

CONSULTANTS IN ENGINEERING, **ENVIRONMENTAL SCIENCE & PLANNING**

KILKENNY HISTORIC LANDFILLS

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Prepared for: Kilkenny County Council



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TIER 3 RISK ASSESSMENT HISTORIC LANDFILL AT THORPES, CO. KILKENNY

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Abstract: This report presents the findings of a Tier 3 risk assessment carried out on the Thorpes Historic

Landfill site, Co. Kilkenny, conducted in accordance with the EPA Code of Practice for unregulated landfill sites. The Tier 3 risk assessment was conducted following

recommendations made in an earlier Tier 2 risk assessment.

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1. INTRODUCTION

1.1 Overview

Fehily Timoney and Company (FT) was appointed by Kilkenny County Council to carry out and prepare a Tier 3 risk assessment for Thorpes Historical landfill located east of the town of Ballyragget, Co. Kilkenny. The location of the site is presented in Figure 1.1.

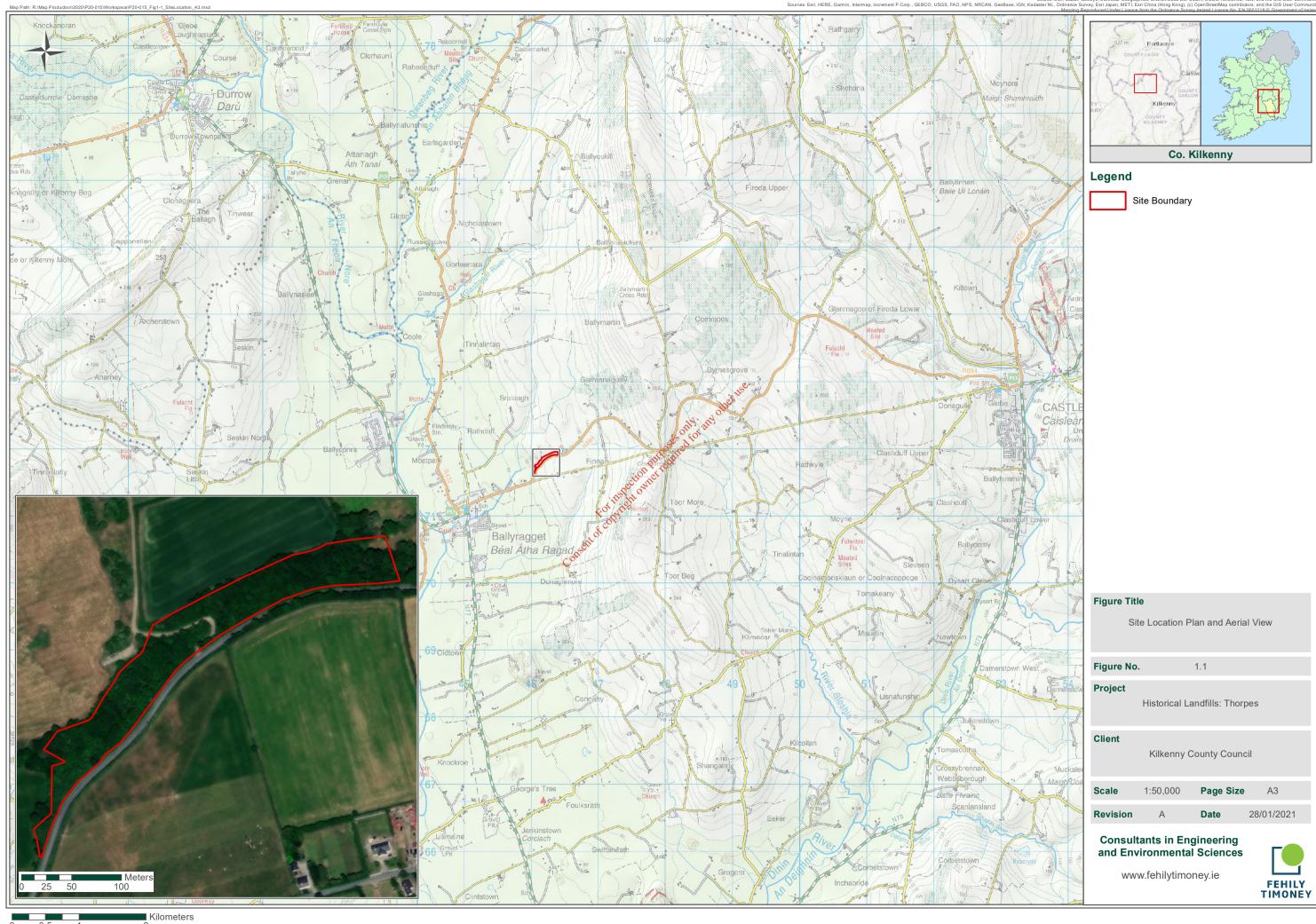
This Tier 3 is developed upon the findings of:

- Tier 1 Risk Assessment, Kilkenny County Council.
- Tier 2 Risk Assessment including Site Investigations and Testing, Fehily Timoney and Company, 2019.

All FT risk assessments were carried out in accordance with the Environmental Protection Agency (EPA) Code of practice (CoP) - Environmental Risk Assessment for Unregulated Waste Disposal Sites guidance document.

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1.2 Tier 1 Risk Classification

Kilkenny County Council initially prepared a Tier 1 risk assessment for the site. This risk assessment determined that the site was a medium (Class B) risk to the receiving environment. Applying the EPA risk assessment tool as per the EPA CoP for Unregulated Waste Disposal Sites, yielded risk scores of 50% for source-pathway-receptors (SPR) linkages SPR1, SPR5, SPR7 and SPR8. All other SPR linkages were calculated to be of low risk. A summary of the risks is presented below in Table 1-1.

Table 1-1 normalised scores for Tier 1 assessment have been provided for reference purposes as per the current (2020) EPA Section 22 register.

Table 1-1: Tier 1 SPR Linkages

SPR No.	Linkage	Normalised Score	Justification
Leachate migr	ation through cor	mbined groundwa	ater and surface water pathways
SPR1	Leachate => surface water	50%	Groundwater vulnerability was identified as being 'High' and site is underlain by a 'Poor Aquifer – Bedrock which is generally unproductive'; an area of 'Regionally important Aquifer – Karstified (diffuse)' is present within 50m of the western site perimeter. The nearest SAC/NHA (River Nore / Abbeyleix Woods Complex) is located greater than 1km from the waste body. There is a direct connection between the site and the Ballyragget stream.
SPR2	Leachate => SWDTE	0% inst	There is no SWDTE at risk from the site
Leachate migr	ation through gro		ray
SPR3	Leachate => human presence	Consens 33.3%	Residential dwellings located within 250m south-west of the waste body. It is unlikely that this dwelling would be exposed to any subsurface leachate.
SPR4	Leachate => GWDTE	0%	The nearest SAC/NHA (River Nore / Abbeyleix Woods Complex) is located greater than 1 km away from the site boundary.
SPR5	Leachate => Aquifer	50%	Poor Aquifer – generally unproductive except for Local Zones.
SPR6	Leachate => Public Supply	21.4%	No public water supply within 1km of the site (Karst aquifer adjacent to site).
SPR7	Leachate => SWDTE	50%	Direct connection between the waste and surface Ballyragget stream, which crosses the entire site through the centre.
Leachate migr	ation through sur	face water pathy	vay
SPR8	Leachate => Surface Water	50%	There is a direct connection between the landfill site and the Ballyragget stream surface water receptor, which crosses the site.

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Kilkenny County Council Tier 3- Thorpes Historical Landfill

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SPR No.	Linkage	Normalised Score	Justification
SPR9	Leachate => SWDTE	0%	There is a direct surface water pathway from the site to surface water receptors.
Landfill gas mi	gration pathway	(lateral & vertica	1)
SPR10	Landfill Gas => Human Presence	5%	The historic landfill is located within dense forestation overgrown with the groundwater vulnerability described as 'High' and the aquifer as 'Poor'.
SPR11	Landfill Gas => Human Presence	0%	The historic landfill is located within dense forestation overgrown with the nearest residential dwelling located within 250 m west of the waste body.

Tier 2 Site investigation

Fehily Timoney and Company (FT) was appointed by Kilkenny County Council to undertake a Tier 2 Risk Assessment. The Tier 2 risk assessment included the following elements:

- Intrusive site investigation works
- Surface water monitoring upstream and downstream of the site

 Factual reporting

The Tier 2 site investigations confirmed that the historic fundfill typically contained fragments of waste typical of non-putrescible commercial and industrial type waste deposited in a single infill area tending east to west within and along the banks of the Ballyragget stream within the site, which covers an area of approximately 0.84 hectares. The waste footprint was estimated from the site walkover, extending to maximum dimensions 210m in length and 40m in width.

Tier 2 Risk Classification and Tier 2 SPRs

The Tier 2 site investigation risk assessment concluded that the risk rating of the site was Low (Class C). The highest single risk rating for the site was calculated to be 17% for source-pathway-receptor (SPR) Linkage 8, which referred to leachate migration through a surface water pathway to a surface water receptor. The SPR linkages examined in the Tier 2 are presented on Table 1.2:

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Table 1-2: Tier 2 Selected SPR Linkages

SPR No.	Linkage	Normalised Score	Justification
Leachate migr	ation through cor	mbined ground	dwater and surface water pathways
SPR1	Leachate => surface water	8%	Groundwater vulnerability was identified as 'Low' for the central and eastern areas and as 'High' within the western portion of the site. The site is underlain by a 'Poor Aquifer – generally unproductive except for Local Zones'. The nearest SAC/NHA (River Nore / Abbeyleix Woods Complex) is located greater than 1km from the waste body. There is a direct connection between the site and the Ballyragget stream. Surface water monitoring was conducted at upstream and downstream locations on the Ballyragget stream as part of the Tier 2 site investigation. Surface water monitoring did not demonstrate any deterioration in water quality between upstream and downstream monitoring locations therefore indicating that the landfill is not having a deleterious effect on the Ballyragget stream and connected rivers, as the nearest surface water receptors.
SPR2	Leachate => SWDTE	0%	Aquifer and bedrock present a groundwater pathway however, the surface water monitoring did not demonstrate any deterioration in surface water quality.
Leachate migr	ation through gro	oundwater pat	hwayingtie
SPR3	Leachate => human presence	6% For	Residential dwellings located within 250m south-west of the waste body. Dwellings are upgradient of the site and it is unlikely that this dwelling would be exposed to any subsurface leachate.
SPR4	Leachate => GWDTE	0%	No public water supply within 1km of the site (Karst aquifer adjacent to site).
SPR5	Leachate => Aquifer	2%	Poor Aquifer – generally unproductive except for Local Zones.
SPR6	Leachate => Public Supply	4%	No public water supply within 1km of the site (Karst aquifer adjacent to site).
SPR7	Leachate => SWDTE	6%	Direct connection between the waste and surface Ballyragget stream, which crosses the entire site through the centre. The nearest SAC/NHA (River Nore / Abbeyleix Woods Complex) is located greater than 1km from the waste body. Surface water monitoring did not indicate any deterioration in surface quality attributable to the presence of waste at the historical landfill.
Leachate migr	ation through sur	face water pa	thway
SPR8	Leachate => Surface Water	17%	There is a direct connection between the landfill site and the Ballyragget stream surface water receptor, which crosses the entire site. Surface water monitoring did not demonstrate any deterioration in water quality between upstream and

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Tier 3- Thorpes Historical Landfill

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SPR No.	Linkage	Normalised Score	Justification
			downstream monitoring locations therefore indicating that the landfill is not having a deleterious effect on the Ballyragget stream, as the nearest surface water receptor.
SPR9	Leachate => SWDTE	0%	There is a direct surface water pathway from the site to surface water receptors. The nearest SAC/NHA (River Nore / Abbeyleix Woods Complex) is located greater than 1km from the waste body. Surface water monitoring did not demonstrate any deterioration in water quality between upstream and downstream monitoring locations.
Landfill gas mi	igration pathway	(lateral & vert	ical)
SPR10	Landfill Gas => Human Presence	5%	The historic landfill is located within dense forestation overgrown with the groundwater vulnerability described as 'High' and the aquifer as 'Poor'. No visual or olfactory evidence of putrescible / biodegradable waste was noted by FT during the site walkover.
SPR11	Landfill Gas => Human Presence	0%	The historic landfill is located within dense forestation overgrown with the nearest residential dwelling located approximately 250 m south-west of the site. No visual or olfactory evidence of putrescible / biodegradable waste was noted by FT our ing the site walkover.

1.4.1 <u>Leachate migration through surface water pathways (SPR8)</u>

Leachate migration poses a low risk to the adjacent surface water stream, the Ballyragget stream. Surface water monitoring was conducted on four occasions, in September 2018, May and twice in June 2020 at two locations on the Ballyragget stream upstream and downstream of the historic landfill. The monitoring results did not present concentrations above the relevant surface water quality thresholds nor did they suggest any deterioration in water quality downstream of the waste body. Although leachate wasn't observed within the Ballyragget Stream and the outcome of surface water monitoring doesn't suggest the site is actively causing a deterioration in water quality downstream of the site there is still a potential pathway for leachate to migrate to the river.

The Tier 2 assessment recommended that additional surface water monitoring be conducted prior to a Certificate of Authorisation (CoA) application. This Tier 3 has been prepared for the purpose of examining the findings of additional surface water monitoring and to inform appropriate site remediation measures.

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TIER 3 QUANTITATIVE RISK ASSESSMENT

2.1 **Tier 3 Overview**

A Tier 3 assessment includes some form of quantitative risk assessment either as a Generic Quantitative Risk Assessment (GQRA) or as a Detailed Quantitative Risk Assessment (DQRA).

This Tier 3 assessment report applies a GQRA to further assess the risk to surface waters and further examines the Tier 2 (see Table 1-2) linkage in relation to the SPR8 Leachate migration through surface water pathway resulting in a risk rating score of 17%.

As part of the Tier 3 assessment, a further review of the Tier 2 site investigations and environment risk assessments was conducted.

The 2018 site investigation findings and the subsequent 2019 Tier 2 assessment concluded that the Thorpes site presents a low risk.

The Tier 2 report recommended additional surface water monitoring be conducted at upstream and downstream locations on the Ballyragget Stream prior to the Certificate of Authorisation (CoA) application. This Tier 3 assessment included an analysis and interpretation of those additional rounds of monitoring to confirm the findings of the Tier assessment and confirm the potential risk of the site to the Ballyragget Stream.

Based on the outcomes of the GQRA, suitable remediation measures are presented in Section 4. of this report.

Generic Quantitative Risk Assessment action purposed average quantitative risk average quantitat The generic quantitative risk assessment addressed the risk SPR8 Leachate migration through surface water pathway to surface water receptors (SPR&)?

The GQRA rely on information gathered as part of the Tier 2 investigations and additional surface water monitoring conducted in 2020. Relevant environmental characteristics considered in evaluating the site and carrying out this Tier 3 investigation are discussed below.

2.3 Existing Geological, and Hydrogeological and Hydrological Environment

The risk to adjacent surface water was identified as the primary environmental risk associated with the site. The application of the EPA risk calculation and scoring methodology, as outlined in the EPA CoP, is reliant on understanding the geological and hydrogeological characteristics of the site and the surrounding environment. An accurate understanding and rating of the geological, hydrogeological and hydrological characteristics of the site and environment are directly linked to determining the primary source-pathway-receptor linkages and potential impacts/risks associated with the site. The Tier 2 site investigation and risk assessment provided a better understanding of the site and surrounding environs. Summary findings of the relevant environmental characteristics considered when evaluating the site and carrying out this Tier 3 investigation are discussed below.

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Tier 3- Thorpes Historical Landfill
2 - Tier 3 Quantitative Risk Assessment



The site is approximately 1.8 ha in size, in a rural area predominantly overgrown with vegetation and trees, primarily agricultural area in north Kilkenny. The site is located 1.5 km from Ballyragget town. Lands within 1 km of the site are used primarily for agriculture namely grazing. The quaternary map provided by GSI Online identifies the quaternary sediments at the site as 'glaciofluvial sands and gravels' derived from Limestones.

The bedrock beneath the site is founded on the Killeshin Siltstone Formation. This formation is described as 'Muddy siltstone and silty mudstone'. An unconformity runs northwest to southeast beyond the southwestern boundary of the site. The bedrock mapping indicates the sites western boundary lies near 'cherty, muddy, calcarenitic limestone' bedrock from the Clongrenan Formation. The bedrock is characterised as typically medium-coarse grained thick limestone beds with a variable presence of shales. Evidence of karstic landforms have been identified within this bedrock formation at Donaghmore Well located approximately 1.5 km south of the project site.

The underlying bedrock aquifer is a 'Poor Aquifer – Bedrock which is generally unproductive'. An area of 'Regionally important Aquifer – Karstified (diffuse)' is present within 50m of the western site perimeter. There are no Groundwater Drinking Water Protection Areas within the site boundaries according to GSI. The closest one, Ballyconra PWS, is located approximately 2.5 km from site.

