leachate (LE)	Surface Water (SW)	Surface Water (SW)		
alpha-HCH	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
gamma-HCH (Lindane)	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Heptachlor	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Aldrin	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
beta-HCH	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Isodrin	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
delta-HCH	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Heptachlor epoxide	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
o,p'-DDE	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Endosulphan I	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
p,p'-DDE	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Dieldrin	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
o,p'-DDD (TDE)	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Endrin	<0.01 µg/l	TM343	0.00 - 0.00	<0.02	<0.02	<0.01	<0.02		
o,p'-DDT	<0.01 µg/l	TM343	0.00 - 0.00	<0.03	<0.03	<0.01	<0.03		
p,p'-DDD (TDE)	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Endosulphan II	<0.02 µg/l	TM343	0.00 - 0.00	<0.02	<0.02	<0.02	<0.02		
p,p'-DDT	<0.01 µg/l	TM343	0.00 - 0.00	<0.05	<0.05	<0.02	<0.05		
o,p'-Methoxychlor	<0.01 µg/l	TM343	0.00 - 0.00	<0.03	<0.03	<0.02	<0.03		
p,p'-Methoxychlor	<0.01 µg/l	TM343	0.00 - 0.00	<0.05	<0.05	<0.02	<0.05		
Endosulphan Sulphate	<0.02 µg/l	TM343	0.00 - 0.00	<0.02	<0.02	<0.02	<0.02		
Permethrin I	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Permethrin II	<0.01 µg/l	TM343	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Hexachlorobutadiene	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Dichlorvos	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Dichlobenil	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Mevinphos	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		
Tecnazene	<0.01 µg/l	TM344	0.00 - 0.00	<0.01	<0.01	<0.01	<0.01		



CERTIFICATE OF ANALYSIS

Validated

SDG: 200702-50	Client Reference: P2282	Report Number: 563812
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562070

Results Legend			Customer Sample Ref.	Holy Well	MH-1	SW1	SW2		
# ISO17025 accredited. M mCERTS accredited. sq 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*5@ Sample deviation (see appendix)	Depth (m)	Sample Type							
	Date Sampled	Sample Time							
	Date Received	SDG Ref							
	Lab Sample No.(s)	AGS Reference							
Component	LOD/Units	Method							
Hexachlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Phorate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Triallate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Atrazine	<0.01 µg/l	TM344	0.0777	0.0174	<0.01	<0.01	<0.01		
Simazine	<0.01 µg/l	TM344	0.0312	<0.01	<0.01	<0.01	<0.01		
Disulfoton	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Propetamphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Chlorpyrifos-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Chlorpyrifos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Malathion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Fenthion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Parathion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
trans-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
cis-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Ethion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Carbophenothion	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Triazophos	<0.01 µg/l	TM344	<0.01	<0.01	<0.01	<0.01	<0.01		
Phosalone	<0.01 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02		
Azinphos methyl	<0.02 µg/l	TM344	<0.04	<0.04	<0.04	<0.04	<0.04		
Azinphos ethyl	<0.02 µg/l	TM344	<0.02	<0.02	<0.02	<0.02	<0.02		
Etridiazole	<0.01 µg/l	TM345	<0.02	<0.02	<0.02	<0.02	<0.02		
Pentachlorobenzene	<0.01 µg/l	TM345	<0.01	<0.01	<0.01	<0.01	<0.01		
Propachlor	<0.01 µg/l	TM345	<0.01	<0.01	<0.01	<0.01	<0.01		
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01	<0.01	<0.01	<0.01		



CERTIFICATE OF ANALYSIS

Validated

SDG:	200702-50	Client Reference:	P2282	Report Number:	563812
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562070

Results Legend			Customer Sample Ref.	Holy Well	MH-1	SW1	SW2		
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.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	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)
Omethoate	<0.01 µg/l	TM345	0.00 - 0.00	Ground Water (GW)	01/07/2020				22408528
Propazine	<0.01 µg/l	TM345	0.00 - 0.00	Land Leachate (LE)	01/07/2020				22408517
Propyzamide	<0.01 µg/l	TM345	0.00 - 0.00	Surface Water (SW)	01/07/2020				22408488
Alachlor	<0.01 µg/l	TM345	0.00 - 0.00	Surface Water (SW)	01/07/2020				22408504
Prometryn	<0.01 µg/l	TM345	<0.01						
Telodrin	<0.01 µg/l	TM345	<0.01						
Terbutryn	<0.01 µg/l	TM345	<0.01						
Chlorothalonil	<0.01 µg/l	TM345	<0.02						
Etrimphos	<0.01 µg/l	TM345	<0.01						
Metazachlor	<0.01 µg/l	TM345	<0.02						
Cyanazine	<0.01 µg/l	TM345	<0.01						
Trietazine	<0.01 µg/l	TM345	<0.01						
Coumaphos	<0.01 µg/l	TM345	<0.01						
Phosphamidon I	<0.01 µg/l	TM345	<0.01						
Phosphamidon II	<0.01 µg/l	TM345	<0.01						
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.2						
Clopyralid	<0.04 µg/l	TM411	<0.08						
MCPA	<0.05 µg/l	TM411	<0.1						
Mecoprop	<0.04 µg/l	TM411	<0.08						
Dicamba	<0.04 µg/l	TM411	<0.08						
MCPB	<0.05 µg/l	TM411	<0.1						
2,4-DB	<0.1 µg/l	TM411	<0.2						
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.1						
Dichlorprop	<0.1 µg/l	TM411	<0.2						
Triclopyr	<0.05 µg/l	TM411	<0.75						
Fenoprop (Silvex)	<0.1 µg/l	TM411	<0.2						
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.1						
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.1						
Bromoxynil	<0.04 µg/l	TM411	<0.08						
Benazolin	<0.04 µg/l	TM411	<0.08						
loxynil	<0.05 µg/l	TM411	<0.1						
Pentachlorophenol	<0.04 µg/l	TM411	<0.08						
Fluoroxypyr	<0.1 µg/l	TM411	<0.2						



CERTIFICATE OF ANALYSIS

Validated

SDG: 200702-50
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 563812
Superseded Report: 562070

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	Holy Well	MH-1	SW1	SW2		
#	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.	Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00		
..	% 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	Sample Type	Ground Water (GW)	Land Leachate (LE)	Surface Water (SW)	Surface Water (SW)		
(F)	Trigger breach confirmed	Date Sampled	01/07/2020	01/07/2020	01/07/2020	01/07/2020		
1-3*5@	Sample deviation (see appendix)	Date Received	02/07/2020	02/07/2020	02/07/2020	02/07/2020		
		SDG Ref	200702-50	200702-50	200702-50	200702-50		
		Lab Sample No.(s)	22408528	22408517	22408488	22408504		
		AGS Reference						
Component	LOD/Units	Method						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
Azobenzene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
Acenaphthene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
Anthracene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<4	<2	<2	#	#
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<2	<1	<1	#	#



CERTIFICATE OF ANALYSIS

Validated

SDG: 200702-50
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 563812
Superseded Report: 562070

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	Holy Well	MH-1	SW1	SW2		
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
dis.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						
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Carbazole (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Chrysene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Dibenzofuran (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Diethyl phthalate (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5 #	<10 #	<5 #	<5 #		
Fluoranthene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Fluorene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Pentachlorophenol (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Phenol (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Hexachloroethane (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Nitrobenzene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Naphthalene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Isophorone (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Phenanthrene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		
Pyrene (aq)	<1 µg/l	TM176	<1 #	<2 #	<1 #	<1 #		



CERTIFICATE OF ANALYSIS

Validated

SDG: 200702-50	Client Reference: P2282	Report Number: 563812
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562070

VOC MS (W)

Results Legend			Customer Sample Ref.			
# 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)	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	Holy Well	MH-1	SW1	SW2	
		0.00 - 0.00 Ground Water (GW) 01/07/2020	0.00 - 0.00 Land Leachate (LE) 01/07/2020	0.00 - 0.00 Surface Water (SW) 01/07/2020	0.00 - 0.00 Surface Water (SW) 01/07/2020	
		02/07/2020 200702-50 22408528	02/07/2020 200702-50 22408517	02/07/2020 200702-50 22408488	02/07/2020 200702-50 22408504	
Component	LOD/Units	Method				
Dibromofluoromethane**	%	TM208	113	114	112	113
Toluene-d8**	%	TM208	100	99	99	99.3
4-Bromofluorobenzene**	%	TM208	95.2	94.4	96.6	94.7
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

Validated

SDG: 200702-50	Client Reference: P2282	Report Number: 563812	
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562070	

VOC MS (W)

Results Legend		Customer Sample Ref.	Holy Well	MH-1	SW1	SW2		
#	ISO17025 accredited.							
M	mCERTS accredited.							
sq	Aqueous / settled sample.							
dis.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						
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

