



**BALLEALLY LANDFILL
BALLEALLY, LUSK, CO. DUBLIN**

ANNUAL ENVIRONMENTAL REPORT 2013

WASTE LICENCE REF. NO. W0009-03

ORIGINAL

MARCH 2014





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Abstract: This report represents the monitoring results for Balleally landfill, Balleally, Lusk, Co. Dublin. This report covers the annual reporting period of 2013 in accordance with Waste Licence Reg. No. W0009-03.



**BALLEALLY LANDFILL
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COUNTY DUBLIN**

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1. INTRODUCTION

1.1 Reporting Period

The reporting period for the AER is 1st January to 31st December 2013.

1.2 Waste Licence

In 2000 Fingal County Council was granted a Waste Licence (Reg. 9-1) to continue operating Balleally Landfill. In July 2001 Fingal County Council applied for a review of this licence. Waste Licence W0009-02 was issued on the 8th January 2003. On the 21st December 2009 the Environmental Protection Agency (EPA) issued Fingal County Council a third revision of the waste licence for Balleally Landfill: Waste Licence W0009-03.

This licence permits the operation of a non-hazardous landfill. In accordance with the requirements of Condition 11.6 of the Waste Licence, an Annual Environmental Report (AER) for the facility must be submitted to the EPA.

1.3 Facility Location

Fingal County Council has responsibility for the management and operation of the facility. The facility is located at:

Balleally Landfill
Balleally Lane
Lusk
Co. Dublin
Tel./Fax. (01) 8431600

National Grid reference 322500 252200.

Drawing DE07-164-03-001 (Figure 1) in Appendix I is a map of the facility and the surrounding locations.

1.4 Licensed Waste Activities at the Facility

Balleally Landfill is situated in Lusk, Co. Dublin. It has been in operation since 1971. Waste activities at the facility include landfill, special handling, a construction and demolition (C&D) recycling facility (which ceased in August 2005 due to capping commitments) and a civic amenity site (which ceased in December 2008 due to capping/operational commitments). Balleally Landfill closed to waste on 11th May 2012.

On January 8th 2003 Fingal County Council was licensed to carry out the following waste activities at Balleally Landfill, Lusk, Co. Dublin subject to twelve conditions.

Licensed waste disposal activities, in accordance with the Third Schedule of the Waste Management Act, 1996.

- | | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Class 1: | Deposit on, in or under land (including landfill). |
| Class 5 | Specially engineered landfill, including placement into lined discrete cells, which are capped and isolated from one another and the environment. |
| Class 10 | Release of waste into a water body (including a seabed insertion). |
| Class 12 | Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule. |

Class 13 Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Licensed waste recovery activities, in accordance with the *Fourth Schedule* of the Waste Management Act, 1996.

Class 2: Recycling or reclamation of organic substances, which are not used as solvents (including composting and other biological transformation processes).

Class 3: Recycling or reclamation of metals and metal compounds.

Class 4: Recycling or reclamation of other inorganic metals.

Class 9: Use of any waste principally as a fuel or other means to generate energy.

Class 11: Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.

Class 13: Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

During 2013 Balleally Landfill continued to receive C&D EWC 17-01-07 and Soil & Stone 17-05-04 (Class 4&11). Gas is collected and converted to electricity (Class 9)

E39 is the appropriate NACE code to describe activities undertaken in Balleally during 2013 – “Remediation activities and other waste management activities.”

1.5 Local Environmental Conditions

The landfill site covers approx. 50 ha in total. The east face of the landfill is bordered by the Dublin-Belfast railway line and to the south by Rogerstown Estuary. See Figure DE07-164-03-001, Appendix I.

The former landfill facility was approx. 40ha. The extension to this facility to the north west of the site (OS National Grid Ref. 3225E 2522N) consists of 6 new engineered lined cell (approx. 10 Ha). The primary objective of its design is to prevent or reduce negative effects on the environment arising from landfilling of waste.

All waste was deposited in a limited working face, covered daily and surrounded by soil bunds. The entire site is surrounded by perimeter berms to reduce the visual impact and to create shelter to minimise the conditions that create windblown litter.

2. ENVIRONMENTAL MONITORING

2.1 Environmental Monitoring

All original monitoring results certificates issued by Alcontrol Laboratories Ltd., for surface water, groundwater, leachate results and from Southern Scientific Services Ltd. for dust have been already included and submitted to the EPA in the four quarterly reports submitted during the reporting period. The original results certificates are not included again in this report. This report only presents summary data.