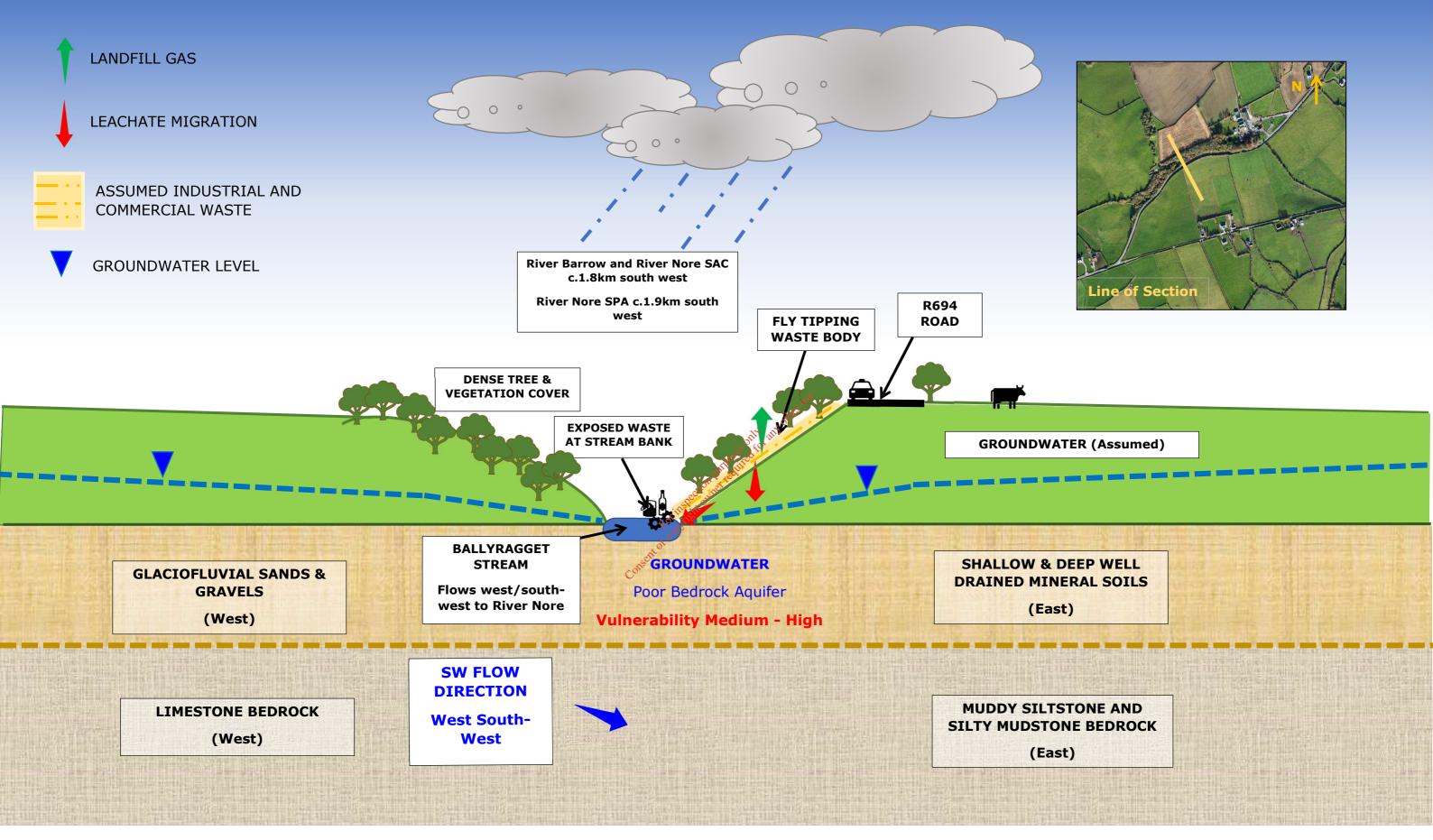
The vulnerability of groundwater to contamination is classified as High.

The site is located within the: Nore catchment (Hydrometric Area 15), in the Nore_SC_080 sub-catchment and Nore_130 river sub-basin. The nearest surface water feature to the site is a stream (EPA Name: Ballyragget) which crosses the entire site in the flows through the centre of the site in a southwest direction towards the River Nore, meeting c.1.70 km downstream of the site. The Nore River is located approximately 1.60 km west of the site at its closest point. The Nore discharges eventually to River Barrow, which discharges to Waterford Harbour c. 67 km south of the site.

2.3.1 Conceptual Site Model (CSM)

A revised conceptual site model has been prepared as part of the Tier 2 assessment and is included below for reference. The revised CSM illustrates the identified potential for leachate migration from the site to the adjacent surface water stream, the Ballyragget stream.

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CROSS SECTION NORTH-WEST / SOUTH-EAST

FIGURE 2.1 THORPES HISTORIC LANDFILL CONCEPTUAL SITE MODEL

Kilkenny County Council Tier 3- Thorpes Historical Landfill 2 - Tier 3 Quantitative Risk Assessment



2.4 Impact of Leachate on Receiving Surface Waters

The potential impact of leachate emissions to the waterbody crossing the site was identified as being the primary risk associated with the site.

Surface water monitoring was conducted in 2018 at two locations upstream (SW2) and downstream (SW1) of the site. In accordance with Tier 2 recommendations, to further assess the potential impact of the landfill, if any, on downstream water quality, further surface water analysis was undertaken at both monitoring locations, SW1 and SW2, monthly for three months on the 13th May, 10th June and 30th June 2020.

The results of the surface water monitoring from SW1 (downstream) and SW2 (upstream) show no exceedances of the water quality standards as per the European Communities Environmental Objectives (Surface Waters) Regulations 2009 as amended 2015, 2019 on four no. monitoring rounds with the exception of ortho-phosphate as PO_4^{-1} .

The results of all monitoring rounds for this site, including September 2018, are shown in Table 3-3. The complete laboratory reports with all results are presented in Appendix 1 to this report.

Orthophosphate (ortho-P) is found to be above the surface water quality thresholds, with upstream samples consistently yielding slightly higher concentrations than downstream samples.

This indicates that the elevated concentrations of ortho-P downstream of the site are more likely to be caused by sources upstream and not directly associated with the waste present.

A review of publicly available EPA monitoring data was conducted to determine surface quality of the River Nore, downstream of the site and to which the Ballyragger Stream is a tributary. The closest monitoring station upstream of the Ballyragget Stream and River Nore confluence is Station ID: RS15NO11400, '0.5 km u/s Ballyragget'. The EPA data (2017) shows a baseline concentration of 0.035 mg/l Orthophosphate for the 2007 to 2018 period. The closest monitoring station downstream to Ballyragget Stream and River Nore confluence is Station ID: RS15NO11480, 'upstream's Ballyragget WWTP'. The 2017 baseline concentration for orthophosphate at this location is 0.047 mg/l.

This data shows a slight increase in orthophosphate concentrations between locations upstream and downstream of the Ballyragget Stream confluence, however downstream concentrations remaining slightly above the 'Good' status mean surface water quality threshold value of 0.035 mg/l for orthophosphate as per European Communities Environmental Objectives (Surface Waters) Regulations 2009 as amended 2015, 2019.

It is noted that the downstream location is positioned downstream of another stream and tributary of the River Nore which may be contributing to the observed increase in orthophosphate concentrations in the River Nore.

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¹ Orthophosphate as PO₄ is expressed as 'Molybdate Reactive Phosphorous' within S.I. No. 272 of 2009 (as amended).

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Table 2-1: Surface Water Sampling Results

				19/09/	2018	13/05/2020		10/06/2020		30/06/2020	
Test	Units	EQS ¹	MAC	SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
Inorganics											
Ammoniacal Nitrogen as N		0.065 (mean)									
(Total Ammonia)	mg/l	0.140 (95%ile)	0.14	<0.2	<0.2	-	-	-	-	-	-
Conductivity @ 20 deg.C	mS/cm			0.56	0.543	0.521	0.534	0.528	0.545	0.532	0.535
Fluoride	mg/l	0.5		-	<u>ت</u> و،	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Oxygen, dissolved	mg/l			10.1	10.3	10.4	10.7	10.8	10.9	12.1	12.4
рН	pH Units	6.0 <ph<9.0< td=""><td></td><td>8.08</td><td>80.8</td><td>8.3</td><td>8.32</td><td>8.2</td><td>8.24</td><td>8.25</td><td>8.28</td></ph<9.0<>		8.08	80.8	8.3	8.32	8.2	8.24	8.25	8.28
		≤0.035(mean)		MPOSES OF FO	,						
Phosphate (Ortho as PO4)	mg/l	≤0.075 (95%ile)		atto ses dired fo	-	0.067	0.092	0.109	0.142	0.114	0.146
Sulphate	mg/l		ز	on gried 13.6	14.4	-	-	-	-	-	-
Chloride	mg/l		250°	owit 21.1	23.6	19.3	18.9	19.5	18.6	22.7	20.4
COD, unfiltered	mg/l		For its light	-	-	<7	9.01	15.2	16.3	<7	<7
Ammoniacal Nitrogen as N		≤0.065 (mean)	Fod,								
(low level)	mg/l	≤0.140 (95%ile)	0.14	-	-	< 0.01	<0.01	0.0532	0.0287	0.0274	0.041
Cyanide, Total	mg/l	0.01		-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
		≤1.5 (mean)									
BOD, unfiltered	mg/l	≤2.6 (95%ile)		<1	<1	<1	<1	<1	<1	<1	<1
Suspended solids, Total	mg/l			-	-	<2	<4	3.75	6.2	<2	<2
Sulphate (soluble) as S	mg/l			-	-	5.37	5.13	4.87	4.83	5.13	4.87
Filtered (Dissolved) Metals											
Mercury (diss.filt)	μg/l		0.07	-	-	< 0.01	<0.01	<0.01	<0.01	< 0.01	< 0.01
Arsenic (diss.filt)	μg/l	25		-	-	<0.5	0.5	<0.5	<0.5	<0.5	0.511
Cadmium (diss.filt)	μg/l	0.15	0.9	-	-	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium (diss.filt)	μg/l	4.7	32	-	-	<1	<1	<1	<1	<1	<1
Copper (diss.filt)	μg/l	30		-	-	0.706	0.768	0.755	0.75	0.777	0.735

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				19/09/	2018	13/05/	2020	10/06/	2020	30/06/2	2020
Test	Units	EQS ¹	MAC	SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
Lead (diss.filt)	μg/l	1.2	14	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nickel (diss.filt)	μg/l	4	34	-	-	<0.4	<0.4	<0.4	<0.4	0.575	0.52
Semi-Volatile Organic Compour	nds (SVOCs)										
1,2,4-Trichlorobenzene (aq)	μg/l	0.4	N/A	-	-	<1	<1	<1	<1	<2	<1
Anthracene (aq)	μg/l	0.1	0.1	-	-	<1	<1	<1	<1	<2	<1
bis(2-Ethylhexyl) phthalate (aq)	μg/l	1.3	N/A	-	-9)	<2	<2	<2	<2	<4	<2
Benzo(b)fluoranthene (aq)	μg/l		0.017	-	aher 13-8	<1	<1	<1	<1	<2	<1
Benzo(k)fluoranthene (aq)	μg/l		0.017	73.	- 104 Ott.	<1	<1	<1	<1	<2	<1
Benzo(a)pyrene (aq)	μg/l	0.00017	0.27	ses of to	-	<1	<1	<1	<1	<2	<1
Benzo(g,h,i)perylene (aq)	μg/l		0.0082	1005, 11ell	-	<1	<1	<1	<1	<2	<1
Diethyl phthalate (aq)	μg/l	1.3	N/A	on full teduli -	-	<1	<1	<1	<1	<2	<1
Fluoranthene (aq)	μg/l	0.0063	0.12	OTATE -	-	<1	<1	<1	<1	<2	<1
Hexachlorobenzene (aq)	μg/l		0.05	-	-	<1	<1	<1	<1	<2	<1
Hexachlorobutadiene (aq)	μg/l		g.e	-	-	<1	<1	<1	<1	<2	<1
Pentachlorophenol (aq)	μg/l	0.4	1	-	-	<1	<1	<1	<1	<2	<1
Phenol (aq)	μg/l	8 Coff	46	-	-	<1	<1	<1	<1	<2	<1
Naphthalene (aq)	μg/l	2	130	-	-	<1	<1	<1	<1	<2	<1
Indeno(1,2,3-cd)pyrene (aq)	μg/l		N/A	-	-	<1	<1	<1	<1	<2	<1
Volatile Organic Compounds (V	OCs)	1									
Dichloromethane	μg/l	20	N/A	-	-	<3	<3	<3	<3	<3	<3
Carbontetrachloride	μg/l	12	N/A	-	-	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	μg/l	10	N/A	-	-	<1	<1	<1	<1	<1	<1
Benzene	μg/l	10	50	-	-	<1	<1	<1	<1	<1	<1
Toluene	μg/l	10		-	-	<1	<1	<1	<1	<1	<1
m,p-Xylene	μg/l	10		-	-	<1	<1	<1	<1	<1	<1
o-Xylene	μg/l	10		-	-	<1	<1	<1	<1	<1	<1

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				19/09/	2018	13/05/	2020	10/06/	2020	30/06/2	2020
Test	Units	EQS ¹	MAC	SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
1,2,4-Trichlorobenzene	μg/l	0.4	N/A	-	-	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	μg/l		0.6	-	-	<1	<1	<1	<1	<1	<1
Naphthalene	μg/l	2	130	-	ı	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	μg/l	0.4	N/A	-	-	<1	<1	<1	<1	<1	<1
1,3,5-Trichlorobenzene	μg/l	0.4	N/A	-	-	<1	<1	<1	<1	<1	<1
Combined Pesticides / Herbicid	es										
Pentachlorobenzene	μg/l	0.007	N/A	-	, 	< 0.01	<0.01	< 0.01	<0.01	< 0.01	<0.01
Trifluralin	μg/l	0.03	N/A	-	ather -	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01
Alachlor	μg/l	0.3	0.7	94).	any -	< 0.01	<0.01	< 0.01	<0.01	< 0.01	<0.01
Heptachlor	μg/l	0.0000002	0.0003	356.99.70	-	< 0.01	<0.01	< 0.01	<0.01	< 0.01	<0.01
Aldrin	μg/l	sum = 0.01	N/A	altipolitic -	-	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01
Terbutryn	μg/l	0.065	0.34	on or rect	ı	< 0.01	<0.01	< 0.01	<0.01	< 0.01	<0.01
Isodrin	μg/l	sum = 0.01	N/Agen	-	1	<0.02	<0.02	<0.01	<0.01	< 0.01	<0.01
Heptachlor epoxide	μg/l	0.0000002	6.0003	-	1	<0.02	<0.02	< 0.01	<0.01	< 0.01	<0.01
Endosulphan I	μg/l	0.005	6.01	-	ı	< 0.01	< 0.01	< 0.01	<0.01	< 0.01	<0.01
1,3,5-Trichlorobenzene	μg/l	0.4	N/A	-	-	< 0.01	<0.01	< 0.01	< 0.01	< 0.01	<0.01
Dieldrin	μg/l	sum = 0.01	N/A	-	ı	< 0.01	< 0.01	< 0.01	<0.01	< 0.01	<0.01
Hexachlorobutadiene	μg/l		0.6	-	1	<0.01	<0.01	<0.01	<0.01	< 0.01	<0.01
1,2,4-Trichlorobenzene	μg/l	0.4	N/A	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin	μg/l	sum = 0.01	N/A	-	ı	< 0.01	< 0.01	< 0.01	<0.02	< 0.01	<0.01
1,2,3-Trichlorobenzene	μg/l	0.4	N/A	-	ı	< 0.01	< 0.01	< 0.01	<0.01	< 0.01	<0.01
Dichlorvos	μg/l	0.0006	0.0007	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan II	μg/l	0.005	0.01	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
p,p'-DDT	μg/l	0.01	N/A	-	-	<0.01	<0.01	<0.02	<0.02	<0.03	<0.03
Hexachlorobenzene	μg/l		0.05	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulphan Sulphate	μg/l	0.005	0.01	-	-	<0.04	<0.04	<0.02	<0.02	<0.02	<0.02
Diazinon	μg/l	0.01	0.02	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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Kilkenny County Council

Tier 3- Thorpes Historical Landfill 2 - Tier 3 Quantitative Risk Assessment



				19/09/	2018	13/05/	2020	10/06/	2020	30/06/	2020
Test	Units	EQS ¹	MAC	SW1	SW2	SW1	SW2	SW1	SW2	SW1	SW2
Triallate	μg/l	670	670	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Atrazine	μg/l	0.6	2	1	-	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Simazine	μg/l	1	4	-	-	< 0.01	<0.01	< 0.01	<0.01	0.0156	0.0165
Chlorpyriphos-methyl	μg/l	0.03	0.1	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.01
Dimethoate	μg/l	0.8	4	1	-	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorpyriphos	μg/l	0.03	0.1	1	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chlorfenvinphos	μg/l	0.1	0.3	-	, <u>z</u> e	<0.01	< 0.01	< 0.01	<0.01	< 0.01	<0.01

conclusions and recommendations

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es:
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 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 Maximum Admissible Concentration (MAC), as classified by European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009). Refers to Annual-Average (AA) tems shaded in bold are in exceedance of the European Communities MACs are in exceedance of the 2009 EQS Regulations enclusions and recommendations enclusions and recommendations the commendations of the 2009 EQS Regulations enclusions are in exceedance of the 2009 EQS Regulations enclusions and recommendations enclusions are in exceedance of the 2009 EQS Regulations enclusions enclusive enclusions enclusive enclusions enclusions enclusions enclusive enclusions enclusive enclusions enclusive e

^{*} Items shaded in **bold** are in exceedance of the European Communities MACs

^{**} Items shaded in **orange** are in exceedance of the 2009 EQS Regulations



CONCLUSIONS AND RECCOMENDATIONS

3.1 Conclusion

This Tier 3 assessment:

- Reviewed the findings of the Tier 1 risk assessment.
- Reviewed the findings of the Tier 2 site investigation and risk assessment.
- Applied a GQRA and reviewed additional surface water monitoring results comparing them to relevant surface water quality standards in order to determine the impact of the deposited waste on the quality of the Ballyragget Stream.
- Determined the site to be a Low Risk (Class C), with the highest risk identified at the site is the potential for migration of pollutants from the site to the adjacent Ballyragget stream. However, monitoring of the stream has shown no observable impact of the landfill on the water body.
- Based on the site investigation results of the initial Tier 2 assessment and the further monitoring undertaken the site is classified as Low Risk.
- For a low-risk site, the CoP indicates that these sites are not considered to pose a significant risk to the

environment or human health.