Validated

SDG: 200702-50	Client Reference: P2282	Report Number: 563812
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562070

Table of Results - Appendix

Method No	Reference	Description
SUB		Subcontracted Test
TM022	Method 2540D, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part120 1981;BS EN 872	Determination of total suspended solids in waters
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
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
TM284		
TM328		
TM343	EPA 8270D - Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of Selected Pesticides (Suite I) in Liquids by GCMS
TM344	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite II) by GCMS
TM345	EPA 8270D – Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of selected pesticides (Suite III) by GCMS
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

Validated

SDG: 200702-50	Client Reference: P2282	Report Number: 563812	
Location: Gort Landfill	Order Number: Z2189	Superseded Report: 562070	

Test Completion Dates

Lab Sample No(s)	22408528	22408517	22408488	22408504
Customer Sample Ref.	Holy Well	MH-1	SW1	SW2
AGS Ref.				
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Land Leachate	Surface Water	Surface Water

	22408528	22408517	22408488	22408504
Acid Herbicides by GCMS	07-Jul-2020		07-Jul-2020	07-Jul-2020
Alkalinity as CaCO3	07-Jul-2020			
Ammoniacal Nitrogen		06-Jul-2020		06-Aug-2020
Ammonium Low	06-Jul-2020	06-Jul-2020	08-Jul-2020	19-Aug-2020
Anions by Kone (w)	04-Jul-2020	04-Jul-2020	05-Jul-2020	05-Jul-2020
BOD True Total		08-Jul-2020	08-Jul-2020	08-Jul-2020
COD Unfiltered		06-Jul-2020	06-Jul-2020	06-Jul-2020
Coliforms (W)	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
Fluoride	07-Jul-2020	03-Jul-2020	03-Jul-2020	07-Jul-2020
Mercury Dissolved	03-Jul-2020	03-Jul-2020	03-Jul-2020	03-Jul-2020
Mineral Oil C10-40 Aqueous (W)	07-Jul-2020	07-Jul-2020	07-Jul-2020	07-Jul-2020
Nitrite by Kone (w)		03-Jul-2020		
Organotins in Aqueous Samples		06-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
Silicon Dissolved by ICP-OES		10-Jul-2020		
Suspended Solids		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
Total Organic and Inorganic Carbon	04-Jul-2020	04-Jul-2020		
VOC MS (W)	06-Jul-2020	06-Jul-2020	06-Jul-2020	06-Jul-2020

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.

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

Date of Sampling: 01/07/2020

Sample Type: Ground

Date Sample Received: 01/07/2020

Lab Reference Number: 517821

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

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

Date of Sampling: 01/07/2020

Sample Type: Ground

Date Sample Received: 01/07/2020

Lab Reference Number: 517822

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.

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TVC - Total viable count

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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: RC3 Tuam

Date of Sampling: 01/07/2020

Sample Type: Ground

Date Sample Received: 01/07/2020

Lab Reference Number: 517823

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.

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

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: Holywell Gort

Date of Sampling: 01/07/2020

Sample Type: Ground

Date Sample Received: 01/07/2020

Lab Reference Number: 517824

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



CERTIFICATE OF ANALYSIS

SDG:	200702-50	Client Reference:	P2282	Report Number:	563812
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	562070

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. 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.



Unit 7-8 Hawarden Business Park
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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: 09 August 2020
Customer: Fehily Timoney
Sample Delivery Group (SDG): 200731-85
Your Reference: P2282
Location: Gort Landfill
Report No: 562378

We received 2 samples on Friday July 31, 2020 and 2 of these samples were scheduled for analysis which was completed on Sunday August 09, 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

Validated

SDG: 200731-85	Client Reference: P2282	Report Number: 562378
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22583238	SW1		0.00 - 0.00	30/07/2020
22583260	SW2		0.00 - 0.00	30/07/2020

Maximum Sample/Coolbox Temperature (°C) :

16.2

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.



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-85	Client Reference: P2282	Report Number: 562378
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

Results Legend <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="display: flex; align-items: center;">X Test</div> <div style="display: flex; align-items: center;">N No Determination Possible</div> </div> Sample Types - S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Sample Type	
		22589238			0.00 - 0.00	Vial (ALE297)	SW
			SW1			Vial (ALE297)	SW
						NaOH (ALE245)	SW
						H2SO4 (ALE244)	SW
						500ml Plastic (ALE208)	SW
						250ml BOD (ALE212)	SW
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
					0.5l glass bottle (ALE227)	SW	
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					NaOH (ALE245)	SW	
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					NaOH (ALE245)	SW	
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					500ml Plastic (ALE208)	SW	
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					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
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					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
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					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
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					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
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					NaOH (ALE245)	SW	
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					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
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					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
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					500ml Plastic (ALE208)	SW	
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					NaOH (ALE245)	SW	
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					500ml Plastic (ALE208)	SW	
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					NaOH (ALE245)	SW	
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					500ml Plastic (ALE208)	SW	
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					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
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					Vial (ALE297)	SW	
					NaOH (ALE245)	SW	
					H2SO4 (ALE244)	SW	
					500ml Plastic (ALE208)	SW	
					250ml BOD (ALE212)	SW	
		</					



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-85	Client Reference:	P2282	Report Number:	562378
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	

Results Legend		Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00			
M	mCERTS accredited.		Surface Water (SW)	Surface Water (SW)			
aq	Aqueous / settled sample.		30/07/2020	30/07/2020			
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*5@	Sample deviation (see appendix)						
				31/07/2020	31/07/2020		
			200731-85	200731-85			
			22583238	22583260			
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	<2	2.65			
			#	#			
BOD, unfiltered	<1 mg/l	TM045	<1	<1			
			#	#			
Oxygen, dissolved	<0.3 mg/l	TM046	9.94	10.3			
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.0229	0.0246			
			#	#			
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5			
COD, unfiltered	<7 mg/l	TM107	42.1	43.5			
			#	#			
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.155	0.145			
			#	#			
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5	<0.5			
			2 #	2 #			
Barium (diss.filt)	<0.2 µg/l	TM152	42.5	42.6			
			2 #	2 #			
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08			
			2 #	2 #			
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1			
			2 #	2 #			
Copper (diss.filt)	<0.3 µg/l	TM152	0.92	1.14			
			2 #	2 #			
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	0.442			
			2 #	2 #			
Manganese (diss.filt)	<3 µg/l	TM152	3.81	8.19			
			2 #	2 #			
Nickel (diss.filt)	<0.4 µg/l	TM152	1.09	1.03			
			2 #	2 #			
Phosphorus (diss.filt)	<10 µg/l	TM152	<10	13.4			
			2 #	2 #			
Selenium (diss.filt)	<1 µg/l	TM152	<1	<1			
			2 #	2 #			
Thallium (diss.filt)	<2 µg/l	TM152	<2	<2			
			2 #	2 #			
Zinc (diss.filt)	<1 µg/l	TM152	1.7	2.81			
			2 #	2 #			
Sodium (Dis.Filt)	<0.076 mg/l	TM152	10	11.1			
			2 #	2 #			
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	2.59	2.67			
			2 #	2 #			
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.03	1.13			
			2 #	2 #			
Calcium (Dis.Filt)	<0.2 mg/l	TM152	20.6	20.6			
			2 #	2 #			
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.183	0.187			
			2 #	2 #			
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	<100	<100			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01			
			2	2			
Phosphate (Ortho as PO4)	<0.05 mg/l	TM184	<0.05	<0.05			
			#	#			
Sulphate	<2 mg/l	TM184	<2	<2			
			#	#			
Chloride	<2 mg/l	TM184	19.6	19.1			
			#	#			
Sulphate (soluble) as S	<1 mg/l	TM184	<1	<1			
			#	#			
PCB congener 28	<0.015 µg/l	TM197	<0.015	<0.015			
PCB congener 52	<0.015 µg/l	TM197	<0.015	<0.015			
PCB congener 101	<0.015 µg/l	TM197	<0.015	<0.015			



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-85	Client Reference:	P2282
Location:	Gort Landfill	Order Number:	Z2189
		Report Number:	562378
		Superseded Report:	