2.2 EPA Updated Reporting Requirements

FINGAL COUNTY COUNCIL has decided to begin a process to bring the annual environmental report into line with the new EPA 2013 draft reporting requirements "AER Draft Guidance Document: Annual Environmental Report: Standardised Reporting Guidance for all IPPC (Excluding Intensive Agriculture) and Waste Licences". To this end a text document is being employed whereby the 2013 AER will follow the same format as the summary template structure, where currently possible, and include only information as required under the templates. In some instances individual tabs from the AER Workbook are filled out and included as appendices to the text document. This will allow Fingal County Council to streamline the AER process prior to the summary templates becoming mandatory in the coming years.

3. AIR EMISSIONS MONITORING

3.1 Landfill Gas Management – Stack Emissions

As per Schedule D.7.1 of Waste Licence W0009-03 the licensee is required to carry out annual or periodic environmental monitoring of the Gas Combustion Plant/Enclosed Flare. Odour monitoring Ireland personnel conducted the survey on the 16th December 2013.

The monitoring included the gas composition in the flue outlets from the two generators and flare in order to meet the requirements of the waste licence. The monitoring for CO, SO₂, NO_x, and O₂ was carried out *in-situ* using an electrochemical analyser. Temperature, velocity and flow rate were also monitored *in-situ* using a thermocouple and a pilot tube and manometer respectively. Samples were collected for analysis to determine TA Luft Class I, II, III organic substances. In addition, samples were collected for the landfill gas delivery system and determined for chlorine, fluorine and sulphur content.

The results are presented in Table 3.1(a) and the compliance status of emissions from the two generators with respect to the Waste Licence Limit is presented in Table 3.1b:

Table 3.1a: Results of emissions testing of landfill gas plant 2013

Emission reference no:	Parameter/ Substance	Frequency of Monitoring	ELV in licence or any revision thereof	Licence Compliance criteria	Measured value	Unit of measurement	Annual mass load (kg)
BY01, BY03, Flare	volumetric flow	Annual	4500Nm ³ /hr	No mean can exceed the ELV 30min	3125.75		NA
BY01	Carbon monoxide (CO)	Annual	650mg/Nm ³	No mean can exceed the ELV 30min	802.78	mg/Nm ³	7222
BY03	Carbon monoxide (CO)	Annual	6500mg/Nm ³	No mean can exceed the ELV 30min	773.58	mg/Nm ³	6356
Flare 1	Carbon monoxide (CO)	Annual	50mg/Nm ³	No mean can exceed the ELV 30min	13.36	mg/Nm ³	0.86
BY01	Nitrogen oxides (NO _x /NO ₂)	Annual	500mg/Nm ³	No mean can exceed the ELV 30min	328.7	mg/Nm ³	2988
BY03	Nitrogen oxides (NO _x /NO ₂)	Annual	500mg/Nm ³	No mean can exceed the ELV 30min	261.94	mg/Nm ³	2175
Flare 1	Nitrogen oxides (NO _x /NO ₂)	Annual	150mg/Nm ³	No mean can exceed the ELV 30min	105.28	mg/Nm ³	6.85
BY01	TA Luft organic substances class 1	Annual	20mg/Nm ³	No mean can exceed the ELV 30min	0.82	mg/Nm ³	NA

Emission reference no:	Parameter/ Substance	Frequency of Monitoring	ELV in licence or any revision thereof	Licence Compliance criteria	Measured value	Unit of measurement	Annual mass load (kg)
BY03	TA Luft organic substances class 1	Annual	20mg/Nm ³	No mean can exceed the ELV	0.66	mg/Nm ³	NA
BY01	Particulate matter (PM10)	Annual	130mg/Nm ³	No mean can exceed the ELV	21.75	mg/Nm ³	197
BY03	Particulate matter (PM10)	Annual	130mg/Nm ³	No mean can exceed the ELV	21.06	mg/Nm ³	175
Flare 1	Total Organic Carbon (as C)	Annual	10mg/Nm ³	No mean can exceed the ELV	0.92	mg/Nm ³	NA