3.2 Recommendations

It is recommended that this site can proceed with a Certificate of Authorisation application. The Tier 3 environmental risk assessment has confirmed the site to be less site to be less site (Class C). environmental risk assessment has confirmed the rating of the site to be Low risk (Class C).

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Kilkenny County Council Tier 3- Thorpes Historical Landfill 4 - Remedial Action Plan



4. REMEDIAL ACTION PLAN

4.1 Remediation Plan

The Tier 3 risk assessment has determined the site to be a Low Risk (Class C), with the principle risk identified at the site is the potential for migration of pollutants from the site to the adjacent Ballyragget stream.

4.1.1 Leachate migration through surface water pathways (SPR8)

The Tier 2 assessment determined that the site presented only a low risk to the environment, with respect to all SPR linkages with the highest calculated score for the site being 17%, referring to SPR8.

Three additional rounds of surface water monitoring on the Ballyragget Stream conducted in 2020, indicated that the waste is not causing deleterious effect on the surface water quality of the stream.

Elevated concentrations of ortho-phosphate, above the environmental quality standard threshold value were detected in upstream and downstream samples, with upstream samples yielding higher concentrations than downstream samples. This indicates that the elevated concentrations observed are likely attributed to other sources upstream of the waste material and not directly associated with the site.

These findings confirm the determination that the risk associated with the site is low.

No physical remediation or engineering works are proposed. The primary objective of the proposed remediation will be to routinely monitor the surface water quality of the Ballyragget Stream, upstream and downstream of the site.

4.1.1 Proposed Surface Water Monitoring Regime

The EPA Landfill Monitoring landfill manual outlines recommended, minimum monitoring requirements for ground and surface waters. These parameters are shown in Table 5-1 below and are as presented in Table C.2 of the EPA's Landfill Manuals - Landfill Monitoring, 2nd Edition (2003).

Surface water monitoring shall be measured at SW1 and SW2 locations annually in accordance with parameters listed in Table 5-1.

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Table 5-1: Proposed Monitoring Schedule

Monitoring Parameter ²	Frequency	Surface Water	Location
Temperature		✓	
Dissolved Oxygen		✓	
рН		✓	
Electrical Conductivity		✓	
Total suspended solids		✓	
Total dissolved solids		✓	
Ammonia (as N)		✓	
Total oxidized nitrogen (as N)		✓	
Total organic carbon		✓	SW1
Biochemical Oxygen Demand	Annual	✓	
Chemical Oxygen Demand		✓	SW2
Metals ³		nettise.	
Total Alkalinity (as CaCO ₃)		M. My oth	
Sulphate	20°.46°	101 V	
Chloride	on Purpoliti	✓	
Molybdate Reactive Phosphorous	of its pection purposes of the copyright owner required	√	
Cyanide (Total)	, og,	✓	
Fluoride Consent		✓	

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 $^{^{2}}$ Tables D.1 and D.2 of the EPA Landfill Monitoring manual recommend guideline minimum reporting values for parameters.

³ Metals for analysis should include: calcium, magnesium, sodium, potassium, iron, manganese, cadmium, chromium (total), copper, nickel, lead, zinc, arsenic, boron and mercury.



CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

Surface Water Sampling
Results

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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:
 28 September 2018

 Customer:
 D_FTIM_DUB

 Sample Delivery Group (SDG):
 180920-159

 Your Reference:
 Surface Water

 Location:
 Thorpes

 Report No:
 474401

This report has been revised and directly supersedes 474266 in its entirety.

We received 2 samples on Thursday September 20, 2018 and 2 of these samples were scheduled for analysis which was completed on Friday September 28, 2018. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

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

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

Approved By:

Sonia McWhan
Operations Manager







Validated

SDG: 180920-159 Surface Water 474401 Client Reference: Report Number: Location: Superseded Report: 474266 Thorpes Order Number: Z1237

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
18372401	SW1		0.00 - 0.00	19/09/2018
18379843	SW2		0.00 - 0.00	19/09/2018

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining

a temperature of (5±3)°C.

12.2

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

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



Validated

CERTIFICATE OF ANALYSIS

ALS

SDG:180920-159Client Reference:Surface WaterReport Number:474401Location:ThorpesOrder Number:Z1237Superseded Report:474266

(ALS) Location:	Thorpes	Order Number:				Z	Z1237				_	
Results Legend X Test N No Determination	Lab Sample No(s)			18372401							18379843	
Possible Sample Types -	Custome Sample Refei	SWI				CW1				SW2	-	
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate	AGS Refere											
PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage	Depth (m)			0.00 - 0.00						0.00 - 0.00	
RE - Recreational Water DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge G - Gas OTH - Other	Containe	250ml BOD (ALE212)	500ml Plastic (ALE208)	H2SO4 (ALE244)	(ALE204)	(ALE212)	250ml BOD	(ALE208)	F00ml Plastic	HNO3 Filtered (ALE204)		
	Sample Ty	WS	WS	WS	(S S	WS	9	ρ <u>(</u>	WS W	1	
Ammoniacal Nitrogen	All	NDPs: 0 Tests: 2			X					X	net ue	ġ.
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X			S Constitution of the cons	ر چې درو	g X giz	and		
BOD True Total	All	NDPs: 0 Tests: 2	Х		section of	a Pu	200	X				
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2	Ŷ	ON A	lejit.				X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	entof			X					X	
Dissolved Oxygen by Probe	All	NDPs: 0 Tests: 2		X					X			
pH Value	All	NDPs: 0 Tests: 2		X					X			

Validated

CERTIFICATE OF ANALYSIS



SDG:180920-159Client Reference:Surface WaterReport Number:474401Location:ThorpesOrder Number:Z1237Superseded Report:474266

Results Legend # ISO17025 accredited.	С	ustomer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
* Subcontracted test. ** % recovery of the surrogate standar	ard to	Date Sampled	19/09/2018	19/09/2018			
check the efficiency of the method.	. The	Sample Time Date Received	20/09/2018	20/09/2018			
results of individual compounds wi samples aren't corrected for the re-		SDG Ref	180920-159 18372401	180920-159 18379843			
(F) Trigger breach confirmed 1-5&+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	10372401	10373043			
Component	LOD/Units	Method	-4	.4			
BOD, unfiltered	<1 mg/l	TM045	<1 #	<1 #			
Oxygen, dissolved	<0.3 mg/l	TM046	10.1	10.3			
Ammoniacal Nitrogen as N	<0.2 mg/l	TM099	<0.2	<0.2			
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	0.56 #	0.543 #			
Sodium (Dis.Filt)	<0.076 mg/l	TM152	19.7 #	17.4 #			
Potassium (Dis.Filt)	<0.2 mg/l	TM152	3.51 #	3.45 #			
Sulphate	<2 mg/l	TM184	13.6 #	14.4 #			
Chloride	<2 mg/l	TM184	21.1 #	23.6 #			
pH	<1 pH Units	TM256	8.08 #	8.08 #			
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Validated

SDG: 180920-159 Surface Water Report Number: Superseded Report: 474401 Client Reference: Thorpes Z1237 474266 Location: Order Number:

Table of Results - Appendix

	• •
Reference	Description
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
Method 4500G, AWWA/APHA, 20th Ed., 1999	Measurement of Dissolved Oxygen by Oxygen Meter
BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter
Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
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
	MEWAM BOD5 2nd Ed.HMSO 1988 / Method 5210B, AWWA/APHA, 20th Ed., 1999; SCA Blue Book 130 Method 4500G, AWWA/APHA, 20th Ed., 1999 BS 2690: Part 7:1968 / BS 6068: Part2.11:1984 Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970 Method 3125B, AWWA/APHA, 20th Ed., 1999 EPA Methods 325.1 & 325.2, The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated

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).

Consent of copyright owner required for any other use.





 SDG:
 180920-159
 Client Reference:
 Surface Water
 Report Number:
 474401

 Location:
 Thorpes
 Order Number:
 Z1237
 Superseded Report:
 474266

Test Completion Dates

070040
379843
SW2
0.00 - 0.00
ace Water
Sep-2018



SDG: 180920-159 Surface Water 474401 Client Reference: Report Number: Superseded Report: 474266 Location: **Thorpes** Order Number: Z1237

Appendix

General

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

 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

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

Sample Deviations

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

	1	Container with Headspace provided for volatiles analysis
	2	Incorrect container received
	63. K	Deviation from method
ş	SOL	Holding time exceeded before sample received
2	5	Samples exceeded holding time before presevation was performed
	Ş	Sampled on date not provided
	•	Sample holding time exceeded in laboratory
	@	Sample holding time exceeded due to sampled on date
	&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

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

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

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

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

12:36:02 28/09/2018 Modification Date: 28/09/2018 EPA Export 22-10-2021:02:37:56



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

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

CH5 3US

email: haward encustomers ervices@alsglobal.com

Website: www.alsenvironmental.co.uk

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

Attention: Gary Lawlor

CERTIFICATE OF ANALYSIS

Date of report Generation:22 May 2020Customer:Fehily TimoneySample Delivery Group (SDG):200516-38Your Reference:P20-015Location:Thorpes LandfillReport No:553006

We received 2 samples on Saturday May 16, 2020 and 2 of these samples were scheduled for analysis which was completed on Friday May 22, 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 ALSCLife 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







Validated

 SDG:
 200516-38
 Client Reference:
 P20-015
 Report Number:
 553006

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22157361	SW1		0.00 - 0.00	13/05/2020
22157370	SW2		0.00 - 0.00	13/05/2020

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

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

6.8

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

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



Validated

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CERTIFICATE OF ANALYSIS

ALS

SDG: 200516-38 Client Reference: P20-015 Report Number: Thorpes Landfill Z2085 Superseded Report: Location: Order Number: Results Legend 22157361 22157370 Lab Sample No(s) X Test No Determination Possible Customer Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 500ml Plastic (ALE208) 250ml BOD (ALE212) 0.5l glass bottle (ALE227) 0.5l glass bottle (ALE227) Vial (ALE297) H2SO4 (ALE244) HNO3 Filtered (ALE204) (ALE204) 500ml Plastic (ALE208) NaOH (ALE245) DW - Drinking Water Non-regulatory 250ml BOD (ALE212) HNO3 Filtered Vial (ALE297) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type WS Acid Herbicides by GCMS All NDPs: 0 Tests: 2 X Met Х Ammonium Low All NDPs: 0 Tests: 2 Χ Anions by Kone (w) All NDPs: 0 Tests: 2 X X BOD True Total All NDPs: 0 Tests: 2 X COD Unfiltered All NDPs: 0 Tests: 2 X Х Conductivity (at 20 deg.C) All NDPs: 0 Tests: 2 Х Х Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 2 Х Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 2 Χ Χ Dissolved Oxygen by Probe All NDPs: 0 Tests: 2 Χ X Fluoride All NDPs: 0 Tests: 2 Χ X Mercury Dissolved All NDPs: 0 Tests: 2 X Х Mineral Oil C10-40 Aqueous (W) All NDPs: 0 Tests: 2 Х X PCB Congeners - Aqueous (W) All NDPs: 0 Tests: 2 Х Х Pesticides (Suite I) by GCMS All NDPs: 0 Tests: 2 Х Х Pesticides (Suite II) by GCMS All NDPs: 0 Tests: 2 X Χ

Validated

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CERTIFICATE OF ANALYSIS

SDG: 200516-38 Client Reference: P20-015 Report Number: Location: Thorpes Landfill Z2085 Superseded Report: Order Number: Results Legend 22157361 22157370 Lab Sample No(s) X Test No Determination Possible Customer SW2 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.00-PR - Process Water 0.00 - 0.00 SA - Saline Water Depth (m) - 0.00 TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 500ml Plastic
(ALE208)
250ml BOD
(ALE212)
0.5l glass bottle
(ALE227) 0.5l glass bottle (ALE227) Vial (ALE297) H2SO4 (ALE244) HNO3 Filtered (ALE204) HNO3 Filtered (ALE204) 500ml Plastic (ALE208) NaOH (ALE245) DW - Drinking Water Non-regulatory 250ml BOD (ALE212) Vial (ALE297) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type WS Pesticides (Suite III) by GCMS All NDPs: 0 Tests: 2 X nei X pH Value All NDPs: 0 Tests: 2 X X Phosphate by Kone (w) All NDPs: 0 Tests: 2 X Suspended Solids All NDPs: 0 Tests: 2 Х SVOC MS (W) - Aqueous All NDPs: 0 Tests: 2 X VOC MS (W) All NDPs.0 Tests: 2 Χ Χ

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 SDG:
 200516-38
 Client Reference:
 P20-015
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 Location:
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 Z2085
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Results Legend		Out the second second second				†		
# ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	SW1	SW2				
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 0.00	0.00 - 0.00				
tot.unfilt Total / unfiltered sample.	46	Sample Type	0.00 - 0.00 Surface Water (SW)	Surface Water (SW	0			
* Subcontracted - refer to subcontractor report accreditation status.		Date Sampled Sample Time	13/05/2020	13/05/2020				
** % recovery of the surrogate standard to che efficiency of the method. The results of indiv	ridual	Date Received	16/05/2020	16/05/2020				
compounds within samples aren't corrected recovery	for the	SDG Ref	200516-38 22157361	200516-38 22157370				
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22157301	2215/3/0				
Component	LOD/Units							
Suspended solids, Total	<2 mg/l	TM022	<2 	<4	ш			
BOD, unfiltered	<1 mg/l	TM045	# <1	<1	#			
	1		#		#			
Oxygen, dissolved	<0.3 mg/	I TM046	10.4	10.7				
Ammoniacal Nitrogen as N (low level)	<0.01 mg	/I TM099	<0.01	<0.01	2 #			
Fluoride	<0.5 mg/	I TM104	*	<0.5	2#			
	0.09		0.0	0.0				
COD, unfiltered	<7 mg/l	TM107	<7	9.01				
			#		#			
Conductivity @ 20 deg.C	<0.005	TM120	0.521	0.534	,n			
Arsenic (diss.filt)	mS/cm <0.5 μg/l	I TM152	* <0.5	0.5	#			
, a seriic (aiss.iiit)	~υ.ο μg/I	I IVI I JZ	~0.5 #	0.5	#			
Barium (diss.filt)	<0.2 µg/l	I TM152	22.1	22.1				
· ·			#		#			
Boron (diss.filt)	<10 µg/l	TM152	19.2	21.2		2.1		
0 1 : (1: 510)	.0.00	// Thirdso	#	.0.00	#	ese.		
Cadmium (diss.filt)	<0.08 µg/	/I TM152	<0.08 #	<0.08	#	other us		
Chromium (diss.filt)	<1 µg/l	TM152	<1	<1	π	17. JUS		
(, , , ,			#		#	orly, and		
Copper (diss.filt)	<0.3 µg/l	TM152	0.706	0.768	05°,	50 °		
			#	DUIT				
Lead (diss.filt)	<0.2 µg/l	I TM152	<0.2	ection part	<u>_</u>			
Manganese (diss.filt)	<3 µg/l	TM152	# <3	22 Q3	#			
wanganese (diss.iiit)	νο μισπ	TIVITOZ	#,	insper Q3	#			
Nickel (diss.filt)	<0.4 µg/l	I TM152	<0.4	⊘ ₹ <0.4				
			₩,	1	#			
Phosphorus (diss.filt)	<10 µg/l	TM152	34.3 and #	34.8	,,			
Colonium (dice filt)	<1.ua/l	TM152	Calife #	<1	#			
Selenium (diss.filt)	<1 µg/l	1101132	#		#			
Thallium (diss.filt)	<2 µg/l	TM152	<2	<2				
			#		#			
Zinc (diss.filt)	<1 µg/l	TM152	21	3.35				
Sodium (Dis.Filt)	<0.076 mg	g/I TM152	# 14.6	14.8	#			
Sodium (Dis.Filt)	<0.076 mg	J/I IIVI152	14.6	14.8	#			
Magnesium (Dis.Filt)	<0.036 mg	g/I TM152	13.7	14.6				
			#		#			
Potassium (Dis.Filt)	<0.2 mg/	I TM152	2.33	2.05				
Coloium (Die Eile)	-0.0	T T T T T T T T T T T T T T T T T T T	00.0	101	#			
Calcium (Dis.Filt)	<0.2 mg/	I TM152	99.9 #	101	#			
Iron (Dis.Filt)	<0.019 mg	g/I TM152	<0.019	0.0193	п			
			#		#			
Mineral oil >C10 C40 (aq)	<100 µg/	TM172	<100	<100				
14 (11 (11)	2.24	" T14400	2.24	201				
Mercury (diss.filt)	<0.01 µg/	/I TM183	<0.01	<0.01				
Phosphate (Ortho as PO4)	<0.05 mg	/I TM184	0.067	0.092				
, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		•	#		#		 	
Chloride	<2 mg/l	TM184	19.3	18.9				
011177111		711101	#		#			
Sulphate (soluble) as S	<1 mg/l	TM184	5.37 #	5.13	#			
PCB congener 28	<0.015 µg	ı/l TM197	<0.015	<0.015	#			
. =g 2 0	J.5.10 pg	,	5.5.5	0.010				
PCB congener 52	<0.015 µg	ı/l TM197	<0.015	<0.015				
PCB congener 101	<0.015 µg	ı/l TM197	<0.015	<0.015				
I	1	1	l	I		I		