#	ISO17025 accredited.	Customer Sample Ref.	SW1	SW2			
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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)						
		Depth (m)	0.00 - 0.00	0.00 - 0.00			
		Sample Type	Surface Water (SW)	Surface Water (SW)			
		Date Sampled	30/07/2020	30/07/2020			
		Sample Time					
		Date Received	31/07/2020	31/07/2020			
		SDG Ref	200731-85	200731-85			
		Lab Sample No.(s)	22583238	22583260			
		AGS Reference					
Component	LOD/Units	Method					
PCB congener 118	<0.015 µg/l	TM197	<0.015	<0.015			
PCB congener 138	<0.015 µg/l	TM197	<0.015	<0.015			
PCB congener 153	<0.015 µg/l	TM197	<0.015	<0.015			
PCB congener 180	<0.015 µg/l	TM197	<0.015	<0.015			
Sum of detected EC7 PCB's	<0.105 µg/l	TM197	<0.105	<0.105			
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05			
pH	<1 pH Units	TM256	7.52	7.52			
			#	#			
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01			
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01			
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01			
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01			
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01			
delta-HCH	<0.01 µg/l	TM343	<0.02	<0.02			
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01			
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01			
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01			
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01			
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01			
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01			
Endrin	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-DDT	<0.01 µg/l	TM343	<0.04	<0.04			
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01			
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02			
p,p'-DDT	<0.01 µg/l	TM343	<0.07	<0.07			
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.04	<0.04			
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.07	<0.07			
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.04	<0.04			
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01			
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01			



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-85 **Client Reference:** P2282 **Report Number:** 562378
Location: Gort Landfill **Order Number:** Z2189 **Superseded Report:**

Results Legend			Customer Sample Ref.	SW1	SW2					
#	ISO17025 accredited.									
M	mCERTS accredited.									
sq	Aqueous / settled sample.									
dis.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	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	0.00 - 0.00	Surface Water (SW)	30/07/2020		30/07/2020	200731-85	22583238	
Hexachlorobutadiene	<0.01 µg/l	TM344	0.00 - 0.00	Surface Water (SW)	30/07/2020		30/07/2020	200731-85	22583260	
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.01							
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.01							
Dichlorvos	<0.01 µg/l	TM344	<0.01							
Dichlobenil	<0.01 µg/l	TM344	<0.01							
Mevinphos	<0.01 µg/l	TM344	<0.01							
Tecnazene	<0.01 µg/l	TM344	<0.01							
Hexachlorobenzene	<0.01 µg/l	TM344	<0.01							
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01							
Phorate	<0.01 µg/l	TM344	<0.01							
Diazinon	<0.01 µg/l	TM344	<0.01							
Triallate	<0.01 µg/l	TM344	<0.01							
Atrazine	<0.01 µg/l	TM344	<0.01							
Simazine	<0.01 µg/l	TM344	<0.01							
Disulfoton	<0.01 µg/l	TM344	<0.01							
Propetamphos	<0.01 µg/l	TM344	<0.01							
Chlorpyrifos-methyl	<0.01 µg/l	TM344	<0.01							
Dimethoate	<0.01 µg/l	TM344	<0.01							
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01							
Chlorpyrifos	<0.01 µg/l	TM344	<0.01							
Methyl Parathion	<0.01 µg/l	TM344	<0.01							
Malathion	<0.01 µg/l	TM344	<0.01							
Fenthion	<0.01 µg/l	TM344	<0.01							
Fenitrothion	<0.01 µg/l	TM344	<0.01							
Triadimefon	<0.01 µg/l	TM344	<0.01							
Pendimethalin	<0.01 µg/l	TM344	<0.01							
Parathion	<0.01 µg/l	TM344	<0.01							
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01							
trans-Chlordane	<0.01 µg/l	TM344	<0.01							
cis-Chlordane	<0.01 µg/l	TM344	<0.01							
Ethion	<0.01 µg/l	TM344	<0.01							
Carbophenothion	<0.01 µg/l	TM344	<0.01							



CERTIFICATE OF ANALYSIS

Validated

SDG:	200731-85	Client Reference:	P2282	Report Number:	562378
Location:	Gort Landfill	Order Number:	Z2189	Superseded Report:	

Results Legend		Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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)						
		Depth (m)	0.00 - 0.00	0.00 - 0.00			
		Sample Type	Surface Water (SW)	Surface Water (SW)			
		Date Sampled	30/07/2020	30/07/2020			
		Sample Time					
		Date Received	31/07/2020	31/07/2020			
		SDG Ref	200731-85	200731-85			
		Lab Sample No.(s)	22583238	22583260			
		AGS Reference					
Component	LOD/Units	Method					
Triazophos	<0.01 µg/l	TM344	<0.01	<0.01			
Phosalone	<0.01 µg/l	TM344	<0.01	<0.01			
Azinphos methyl	<0.02 µg/l	TM344	<0.02	<0.02			
Azinphos ethyl	<0.02 µg/l	TM344	<0.02	<0.02			
Etridiazole	<0.01 µg/l	TM345	<0.02	<0.02			
Pentachlorobenzene	<0.01 µg/l	TM345	<0.01	<0.01			
Propachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01			
Omethoate	<0.01 µg/l	TM345	<0.01	<0.01			
Propazine	<0.01 µg/l	TM345	<0.01	<0.01			
Propyzamide	<0.01 µg/l	TM345	<0.01	<0.01			
Alachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Prometryn	<0.01 µg/l	TM345	<0.01	<0.01			
Telodrin	<0.01 µg/l	TM345	<0.01	<0.01			
Terbutryn	<0.01 µg/l	TM345	<0.01	<0.01			
Chlorothalonil	<0.01 µg/l	TM345	<0.03	<0.03			
Etrimphos	<0.01 µg/l	TM345	<0.01	<0.01			
Metazachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Cyanazine	<0.01 µg/l	TM345	<0.01	<0.01			
Trietazine	<0.01 µg/l	TM345	<0.01	<0.01			
Coumaphos	<0.01 µg/l	TM345	<0.01	<0.01			
Phosphamidon I	<0.01 µg/l	TM345	<0.02	<0.02			
Phosphamidon II	<0.01 µg/l	TM345	<0.02	<0.02			
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.1	<0.1			
Clopyralid	<0.04 µg/l	TM411	<0.04	<0.04			
MCPA	<0.05 µg/l	TM411	<0.05	<0.05			
Mecoprop	<0.04 µg/l	TM411	<0.04	<0.04			
Dicamba	<0.04 µg/l	TM411	<0.04	<0.04			
MCPB	<0.05 µg/l	TM411	<0.05	<0.05			
2,4-DB	<0.1 µg/l	TM411	<0.1	<0.1			
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.05	<0.05			
Dichlorprop	<0.1 µg/l	TM411	<0.1	<0.1			
Triclopyr	<0.05 µg/l	TM411	<0.05	<0.05			



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-85
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 562378
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	SW1	SW2			
# ISO17025 accredited.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
M mCERTS accredited.		Sample Type	Surface Water (SW)	Surface Water (SW)			
aq Aqueous / settled sample.		Date Sampled	30/07/2020	30/07/2020			
diss.filt Dissolved / filtered sample.		Sample Time	31/07/2020	31/07/2020			
tot.unfilt Total / unfiltered sample.		Date Received	200731-85	200731-85			
- Subcontracted - refer to subcontractor report for accreditation status.		SDG Ref	22583238	22583260			
** % 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		Lab Sample No.(s)					
(F) Trigger breach confirmed		AGS Reference					
1-3*#@ Sample deviation (see appendix)							
Component	LOD/Units	Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<8	<10	#	#	
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<8	<10	#	#	
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<8	<10	#	#	
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<8	<10	#	#	
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<8	<10	#	#	
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<8	<10	#	#	
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<8	<10	#	#	
2-Chlorophenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<8	<10	#	#	
2-Methylphenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
2-Nitroaniline (aq)	<1 µg/l	TM176	<8	<10	#	#	
2-Nitrophenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
3-Nitroaniline (aq)	<1 µg/l	TM176	<8	<10	#	#	
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<8	<10	#	#	
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
4-Chloroaniline (aq)	<1 µg/l	TM176	<8	<10	#	#	
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<8	<10	#	#	
4-Methylphenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
4-Nitroaniline (aq)	<1 µg/l	TM176	<8	<10	#	#	
4-Nitrophenol (aq)	<1 µg/l	TM176	<8	<10	#	#	
Azobenzene (aq)	<1 µg/l	TM176	<8	<10	#	#	
Acenaphthylene (aq)	<1 µg/l	TM176	<8	<10	#	#	
Acenaphthene (aq)	<1 µg/l	TM176	<8	<10	#	#	
Anthracene (aq)	<1 µg/l	TM176	<8	<10	#	#	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<8	<10	#	#	
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<8	<10	#	#	
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<16	<20	#	#	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<8	<10	#	#	
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<8	<10	#	#	



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-85	Client Reference: P2282	Report Number: 562378
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

VOC MS (W)