Table 3.2b: Summary Result of emissions testing of landfill gas plant 2013

ENGINE #	PARAMETER	COMPLIANCE STATUS
BY 01.	FLOW CO NOx TA LUFT CLASS I ORGANICS TA LUFT CLASS II ORGANICS TA LUFT CLASS III ORGANICS HCl HF PARTICULATES	COMPLIES NON COMPLIANCE COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES
BY 03.	FLOW CO NOx TA LUFT CLASS I ORGANICS TA LUFT CLASS II ORGANICS TA LUFT CLASS III ORGANICS HCl HF PARTICULATES	COMPLIES NON COMPLIANCE COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES
FLARE	FLOW CO NOx TA LUFT CLASS I ORGANICS TA LUFT CLASS II ORGANICS TA LUFT CLASS III ORGANICS HCl HF	COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES COMPLIES

NO_x as NO₂, particulates, Total Non Methane Volatile Organic Compounds, Hydrochloric acid and Hydrogen fluoride were low in the gas utilisation engines and within Emission Limit Values set out in Schedule C.5 of the Waste Licence.

CO emission concentration values were above the 650 mg/Nm³ Emission Limit Value established for Waste Licence W0009-03 at BY01 & 03. These gas utilization engines were below the Emission Limit Value (ELV) (1400mg/m³) set for Carbon monoxide in other licences, e.g. W0127-01. Fingal County Council has applied for request for approval to amend the ELV to 1400mg/m³.

3.2 Dust Monitoring

3.2.1 Dust Monitoring

Dust monitoring was carried out at 4 locations in accordance with Schedule D of the licence. The locations of these monitoring points are shown on Figure DE07-164-03-001-(C), Appendix I and presented in Table 3.11 over.

Bergerhoff style gauges were used to determine total dust deposition levels at the site. Four gauges were set up so that the dust jars were at a height of at least 1.5 m above the ground and the jars were set in place during the monthly monitoring events. The samples were submitted to Southern Scientific Ltd. for analysis of total dust contents.

Table 3.3: Dust Monitoring Locations

Location	Easting	Northing
DM1 (PM1)	321 874	252 321
DM2	321 927	252 482
DM3 (PM2)	322 038	252 484
DM4 (PM3)	322 728	252 671

Note = (PM Labels = PM10 monitoring locations)

3.2.2 Monitoring Results

The annual results for total dust deposition are presented in Table 3.12. Results for organic and inorganic dust were included along with total dust results in the quarterly reports.

Table 3.4: Total Dust Deposition Results (mg/m²/day)

Monitoring Locations	April-May 2013	May-July 2013	Aug-Sept-13
D1	551	865	42.5
D2	125	117.7	36.77
D3	10.9	28.5	104.9
D4	27.5	51.3	11.45

3.2.3 Interpretation of Results

An organic and inorganic analysis of dust was performed in addition to the total dust deposition analysis to give a greater understanding of the results.

The results indicate that during the monitoring period all results were under the licence limit of 350 mg/m³/day except at monitoring location D1 where a dust deposition level of 551 mg/m²/day was reported during quarter 2. The probable cause for the exceedances recorded at this monitoring location is due to its close proximity to the local access road and the dust generating potential of passing local traffic.

4. SURFACE WATER MONITORING

This section of the Annual Environmental Report presents the surface water monitoring results.

4.1.1 Introduction

Schedule D of the waste licence requires the monitoring of surface water. The surface water monitoring locations are predominately upstream of the landfill footprint.

4.1.2 Monitoring Locations

The sample locations can be seen in Drawing DE07-164-03-001-(C), Appendix I and are presented in Table 4.1.

Table 4.1: Surface water monitoring locations

Monitoring ID	Easting	Northing
SWFD	322 036	252 412
SWV1	321 980.2	252 187.4
S3	322 985	252 692
S7	322 646	253 213
SW20a	322 897	252 687

SWFD

Discharges to an open drain immediately west of the entrance to the wastewater treatment plant.

SWV1

The surface water discharge at the Western Point Surface Water Outfall – The samples are collected in the open channel immediately upstream of the discharge pipe/cut-off flap.

S3

This sampling point is located on a stream to the north east edge of the landfill site prior to its discharge to the estuary.

S7

This sampling point is located upstream of the site on the stream to the north of the landfill site.

SW20a

This sampling point is located at a drainage ditch to the east of Rogerstown Lane, close to the north-eastern tip of the landfill, currently bunged.