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CERTIFICATE OF ANALYSIS

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 SDG:
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Results Legend # ISO17025 accredited. M mCERTS accredited.	(Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample.	for	Sample Type	Surface Water (SW)	Surface Water (SW)			
* Subcontracted - refer to subcontractor report accreditation status.		Date Sampled	13/05/2020	13/05/2020			
** % recovery of the surrogate standard to check efficiency of the method. The results of individuals of the surrogate standard to check the surrogate standard	dual	Sample Time Date Received	16/05/2020	16/05/2020			
compounds within samples aren't corrected for recovery	or the	SDG Ref	200516-38	200516-38			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22157361	22157370			
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		<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 2	<0.05			
pH	<1 pH Units		8.3	8.32 #			
Trifluralin	<0.01 µg/l	TM343	<0.02	<0.02			
alpha-HCH	<0.01 µg/l	TM343	<0.01	<0.01			
gamma-HCH (Lindane)	<0.01 µg/l	TM343	<0.01	<0.01	use.		
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01	odia sua odierne.		
Aldrin	<0.01 µg/l	TM343	<0.02	<0.02	officiali.		
beta-HCH	<0.01 µg/l	TM343	<0.01	0.01	ν ⁻		
Isodrin	<0.01 µg/l	TM343	<0.02	150.0201			
delta-HCH	<0.01 µg/l	TM343	Ç.C	Klitight			
Heptachlor epoxide	<0.01 µg/l	TM343	<0.02	<0.02			
o,p'-DDE	<0.01 µg/l	TM343	<0.02 ent	<0.02			
Endosulphan I	<0.01 µg/l			<0.01			
trans-Chlordane	<0.01 µg/l	TM343	<0.02	<0.02			
cis-Chlordane	<0.01 µg/l	TM343	<0.02	<0.02			
p,p'-DDE	<0.01 µg/l						
Dieldrin	<0.01 µg/l	TM343	<0.01	<0.01 <0.01			
o,p'-DDD (TDE) Endrin	<0.01 µg/l	TM343	<0.01	<0.01			
		TM343	<0.01	<0.01			
o,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01			
p,p'-DDD (TDE)	<0.01 µg/l <0.02 µg/l	TM343	<0.01	<0.01			
Endosulphan II		TM343	<0.02	<0.02			
p,p'-DDT	<0.01 µg/l	TM343	<0.01	<0.01			
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.01	<0.01			
p,p'-Methoxychlor	<0.01 µg/l						
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			

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 SDG:
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(7(23)						 	
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	SW1	SW2			
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report accreditation status.	for	Sample Type Date Sampled	Surface Water (SW) 13/05/2020	Surface Water (SW) 13/05/2020			
** % recovery of the surrogate standard to check efficiency of the method. The results of indivi-	dual	Sample Time Date Received	16/05/2020	16/05/2020			
compounds within samples aren't corrected for recovery (F) Trigger breach confirmed	or tile	SDG Ref Lab Sample No.(s)	200516-38 22157361	200516-38 22157370			
1-3+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method					
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			
Demeton-S-methyl	<0.01 µg/l	TM344	<0.01	<0.01	1150.		
Phorate	<0.01 µg/l	TM344	<0.01	<0.01	offer and other use.		
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01	ould air,		
Triallate	<0.01 µg/l	TM344	<0.01	OUT THE CHIL	20		
Atrazine	<0.01 µg/l	TM344	<0.01	ectionier i			
Simazine	<0.01 µg/l	TM344	<0.01	itight 0.01			
Disulfoton	<0.01 µg/l	TM344		<u>र</u> ू <0.01			
Propetamphos	<0.01 µg/l	TM344	<0.01 cont	<0.01			
Chlorpyriphos-methyl	<0.01 µg/l	TM344		<0.01			
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01			
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01			
Chlorpyriphos	<0.01 µg/l	TM344	<0.01	<0.01			
Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01			
Malathion	<0.01 µg/l	TM344	<0.01	<0.01			
Fenthion	<0.01 µg/l	TM344	<0.01	<0.01			
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01			
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01			
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01			
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		•	

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CERTIFICATE OF ANALYSIS

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Results Legend		Custome- Samuel D. C					,
# ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	SW1	SW2			
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report	t for	Sample Type	Surface Water (SW)	Surface Water (SW)			
accreditation status.		Date Sampled Sample Time	13/05/2020	13/05/2020			
efficiency of the method. The results of indiv	idual	Date Received	16/05/2020	16/05/2020			
compounds within samples aren't corrected recovery	for the	SDG Ref	200516-38 22157361	200516-38 22157370			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22107001	22107070			
Component	LOD/Units	Method	2.24	2.21			
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	<0.04	<0.04			
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			
Tributylphosphate	<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	<0.02	<0.02	use.		
Propazine	<0.01 µg/l	TM345	<0.01	<0.01	odiff and other use.		
Propyzamide	<0.01 µg/l	TM345	<0.01	<0.01	office air.		
Alachlor	<0.01 µg/l	TM345	<0.01	<0.01 100 50 100 100 100 100 100 100 100 10	ζ [*]		
Prometryn	<0.01 µg/l	TM345	<0.01	Decite 1001 pt 1			
Telodrin	<0.01 µg/l	TM345	\$C	1 100			
Terbutryn	<0.01 µg/l	TM345	<0.01	<0.01			
Chlorothalonil	<0.01 µg/l	TM345	<0.01 ent	<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	<0.02	<0.02			
Phosphamidon II	<0.01 µg/l	TM345	<0.01	<0.01			
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			

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Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
* Subcontracted - refer to subcontractor report	t for	Sample Type Date Sampled	Surface Water (SW) 13/05/2020	Surface Water (SW) 13/05/2020			
accreditation status. ** % recovery of the surrogate standard to chec	k the	Sample Time					
efficiency of the method. The results of indivi compounds within samples aren't corrected to		Date Received	16/05/2020 200516-38	16/05/2020 200516-38			
recovery (F) Trigger breach confirmed		SDG Ref	22157361	22157370			
1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference					
Component	LOD/Units						
Triclopyr	<0.05 µg/l	TM411	<0.05	<0.05			
Fenoprop (Silvex)	<0.1 µg/l	TM411	<0.1	<0.1			
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05	<0.05			
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05	<0.05			
Bromoxynil	<0.04 µg/l	TM411	<0.04	<0.04			
Benazolin	<0.04 µg/l		<0.04	<0.04			
loxynil	<0.05 µg/l		<0.05	<0.05			
Pentachlorophenol	<0.04 µg/l		<0.04	<0.04			
Fluoroxypyr	<0.1 µg/l	TM411	2.07	1.28			
				Ting editor purpose, a ting editor of the control o	Jige.		
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				75°	official		
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200516-38 Thorpes Landfill P20-015 Z2085 Report Number: Superseded Report: SDG: Client Reference: 553006 Location: Order Number:

SVOC MS (W) - Aqueous	3						
# ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report:	for	Sample Type Date Sampled	Surface Water (SW) 13/05/2020	Surface Water (SW) 13/05/2020			
accreditation status. ** % recovery of the surrogate standard to check efficiency of the method. The results of indivice	k the	Sample Time	16/05/2020	16/05/2020			
compounds within samples aren't corrected for recovery		Date Received SDG Ref	200516-38 22157361	200516-38 22157370			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22197301	22131310			
1,2,4-Trichlorobenzene (aq)	LOD/Units <1 µg/l	Method 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 #	æ.		
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1 #	<1 #	other use		
2-Chlorophenol (aq)	<1 µg/l	TM176	<1 #	<1 #	Outh, stud		
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1 #	<1 2000	20		
2-Methylphenol (aq)	<1 µg/l	TM176	<1 #	action per red.			
2-Nitroaniline (aq)	<1 µg/l	TM176	<1 #.	inspired #			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	্বী *1			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1 strain #	<1 #			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	#	<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 #			

Validated

CERTIFICATE OF ANALYSIS

Report Number: Superseded Report: SDG: 200516-38 Client Reference: P20-015 553006 Location: Thorpes Landfill Order Number: Z2085

SVOC MS (W) - Aqueous	S						
Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
# ISO/Taya accelerated M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total unfiltered sample. * Subcontracted - refer to subcontractor report accreditation status.	for	Depth (m) Sample Type Date Sampled	0.00 - 0.00 Surface Water (SW) 13/05/2020	0.00 - 0.00 Surface Water (SW) 13/05/2020			
" % recovery of the surrogate standard to check efficiency of the method. The results of individual compounds within samples aren't corrected for recovery (F) Trigger breach confirmed 3-as@ Sample deviation (see appendix)	dual	Sample Time Date Received SDG Ref Lab Sample No.(s) AGS Reference	16/05/2020 200516-38 22157361	16/05/2020 200516-38 22157370			
Component	LOD/Units	Method					
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Carbazole (aq)	<1 µg/l	TM176	<1 #	<1 #			
Chrysene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Dibenzofuran (aq)	<1 µg/l	TM176	<1 #	<1 #			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1 #	<1 #			
Diethyl phthalate (aq)	<1 µg/l	TM176	<1 #	<1 #			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1 #	<1 #	115°.		
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1 #	<1 #	otherit		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5 #-	ong and difference.		
Fluoranthene (aq)	<1 µg/l	TM176	<1 #	<1 HERELIEF CONTROL # ITER CHIEF CONTROL # OP <1 #	20.		
Fluorene (aq)	<1 µg/l	TM176	<1 #	ecited to the			
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1 #c	inspired #			
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	ুক্ ^ক <1 #			
Pentachlorophenol (aq)	<1 µg/l	TM176	<1 consent of	<1			
Phenol (aq)	<1 µg/l	TM176	प्र	<1			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1 #	<1 #			
Hexachloroethane (aq)	<1 µg/l	TM176	<1 #	<1 #			
Nitrobenzene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Naphthalene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Isophorone (aq)	<1 µg/l	TM176	<1 #	<1 #			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1			
Phenanthrene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Pyrene (aq)	<1 µg/l	TM176	<1 #	<1 #			

200516-38 Thorpes Landfill P20-015 Z2085 Report Number: Superseded Report: SDG: Client Reference: 553006 Location: Order Number:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
* Subcontracted - refer to subcontractor report accreditation status.		Date Sampled Sample Time	13/05/2020	13/05/2020			
** % recovery of the surrogate standard to check efficiency of the method. The results of indivi- compounds within samples aren't corrected for the standard to check the standard the	dual	Date Received	16/05/2020	16/05/2020			
recovery (F) Trigger breach confirmed	or tile	SDG Ref Lab Sample No.(s)	200516-38 22157361	200516-38 22157370			
1-3+§@ Sample deviation (see appendix)		AGS Reference					
Component Dibromofluoromethane**	LOD/Units %	Method TM208	111	110			
Dibromondorometriane	//	TWZOO	111	110			
Toluene-d8**	%	TM208	104	103			
4-Bromofluorobenzene**	%	TM208	105	103			
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 #	, 1 50.		
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	of other as		
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #_	orly, stry		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 purpose	20		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	Oction Particular			
1,1-Dichloroethane cis-1,2-Dichloroethene	<1 µg/l	TM208 TM208		Lite Part Pi			
2,2-Dichloropropane	<1 µg/l	TM208	J#`	₹ <1 #			
Bromochloromethane	<1 μg/l	TM208	<1 calsent or	<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	**************************************			
Carbontetrachloride	<1 μg/l	TM208	** <1	# <1			
1,2-Dichloroethane	<1 μg/l	TM208	*1 <1	# <1			
Benzene	<1 μg/l	TM208	*1 <1	*1 <1			
Trichloroethene	<1 μg/l	TM208	<1	**************************************			
1,2-Dichloropropane	<1 μg/l	TM208	# <1	# <1			
Dibromomethane	<1 µg/l	TM208	** <1	# <1			
Bromodichloromethane	<1 μg/l	TM208	*1 <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			
		1	#	#			

200516-38 Thorpes Landfill P20-015 Z2085 Report Number: Superseded Report: SDG: Client Reference: 553006 Location: Order Number:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mcRRTs accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt total / unfiltered sample. **Subcontracted - refer to subcontractor report accreditation status. ** recovery of the surrogate standard to chec		Depth (m) Sample Type Date Sampled Sample Time	0.00 - 0.00 Surface Water (SW) 13/05/2020	0.00 - 0.00 Surface Water (SW) 13/05/2020			
efficiency of the method. The results of indivi	idual	Date Received SDG Ref	16/05/2020 200516-38	16/05/2020 200516-38			
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	22157361	22157370			
1-3+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference 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 #	1150.		
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #	other us		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1 #	<1	only and		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1 #	<1 political	2		
Bromobenzene	<1 µg/l	TM208	<1 #	cities net			
Propylbenzene	<1 µg/l	TM208	<1 #0	rifight 4			
2-Chlorotoluene	<1 µg/l	TM208 TM208	₩	<1 <1			
1,3,5-Trimethylbenzene 4-Chlorotoluene	<1 µg/l	TM208	<1 called #	<1 **			
tert-Butylbenzene	<1 µg/l	TM208	**************************************	<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			
1,3-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			<u>. </u>



553006

CERTIFICATE OF ANALYSIS

SDG: 200516-38 P20-015 Client Reference: Location: Thorpes Landfill Order Number: Z2085

Report Number: 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 Acid Herbs in Water by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbern Water by GCMS
ot applicable.	subcontracted) performed at ALS Life Sciences Ltd Hawarder	(Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



553006

CERTIFICATE OF ANALYSIS

ALS

 SDG:
 200516-38
 Client Reference:
 P20-015
 Report Number:

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

Test Completion Dates

Lab Sample No(s)	22157361	22157370
Customer Sample Ref.	SW1	SW2
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Туре	Surface Water	Surface Water
Acid Herbicides by GCMS	20-May-2020	20-May-2020
Ammonium Low	19-May-2020	19-May-2020
Anions by Kone (w)	18-May-2020	18-May-2020
BOD True Total	21-May-2020	21-May-2020
COD Unfiltered	18-May-2020	18-May-2020
Conductivity (at 20 deg.C)	19-May-2020	20-May-2020
Cyanide Comp/Free/Total/Thiocyanate	19-May-2020	19-May-2020
Dissolved Metals by ICP-MS	21-May-2020	21-May-2020
Dissolved Oxygen by Probe	20-May-2020	20-May-2020
Fluoride	18-May-2020	18-May-2020
Mercury Dissolved	18-May-2020	18-May-2020
Mineral Oil C10-40 Aqueous (W)	22-May-2020	22-May-2020
PCB Congeners - Aqueous (W)	22-May-2020	22-May-2020
Pesticides (Suite I) by GCMS	21-May-2020	21-May-2020
Pesticides (Suite II) by GCMS	21-May-2020	21-May-2020
Pesticides (Suite III) by GCMS	21-May-2020	21-May-2020
pH Value	19-May-2020	19-May-2020
Phosphate by Kone (w)	18-May-2020	18-May-2020
Suspended Solids	21-May-2020	21-May-2020
SVOC MS (W) - Aqueous	19-May-2020	19-May-2020
VOC MS (W)	18-May-2020	18-May-2020

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SDG: 200516-38 Client Reference: P20-015 Report Number: 553006 Location: Thorpes Landfill Order Number: Z2085 Superseded Report:

Appendix

General

- 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
- 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 For representative sub sample from the received sample.
- 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. OTI
- 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 wing ALS (Hawarden) in-house method of transmitted/polarised light microscopy and

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of selections.

ALS (Hawarden) in house 1000 and 1000 are 1000 and 1000 and 1000 are 1000 and 1000 an stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name			
Chrysot le	White Asbestos			
Amosite	Brow n Asbestos			
Cro di dolite	Blue Asbe stos			
Fibrous Act nolite	-			
Fib to us Anthop hyll ite	-			
Fibrous Tremolite	-			

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

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.

15:39:53 22/05/2020 Modification Date: 22/05/2020 EPA Export 22-10-2021:02:37:57 Page 16 of 16



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email: haward encustomers er vices@alsglobal.com

Website: www.alsenvironmental.co.uk

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

Attention: Gary Lawlor

CERTIFICATE OF ANALYSIS

Date of report Generation:18 June 2020Customer:Fehily TimoneySample Delivery Group (SDG):200611-48Your Reference:P20-015Location:Thorpes LandfillReport No:555813

We received 2 samples on Thursday June 11, 2020 and 2 of these samples were scheduled for analysis which was completed on Thursday June 18, 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 ALSCLife 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







Validated

SDG: 200611-48 Client Reference: Location: Thorpes Landfill Order Number:

P20-015 Z2085 Report Number: Superseded Report: 555813

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22287201	SW1		0.00 - 0.00	10/06/2020
22287216	SW2		0.00 - 0.00	10/06/2020

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

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

10.0

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of $(5\pm3)^{\circ}$ C for a period of up to 24hrs.