Results Legend			Customer Sample Ref.							
# 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)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	SW1	SW2					
Component	LOD/Units	Method								
Dibromofluoromethane**	%	TM208	0.00 - 0.00 Surface Water (SW) 30/07/2020	107	0.00 - 0.00 Surface Water (SW) 30/07/2020	105				
Toluene-d8**	%	TM208		96.8		97.4				
4-Bromofluorobenzene**	%	TM208		100		101				
Dichlorodifluoromethane	<1 µg/l	TM208		<1 #		<1 #				
Chloromethane	<1 µg/l	TM208		<1 #		<1 #				
Vinyl chloride	<1 µg/l	TM208		<1 #		<1 #				
Bromomethane	<1 µg/l	TM208		<1 #		<1 #				
Chloroethane	<1 µg/l	TM208		<1 #		<1 #				
Trichlorofluoromethane	<1 µg/l	TM208		<1 #		<1 #				
1,1-Dichloroethene	<1 µg/l	TM208		<1 #		<1 #				
Carbon disulphide	<1 µg/l	TM208		<1 #		<1 #				
Dichloromethane	<3 µg/l	TM208		<3 #		<3 #				
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208		<1 #		<1 #				
trans-1,2-Dichloroethene	<1 µg/l	TM208		<1 #		<1 #				
1,1-Dichloroethane	<1 µg/l	TM208		<1 #		<1 #				
cis-1,2-Dichloroethene	<1 µg/l	TM208		<1 #		<1 #				
2,2-Dichloropropane	<1 µg/l	TM208		<1 #		<1 #				
Bromochloromethane	<1 µg/l	TM208		<1 #		<1 #				
Chloroform	<1 µg/l	TM208		<1 #		<1 #				
1,1,1-Trichloroethane	<1 µg/l	TM208		<1 #		<1 #				
1,1-Dichloropropene	<1 µg/l	TM208		<1 #		<1 #				
Carbontetrachloride	<1 µg/l	TM208		<1 #		<1 #				
1,2-Dichloroethane	<1 µg/l	TM208		<1 #		<1 #				
Benzene	<1 µg/l	TM208		<1 #		<1 #				
Trichloroethene	<1 µg/l	TM208		<1 #		<1 #				
1,2-Dichloropropane	<1 µg/l	TM208		<1 #		<1 #				
Dibromomethane	<1 µg/l	TM208		<1 #		<1 #				
Bromodichloromethane	<1 µg/l	TM208		<1 #		<1 #				
cis-1,3-Dichloropropene	<1 µg/l	TM208		<1 #		<1 #				
Toluene	<1 µg/l	TM208		<1 #		<1 #				
trans-1,3-Dichloropropene	<1 µg/l	TM208		<1 #		<1 #				
1,1,2-Trichloroethane	<1 µg/l	TM208		<1 #		<1 #				
1,3-Dichloropropane	<1 µg/l	TM208		<1 #		<1 #				



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-85
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 562378
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	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					
Tetrachloroethene	<1 µg/l	TM208	<1	<1			
			#	#			
Dibromochloromethane	<1 µg/l	TM208	<1	<1			
			#	#			
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1			
			#	#			
Chlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1			
			#	#			
Ethylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
m,p-Xylene	<1 µg/l	TM208	<1	<1			
			#	#			
o-Xylene	<1 µg/l	TM208	<1	<1			
			#	#			
Styrene	<1 µg/l	TM208	<1	<1			
			#	#			
Bromoform	<1 µg/l	TM208	<1	<1			
			#	#			
Isopropylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1			
			#	#			
Bromobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
Propylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
2-Chlorotoluene	<1 µg/l	TM208	<1	<1			
			#	#			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
4-Chlorotoluene	<1 µg/l	TM208	<1	<1			
			#	#			
tert-Butylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
sec-Butylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1			
			#	#			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
n-Butylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1			
			#	#			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1			
			#	#			
Naphthalene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1			



CERTIFICATE OF ANALYSIS

Validated

SDG: 200731-85	Client Reference: P2282	Report Number: 562378
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

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

Validated

SDG: 200731-85
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2189

Report Number: 562378
Superseded Report:

Test Completion Dates

Lab Sample No(s)	22583238	22583260
Customer Sample Ref.	SW1	SW2
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water

Acid Herbicides by GCMS	07-Aug-2020	07-Aug-2020
Ammonium Low	06-Aug-2020	06-Aug-2020
Anions by Kone (w)	03-Aug-2020	03-Aug-2020
BOD True Total	06-Aug-2020	05-Aug-2020
COD Unfiltered	01-Aug-2020	01-Aug-2020
Conductivity (at 20 deg.C)	05-Aug-2020	05-Aug-2020
Cyanide Comp/Free/Total/Thiocyanate	07-Aug-2020	07-Aug-2020
Dissolved Metals by ICP-MS	07-Aug-2020	07-Aug-2020
Dissolved Oxygen by Probe	02-Aug-2020	02-Aug-2020
Fluoride	04-Aug-2020	04-Aug-2020
Mercury Dissolved	05-Aug-2020	05-Aug-2020
Mineral Oil C10-40 Aqueous (W)	07-Aug-2020	07-Aug-2020
PCB Congeners - Aqueous (W)	07-Aug-2020	07-Aug-2020
Pesticides (Suite I) by GCMS	06-Aug-2020	06-Aug-2020
Pesticides (Suite II) by GCMS	07-Aug-2020	07-Aug-2020
Pesticides (Suite III) by GCMS	05-Aug-2020	05-Aug-2020
pH Value	04-Aug-2020	03-Aug-2020
Phosphate by Kone (w)	04-Aug-2020	04-Aug-2020
Suspended Solids	05-Aug-2020	05-Aug-2020
SVOC MS (W) - Aqueous	09-Aug-2020	09-Aug-2020
VOC MS (W)	05-Aug-2020	05-Aug-2020



CERTIFICATE OF ANALYSIS

SDG: 200731-85	Client Reference: P2282	Report Number: 562378
Location: Gort Landfill	Order Number: Z2189	Superseded Report:

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH₄ by the BRE method, VOC TICs and SVOC TICs.

2. 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
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Dublin
Dublin 11

Attention: Daniel Hayden

CERTIFICATE OF ANALYSIS

Date of report Generation: 26 July 2021
Customer: Fehily Timoney
Sample Delivery Group (SDG): 210715-109
Your Reference: P2282
Location: Gort Landfill
Report No: 607015

We received 2 samples on Thursday July 15, 2021 and 2 of these samples were scheduled for analysis which was completed on Monday July 26, 2021. 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

Validated

SDG: 210715-109 **Client Reference:** P2282 **Report Number:** 607015
Location: Gort Landfill **Order Number:** Z2798 **Superseded Report:**

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
24638414	SW1		0.00 - 0.00	14/07/2021
24638463	SW2		0.00 - 0.00	14/07/2021

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



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

Results Legend

- X Test
- N No Determination Possible

Sample Types -

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

Lab Sample No(s)	24638414		24638463
Customer Sample Reference	SW1		SW2
AGS Reference			
Depth (m)	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)	Vial (ALE297) NaOH (ALE245) HNO3 Filtered (ALE204) H2SO4 (ALE244) 500ml Plastic (ALE208) 250ml BOD (ALE212) 0.5l glass bottle (ALE227)
Sample Type		SW	SW

Parameter	All	NDPs: 0 Tests: 2	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)
Acid Herbicides by GCMS	All	NDPs: 0 Tests: 2	X							X						
Alkalinity as CaCO3	All	NDPs: 0 Tests: 2		X								X				
Ammonium Low	All	NDPs: 0 Tests: 2			X								X			
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X								X				
BOD True Total	All	NDPs: 0 Tests: 2	X								X					
COD Unfiltered	All	NDPs: 0 Tests: 2	X								X					
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2		X								X				
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 2						X								X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2				X								X		
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2		X								X				
Fluoride	All	NDPs: 0 Tests: 2		X								X				
Mercury Dissolved	All	NDPs: 0 Tests: 2				X										X
Mineral Oil C10-40 Aqueous (W)	All	NDPs: 0 Tests: 2	X								X					
Pesticides (Suite I) by GCMS	All	NDPs: 0 Tests: 2	X								X					
Pesticides (Suite II) by GCMS	All	NDPs: 0 Tests: 2	X								X					



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

Results Legend

- X Test
- N No Determination Possible

Sample Types -

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

Lab Sample No(s)		24639414		24639463
Customer Sample Reference		SW1		SW2
AGS Reference				
Depth (m)		0.00 - 0.00		0.00 - 0.00
Container		0.5l glass bottle (ALE227)	0.5l glass bottle (ALE212)	0.5l glass bottle (ALE212)
Sample Type		SW	SW	SW

Pesticides (Suite III) by GCMS	All	NDPs: 0 Tests: 2															
			X							X							
pH Value				X							X						
Suspended Solids				X							X						
SVOC MS (W) - Aqueous				X							X						
Total Organic and Inorganic Carbon					X							X					
VOC MS (W)										X							X