4.1.3 Monitoring Parameters

Environmental samples taken at the site were submitted for analysis in accordance with Table D.5.1 of Waste Licence W0009-03. As required, a monthly visual assessment of all surface water monitoring locations was undertaken.

Chemical analysis of surface water monitoring point S3 is required monthly. It is analysed monthly for quarterly parameters so that the surface water chemistry can be characterised.

These parameters include pH, temperature, conductivity, Chemical Oxygen Demand (COD), ammoniacal nitrogen, Biochemical Oxygen Demand (BOD), total suspended solids, dissolved oxygen and chloride. Chemical analysis of all surface water sampling points is carried out on a quarterly basis for the parameters listed in Table D.5.1 of Waste Licence W0009-03.

4.1.4 Monitoring Results

The visual assessment results and the full surface water analysis datasets as issued by the Laboratory have been previously submitted in the individual quarterly reports during the reporting period.

A summary of the results is presented in Tables 4.2, 4.3 and 4.4 and in the Water_Wastewater tab from AER summary templates.doc in Appendix III also.

4.1.5 Interpretation of Results

The surface water results have been compared to maximum admissible concentrations (MAC) as outlined in the Surface Water Regulations, 1989. It can be seen from the results that over the course of the year, several parameters were elevated above the regulations (Table 4.2, 4.3 & 4.4).

The parameters examined were chosen because they are likely indicators of leachate impact, but they also may demonstrate impact by other sources, such as sewage or the nearby estuary.

For the monthly S3 sample analysis (Table 4.2), COD and Chloride results were below the MAC in all months except during September when the levels were 51.3 mg/l and 331 mg/l respectively. BOD was also under the MAC during the reporting period. Ammoniacal N was above the MAC at S3 in every monthly monitoring event for the year.

Electrical conductivity levels varied throughout the monitoring period with S7 and SW20A recorded below the MAC for the entire period. S3 results were stable in the period Q1, Q2 and Q4 with an elevation above the MAC seen in Q3. SWFD was seen to be above the MAC in Q1 and Q4 however it dropped below the MAC for the period Q2 and was too dry to allow samples taking in Q3. EC in SWV1 was elevated above the MAC for all 4 quarters.

Chloride monitoring shows all results for the monitoring period are under the MAC (250 mg/l Cl).

Results elevated above the COD MAC (40 mg/l) were recorded in SWV1 in Q1 and Q2, in SWFD in Q2, in S3 in September and in SW20a in Q2 to Q4. Results for S7 were all under the MAC for all samples analysed.

With the exception of Q3 and Q4 in SW20A, all BOD samples were under the MAC (5 mg/l) during the monitoring period.

Ammoniacal nitrogen levels are elevated, ranging between <0.2 mg/l to 13.8 mg/l during the reporting period, suggesting potential landfill impact, with SWFD being the only location not showing any elevation in levels during the four quarters.

Control and Trigger levels have been submitted to The Agency for approval through EDEN for Ammoniacal nitrogen at SWV1 and OF1-OF4.

Table 4.2: Surface water monitoring Results

Parameter	Units	MAC	S3											
			Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	July-13	Aug-13	Sept-13	Oct-13	Nov-13	Dec-13
pH (pH units) (Field)	pH	5.5 – 8.5 ¹	8.18	8.15	8.34	8.29	8.03	7.92	7.7	7.68	-	7.84	8.09	7.82
Temperature (°C) (Field)	°C	No abnormal change	8.6	8.3	4.3	11.3	16.6	13.7	18.4	18	14.9	12.8	7	6.8
Ammoniacal Nitrogen as N (mg/L)	mg/l	0.23 ¹	0.382	0.843	0.539	1.08	1.64	0.829	4.67	9.91	12.4	0.889	1.01	1.72
BOD (mg/L)	mg/l	5 ¹	<2	<2	<2	<2	<1	<1	<1	<1	2.49	<1	<1	<1
COD (mg/L)	mg/l	40 ¹	15.5	13.4	12.3	12.8	17.1	19.9	28.8	32	51.3	31.4	14.9	12.9
Total Suspended Solids (mg/l)	mg/l	50 ¹	18.5	<2	7.5	<2	3	7	40.5	4	33.5	3	<2	<2
Dissolved Oxygen (mg/l) (Field)	mg/l	No abnormal change	8.57	8.29	8.75	7.38	9.88	8.15	5.68	5.66	5.4	7.77	9.31	5.5
Chloride (mg/L)	mg/l	250 ¹	46	52.8	67.5	60.1	51.5	45.9	87.8	135	331	61.3	61.7	60.3
Conductivity (at 25 °C) (mS/cm) (Field)	mS/cm	1 ¹	0.72	0.906	0.812	0.885	0.71	0.613	1.086	1.434	2.12	0.677	0.743	0.756