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



ALS

SDG: 200611-48 Client Reference: P20-015 Report Number: 555813 Thorpes Landfill Z2085 Superseded Report: Location: Order Number: Results Legend 22287201 22287216 Lab Sample No(s) X Test No Determination Possible Customer SW1 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water HNO3 Filtered (ALE204) H2SO4 (ALE244) 500ml Plastic (ALE208) 250ml BOD (ALE212) 0.5l glass bottle (ALE227) 0.5l glass bottle (ALE227) H2SO4 (ALE244) HNO3 Filtered (ALE204) NaOH (ALE245) DW - Drinking Water Non-regulatory NaOH (ALE245) (ALE208) 250ml BOD (ALE212) Vial (ALE297) Vial (ALE297) 500ml Plastic UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type WS Acid Herbicides by GCMS All NDPs: 0 Tests: 2 έx Х Ammonium Low All NDPs: 0 Tests: 2 Χ Anions by Kone (w) All NDPs: 0 Tests: 2 X X BOD True Total All NDPs: 0 Tests: 2 X COD Unfiltered All NDPs: 0 Tests: 2 X Χ Conductivity (at 20 deg.C) All NDPs: 0 Tests: 2 Х Х Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 2 Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 2 Χ X Dissolved Oxygen by Probe All NDPs: 0 Tests: 2 Χ Х Fluoride All NDPs: 0 Tests: 2 Χ X Mercury Dissolved All NDPs: 0 Tests: 2 X X Mineral Oil C10-40 Aqueous (W) All NDPs: 0 Tests: 2 Х Х PCB Congeners - Aqueous (W) All NDPs: 0 Tests: 2 Х Х Pesticides (Suite I) by GCMS All NDPs: 0 Tests: 2 Х Х Pesticides (Suite II) by GCMS All NDPs: 0 Tests: 2 X Χ

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CERTIFICATE OF ANALYSIS

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SDG: 200611-48 Client Reference: P20-015 Report Number: 555813 Location: Thorpes Landfill Z2085 Superseded Report: Order Number: Results Legend 22287201 22287216 Lab Sample No(s) X Test No Determination Possible Customer SW1 SW2 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water HNO3 Filtered (ALE204) H2SO4 (ALE244) 500ml Plastic (ALE208) 250ml BOD (ALE212) 0.5l glass bottle (ALE227) 0.5l glass bottle (ALE227) H2SO4 (ALE244) HNO3 Filtered (ALE204) 500ml Plastic (ALE208) 250ml BOD (ALE212) NaOH (ALE245) NaOH (ALE245) DW - Drinking Water Non-regulatory Vial (ALE297) Vial (ALE297) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type WS Pesticides (Suite III) by GCMS All NDPs: 0 Tests: 2 Χ ĺχ pH Value All NDPs: 0 Tests: 2 X X Phosphate by Kone (w) All NDPs: 0 Tests: 2 X Suspended Solids All NDPs: 0 Tests: 2 Х SVOC MS (W) - Aqueous All NDPs: 0 Tests: 2 Χ VOC MS (W) All NDPs.0 Tests: 2 Х Х

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SDG:200611-48Client Reference:P20-015Report Number:555813Location:Thorpes LandfillOrder Number:Z2085Superseded Report:

	Results Legend		Customer Servela D. C	0111	2000	•		
	Results Legend 6017025 accredited.		Customer Sample Ref.	SW1	SW2			
aq A	queous / settled sample. issolved / filtered sample.		Depth (m)	0.00 0.00	0.00 - 0.00			
tot.unfilt To	otal / unfiltered sample.		Sample Type	0.00 - 0.00 Surface Water (SW)	Surface Water (SW)			
ac	ubcontracted - refer to subcontractor report for coreditation status.		Date Sampled Sample Time	10/06/2020	10/06/2020			
ef	recovery of the surrogate standard to check fficiency of the method. The results of individ	lual	Date Received	11/06/2020	11/06/2020			
	ompounds within samples aren't corrected fo acovery	r the	SDG Ref	200611-48 22287201	200611-48 22287216			
	rigger breach confirmed ample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22201201	22207210			
Compone		LOD/Units	s Method					
Suspende	ed solids, Total	<2 mg/l	TM022	3.75	6.2			
BOD, unfil	Itarad	<1 mg/l	TM045	# <1	# <1			
BOD, uniii	itereu	\ 1 111g/1	110043	#	"#			
Oxygen, d	lissolved	<0.3 mg/	TM046	10.8	10.9			
, 3,		j						
Ammonia	cal Nitrogen as N (low	<0.01 mg	/I TM099	0.0532	0.0287			
level)				#	#			
Fluoride		<0.5 mg/	TM104	<0.5	<0.5			
000 5		.7 //	T14407	45.0	40.0			
COD, unfi	Itered	<7 mg/l	TM107	15.2	16.3			
Conductiv	rity @ 20 deg.C	<0.005	TM120	0.528	0.545 #	 	+	
Johnadolly	, <u>w 20 009</u> .0	mS/cm	1101120	0.320 #	0.545			
Arsenic (d	liss.filt)	<0.5 µg/l	I TM152	<0.5	<0.5			
. (·	. 1. 3.		#	#			
Barium (di	iss.filt)	<0.2 µg/l	I TM152	23.3	24.1			
_				#	#			
Boron (dis	ss.filt)	<10 µg/l	TM152	18.3	18.5	0.1		
Codmium	(ding filt)	<0.00 ug	/I TM152	<0.08	* <0.08	1 45°C.		
Cadmium	(diss.tiit)	<0.08 µg/	/1 11/1152	<0.08	<0.08	otherus		
Chromium	(diss.filt)	<1 µg/l	TM152	<1	<1	24.204		
	(* * * * * * * * * * * * * * * * * * *	15		#	<u>#</u>	विधि विष्		
Copper (d	iss.filt)	<0.3 µg/l	I TM152	0.755	0.75	50		
				#	out Pari	•		
Lead (diss	s.filt)	<0.2 µg/l	I TM152	<0.2	ecitore #			
Managara	(-E EW)	42	TMACO	#	O No #			
ivianganes	se (diss.filt)	<3 µg/l	TM152	<3 # ₆	its 19.19			
Nickel (dis	ss.filt)	<0.4 µg/l	I TM152	<0.4	₹ <0.4			
	·-····································			JE (#			
Phosphore	us (diss.filt)	<10 µg/l	TM152	38.2 and #	57.2			
				Collise #	#			
Selenium	(diss.filt)	<1 µg/l	TM152	G ^s .	<1 ,,,			
Thallium (dian filt)	المدد 20	TM152	<2	# <2			
maillum (aiss.iiit)	<2 µg/l	1101152	~2 #	\ \ \ \ #			
Zinc (diss.	.filt)	<1 µg/l	TM152	4.44	4.46			
. (,	13		#	#			
Sodium (E	Dis.Filt)	<0.076 mg	g/l TM152	17.8	19.3			
				#	#			
Magnesiu	m (Dis.Filt)	<0.036 mg	g/I TM152	14	15.1			
Potassium	, (Dio Eilt)	<0.2 mg/	TM152	2.97	2.84			
Polassiuii	I (DIS.FIII)	<0.2 mg/	1 1101132	2.97	2.04			
Calcium (I	Dis.Filt)	<0.2 mg/	TM152	97.2	94.2			
	·			#	#			
Iron (Dis.F	Filt)	<0.019 mg	g/I TM152	<0.019	<0.019			
				#	#			
Mineral oil	I >C10 C40 (aq)	<100 µg/	1 TM172	<100	<100			
Mercury (d	dice filt)	<0.01 µg/	/I TM183	<0.01	<0.01	 		
ividiculy (C	uioo.iiit)	-υ.υ ι μg/	, IIVIIOO	\U.U 1	\0.01			
Phosphate	e (Ortho as PO4)	<0.05 mg	/I TM184	0.109	0.142			
	. ,			#	#			
Chloride		<2 mg/l	TM184	19.5	18.6			
				#	#			
Sulphate ((soluble) as S	<1 mg/l	TM184	4.87	4.83			
PCB cong	ionar 28	<0.01E · · ·	g/I TM197	<0.015	<0.015	-		
LCB coud	CHELZO	<0.015 µg	g/i 11V1197	CI U.U?	<0.015			
PCB cong	jener 52	<0.015 µg	g/I TM197	<0.015	<0.015			
	· 						 <u> </u>	
PCB cong	ener 101	<0.015 µg	g/l TM197	<0.015	<0.015			
1		l						

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SDG:200611-48Client Reference:P20-015Report Number:555813Location:Thorpes LandfillOrder Number:Z2085Superseded Report:

Results Legend		Customer Sample Ref.	SW1	SW2		1	
# ISO17025 accredited. M mCERTS accredited.	,	sustomer sample Kei.	SW1	SW2			
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
Subcontracted - refer to subcontractor report accreditation status.	for	Sample Type Date Sampled	Surface Water (SW) 10/06/2020	Surface Water (SW) 10/06/2020			
** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi	dual	Sample Time Date Received	11/06/2020	11/06/2020			
compounds within samples aren't corrected f recovery (F) Trigger breach confirmed	or the	SDG Ref Lab Sample No.(s)	200611-48 22287201	200611-48 22287216			
1-3+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference					
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			
рН	<1 pH Units	TM256	8.2 #	8.24 #			
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	odia, su,		
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01	other		
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01	only and		
beta-HCH	<0.01 µg/l	TM343	<0.01	out all	ي و		
Isodrin	<0.01 µg/l	TM343	<0.01	<0.01 ×			
delta-HCH	<0.01 µg/l	TM343	<0.01 &	institute 0.01			
Heptachlor epoxide	<0.01 µg/l	TM343					
o,p'-DDE	<0.01 µg/l	TM343	<0.01 ent	<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	<0.02			
o,p'-DDT	<0.01 µg/l	TM343	<0.02	<0.02			
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	<0.02	<0.02			
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02	<0.02			
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02	<0.02			
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.02	<0.02			
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01			
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01			

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Results Legend # ISO17025 accredited. # WCERTS convolited		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report for	or	Sample Type Date Sampled	Surface Water (SW) 10/06/2020	Surface Water (SW) 10/06/2020			
accreditation status. ** % recovery of the surrogate standard to check efficiency of the method. The results of individi		Sample Time					
compounds within samples aren't corrected for recovery		Date Received SDG Ref	11/06/2020 200611-48	11/06/2020 200611-48			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22287201	22287216			
Component 1,3,5-Trichlorobenzene	LOD/Units	Method TM344	z0.01	<0.01			
1,5,5-Trichlorobenzene	<0.01 µg/l	1 W344	<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		<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		<0.01	<0.01	ilse.		
Phorate	<0.01 µg/l	TM344	<0.01	<0.01	offer and other use.		
Diazinon	<0.01 µg/l	TM344	<0.01	<0.01	office air.		
Triallate	<0.01 µg/l		<0.01	OUT BUILD	2		
Atrazine	<0.01 µg/l	TM344	<0.01	£6.01 cs			
Simazine	<0.01 µg/l	TM344	<0.01	THE COUNTY CO.01			
Disulfoton	<0.01 µg/l		<0.01				
Propetamphos	<0.01 µg/l	TM344	<0.01 ent	<0.01			
Chlorpyriphos-methyl	<0.01 µg/l		<0.01	<0.01			
Dimethoate	<0.01 µg/l		<0.01	<0.01			
Pirimiphos-methyl	<0.01 µg/l		<0.01	<0.01			
Chlorpyriphos	<0.01 µg/l		<0.01	<0.01			
Methyl Parathion	<0.01 µg/l		<0.01	<0.01			
Malathion	<0.01 µg/l		<0.01	<0.01			
Fenthion	<0.01 µg/l		<0.01	<0.01			
Fenitrothion	<0.01 µg/l		<0.01	<0.01			
Triadimefon	<0.01 µg/l		<0.01	<0.01			
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01			
Parathion	<0.01 µg/l		<0.01	<0.01			
Chlorfenvinphos	<0.01 µg/l	TM344	<0.01	<0.01			
trans-Chlordane	<0.01 µg/l		<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			

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# M	Results Legend ISO17025 accredited. mCERTS accredited.		Customer Sample Ref.	SW1	SW2			
aq diss.filt	Aqueous / settled sample. Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt *	Total / unfiltered sample. Subcontracted - refer to subcontractor report f accreditation status.	for	Sample Type Date Sampled	Surface Water (SW) 10/06/2020	Surface Water (SW) 10/06/2020			
*	% recovery of the surrogate standard to check efficiency of the method. The results of individ	lual	Sample Time Date Received	11/06/2020	11/06/2020			
(F)	compounds within samples aren't corrected fo recovery Trigger breach confirmed	or the	SDG Ref Lab Sample No.(s)	200611-48 22287201	200611-48 22287216			
1-3+§@	Sample deviation (see appendix)	LOD/Units	AGS Reference					
Triazop		<0.01 µg/l		<0.01	<0.01			
Phosal	one	<0.01 µg/l	TM344	<0.01	<0.01			
Azinph	os methyl	<0.02 µg/l	TM344	<0.02	<0.02			
Azinph	os ethyl	<0.02 µg/l	TM344	<0.02	<0.02			
Etridiaz	zole	<0.01 µg/l	TM345	<0.01	<0.01			
Pentac	hlorobenzene	<0.01 µg/l	TM345	<0.01	<0.01			
Propac	hlor	<0.01 µg/l	TM345	<0.01	<0.01			
	zene (PCNB)	<0.01 µg/l		<0.01	<0.01			
Ometho	oate	<0.01 µg/l		<0.01	<0.01			
Propaz	ine	<0.01 µg/l		<0.01	<0.01	1150.		
Propyz		<0.01 µg/l		<0.01	<0.01	off of oth offer use.		
Alachlo		<0.01 µg/l		<0.01	<0.01	only all,		
Promet	•	<0.01 µg/l		<0.01	Dur Pelli	e ^e		
Telodri		<0.01 µg/l		<0.01	ection to			
Terbutr		<0.01 µg/l		<0.01	institute 0.01			
Chlorot		<0.01 µg/l			<0.01			
Etrimph		<0.01 µg/l		<0.01 cont	<0.01			
Metaza		<0.01 µg/l			<0.01			
Cyanaz		<0.01 µg/l		<0.01	<0.01			
Trietazi		<0.01 µg/l		<0.01	<0.01			
Couma		<0.01 µg/l		<0.01	<0.01			
	namidon I	<0.01 µg/l		<0.01	<0.01			
	namidon II	<0.01 µg/l		<0.01	<0.01			
	o-cresol	<0.1 µg/l		<0.1	<0.1			
Clopyra		<0.04 µg/l		<0.04	<0.04			
MCPA		<0.05 µg/l		<0.05	<0.05			
Mecopi		<0.04 µg/l		<0.04	<0.04			
Dicamb		<0.04 µg/l		<0.04	<0.04			
MCPB		<0.05 µg/l		<0.05	<0.05			
2,4-DB		<0.1 µg/l		<0.1	<0.1			
	richlorobenzoic acid	<0.05 µg/l		<0.05	<0.05			
Dichlor		<0.1 µg/l	TM411	<0.1	<0.1			
Triclopy	yr	<0.05 µg/l	TM411	<0.05	<0.05			

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CERTIFICATE OF ANALYSIS

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Results Legend # ISO17025 accredited.	C	Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
 Subcontracted - refer to subcontractor report accreditation status. 	for	Date Sampled	10/06/2020	10/06/2020			
** % recovery of the surrogate standard to check efficiency of the method. The results of individ	the Jual	Sample Time Date Received	. 11/06/2020	11/06/2020			
compounds within samples aren't corrected for recovery		SDG Ref	200611-48	200611-48			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22287201	22287216			
Component	LOD/Units	Method					
Fenoprop (Silvex)	<0.1 µg/l	TM411	<0.1	<0.1			
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05	<0.05			
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.05	<0.05			
Bromoxynil	<0.04 µg/l	TM411	<0.04	<0.04			
Benazolin	<0.04 µg/l	TM411	<0.04	<0.04			
loxynil	<0.05 µg/l	TM411	<0.05	<0.05			
Pentachlorophenol	<0.04 µg/l	TM411	<0.04	<0.04			
Fluoroxypyr	<0.1 µg/l	TM411	0.314	0.415			
					offer and other tree.		
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			Ç (Kiftight			
			38	OV.			
			Consentor				

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SDG:200611-48Client Reference:P20-015Report Number:555813Location:Thorpes LandfillOrder Number:Z2085Superseded Report:

SVOC MS (W) - Aqueous	S						
# ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.		Double (m)					
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
 * Subcontracted - refer to subcontractor report accreditation status. 		Date Sampled	10/06/2020	10/06/2020			
** % recovery of the surrogate standard to check efficiency of the method. The results of individe	dual	Sample Time Date Received	11/06/2020	11/06/2020			
compounds within samples aren't corrected for recovery	or the	SDG Ref	200611-48	200611-48 22287216			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22287201	22207210			
Component	LOD/Units						
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, 1,0 1110111011011011(04)	. 49.		. #	. #			
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		+	
2,7-Dilliethyrphenol (a4)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	11011/0	<u> </u>	#			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1			
			#	#			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<1	<1			
0.011	.4 //	T14470	#	#	e sec.		
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<1 #	<1 #	of other us		
2-Chlorophenol (aq)	<1 µg/l	TM176	<1	<1	24.00		
			#	#	only any		
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<1	<1 por	20°		
			#	<1 05 Partitors	Y		
2-Methylphenol (aq)	<1 µg/l	TM176	<1	Section Period			
2-Nitroaniline (aq)	<1 µg/l	TM176	# <1	4 2 21			
2-Milioaniline (aq)	ν μ μ μ μ μ	11W170	#	titistett Q1 #			
2-Nitrophenol (aq)	<1 µg/l	TM176	<1	2 <1			
			W.	#			
3-Nitroaniline (aq)	<1 µg/l	TM176	<1 cm sent at	<1			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	Galise #	<1			
4-biomophenyiphenyiether (aq)	\ μg/ι	TIWIT70	#	#			
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-Onlorophenyiphenyiether (aq)	\ μg/ι	TIWITTO	-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			
4-Millophenol (aq)	\ \ \ μg/ι	TIVITA	<u> </u>				
Azobenzene (aq)	<1 µg/l	TM176	<1	<1			
			#	#			
Acenaphthylene (aq)	<1 µg/l	TM176	<1	<1			
A 10 ()	.4 //	T14470	#				
Acenaphthene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Anthracene (aq)	<1 µg/l	TM176	<1	<1			
V- W	1-3/1		. #	. #		 	
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	<1	<1			
11.70.011			#				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176	<1 **	<1 #			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	# <2	<2			
2.2(2 20.73x,7) printidiate (aq)	- μg/1	1	` <u>`</u> #	1			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1			
			#				
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<1	<1			
			#	#	Ţ		

Validated

CERTIFICATE OF ANALYSIS

Report Number: Superseded Report: SDG: 200611-48 Client Reference: P20-015 555813 Location: Thorpes Landfill Order Number: Z2085

Results Legend # ISO17025 accredited.	Cı	ustomer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample. diss.fill: Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.	ır	Depth (m) Sample Type Date Sampled	0.00 - 0.00 Surface Water (SW) 10/06/2020	0.00 - 0.00 Surface Water (SW) 10/06/2020			
** % recovery of the surrogate standard to check the efficiency of the method. The results of individua compounds within samples aren't corrected for the recovery (F) Trigger breach confirmed	ıal	Sample Time Date Received SDG Ref Lab Sample No.(s)	11/06/2020 200611-48 22287201	11/06/2020 200611-48 22287216			
1-3+§@ Sample deviation (see appendix) Component	LOD/Units	AGS Reference Method					
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	* <1 #	* <1 #			
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Carbazole (aq)	<1 µg/l	TM176	<1 #	<1 #			
Chrysene (aq)	<1 µg/l	TM176	<1 #	<1 #			
Dibenzofuran (aq)	<1 µg/l	TM176	<1 #	<1 #			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1 #	<1 #			
Diethyl phthalate (aq)	<1 µg/l	TM176	<1 #	<1 #			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1 #	<1 #	Juse.		
Dimethyl phthalate (aq)	<1 µg/l	TM176 TM176	<1 # <5	<1 # <5	offer and other use.		
n-Dioctyl phthalate (aq) Fluoranthene (aq)	<5 μg/l <1 μg/l	TM176		4	off of ar		
Fluorene (aq)	<1 μg/l	TM176	#_ <1	<1 update of the first of the f	~		
Hexachlorobenzene (aq)	<1 μg/l	TM176	<u>#</u>	25 x S1			
Hexachlorobutadiene (aq)	<1 μg/l	TM176	<1	Mitight #			
Pentachlorophenol (aq)	<1 µg/l	TM176	<1 3	**************************************			
Phenol (aq)	<1 μg/l	TM176	<1 consent	<1			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1			
Hexachloroethane (aq)	<1 μg/l	TM176	#	# <1			
Nitrobenzene (aq)	<1 µg/l	TM176	<1 #	# <1			
Naphthalene (aq)	<1 µg/l	TM176	<1 #	# <1			
Isophorone (aq)	<1 µg/l	TM176	<1	# <1			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	# <1			
Phenanthrene (aq)	<1 µg/l	TM176	<1 "	<1			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	* <1 #	* <1 *			
Pyrene (aq)	<1 µg/l	TM176		<1 <1 #			
			The state of the s	,			

200611-48 Thorpes Landfill P20-015 Z2085 Report Number: Superseded Report: SDG: Client Reference: 555813 Location: Order Number:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
 Subcontracted - refer to subcontractor report accreditation status. 		Date Sampled	10/06/2020	10/06/2020			
** % recovery of the surrogate standard to check efficiency of the method. The results of individual	dual	Sample Time Date Received	11/06/2020	11/06/2020			
compounds within samples aren't corrected for recovery	or the	SDG Ref	200611-48 22287201	200611-48 22287216			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22207201	22201210			
Component	LOD/Units	Method	445	440			
Dibromofluoromethane**	%	TM208	115	113			
Toluene-d8**	%	TM208	103	103			
4-Bromofluorobenzene**	%	TM208	102	100			
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 #	13 50.		
Carbon disulphide	<1 µg/l	TM208	<1 #	<1 #	of other us		
Dichloromethane	<3 µg/l	TM208	<3 #	<3 #_	जीप वार्ष		
Methyl tertiary butyl ether (MTBE)	<1 µg/l	TM208	<1 #	<1 (705)	20		
trans-1,2-Dichloroethene	<1 µg/l	TM208	<1 #	ition of it			
1,1-Dichloroethane	<1 µg/l	TM208		tinspit 41			
cis-1,2-Dichloroethene	<1 µg/l	TM208	#	₹ <1 #			
2,2-Dichloropropane	<1 µg/l	TM208	<1 ent or	<1			
Bromochloromethane	<1 µg/l	TM208	#	<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 #			

ALS

 SDG:
 200611-48
 Client Reference:
 P20-015
 Report Number:
 555813

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
 Subcontracted - refer to subcontractor report accreditation status. 		Date Sampled	10/06/2020	10/06/2020			
** % recovery of the surrogate standard to check efficiency of the method. The results of indivi-	dual	Sample Time Date Received	11/06/2020	11/06/2020			
compounds within samples aren't corrected for recovery	or the	SDG Ref	200611-48 22287201	200611-48 22287216			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22201201	22207210			
Component	LOD/Units		.4	.4			
Tetrachloroethene	<1 µg/l	TM208	<1 #	<1 #			
Dibromochloromethane	<1 µg/l	TM208	<1	<1			
			#	#			
1,2-Dibromoethane	<1 µg/l	TM208	<1	<1			
011	4 "	T1 1000	#	#			
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			
- Aylono	, μg/ι	1 141200	-1 #	#			
Styrene	<1 µg/l	TM208	<1	<1			
			#	#			
Bromoform	<1 µg/l	TM208	<1	<1 ,,,	<u>ر</u> و.		
Isopropylhonzono	<1 ug/l	TM208	# <1	* <1	3115°.		
Isopropylbenzene	<1 µg/l	1101200	<u> </u>	"#	ony and difference.		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	913, 311,		
			#	#	of for t		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1 purposition	es.		
D 1	-4 ()	Th 4000	#	Out to the			
Bromobenzene	<1 µg/l	TM208	<1 #	cite net			
Propylbenzene	<1 µg/l	TM208	<1	inspired #			
.,,,	"		#6	KITIEST #			
2-Chlorotoluene	<1 µg/l	TM208		10% · <1			
				#			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 chieff *	<1 #			
4-Chlorotoluene	<1 µg/l	TM208	G "	<1			
	"		#	1			
tert-Butylbenzene	<1 µg/l	TM208	<1	<1			
12171 111			#				
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			
40.8744			#	#			
1,3-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #			
1,4-Dichlorobenzene	<1 µg/l	TM208	<1	<1			
	. 64		#	#			
n-Butylbenzene	<1 µg/l	TM208	<1	<1			
40.00			#				
1,2-Dichlorobenzene	<1 µg/l	TM208	<1 #	<1 #			
1,2-Dibromo-3-chloropropane	<1 µg/l	TM208	<1	<1			
1,2 Distante e dinarapropana	l pg/	1111200	''				
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			
(IAIVIL)	- μg/Ι	1 141200	-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	*			
1,0,0 1110111010001120110	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	I IVIZUU	`']			
		_			•		



Report Number: Superseded Report: SDG: 200611-48 P20-015 555813 Client Reference: Location: Thorpes Landfill Order Number: Z2085

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 Acid Herbs in Water by GCMS
TM411	Acid_Herbs_GCMS	Acid Herbern Water by GCMS
ot applicable.	subcontracted) performed at ALS Life Sciences Ltd Hawarder	(Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



ALS

 SDG:
 200611-48
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 P20-015
 Report Number:
 555813

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

Test Completion Dates

Customer Sample No(s) Customer Sample Ref. SW1 SW2			
AGS Ref. Depth Type Acid Herbicides by GCMS Ammonium Low Anions by Kone (w) BOD True Total COD Unfiltered Conductivity (at 20 deg.C) Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Dissolved Metals by ICP-MS Dissolved Oxygen by Probe Fluoride Dissolved Oxygen by Probe Fluoride Dissolved Metals by ICP-MS Dissolved (w) Dis	Lab Sample No(s)	22287201	22287216
AGS Ref. Depth Type Acid Herbicides by GCMS Acid Herbicides by GCMS Anions by Kone (w) BDD True Total COD Unfiltered Conductivity (at 20 deg.C) Cyanide Comp/Free/Total/Thiocyanate Dissolved Metals by ICP-MS Dissolved Oxygen by Probe Fluoride Tr-Jun-2002 Tr-	Customer Sample Ref.	SW1	SW2
Depth Type Surface Water			
Type	AGS Ref.		
Acid Herbicides by GCMS Ammonium Low Anions by Kone (w) B-Jun-2020 18-Jun-2020 18-Jun-2020 18-Jun-2020 11-Jun-2020 Phosphate by Kone (w) 11-Jun-2020 11	Depth	0.00 - 0.00	0.00 - 0.00
Ammonium Low 18-Jun-2020 18-Jun-2020 Anions by Kone (w) 11-Jun-2020 11-Jun-2020 BOD True Total 17-Jun-2020 17-Jun-2020 COD Unfiltered 18-Jun-2020 18-Jun-2020 Conductivity (at 20 deg.C) 16-Jun-2020 16-Jun-2020 Cyanide Compl/Treel/Total/Thiocyanate 16-Jun-2020 15-Jun-2020 Dissolved Metals by ICP-MS 15-Jun-2020 15-Jun-2020 Dissolved Oxygen by Probe 17-Jun-2020 17-Jun-2020 Fluoride 12-Jun-2020 12-Jun-2020 Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Туре	Surface Water	Surface Water
Anions by Kone (w) 11-Jun-2020 11-Jun-2020 11-Jun-2020 11-Jun-2020 11-Jun-2020 11-Jun-2020 11-Jun-2020 17-Jun-2020 17-Jun-2020 17-Jun-2020 17-Jun-2020 18-Jun-2020 18-Jun-2020 16-Jun-2020 16-Jun-2020 16-Jun-2020 16-Jun-2020 16-Jun-2020 16-Jun-2020 16-Jun-2020 15-Jun-2020 15-Jun-2020 17-Jun-2020	Acid Herbicides by GCMS	16-Jun-2020	16-Jun-2020
BOD True Total 17-Jun-2020 17-Jun-2020 COD Unfiltered 18-Jun-2020 18-Jun-2020 Conductivity (at 20 deg.C) 16-Jun-2020 16-Jun-2020 Cyanide Compi/Free/Total/Thiocyanate 16-Jun-2020 16-Jun-2020 Dissolved Metals by ICP-MS 15-Jun-2020 15-Jun-2020 Dissolved Oxygen by Probe 17-Jun-2020 17-Jun-2020 Fluoride 12-Jun-2020 12-Jun-2020 Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Ammonium Low	18-Jun-2020	18-Jun-2020
COD Unfiltered 18-Jun-2020 18-Jun-2020 Conductivity (at 20 deg.C) 16-Jun-2020 16-Jun-2020 Cyanide Compi/Free/Total/Thiocyanate 16-Jun-2020 16-Jun-2020 Dissolved Metals by ICP-MS 15-Jun-2020 15-Jun-2020 Dissolved Oxygen by Probe 17-Jun-2020 17-Jun-2020 Fluoride 12-Jun-2020 12-Jun-2020 Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Anions by Kone (w)	11-Jun-2020	11-Jun-2020
Conductivity (at 20 deg.C) 16-Jun-2020 16-Jun-2020 Cyanide Comp/Free/Total/Thiocyanate 16-Jun-2020 16-Jun-2020 Dissolved Metals by ICP-MS 15-Jun-2020 15-Jun-2020 Dissolved Oxygen by Probe 17-Jun-2020 17-Jun-2020 Fluoride 12-Jun-2020 12-Jun-2020 Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	BOD True Total	17-Jun-2020	17-Jun-2020
Cyanide Comp/Free/Total/Thiocyanate 16-Jun-2020 16-Jun-2020 Dissolved Metals by ICP-MS 15-Jun-2020 15-Jun-2020 Dissolved Oxygen by Probe 17-Jun-2020 17-Jun-2020 Fluoride 12-Jun-2020 12-Jun-2020 Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	COD Unfiltered	18-Jun-2020	18-Jun-2020
Dissolved Metals by ICP-MS 15-Jun-2020 15-Jun-2020 Dissolved Oxygen by Probe 17-Jun-2020 17-Jun-2020 Fluoride 12-Jun-2020 12-Jun-2020 Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 PH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Conductivity (at 20 deg.C)	16-Jun-2020	16-Jun-2020
Dissolved Oxygen by Probe 17-Jun-2020 17-Jun-2020 17-Jun-2020 17-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 18-Jun-2020 18-Jun-2020 18-Jun-2020 18-Jun-2020 17-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 12-Jun-2020 17-Jun-2020 17-Jun-2	Cyanide Comp/Free/Total/Thiocyanate	16-Jun-2020	16-Jun-2020
Fluoride 12-Jun-2020 12-Jun-2020 Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 PH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Dissolved Metals by ICP-MS	15-Jun-2020	15-Jun-2020
Mercury Dissolved 12-Jun-2020 12-Jun-2020 Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 PH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Dissolved Oxygen by Probe	17-Jun-2020	17-Jun-2020
Mineral Oil C10-40 Aqueous (W) 18-Jun-2020 18-Jun-2020 PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 PH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Fluoride	12-Jun-2020	12-Jun-2020
PCB Congeners - Aqueous (W) 17-Jun-2020 17-Jun-2020 Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 PH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Mercury Dissolved	12-Jun-2020	12-Jun-2020
Pesticides (Suite I) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 PH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Mineral Oil C10-40 Aqueous (W)	18-Jun-2020	18-Jun-2020
Pesticides (Suite II) by GCMS 17-Jun-2020 17-Jun-2020 Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 pH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	PCB Congeners - Aqueous (W)	17-Jun-2020	17-Jun-2020
Pesticides (Suite III) by GCMS 17-Jun-2020 17-Jun-2020 pH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Pesticides (Suite I) by GCMS	17-Jun-2020	17-Jun-2020
pH Value 17-Jun-2020 17-Jun-2020 Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Pesticides (Suite II) by GCMS	17-Jun-2020	17-Jun-2020
Phosphate by Kone (w) 12-Jun-2020 12-Jun-2020 Suspended Solids 17-Jun-2020 17-Jun-2020	Pesticides (Suite III) by GCMS	17-Jun-2020	17-Jun-2020
Suspended Solids 17-Jun-2020 17-Jun-2020	pH Value	17-Jun-2020	17-Jun-2020
	Phosphate by Kone (w)	12-Jun-2020	12-Jun-2020
SV/OC MS (W) - Aqueous 16- Jun-2020 16- Jun-2020	Suspended Solids	17-Jun-2020	17-Jun-2020
0 00 1	SVOC MS (W) - Aqueous	16-Jun-2020	16-Jun-2020
VOC MS (W) 17-Jun-2020 17-Jun-2020	VOC MS (W)	17-Jun-2020	17-Jun-2020

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SDG: 200611-48 Client Reference: P20-015 Report Number: 555813 Location: Thorpes Landfill Order Number: Z2085 Superseded Report:

Appendix

General

- 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
- 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 For representative sub sample from the received sample.
- 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. OTI
- 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 wing ALS (Hawarden) in-house method of transmitted/polarised light microscopy and

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of selections.

ALS (Hawarden) in house 1000 and 1000 are 1000 and 1000 and 1000 are 1000 and 1000 an stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name		
Chrysof le	White Asbestos		
Amosite	Brow n Asbests		
Cro d dolite	Blue Asbe stos		
Fibrous Act nolite	-		
Fib to us Anthop hyll ite	-		
Fibrous Tremolite	-		

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

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.