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109	Client Reference: P2282	Report Number: 607015
Location: Gort Landfill	Order Number: Z2798	Superseded Report:

Results Legend		Customer Sample Ref.	SW1	SW2			
# 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 1-4*\$@ Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Surface Water (SW) 14/07/2021	0.00 - 0.00 Surface Water (SW) 14/07/2021			
Component	LOD/Units	Method					
Suspended solids, Total	<2 mg/l	TM022	<2 #	<2 #			
Alkalinity, Total as HCO3	<2 mg/l	TM043	84.4	85.4			
BOD, unfiltered	<1 mg/l	TM045	<1 3 #	<1 #			
Oxygen, dissolved	<0.3 mg/l	TM046	10.2	12.2			
Organic Carbon, Total	<3 mg/l	TM090	9.64 ♦ #	9.78 ♦ #			
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.023 #	0.036 #			
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5			
COD, unfiltered	<7 mg/l	TM107	28.8 #	31.2 #			
Conductivity @ 20 deg.C	<0.02 mS/cm	TM120	0.166 #	0.162 #			
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5 #	<0.5 #			
Barium (diss.filt)	<0.2 µg/l	TM152	37.5 #	36.5 #			
Boron (diss.filt)	<10 µg/l	TM152	<10 #	<10 #			
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08 #	<0.08 #			
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #			
Copper (diss.filt)	<0.3 µg/l	TM152	18.9 #	12.7 #			
Lead (diss.filt)	<0.2 µg/l	TM152	0.891 #	0.251 #			
Manganese (diss.filt)	<3 µg/l	TM152	27.9 #	26.9 #			
Nickel (diss.filt)	<0.4 µg/l	TM152	0.709 #	0.801 #			
Phosphorus (diss.filt)	<10 µg/l	TM152	<10 #	11.2 #			
Selenium (diss.filt)	<1 µg/l	TM152	<1 #	<1 #			
Thallium (diss.filt)	<2 µg/l	TM152	<2 #	<2 #			
Zinc (diss.filt)	<1 µg/l	TM152	21.4 #	41.5 #			
Sodium (Dis.Filt)	<0.076 mg/l	TM152	8.04 #	7.91 #			
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	2.67 #	2.65 #			
Potassium (Dis.Filt)	<0.2 mg/l	TM152	1.17 #	1.09 #			
Calcium (Dis.Filt)	<0.2 mg/l	TM152	23.7 #	23.9 #			
Iron (Dis.Filt)	<0.019 mg/l	TM152	0.144 #	0.139 #			
Mineral oil >C10 C40 (aq)	<100 µg/l	TM172	<100	<100			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01			
Sulphate	<2 mg/l	TM184	<2 #	<2 #			
Chloride	<2 mg/l	TM184	13.6 #	13.4 #			
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	0.126 #	0.126 #			
Cyanide, Total	<0.05 mg/l	TM227	<0.05	<0.05			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

Results Legend		Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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						
1-4*\$@	Sample deviation (see appendix)						
		Depth (m)	0.00 - 0.00	0.00 - 0.00			
		Sample Type	Surface Water (SW)	Surface Water (SW)			
		Date Sampled	14/07/2021	14/07/2021			
		Sample Time					
		Date Received	15/07/2021	15/07/2021			
		SDG Ref	210715-109	210715-109			
		Lab Sample No.(s)	24638414	24638463			
		AGS Reference					
Component	LOD/Units	Method					
pH	<1 pH Units	TM256	7.85	7.99			
Trifluralin	<0.01 µg/l	TM343	<0.01	<0.01	#	#	
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01			
Heptachlor	<0.01 µg/l	TM343	<0.02	<0.02			
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01			
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01			
delta-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01			
Endosulphan I	<0.01 µg/l	TM343	<0.01	<0.01			
trans-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01			
cis-Chlordane	<0.01 µg/l	TM343	<0.01	<0.01			
p,p'-DDE	<0.01 µg/l	TM343	<0.01	<0.01			
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01			
Endrin	<0.01 µg/l	TM343	<0.02	<0.02			
o,p'-DDT	<0.01 µg/l	TM343	<0.05	<0.05			
p,p'-DDD (TDE)	<0.01 µg/l	TM343	<0.01	<0.01			
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02			
p,p'-DDT	<0.01 µg/l	TM343	<0.08	<0.08			
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.04	<0.04			
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.08	<0.08			
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.04	<0.04			
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01			
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01			
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			
Hexachlorobutadiene	<0.01 µg/l	TM344	<0.01	<0.01			
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			
Dichlorvos	<0.01 µg/l	TM344	<0.01	<0.01			
Dichlobenil	<0.01 µg/l	TM344	<0.01	<0.01			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

Results Legend		Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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						
1-4*\$@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Mevinphos	<0.01 µg/l	TM344	<0.01	<0.01			
Tecnazene	<0.01 µg/l	TM344	<0.01	<0.01			
Hexachlorobenzene	<0.01 µg/l	TM344	<0.01	<0.01			
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01	<0.01			
Phorate	<0.01 µg/l	TM344	<0.03	<0.03			
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01			
Triallate	<0.01 µg/l	TM344	<0.01	<0.01			
Atrazine	<0.01 µg/l	TM344	<0.01	<0.01			
Simazine	<0.01 µg/l	TM344	<0.01	<0.01			
Disulfoton	<0.01 µg/l	TM344	<0.07	<0.07			
Propetamphos	<0.01 µg/l	TM344	<0.01	<0.01			
Chlorpyrifos-methyl	<0.01 µg/l	TM344	<0.01	<0.01			
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01			
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01			
Chlorpyrifos	<0.01 µg/l	TM344	<0.01	<0.01			
Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01			
Malathion	<0.01 µg/l	TM344	<0.01	<0.01			
Fenthion	<0.01 µg/l	TM344	<0.02	<0.02			
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01			
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01			
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01			
Parathion	<0.01 µg/l	TM344	<0.01	<0.01			
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01			
trans-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01			
cis-Chlordane	<0.01 µg/l	TM344	<0.01	<0.01			
Ethion	<0.01 µg/l	TM344	<0.01	<0.01			
Carbophenothion	<0.01 µg/l	TM344	<0.01	<0.01			
Triazophos	<0.01 µg/l	TM344	<0.01	<0.01			
Phosalone	<0.01 µg/l	TM344	<0.01	<0.01			
Azinphos methyl	<0.02 µg/l	TM344	<0.02	<0.02			
Azinphos ethyl	<0.02 µg/l	TM344	<0.02	<0.02			
Etridiazole	<0.01 µg/l	TM345	<0.01	<0.01			
Pentachlorobenzene	<0.01 µg/l	TM345	<0.01	<0.01			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

Results Legend		Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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						
1-4*\$@	Sample deviation (see appendix)						
		Depth (m)	0.00 - 0.00	0.00 - 0.00			
		Sample Type	Surface Water (SW)	Surface Water (SW)			
		Date Sampled	14/07/2021	14/07/2021			
		Sample Time					
		Date Received	15/07/2021	15/07/2021			
		SDG Ref	210715-109	210715-109			
		Lab Sample No.(s)	24638414	24638463			
		AGS Reference					
Component	LOD/Units	Method					
Propachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01			
Omethoate	<0.01 µg/l	TM345	<0.01	<0.01			
Propazine	<0.01 µg/l	TM345	<0.01	<0.01			
Propyzamide	<0.01 µg/l	TM345	<0.01	<0.01			
Alachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Prometryn	<0.01 µg/l	TM345	<0.01	<0.01			
Telodrin	<0.01 µg/l	TM345	<0.01	<0.01			
Terbutryn	<0.01 µg/l	TM345	<0.01	<0.01			
Chlorothalonil	<0.01 µg/l	TM345	<0.01	<0.01			
Etrimphos	<0.01 µg/l	TM345	<0.01	<0.01			
Metazachlor	<0.01 µg/l	TM345	<0.01	<0.01			
Cyanazine	<0.01 µg/l	TM345	<0.01	<0.01			
Trietazine	<0.01 µg/l	TM345	<0.01	<0.01			
Coumaphos	<0.01 µg/l	TM345	<0.01	<0.01			
Phosphamidon I	<0.01 µg/l	TM345	<0.01	<0.01			
Phosphamidon II	<0.01 µg/l	TM345	<0.01	<0.01			
Dinitro-o-cresol	<0.1 µg/l	TM411	0.155	<0.2			
Clopyralid	<0.04 µg/l	TM411	<0.04	<0.08			
MCPA	<0.05 µg/l	TM411	<0.05	<0.1			
Mecoprop	<0.04 µg/l	TM411	<0.04	<0.08			
Dicamba	<0.04 µg/l	TM411	<0.04	<0.08			
MCPB	<0.05 µg/l	TM411	<0.05	<0.1			
2,4-DB	<0.1 µg/l	TM411	<0.1	<0.2			
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.05	<0.1			
Dichlorprop	<0.1 µg/l	TM411	<0.1	<0.2			
Triclopyr	<0.05 µg/l	TM411	<0.05	<0.1			
Fenoprop (Silvex)	<0.1 µg/l	TM411	<0.1	<0.2			
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05	<0.1			
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05	<0.1			
Bromoxynil	<0.04 µg/l	TM411	<0.04	<0.08			
Benazolin	<0.04 µg/l	TM411	<0.04	<0.08			
loxynil	<0.05 µg/l	TM411	<0.05	<0.1			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	SW1	SW2			
# ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00			
M mCERTS accredited.			Surface Water (SW)	Surface Water (SW)			
aq Aqueous / settled sample.			14/07/2021	14/07/2021			
diss.filt Dissolved / filtered sample.			15/07/2021	15/07/2021			
tot.unfilt Total / unfiltered sample.			210715-109	210715-109			
- Subcontracted - refer to subcontractor report for accreditation status.			24638414	24638463			
.. % 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							
1-4*#@ Sample deviation (see appendix)							
Component	LOD/Units		Method				
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	#	#	
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	#	#	
Azobenzene (aq)	<1 µg/l	TM176	<1	<1	#	#	
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1	#	#	
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1	#	#	
Anthracene (aq)	<1 µg/l	TM176	<1	<1	#	#	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1	#	#	
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1	#	#	
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2	#	#	
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	#	#	
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1	#	#	



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

VOC MS (W)

Results Legend			Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00	0.00 - 0.00			
M	mCERTS accredited.			Surface Water (SW)	Surface Water (SW)			
aq	Aqueous / settled sample.			14/07/2021	14/07/2021			
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			15/07/2021	15/07/2021			
(F)	Trigger breach confirmed			210715-109	210715-109			
1-4*#@	Sample deviation (see appendix)			24638414	24638463			
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM208	112	109				
Toluene-d8**	%	TM208	101	101				
4-Bromofluorobenzene**	%	TM208	100	99				
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	#	#		
Chloromethane	<1 µg/l	TM208	<1	<1	#	#		
Vinyl chloride	<1 µg/l	TM208	<1	<1	#	#		
Bromomethane	<1 µg/l	TM208	<1	<1	#	#		
Chloroethane	<1 µg/l	TM208	<1	<1	#	#		
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	#	#		
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#		
Carbon disulphide	<1 µg/l	TM208	<1	<1	#	#		
Dichloromethane	<3 µg/l	TM208	<3	<3	#	#		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	#	#		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#		
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#		
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	#	#		
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#		
Bromochloromethane	<1 µg/l	TM208	<1	<1	#	#		
Chloroform	<1 µg/l	TM208	<1	<1	#	#		
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#		
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#		
Carbontetrachloride	<1 µg/l	TM208	<1	<1	#	#		
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	#	#		
Benzene	<1 µg/l	TM208	<1	<1	#	#		
Trichloroethene	<1 µg/l	TM208	<1	<1	#	#		
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#		
Dibromomethane	<1 µg/l	TM208	<1	<1	#	#		
Bromodichloromethane	<1 µg/l	TM208	<1	<1	#	#		
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#		
Toluene	<1 µg/l	TM208	<1	<1	#	#		
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	#	#		
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	#	#		
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	#	#		



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

VOC MS (W)

Results Legend		Customer Sample Ref.	SW1	SW2			
#	ISO17025 accredited.						
M	mCERTS accredited.						
sq	Aqueous / settled sample.						
dis.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						
1-4*§@	Sample deviation (see appendix)						
Component	LOD/Units	Method					
Tetrachloroethene	<1 µg/l	TM208	<1	<1			
			#	#			
Dibromochloromethane	<1 µg/l	TM208	<1	<1			
			#	#			
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1			
			#	#			
Chlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,1,1,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1			
			#	#			
Ethylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
m,p-Xylene	<1 µg/l	TM208	<1	<1			
			#	#			
o-Xylene	<1 µg/l	TM208	<1	<1			
			#	#			
Styrene	<1 µg/l	TM208	<1	<1			
			#	#			
Bromoform	<1 µg/l	TM208	<1	<1			
			#	#			
Isopropylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1			
			#	#			
Bromobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
Propylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
2-Chlorotoluene	<1 µg/l	TM208	<1	<1			
			#	#			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
4-Chlorotoluene	<1 µg/l	TM208	<1	<1			
			#	#			
tert-Butylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
sec-Butylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
4-iso-Propyltoluene	<1 µg/l	TM208	<1	<1			
			#	#			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
n-Butylbenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,4-Trichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1			
			#	#			
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1	<1			
			#	#			
Naphthalene	<1 µg/l	TM208	<1	<1			
			#	#			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1			
			#	#			
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<1	<1			



CERTIFICATE OF ANALYSIS

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

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
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
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
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

Validated

SDG: 210715-109
Location: Gort Landfill

Client Reference: P2282
Order Number: Z2798

Report Number: 607015
Superseded Report:

Test Completion Dates

Lab Sample No(s)	24638414	24638463
Customer Sample Ref.	SW1	SW2
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Type	Surface Water	Surface Water

Acid Herbicides by GCMS	22-Jul-2021	22-Jul-2021
Alkalinity as CaCO3	21-Jul-2021	17-Jul-2021
Ammonium Low	20-Jul-2021	20-Jul-2021
Anions by Kone (w)	21-Jul-2021	21-Jul-2021
BOD True Total	20-Jul-2021	21-Jul-2021
COD Unfiltered	17-Jul-2021	17-Jul-2021
Conductivity (at 20 deg.C)	21-Jul-2021	20-Jul-2021
Cyanide Comp/Free/Total/Thiocyanate	21-Jul-2021	21-Jul-2021
Dissolved Metals by ICP-MS	20-Jul-2021	21-Jul-2021
Dissolved Oxygen by Probe	16-Jul-2021	16-Jul-2021
Fluoride	16-Jul-2021	16-Jul-2021
Mercury Dissolved	19-Jul-2021	20-Jul-2021
Mineral Oil C10-40 Aqueous (W)	20-Jul-2021	21-Jul-2021
Pesticides (Suite I) by GCMS	20-Jul-2021	20-Jul-2021
Pesticides (Suite II) by GCMS	22-Jul-2021	22-Jul-2021
Pesticides (Suite III) by GCMS	26-Jul-2021	26-Jul-2021
pH Value	19-Jul-2021	19-Jul-2021
Suspended Solids	19-Jul-2021	19-Jul-2021
SVOC MS (W) - Aqueous	19-Jul-2021	19-Jul-2021
Total Organic and Inorganic Carbon	22-Jul-2021	22-Jul-2021
VOC MS (W)	18-Jul-2021	18-Jul-2021



CERTIFICATE OF ANALYSIS

SDG: 210715-109	Client Reference: P2282	Report Number: 607015
Location: Gort Landfill	Order Number: Z2798	Superseded Report:

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. 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
4	Matrix interference
◆	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

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 asbestos present is not determined unless specifically requested.

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.



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:	17 June 2022
Customer:	Fehily Timoney
Sample Delivery Group (SDG):	220606-23
Your Reference:	Galway Historic Landfills P22-040
Location:	Gort Landfill
Report No:	651052
Order Number:	Z3385

We received 5 samples on Monday June 06, 2022 and 5 of these samples were scheduled for analysis which was completed on Friday June 17, 2022. 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.