15:22:27 18/06/2020 Modification Date: 18/06/2020 EPA Export 22-10-2021:02:37:58 Page 16 of 16



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

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

email: haward encustomers er vices@alsglobal.com

Website: www.alsenvironmental.co.uk

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

Attention: Gary Lawlor

CERTIFICATE OF ANALYSIS

Date of report Generation:10 July 2020Customer:Fehily TimoneySample Delivery Group (SDG):200701-67Your Reference:P20-015Location:Thorpes LandfillReport No:558450

We received 2 samples on Wednesday July 01, 2020 and 2 of these samples were scheduled for analysis which was completed on Thursday July 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 ALSCLife 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







Validated

 SDG:
 200701-67
 Client Reference:
 P20-015
 Report Number:
 558450

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
22402748	SW1		0.00 - 0.00	30/06/2020
22402761	SW2		0.00 - 0.00	30/06/2020

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

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

12.6

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

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



ALS

SDG: 200701-67 Client Reference: P20-015 Report Number: 558450 Thorpes Landfill Z2085 Superseded Report: Location: Order Number: Results Legend 22402748 22402761 Lab Sample No(s) X Test No Determination Possible Customer SW1 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water HNO3 Filtered (ALE204) H2SO4 (ALE244) 500ml Plastic (ALE208) 250ml BOD (ALE212) 0.5l glass bottle (ALE227) 0.5l glass bottle (ALE227) H2SO4 (ALE244) HNO3 Filtered (ALE204) NaOH (ALE245) DW - Drinking Water Non-regulatory NaOH (ALE245) (ALE208) 250ml BOD (ALE212) Vial (ALE297) Vial (ALE297) 500ml Plastic UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type WS Acid Herbicides by GCMS All NDPs: 0 Tests: 2 έx Х Ammonium Low All NDPs: 0 Tests: 2 Χ Anions by Kone (w) All NDPs: 0 Tests: 2 X X BOD True Total All NDPs: 0 Tests: 2 X COD Unfiltered All NDPs: 0 Tests: 2 X Χ Conductivity (at 20 deg.C) All NDPs: 0 Tests: 2 Х Х Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 2 Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 2 Χ X Dissolved Oxygen by Probe All NDPs: 0 Tests: 2 Χ Х Fluoride All NDPs: 0 Tests: 2 Χ X Mercury Dissolved All NDPs: 0 Tests: 2 X X Mineral Oil C10-40 Aqueous (W) All NDPs: 0 Tests: 2 Х Х PCB Congeners - Aqueous (W) All NDPs: 0 Tests: 2 Х Х Pesticides (Suite I) by GCMS All NDPs: 0 Tests: 2 Х Х Pesticides (Suite II) by GCMS All NDPs: 0 Tests: 2 X Χ

Validated

CERTIFICATE OF ANALYSIS

(AIS)	

SDG: 200701-67 Client Reference: P20-015 Report Number: 558450 Location: Thorpes Landfill Z2085 Superseded Report: Order Number: Results Legend 22402748 22402761 Lab Sample No(s) X Test No Determination Possible Customer SW1 SW2 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water HNO3 Filtered (ALE204) H2SO4 (ALE244) 500ml Plastic (ALE208) 250ml BOD (ALE212) 0.5l glass bottle (ALE227) 0.5l glass bottle (ALE227) H2SO4 (ALE244) HNO3 Filtered (ALE204) 500ml Plastic (ALE208) 250ml BOD (ALE212) NaOH (ALE245) NaOH (ALE245) DW - Drinking Water Non-regulatory Vial (ALE297) Vial (ALE297) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type WS Pesticides (Suite III) by GCMS All NDPs: 0 Tests: 2 Χ ĺχ pH Value All NDPs: 0 Tests: 2 X X Phosphate by Kone (w) All NDPs: 0 Tests: 2 X Suspended Solids All NDPs: 0 Tests: 2 Х SVOC MS (W) - Aqueous All NDPs: 0 Tests: 2 Х X VOC MS (W) All NDPs.0 Tests: 2 Х Х

ALS

	_						
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	SW1	SW2			
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report	for	Sample Type	Surface Water (SW)	Surface Water (SW)			
accreditation status. ** % recovery of the surrogate standard to check		Date Sampled Sample Time	30/06/2020	30/06/2020			
efficiency of the method. The results of indivi compounds within samples aren't corrected for	dual	Date Received	01/07/2020	01/07/2020			
recovery (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	200701-67 22402748	200701-67 22402761			
1-3+§@ Sample deviation (see appendix)	L OD/Unit	AGS Reference					
Component Suspended solids, Total	LOD/Unit		<2	<2			
			#	#			
BOD, unfiltered	<1 mg/	I TM045	<1 "	<1			
Oxygen, dissolved	<0.3 mg	/I TM046	# 12.1	12.4	•		
Oxygen, disserved	10.0 mg	71 1100-0	12.1	12.4			
Ammoniacal Nitrogen as N (low	<0.01 mg	g/l TM099	0.0274	0.041			
level)			#	#	!		
Fluoride	<0.5 mg	/l TM104	<0.5	<0.5			
COD, unfiltered	<7 mg/	I TM107	<7	<7			
	, i		#	#	:		
Conductivity @ 20 deg.C	<0.02	TM120	0.532	0.535]
Areanic (dies filt)	mS/cm <0.5 μg	/I TM152	<0.5	0.511	1		
Arsenic (diss.filt)	νυ.ο μg	yı TIVLIƏZ	<0.5	0.511	:		
Barium (diss.filt)	<0.2 µg	/I TM152	24.7	26.2			
· ·			#	#	:		
Boron (diss.filt)	<10 µg	/I TM152	21.2	22.8			
Cadmium (diss.filt)	<0.08 µg	g/I TM152	<0.08	<0.08	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	+	+
Caumum (diss.iiit)	νο.οο μί	g/1 11V1132	~0.00 #	#	otherit		
Chromium (diss.filt)	<1 µg/	I TM152	<1	<1	विधि वाम		
			#	#	Of COLUM		
Copper (diss.filt)	<0.3 µg	/I TM152	0.777	0.735	region .		
Lead (diss.filt)	<0.2 µg	/I TM152	<0.2	citonet real	Y		
Load (diss.iii)	-ν.2 μ9	/1 1111102	#	ecito 27 rest	:		
Manganese (diss.filt)	<3 µg/	I TM152	<3	inspire3			
			#	K11.10[11 #	!		
Nickel (diss.filt)	<0.4 µg	/I TM152	0.575	0.52			
Phosphorus (diss.filt)	<10 µg	/I TM152	61.4	76.2			
' ' '			nser #	#	1		
Selenium (diss.filt)	<1 µg/	I TM152	S 1	<1			
Thallium (diss.filt)	رم در در ا	I TM152	# <2	* <2			
mailium (diss.iiit)	<2 μg/	1 1101152	~ 2	1	:		
Zinc (diss.filt)	<1 µg/	I TM152	7.7	4.64			
			#				
Sodium (Dis.Filt)	<0.076 m	ıg/l TM152	17.1 #	17.8			
Magnesium (Dis.Filt)	<0.036 m	ng/I TM152	13.9	14.9	1		
			#	1	!		
Potassium (Dis.Filt)	<0.2 mg	/l TM152	3.2	3.01			
Coloium (Dio File)	-0.0	.// TA44.50	# 00.6	102			
Calcium (Dis.Filt)	<0.2 mg	/l TM152	99.6 #	102			
Iron (Dis.Filt)	<0.019 m	ıg/l TM152	0.0289	<0.019			
			#	#	:		
Mineral oil >C10 C40 (aq)	<100 µg	g/l TM172	<100	<100			
Mercury (diss.filt)	<0.01 µç	g/l TM183	<0.01	<0.01		+	+
moroury (diss.iiit)	νο.στ μί	g/1 11V11OJ	\U.U I	N.01			
Phosphate (Ortho as PO4)	<0.05 mg	g/l TM184	0.114	0.146			
21			#				
Chloride	<2 mg/	I TM184	22.7 #	20.4			
Sulphate (soluble) as S	<1 mg/	I TM184	5.13	4.87			
(# #	1	:		
PCB congener 28	<0.015 µ	g/l TM197	<0.015	<0.015			
DCP congener 50	ZO 045	a/l TM407	~0.01F	-0.045			
PCB congener 52	<0.015 µ	g/l TM197	<0.015	<0.015			
PCB congener 101	<0.015 µ	g/l TM197	<0.015	<0.015			

ALS

Results Legend		Customer Sample Ref.	SW1	SW2	1	1	
# ISO17025 accredited. M mCERTS accredited.			OW 1	0112			
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report	t for	Sample Type	Surface Water (SW)	Surface Water (SW)			
accreditation status. ** % recovery of the surrogate standard to chec		Date Sampled Sample Time	30/06/2020	30/06/2020			
efficiency of the method. The results of indivi compounds within samples aren't corrected	idual	Date Received	01/07/2020	01/07/2020			
recovery (F) Trigger breach confirmed	ioi die	SDG Ref Lab Sample No.(s)	200701-67 22402748	200701-67 22402761			
1-3+§@ Sample deviation (see appendix)		AGS Reference					
Component	LOD/Units <0.015 μg/		40.04E	-0.045			
PCB congener 118	<0.015 μg/i	1 1101197	<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			
рН	<1 pH Units	TM256	8.25 #	8.28 #			
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	7.112°E.		
Heptachlor	<0.01 µg/l	TM343	<0.01	<0.01	other		
Aldrin	<0.01 µg/l	TM343	<0.01	<0.01	offst and other use.		
beta-HCH	<0.01 µg/l	TM343	<0.01	<0.01 control of the	ev ev		
Isodrin	<0.01 µg/l	TM343	<0.01	ectioning to			
delta-HCH	<0.01 µg/l	TM343	<0.01	1 100			
Heptachlor epoxide	<0.01 µg/l	TM343	<0.01	०० <0.01			
o,p'-DDE	<0.01 µg/l	TM343	<0.01 entor	<0.01			
Endosulphan I	<0.01 µg/l		< 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		<0.01	<0.01			
o,p'-DDT	<0.01 µg/l		<0.02	<0.02			
p,p'-DDD (TDE)	<0.01 µg/l		<0.01	<0.01			
Endosulphan II	<0.02 µg/l	TM343	<0.02	<0.02			
p,p'-DDT	<0.01 µg/l	TM343	<0.03	<0.03			
o,p'-Methoxychlor	<0.01 µg/l	TM343	<0.02	<0.02			
p,p'-Methoxychlor	<0.01 µg/l	TM343	<0.03	<0.03			
Endosulphan Sulphate	<0.02 µg/l	TM343	<0.02	<0.02			
Permethrin I	<0.01 µg/l	TM343	<0.01	<0.01			
Permethrin II	<0.01 µg/l	TM343	<0.01	<0.01			
05:06:42 40/07/2020		_					

ALS

Results Legend		Customer Sample Ref.	0114	0140			
# ISO17025 accredited. M mCERTS accredited.		oustomer sample Ket.	SW1	SW2			
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report	for	Sample Type Date Sampled	Surface Water (SW) 30/06/2020	Surface Water (SW) 30/06/2020			
accreditation status. ** % recovery of the surrogate standard to check	s the	Sample Time					
efficiency of the method. The results of individ compounds within samples aren't corrected for	dual or the	Date Received SDG Ref	01/07/2020 200701-67	01/07/2020 200701-67			
recovery (F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s)	22402748	22402761			
Component	LOD/Units	AGS Reference Method					
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		<0.01	<0.01			
Mevinphos	<0.01 µg/l		<0.01	<0.01			
Tecnazene	<0.01 µg/l		<0.01	<0.01			
Hexachlorobenzene	<0.01 µg/l		<0.01	<0.01			
Demeton-S-methyl Phorate	<0.01 µg/l <0.01 µg/l		<0.01	<0.01 <0.01	14 of Other use.		
Diazinon	<0.01 μg/l		<0.01	<0.01			
Triallate	<0.01 µg/l		<0.01	<0.01 000 000 000 000 000 000 000 000 000	off of a		
Atrazine	<0.01 µg/l		<0.01	-<601 4 telli			
Simazine	<0.01 µg/l		0.0156	negation net			
Disulfoton	<0.01 µg/l		<0.01	0.0165 0.0165			
Propetamphos	<0.01 μg/l		<0.01 sent	<0.01			
Chlorpyriphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01			
Dimethoate	<0.01 µg/l	TM344	<0.01	<0.01			
Pirimiphos-methyl	<0.01 µg/l	TM344	<0.01	<0.01			
Chlorpyriphos	<0.01 µg/l	TM344	<0.01	<0.01			
Methyl Parathion	<0.01 µg/l	TM344	<0.01	<0.01			
Malathion	<0.01 µg/l	TM344	<0.01	<0.01			
Fenthion	<0.01 µg/l	TM344	<0.01	<0.01			
Fenitrothion	<0.01 µg/l	TM344	<0.01	<0.01			
Triadimefon	<0.01 µg/l	TM344	<0.01	<0.01			
Pendimethalin	<0.01 µg/l	TM344	<0.01	<0.01			
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			
05:06:43 40/07/2020							

ALS

SDG: 200701-67 Client Reference: P20-015 Report Number: 558450
Location: Thorpes Landfill Order Number: Z2085 Superseded Report:

# 1	Results Legend ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M r aq / diss.filt I tot.unfilt 1	mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report for accreditation status.	or	Depth (m) Sample Type Date Sampled	0.00 - 0.00 Surface Water (SW) 30/06/2020	0.00 - 0.00 Surface Water (SW) 30/06/2020			
** 6	% recovery of the surrogate standard to check efficiency of the method. The results of individu compounds within samples aren't corrected for recovery	ual	Sample Time Date Received SDG Ref	01/07/2020 200701-67 22402748	01/07/2020 200701-67 22402761			
1-3+§@ \$	Trigger breach confirmed Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22402740	22402701			
Compon Triazopho		LOD/Units <0.01 μg/l		<0.01	<0.01			
Phosalon	пе	<0.01 µg/l	TM344	<0.02	<0.02			
Azinphos	methyl	<0.02 µg/l	TM344	<0.04	<0.04			
Azinphos	ethyl	<0.02 µg/l	TM344	<0.04	<0.04			
Etridiazol	le	<0.01 µg/l	TM345	<0.01	<0.01			
Pentachlo	orobenzene	<0.01 µg/l	TM345	<0.01	<0.01			
Propachlo	or	<0.01 µg/l	TM345	<0.01	<0.01			
Quintoze	ne (PCNB)	<0.01 µg/l	TM345	<0.01	<0.01			
Omethoa	ite	<0.01 µg/l	TM345	<0.01	<0.01			
Propazine	е	<0.01 µg/l	TM345	<0.01	<0.01	, 115°.		
Propyzan	nide	<0.01 µg/l	TM345	<0.01	<0.01	Oils, and other use.		
Alachlor		<0.01 µg/l	TM345	<0.01	<0.01	only and		
Prometry	'n	<0.01 µg/l	TM345	<0.01	<0.01 POSES	200		
Telodrin		<0.01 µg/l	TM345	<0.01	ecitality is			
Terbutryn	1	<0.01 µg/l	TM345	<0.01	1,48			
Chlorotha	alonil	<0.01 µg/l	TM345	<0.02	<0.02			
Etrimpho	s	<0.01 µg/l	TM345	<0.01 ent	<0.01			
Metazach	nlor	<0.01 µg/l	TM345	<0.01	<0.01			
Cyanazin	ne	<0.01 µg/l		<0.01	<0.01			
Trietazine	е	<0.01 µg/l	TM345	<0.01	<0.01			
Coumaph	108	<0.01 µg/l	TM345	<0.01	<0.01			
Phosphar	midon I	<0.01 µg/l	TM345	<0.01	<0.01			
Phosphar	midon II	<0.01 µg/l	TM345	<0.01	<0.01			
Dinitro-o-	cresol	<0.1 µg/l	TM411	<0.2	<0.2			
Clopyralio	d	<0.04 µg/l	TM411	<0.08	<0.08			
MCPA		<0.05 µg/l	TM411	<0.1	<0.1			
Mecoprop	р	<0.04 µg/l	TM411	<0.08	<0.08			
Dicamba		<0.04 µg/l	TM411	<0.08	<0.08			
МСРВ		<0.05 µg/l	TM411	<0.1	<0.1			
2,4-DB		<0.1 µg/l	TM411	<0.2	<0.2			
2,3,6-Tric	chlorobenzoic acid	<0.05 µg/l	TM411	<0.1	<0.1			
Dichlorpro	ор	<0.1 µg/l	TM411	<0.2	<0.2			
		<0.05 µg/l	TM411	<0.75	<0.75		1	1



ALS

Results Legend		Customer Sample Ref.	SW1	SW2	<u> </u>		<u> </u>
# ISO17025 accredited. M mCERTS accredited.		oustomer oumple itel.	SWI	5W2			
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor repo	rt for	Sample Type Date Sampled	Surface Water (SW) 30/06/2020	Surface Water (SW) 30/06/2020			
accreditation status. ** % recovery of the surrogate standard to che	eck the	Sample Time					
efficiency of the method. The results of indi- compounds within samples aren't corrected	vidual I for the	Date Received SDG Ref	01/07/2020 200701-67	01/07/2020 200701-67			
recovery (F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22402748	22402761			
1-3+§@ Sample deviation (see appendix) Component	LOD/Units	Method					
Fenoprop (Silvex)	<0.1 µg/l	TM411	<0.2	<0.2			
2,4-Dichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.1	<0.1			
2,4,5-Trichlorophenoxyacetic acid	<0.05 µg/l	TM411	<0.1	<0.1			
Bromoxynil	<0.04 µg/l	TM411	<0.08	<0.08			
Benazolin	<0.04 µg/l	TM411	<0.08	<0.08			
loxynil	<0.05 µg/l	TM411	<0.1	<0.1			
Pentachlorophenol	<0.04 µg/l	TM411	<0.08	<0.08			
Fluoroxypyr	<0.1 µg/l	TM411	<0.2	<0.2			
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					offer any		
					Only and		
				altPose	28		
				action of reck			
			61	rinsport			
			\$	OBJ			
			consent of				
			8				