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

Validated

SDG: 220606-23

Report Number: 651052

Superseded Report:

Client Ref.: Galway Historic Landfills P22-040

Location: Gort Landfill

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
26388718	GW01		0.00 - 0.00	01/06/2022
26388732	GW02		0.00 - 0.00	01/06/2022
26388696	LH01		0.00 - 0.00	01/06/2022
26388746	SW1		0.00 - 0.00	01/06/2022
26388760	SW2		0.00 - 0.00	01/06/2022

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

26388760	SW2	0.00 - 0.00	Vial (ALE297)	SW					X
			NaOH (ALE245)	SW					
			HNO3 Filtered (ALE204)	SW					
			H2SO4 (ALE244)	SW			X		
			500ml Plastic (ALE208)	SW	X				
			250ml BOD (ALE212)	SW					
			0.5l glass bottle (ALE227)	SW		X			
			Vial (ALE297)	SW					X
			NaOH (ALE245)	SW					
			HNO3 Filtered (ALE204)	SW					
			H2SO4 (ALE244)	SW			X		
26388746	SW1	0.00 - 0.00	500ml Plastic (ALE208)	SW	X				
			250ml BOD (ALE212)	SW					
			0.5l glass bottle (ALE227)	SW					
			Vial (ALE297)	SW					
			NaOH (ALE245)	SW					



CERTIFICATE OF ANALYSIS

Validated

SDG: 220606-23
Client Ref.: Galway Historic Landfills P22-040

Report Number: 651052
Location: Gort Landfill

Superseded Report:

Results Legend		Customer Sample Ref.	GW01	GW02	LH01	SW1	SW2
# 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 1-4*\$@ Sample deviation (see appendix)		Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 01/06/2022	0.00 - 0.00 Ground Water (GW) 01/06/2022	0.00 - 0.00 Land Leachate (LE) 01/06/2022	0.00 - 0.00 Surface Water (SW) 01/06/2022	0.00 - 0.00 Surface Water (SW) 01/06/2022
Component	LOD/Units	Method					
Alkalinity, Total as HCO3	<2 mg/l	TM043	427	479	2300	75.3	76.4
BOD, unfiltered	<1 mg/l	TM045	<1	<1	8.79	<1	<1
Oxygen, dissolved	<0.3 mg/l	TM046	6.02	5.77	4.96	6.47	6.1
Organic Carbon, Total	<3 mg/l	TM090	<3	<3	31	8.46	10.1
Ammoniacal Nitrogen as N (low level)	<0.01 mg/l	TM099	0.0222	0.0148	122	0.0314	0.0347
Fluoride	<0.5 mg/l	TM104	<0.5	<0.5	<0.5	<0.5	<0.5
COD, unfiltered	<7 mg/l	TM107	18.8	73.2	684	17.8	16
Arsenic (diss.filt)	<0.5 µg/l	TM152	0.563	<0.5	19.5	<0.5	<0.5
Barium (diss.filt)	<0.2 µg/l	TM152	11.5	14.6	194	37.6	38
Boron (diss.filt)	<10 µg/l	TM152	13.6	14.9	542	<10	<10
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	1.7	<1	<1
Copper (diss.filt)	<0.3 µg/l	TM152	0.79	0.551	0.584	0.531	0.418
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2	<0.2	0.413	<0.2	<0.2
Manganese (diss.filt)	<3 µg/l	TM152	<3	<3	1030	4	8.58
Nickel (diss.filt)	<0.4 µg/l	TM152	2.41	0.962	3.64	0.581	0.538
Phosphorus (diss.filt)	<10 µg/l	TM152	29.1	12.6	337	<10	<10
Selenium (diss.filt)	<1 µg/l	TM152	<1	<1	<1	<1	<1
Thallium (diss.filt)	<2 µg/l	TM152	<2	<2	<2	<2	<2
Zinc (diss.filt)	<1 µg/l	TM152	3.51	1.04	3.43	4.56	2.03
Sodium (Dis.Filt)	<0.076 mg/l	TM152	22.1	10.2	85.8	10.5	10.5
Magnesium (Dis.Filt)	<0.036 mg/l	TM152	14.8	8.74	52.1	2.97	2.94
Potassium (Dis.Filt)	<0.2 mg/l	TM152	4.3	2.02	85.7	1.1	1.06
Calcium (Dis.Filt)	<0.2 mg/l	TM152	133	148	234	24.8	24.3
Iron (Dis.Filt)	<0.019 mg/l	TM152	<0.019	<0.019	27.8	0.0769	0.0797
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate	<2 mg/l	TM184	23.2	13	<2	<2	<2
Chloride	<2 mg/l	TM184	40.4	19.3	104	22	21.4
Total Oxidised Nitrogen as N	<0.1 mg/l	TM184	4.16	<0.1	<0.1	0.171	0.155
PCB congener 28	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015
PCB congener 52	<0.015 µg/l	TM197	<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
PCB congener 118	<0.015 µg/l	TM197	<0.015	<0.015	<0.015	<0.015	<0.015



CERTIFICATE OF ANALYSIS

Validated

SDG: 220606-23
Client Ref.: Galway Historic Landfills P22-040

Report Number: 651052
Location: Gort Landfill

Superseded Report:

Results Legend			Customer Sample Ref.	GW01	GW02	LH01	SW1	SW2	
#	ISO17025 accredited.								
M	mCERTS accredited.								
aq	Aqueous / settled sample.								
dis.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								
1-4**@	Sample deviation (see appendix)								
Component	LOD/Units	Method	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)
1,3,5-Trichlorobenzene	<0.01 µg/l	TM344	0.00 - 0.00	Ground Water (GW)	01/06/2022				26388718
Hexachlorobutadiene	<0.01 µg/l	TM344	0.00 - 0.00	Ground Water (GW)	01/06/2022				26388732
1,2,4-Trichlorobenzene	<0.01 µg/l	TM344	0.00 - 0.00	Land Leachate (LE)	01/06/2022				26388696
1,2,3-Trichlorobenzene	<0.01 µg/l	TM344	0.00 - 0.00	Surface Water (SW)	01/06/2022				26388746
Dichlorvos	<0.01 µg/l	TM344	0.00 - 0.00	Surface Water (SW)	01/06/2022				26388760
Dichlobenil	<0.01 µg/l	TM344							
Mevinphos	<0.01 µg/l	TM344							
Tecnazene	<0.01 µg/l	TM344							
Hexachlorobenzene	<0.01 µg/l	TM344							
Demeton-S-methyl	<0.01 µg/l	TM344							
Phorate	<0.01 µg/l	TM344							
Diazinon	<0.01 µg/l	TM344							
Triallate	<0.01 µg/l	TM344							
Atrazine	<0.01 µg/l	TM344							
Simazine	<0.01 µg/l	TM344							
Disulfoton	<0.01 µg/l	TM344							
Propetamphos	<0.01 µg/l	TM344							
Chlorpyrifos-methyl	<0.01 µg/l	TM344							
Dimethoate	<0.01 µg/l	TM344							
Pirimiphos-methyl	<0.01 µg/l	TM344							
Chlorpyrifos	<0.01 µg/l	TM344							
Methyl Parathion	<0.01 µg/l	TM344							
Malathion	<0.01 µg/l	TM344							
Fenthion	<0.01 µg/l	TM344							
Fenitrothion	<0.01 µg/l	TM344							
Triadimefon	<0.01 µg/l	TM344							
Pendimethalin	<0.01 µg/l	TM344							
Parathion	<0.01 µg/l	TM344							
Chlorfenvinphos	<0.01 µg/l	TM344							
trans-Chlordane	<0.01 µg/l	TM344							
cis-Chlordane	<0.01 µg/l	TM344							
Ethion	<0.01 µg/l	TM344							
Carbophenothion	<0.01 µg/l	TM344							



CERTIFICATE OF ANALYSIS

Validated

SDG: 220606-23
Client Ref.: Galway Historic Landfills P22-040

Report Number: 651052
Location: Gort Landfill

Superseded Report:

Results Legend			Customer Sample Ref.	GW01	GW02	LH01	SW1	SW2	
# ISO17025 accredited. M mCERTS accredited. sq Aqueous / settled sample. dis.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 1-4*§@ Sample deviation (see appendix)	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)	Land Leachate (LE)	Surface Water (SW)	Surface Water (SW)	Surface Water (SW)	
	Date Sampled		01/06/2022	01/06/2022	01/06/2022	01/06/2022	01/06/2022	01/06/2022	
	Sample Time								
	Date Received		06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022	
	SDG Ref		220606-23	220606-23	220606-23	220606-23	220606-23	220606-23	
	Lab Sample No.(s)		26388718	26388732	26388696	26388746	26388746	26388760	
	AGS Reference								
Component	LOD/Units	Method							
Triazophos	<0.01 µg/l	TM344	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	
Phosalone	<0.01 µg/l	TM344	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	
Azinphos methyl	<0.02 µg/l	TM344	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	
Azinphos ethyl	<0.02 µg/l	TM344	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	
Etridiazole	<0.01 µg/l	TM345	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	
Pentachlorobenzene	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Propachlor	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Quintozene (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Omethoate	<0.01 µg/l	TM345	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	
Propazine	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Propyzamide	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Alachlor	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Prometryn	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Telodrin	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Terbutryn	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Chlorothalonil	<0.01 µg/l	TM345	<0.01	<0.01	<0.2	<0.01	<0.01	<0.02	
Etrimphos	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Metazachlor	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Cyanazine	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Trietazine	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Coumaphos	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Phosphamidon I	<0.01 µg/l	TM345	<0.02	<0.02	<0.2	<0.02	<0.02	<0.02	
Phosphamidon II	<0.01 µg/l	TM345	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	
Dinitro-o-cresol	<0.1 µg/l	TM411	<0.1	<0.1	<10	<0.2	<0.1	<0.1	
Clopyralid	<0.04 µg/l	TM411	<0.04	<0.04	<4	<0.08	<0.04	<0.04	
MCPA	<0.05 µg/l	TM411	<0.05	<0.05	<5	<0.1	<0.05	<0.05	
Mecoprop	<0.04 µg/l	TM411	<0.04	<0.04	<4	<0.08	<0.04	<0.04	
Dicamba	<0.04 µg/l	TM411	<0.04	<0.04	<4	<0.08	<0.04	<0.04	
MCPB	<0.05 µg/l	TM411	<0.05	<0.05	<5	<0.1	<0.05	<0.05	
2,4-DB	<0.1 µg/l	TM411	<0.1	<0.1	<10	<0.2	<0.1	<0.1	
2,3,6-Trichlorobenzoic acid	<0.05 µg/l	TM411	<0.05	<0.05	<5	<0.1	<0.05	<0.05	
Dichlorprop	<0.1 µg/l	TM411	<0.1	<0.1	<10	<0.2	<0.1	<0.1	
Triclopyr	<0.05 µg/l	TM411	<0.05	<0.05	<5	<0.1	<0.05	<0.05	



CERTIFICATE OF ANALYSIS

Validated

SDG: 220606-23
Client Ref.: Galway Historic Landfills P22-040

Report Number: 651052
Location: Gort Landfill

Superseded Report:

SVOC MS (W) - Aqueous

Results Legend		Customer Sample Ref.	GW01	GW02	LH01	SW1	SW2
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.	Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
diss.filt	Dissolved / filtered sample.	Sample Type	Ground Water (GW)	Ground Water (GW)	Land Leachate (LE)	Surface Water (SW)	Surface Water (SW)
tot.unfilt	Total / unfiltered sample.	Date Sampled	01/06/2022	01/06/2022	01/06/2022	01/06/2022	01/06/2022
	* Subcontracted - refer to subcontractor report for accreditation status.	Sample Time					
	** % 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	Date Received	06/06/2022	06/06/2022	06/06/2022	06/06/2022	06/06/2022
	(F) Trigger breach confirmed	SDG Ref	220606-23	220606-23	220606-23	220606-23	220606-23
	1-4* Sample deviation (see appendix)	Lab Sample No.(s)	26388718	26388732	26388696	26388746	26388760
		AGS Reference					
Component	LOD/Units	Method					
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2-Methylphenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
3-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
4-Chloroaniline (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
4-Methylphenol (aq)	<1 µg/l	TM176	<1	24.8	<10	<1	<1
			#	#		#	#
4-Nitroaniline (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
4-Nitrophenol (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
Azobenzene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
Acenaphthene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
Anthracene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<2	<2	<20	<2	<2
			#	#		#	#
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1	<10	<1	<1
			#	#		#	#



CERTIFICATE OF ANALYSIS

Validated

SDG: 220606-23

Report Number: 651052

Superseded Report:

Client Ref.: Galway Historic Landfills P22-040

Location: Gort Landfill

VOC MS (W)

Results Legend		Customer Sample Ref.	GW01	GW02	LH01	SW1	SW2
#	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						
1-4*§	Sample deviation (see appendix)						
Component	LOD/Units	Method	GW01	GW02	LH01	SW1	SW2
Dibromofluoromethane**	%	TM208	102	97.5	111	96.2	98
Toluene-d8**	%	TM208	101	102	101	101	102
4-Bromofluorobenzene**	%	TM208	103	101	101	103	104
Dichlorodifluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Chloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Vinyl chloride	<1 µg/l	TM208	<1	<1	<1	<1	<1
Bromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Chloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Trichlorofluoromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,1-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1
Carbon disulphide	<1 µg/l	TM208	<1	<1	<1	<1	<1
Dichloromethane	<3 µg/l	TM208	<4	<4	<5	<4	<4
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,1-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1
2,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Bromochloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Chloroform	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,1-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1
Carbontetrachloride	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,2-Dichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Benzene	<1 µg/l	TM208	<1	<1	<1	<1	<1
Trichloroethene	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,2-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Dibromomethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
Bromodichloromethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1
Toluene	<1 µg/l	TM208	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1 µg/l	TM208	<1	<1	<1	<1	<1
1,3-Dichloropropane	<1 µg/l	TM208	<1	<1	<1	<1	<1



CERTIFICATE OF ANALYSIS

Validated

SDG: 220606-23
Client Ref.: Galway Historic Landfills P22-040

Report Number: 651052
Location: Gort Landfill

Superseded Report:

VOC MS (W)

Results Legend			Customer Sample Ref.	GW01	GW02	LH01	SW1	SW2	
# ISO17025 accredited. M mCERTS accredited. sq. Aqueous / settled sample. dis. fil. Dissolved / filtered sample. tot.unfil. 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 1-4*# Sample deviation (see appendix)			Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	0.00 - 0.00 Ground Water (GW) 01/06/2022 06/06/2022 220606-23 26388718	0.00 - 0.00 Ground Water (GW) 01/06/2022 06/06/2022 220606-23 26388732	0.00 - 0.00 Land Leachate (LE) 01/06/2022 06/06/2022 220606-23 26388696	0.00 - 0.00 Surface Water (SW) 01/06/2022 06/06/2022 220606-23 26388746	0.00 - 0.00 Surface Water (SW) 01/06/2022 06/06/2022 220606-23 26388760	
Component	LOD/Units	Method							
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	
Bromofom	<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

Validated

SDG: 220606-23

Report Number: 651052

Superseded Report:

Client Ref.: Galway Historic Landfills P22-040

Location: Gort Landfill

Table of Results - Appendix

Method No	Reference	Description
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM045	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130	Determination of BOD5 (ATU) Filtered by Oxygen Meter on liquids
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
TM152	ISO 17294-2:2016 Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS)	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, Standard Methods for the examination of waters and wastewaters 20th Edition, PHA, Washington DC, USA. ISBN 0-87553-235-7 and The Determination of Alkalinity and Acidity in water HMSO, 1981, ISBN 0 11 751601 5.	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
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.



CERTIFICATE OF ANALYSIS

Validated

SDG: 220606-23
Client Ref.: Galway Historic Landfills P22-040

Report Number: 651052
Location: Gort Landfill

Superseded Report:

Test Completion Dates

Lab Sample No(s)	26388718	26388732	26388696	26388746	26388760
Customer Sample Ref.	GW01	GW02	LH01	SW1	SW2
AGS Ref.					
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Type	Ground Water	Ground Water	Land Leachate	Surface Water	Surface Water

	26388718	26388732	26388696	26388746	26388760
Acid Herbicides by GCMS	13-Jun-2022	13-Jun-2022	15-Jun-2022	17-Jun-2022	13-Jun-2022
Alkalinity as CaCO3	09-Jun-2022	09-Jun-2022	13-Jun-2022	09-Jun-2022	09-Jun-2022
Ammonium Low	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022
Anions by Kone (w)	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022
BOD True Total	12-Jun-2022	13-Jun-2022	13-Jun-2022	11-Jun-2022	11-Jun-2022
COD Unfiltered	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022
Cyanide Comp/Free/Total/Thiocyanate	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022
Dissolved Metals by ICP-MS	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022
Dissolved Oxygen by Probe	07-Jun-2022	07-Jun-2022	07-Jun-2022	07-Jun-2022	07-Jun-2022
Fluoride	10-Jun-2022	10-Jun-2022	10-Jun-2022	09-Jun-2022	10-Jun-2022
Mercury Dissolved	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022
PCB Congeners - Aqueous (W)	13-Jun-2022	13-Jun-2022	13-Jun-2022	13-Jun-2022	13-Jun-2022
Pesticides (Suite I) by GCMS	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022
Pesticides (Suite II) by GCMS	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022
Pesticides (Suite III) by GCMS	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022	10-Jun-2022
pH Value	08-Jun-2022	08-Jun-2022	08-Jun-2022	08-Jun-2022	08-Jun-2022
SVOC MS (W) - Aqueous	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022	09-Jun-2022
Total Organic and Inorganic Carbon	07-Jun-2022	07-Jun-2022	08-Jun-2022	07-Jun-2022	07-Jun-2022
VOC MS (W)	14-Jun-2022	14-Jun-2022	10-Jun-2022	14-Jun-2022	14-Jun-2022



CERTIFICATE OF ANALYSIS

SDG: 220606-23
Client Ref: Galway Historic Landfills P22-(

Report Number: 651052
Location: Gort Landfill

Superseded Report:

Appendix

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. 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. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury.

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 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

General

18. **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.

19. Sample Deviations

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

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Matrix interference
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples
§	Sampled on date not provided

20. 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 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials and soils 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 (2021).

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.

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.

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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