ALS

 SDG:
 200701-67
 Client Reference:
 P20-015
 Report Number:
 558450

Location: Thorpes Landfill Order Number: Z2085 Superseded Report:	

SVOC MS (W) - Aqueou		morpeo Edital		ritumber. 22		<u> </u>	•	
Results Legend # ISO17025 accredited.	S	Customer Sample Ref.	SW1	SW2				
M mCERTS accredited. aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)				
 Subcontracted - refer to subcontractor report accreditation status. 		Date Sampled	30/06/2020	30/06/2020				
** % recovery of the surrogate standard to che efficiency of the method. The results of indiv	vidual	Sample Time Date Received	01/07/2020	01/07/2020				
compounds within samples aren't corrected recovery	for the	SDG Ref	200701-67 22402748	200701-67 22402761				
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	22402140	22402701				
Component	LOD/Units	Method	*0	-4				
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176	<2 #	<1 #				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	<1				
			#	#				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176	<2 #	<1 #				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176	<2	<1				
.,			- #	#				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176	<2	<1				
2,4,6-Trichlorophenol (aq)	-1/l	TM176	# <2	# <1				
2,4,0-Trichiorophenor(aq)	<1 µg/l	TIVITO	~2 #	"				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176	<2	<1				
			#	#				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176	<2 #	<1 #				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176	# <2	<1	+			
, (44)		7	#	#				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176	<2	<1				
2 Chloropophthologo ()	ااا	TM4470	# <2	# <1	, A.			
2-Chloronaphthalene (aq)	<1 µg/l	TM176	<2 #	#	1. Nother is			
2-Chlorophenol (aq)	<1 µg/l	TM176	<2	<1	97. July			
			#	#	ठामिं वामे			
2-Methylnaphthalene (aq)	<1 µg/l	TM176	<2 #	<1 00%	ESTO			
2-Methylphenol (aq)	<1 µg/l	TM176	<2	installing #	1			
2	. 49.		- #	action net #				
2-Nitroaniline (aq)	<1 µg/l	TM176	<2	inspectal #				
2 Nitranhanal (as)	-1/l	TM176	<2 **					
2-Nitrophenol (aq)	<1 µg/l	TIVITO		Ox				
3-Nitroaniline (aq)	<1 µg/l	TM176	<2 ************************************	<1				
			mser #	#				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176	≤2 ″ #	<1 #				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176	# <2	<1				
· omore e meany phones (aq)	. 49.		- #	. #				
4-Chloroaniline (aq)	<1 µg/l	TM176	<2	<1				
4 Oblassa hans da hans da tha a (a a)	44//	TM470	<2	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176	<2 #	<u> </u>				
4-Methylphenol (aq)	<1 µg/l	TM176	<2	<1				
			#	#				
4-Nitroaniline (aq)	<1 µg/l	TM176	<2 #	<1 #				
4-Nitrophenol (aq)	<1 µg/l	TM176	<2	<1	+			
1 (204)	. 49"	7						
Azobenzene (aq)	<1 µg/l	TM176	<2	<1				
Acananhthylene (eg)	المدر 4	TM176	# <2	# <1	-		-	
Acenaphthylene (aq)	<1 µg/l	11011/0	<2 #	<1 #				
Acenaphthene (aq)	<1 µg/l	TM176	<2	<1				
			#	#				
Anthracene (aq)	<1 µg/l	TM176	<2 #	<1 **				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176	# <2	# <1	+			
	. 49	7	- <u>-</u> -	#				
bis(2-Chloroethoxy)methane	<1 µg/l	TM176	<2	<1				
(aq)	-0. "	T14470	#	#				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176	<4 #	<2 #				
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	π	<1				
			#	#				
Benzo(a)anthracene (aq)	<1 µg/l	TM176	<2	<1				
			#	#	ļ		L	

ALS

 SDG:
 200701-67
 Client Reference:
 P20-015
 Report Number:
 558450

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

SVOC MS (W) - Aqueous	S						
Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00			
tot.unfilt Total / unfiltered sample.		Sample Type	Surface Water (SW)	Surface Water (SW)			
* Subcontracted - refer to subcontractor report accreditation status.	for	Date Sampled	30/06/2020	30/06/2020			
** % recovery of the surrogate standard to check		Sample Time					
efficiency of the method. The results of individual compounds within samples aren't corrected for	dual or the	Date Received	01/07/2020 200701-67	01/07/2020 200701-67			
recovery		SDG Ref Lab Sample No.(s)	22402748	22402761			
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		AGS Reference					
Component	LOD/Units	Method					
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<2	<1			
			#	#			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<2	<1			
Bonzo(N)ndoranthono (dq)	l r pg/	1111170	#	1			
B ()	.4 //	T14470					
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<2	<1 ,,,			
			#				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<2	<1			
			#	#			
Carbazole (aq)	<1 µg/l	TM176	<2	<1			
			#	#			
Chrysene (aq)	<1 µg/l	TM176	<2	<1			
y \- 1/	"""		#	I			
Dibenzofuran (aq)	<1 µg/l	TM176	-π <2	<1			
Dipolizorari (aq)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	1101170		I			
Bit is the second of		7111-1	#	1			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<2	<1			
			#				
Diethyl phthalate (aq)	<1 µg/l	TM176	<2	<1			
			#	#			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<2	<1			
	'		#		only and difference.		
Dimethyl phthalate (aq)	<1 µg/l	TM176	<2	<1	. 05		
Difficulty printialate (aq)	i pg/i	1101170	#	1 " #	othe		
- Di+1	45	TN447C		۳-	14. 47		
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<10	<5	official		
			#	#	XO.		
Fluoranthene (aq)	<1 µg/l	TM176	<2	<1 post	e ^e		
			#	37' 39'			
Fluorene (aq)	<1 µg/l	TM176	<2	ection of rect			
			#	ect with #			
Hexachlorobenzene (aq)	<1 µg/l	TM176	<2	15 N 21			
(4)	"		#4	inage of the state			
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<2	-C1			
ricxaciiorobatadiciic (aq)	i pg/i	1101170	, <u>,</u>	#			
Dente ship and and (an)	44	TN447C	<2 consent of				
Pentachlorophenol (aq)	<1 µg/l	TM176	<2 sett	<1			
			COLL				
Phenol (aq)	<1 µg/l	TM176	<2	<1			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<2	<1			
			#	#			
Hexachloroethane (aq)	<1 µg/l	TM176	<2	<1			
` "	'		#	#			
Nitrobenzene (aq)	<1 µg/l	TM176	<2	<1			
(64)	. P9/1		#	1			
Naphthalene (aq)	<1 µg/l	TM176	<2	<1			
ιναριπιαιστισ (αγ)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	11011/0	<2 #	1			
Incoherence ()	.4 "	T14470					
Isophorone (aq)	<1 µg/l	TM176	<2	<1			
			#				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<2	<1			
Phenanthrene (aq)	<1 µg/l	TM176	<2	<1			
1			#	#			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<2	<1			
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	. ۳9″		#	1			
Pyrene (aq)	<1 µg/l	TM176	<2	<1			
i yrene (aq)	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	11011/0					
-		-	#	#			
		1					
		+					

ALS

 SDG:
 200701-67
 Client Reference:
 P20-015
 Report Number:
 558450

		SDG.	200701-07	Chefft Reference.	F20-013	Report Number.	330430
	(ALS)	Location:	Thorpes Landfill	Order Number:	Z2085	Superseded Report:	
,	VOC MS (W)						
		Ha I a seed					

#	Results Legend ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M aq diss.filt tot.unfilt	mCERTS accredited. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted - refer to subcontractor report fr	or	Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
	accreditation status. % recovery of the surrogate standard to check		Date Sampled Sample Time	30/06/2020	30/06/2020			
	efficiency of the method. The results of individu compounds within samples aren't corrected for	ual	Date Received	01/07/2020 200701-67	01/07/2020 200701-67			
(F)	recovery Trigger breach confirmed		SDG Ref Lab Sample No.(s)	22402748	22402761			
1-3+§@ Compo	Sample deviation (see appendix)	LOD/Units	AGS Reference Method					
	ofluoromethane**	%	TM208	112	114			
Toluene	9-d8**	%	TM208	98.6	100			
4-Brom	ofluorobenzene**	%	TM208	94.9	93.4			
Dichlor	odifluoromethane	<1 µg/l	TM208	<1 #	<1 #			
Chloror	nethane	<1 µg/l	TM208	<1 #	<1 #			
Vinyl ch	lloride	<1 µg/l	TM208	<1 #	<1 #			
Bromor	nethane	<1 µg/l	TM208	<1 #	<1 #			
Chloroe	thane	<1 µg/l	TM208	<1 #	<1 #			
Trichlor	ofluoromethane	<1 µg/l	TM208	<1 #	<1 #			
1,1-Dicl	nloroethene	<1 µg/l	TM208	<1 #	<1 #	ږي.		
Carbon	disulphide	<1 µg/l	TM208	<1 #	<1 #	otherus		
Dichlor	omethane	<3 µg/l	TM208	<3 #	<3	ज्योत्र, याज्ये व		
Methyl (MTBE)	tertiary butyl ether	<1 µg/l	TM208	<1 #	<1 000 100	8'		
	2-Dichloroethene	<1 µg/l	TM208	<1 #	ation of it			
1,1-Dicl	nloroethane	<1 µg/l	TM208	<1 #_	insperior #			
cis-1,2-	Dichloroethene	<1 µg/l	TM208	<1	of 1 #			
2,2-Dicl	nloropropane	<1 µg/l	TM208	<1 nsent	<1			
Bromod	hloromethane	<1 µg/l	TM208	€P**	<1 #			
Chlorof	orm	<1 µg/l	TM208	<1 #	<1 #			
1,1,1-Tı	ichloroethane	<1 µg/l	TM208	<1 #	<1 #			
1,1-Dicl	nloropropene	<1 µg/l	TM208	<1 #	<1 #			
Carbon	tetrachloride	<1 µg/l	TM208	<1 #	<1 #			
1,2-Dicl	nloroethane	<1 µg/l	TM208	<1 #	<1 #			
Benzen	e	<1 µg/l	TM208	<1 #	<1 #			
	oethene	<1 µg/l	TM208	<1 #	<1 #			
1,2-Dicl	nloropropane	<1 µg/l	TM208	<1 #	<1 #			
Dibrom	omethane	<1 µg/l	TM208	<1 #	<1 #			
Bromod	lichloromethane	<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-Tı	ichloroethane	<1 µg/l	TM208	<1 #	<1 #			
1,3-Dicl	nloropropane	<1 µg/l	TM208	<1 #	<1 #			

ALS

 SDG:
 200701-67
 Client Reference:
 P20-015
 Report Number:
 558450

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

VOC MS (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	SW1	SW2			
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.00 - 0.00 Surface Water (SW)	0.00 - 0.00 Surface Water (SW)			
* Subcontracted - refer to subcontractor report accreditation status.		Date Sampled Sample Time	30/06/2020	30/06/2020			
** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi compounds within samples aren't corrected f	dual	Date Received	01/07/2020	01/07/2020			
recovery (F) Trigger breach confirmed	or tile	SDG Ref Lab Sample No.(s)	200701-67 22402748	200701-67 22402761			
1-3+§@ Sample deviation (see appendix)		AGS Reference					
Component Tetrachloroethene	LOD/Units <1 µg/l	Method TM208	<1	<1			
100000000000000000000000000000000000000	. 43	200	. #	#			
Dibromochloromethane	<1 µg/l	TM208	<1	<1			
40.5"	4 0	T1 1000	#	#			
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			
Laryiberizerie	1 49/1	TIVIZOO	#	#			
m,p-Xylene	<1 µg/l	TM208	<1	<1			
			#				
o-Xylene	<1 µg/l	TM208	<1 #	<1 #			
Styrene	<1 µg/l	TM208	# <1	* <1			
		1111200	*	#		 	
Bromoform	<1 µg/l	TM208	<1	<1	2.1		
			#	#	Jise.		
Isopropylbenzene	<1 µg/l	TM208	<1 #	<1 #	ony and difference.		
1,1,2,2-Tetrachloroethane	<1 µg/l	TM208	<1	<1	712, 511,		
1,1,=,2 100001101000110110	. 43	200	. #	#	offort		
1,2,3-Trichloropropane	<1 µg/l	TM208	<1	<1 purposition	(Z ^O		
2 .	4 "	T1 1000	#	Dritte A			
Bromobenzene	<1 µg/l	TM208	<1 #	cital det , "			
Propylbenzene	<1 µg/l	TM208	<1	inspired #			
1,	10		#	# #			
2-Chlorotoluene	<1 µg/l	TM208		10°V' <1			
4.2.5. Trimethalle annua	44 //	TMOOO	-1 ×	#			
1,3,5-Trimethylbenzene	<1 µg/l	TM208	<1 chieff #	<1 #			
4-Chlorotoluene	<1 µg/l	TM208	र्घ "	<1			
			#				
tert-Butylbenzene	<1 µg/l	TM208	<1	<1			
1,2,4-Trimethylbenzene	<1 µg/l	TM208	# <1	* <1			
1,2,1 11	. 43	200	. #	1			
sec-Butylbenzene	<1 µg/l	TM208	<1	<1			
41. 5. 11.	4 0	T1 1000	#	#			
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			
n-butyiberizerie	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	I IVI∠U0	<i #<="" td=""><td>1</td><td></td><td></td><td> </td></i>	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			
.,=,	µg/i	1111200	#	1			l
Hexachlorobutadiene	<1 µg/l	TM208	<1	<1			
tot Annal man 1 (1) (TANE)	.4 "	T14000	#				
tert-Amyl methyl ether (TAME)	<1 µg/l	TM208	<1 #	<1 #			
Naphthalene	<1 µg/l	TM208	<1	<1			
<u> </u>	F-3··		. #	1			
1,2,3-Trichlorobenzene	<1 µg/l	TM208	<1	<1			
125 Triphlombannons	اا اد	TMOOO	# <1				
1,3,5-Trichlorobenzene	<1 µg/l	TM208	<u> </u>	<1			
		_				1	

Validated

CERTIFICATE OF ANALYSIS

Report Number: Superseded Report: SDG: 200701-67 P20-015 558450 Client Reference: Location: Thorpes Landfill Order Number: Z2085

Table of Results - Appendix

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 Determination of Selected Pesticides (Suite I) in Liquids by GCMS
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 Herbern Water by GCMS
t applicable. I testing (unless si	ubcontracted) performed at ALS Life Sciences Ltd Hawarder	(Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).



ALS

 SDG:
 200701-67
 Client Reference:
 P20-015
 Report Number:
 558450

 Location:
 Thorpes Landfill
 Order Number:
 Z2085
 Superseded Report:

Test Completion Dates

Lab Sample No(s)	22402748	22402761
Customer Sample Ref.	SW1	SW2
,		
AGS Ref.		
Depth	0.00 - 0.00	0.00 - 0.00
Туре	Surface Water	Surface Water
Acid Herbicides by GCMS	07-Jul-2020	07-Jul-2020
Ammonium Low	02-Jul-2020	07-Jul-2020
Anions by Kone (w)	03-Jul-2020	05-Jul-2020
BOD True Total	08-Jul-2020	08-Jul-2020
COD Unfiltered	05-Jul-2020	05-Jul-2020
Conductivity (at 20 deg.C)	03-Jul-2020	03-Jul-2020
Cyanide Comp/Free/Total/Thiocyanate	07-Jul-2020	07-Jul-2020
Dissolved Metals by ICP-MS	06-Jul-2020	06-Jul-2020
Dissolved Oxygen by Probe	03-Jul-2020	03-Jul-2020
Fluoride	03-Jul-2020	03-Jul-2020
Mercury Dissolved	02-Jul-2020	02-Jul-2020
Mineral Oil C10-40 Aqueous (W)	07-Jul-2020	07-Jul-2020
PCB Congeners - Aqueous (W)	08-Jul-2020	08-Jul-2020
Pesticides (Suite I) by GCMS	07-Jul-2020	07-Jul-2020
Pesticides (Suite II) by GCMS	07-Jul-2020	07-Jul-2020
Pesticides (Suite III) by GCMS	09-Jul-2020	09-Jul-2020
pH Value	02-Jul-2020	02-Jul-2020
Phosphate by Kone (w)	02-Jul-2020	02-Jul-2020
Suspended Solids	07-Jul-2020	07-Jul-2020
SVOC MS (W) - Aqueous	07-Jul-2020	05-Jul-2020
VOC MS (W)	06-Jul-2020	06-Jul-2020

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SDG: 200701-67 Client Reference: P20-015 Report Number: 558450 Location: Thorpes Landfill Order Number: Z2085 Superseded Report:

Appendix

General

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
- 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 For representative sub sample from the received sample.
- 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. OTI
- 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 wing ALS (Hawarden) in-house method of transmitted/polarised light microscopy and

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of selections.

ALS (Hawarden) in house 1000 and 1000 are 1000 and 1000 and 1000 are 1000 and 1000 an stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name		
Chrysof le	White Asbestos		
Amosite	Brow nAsbests		
Cro d dolite	Blue Asbe stos		
Fibrous Act nolite	-		
Fib to us Anthop hyll ite	-		
Fibrous Tremolite	-		

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

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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