Notes:

- Maximum Admissible Concentration, (MAC) for A1 waters, as classified by the Surface Water Regulations Amended (2012) Regulations
- Shaded cells are those that exceed the relevant MAC

Table 4.3: Surface water monitoring Results

			SWV1	SWV1	SWV1	SWV1	SWFD	SWFD	SWFD	SWFD
Sample Identity	Units	MAC	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
pH	pH	5.5 – 8.5 ¹	7.66	7.38	7.34	7.32	8.05	7.75	-	7.61
Temperature (°C)	°C	No abnormal change	7.5	14.5	17.2	14.3	5.8	14.9	-	13.1
Ammoniacal Nitrogen	mg/l	0.23	13.8	8.62	8.26	11.2	<0.2	<0.2	-	<0.2
BOD mg/L	mg/l	5 ¹	<2	3.46	<1	2.14	<2	2.4	-	<1
COD mg/L	mg/l	40 ¹	68	131	28.3	35.1	17	47	-	38.4
TSS mg/l	mg/l	50 ²	282	562	3.5	10.5	5.5	89	-	24
Dissolved Oxygen mg/l (Field)	mg/l	No abnormal change	6.48	6.43	4.97	4.45	7.81	8.26	-	5.59
Chloride mg/L	mg/l	250 ¹	124	162	194	187	33.1	9.6	-	38.8
Conductivity (Field)	mS/cm	1 ¹	1.882	1.197	1.395	1.610	1.534	0.488	-	1.381
Conductivity (Laboratory)	mS/cm	1 ¹	1.34	1.32	1.46	1.72	1.21	0.423	-	1.41

Notes:

- Maximum Admissible Concentration, (MAC) for A1 waters, as classified by the Surface Water Regulations (1989)
- Shaded cells are those that exceed the relevant MAC

Table 4.4: Surface water monitoring Results, continued

			S7	S7	S7	S7	SW20a	SW20a	SW20a	SW20a
Sample Identity	Units	MAC	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
pH (pH units) (Field)	pH Units	5.5 – 8.51	8.07	7.67	7.38	7.62	7.96	7.88	7.89	7.42
Temperature (°C) (Field)	°C	No abnormal change	4.5	13.8	20.2	13.1	3.9	14.3	19.6	13.4
Ammoniacal Nitrogen as N mg/L	mg/l	0.23 ¹	<0.2	0.265	0.389	<0.2	<0.2	<0.2	0.28	1.35
BOD mg/L	mg/l	5 ¹	<2	2.38	<1	<1	2.36	4.28	173	7.44
COD mg/L	mg/l	40 ¹	13.3	24.1	23.7	27	31.1	58.1	364	111
Total Suspended Solids mg/l	mg/l	50 ²	16.5	9	20.6	13	55	5	107	10
Dissolved Oxygen mg/l (Field)	mg/l	No abnormal change	8.87	8.71	5.68	6.14	8.5	7.7	8.37	1.12
Chloride mg/L	mg/l	250 ¹	51.1	50.9	50.4	56.9	43.3	45	54.1	78.5
Conductivity (at 25 °C) (mS/cm) (Field)	mS/cm	1 ¹	0.738	0.644	0.781	0.646	0.486	0.577	0.662	0.932
Conductivity (at 25 °C) (mS/cm) (Laboratory)	mS/cm	1 ¹	0.637	0.751	0.824	0.679	0.435	0.619	0.712	0.961

Notes:

¹ – Maximum Admissible Concentration, (MAC) for A1 waters, as classified by the Surface Water Regulations (1989)
Shaded cells are those that exceed the relevant MAC

4.1.6 Surface Water Improvements

The ongoing capping programme and final restoration of the landfill will control and contain the breakouts which occasionally occur near the entrance. The shallow vertical barrier surrounding the facility will be completed at the entrance as part of the closure plan. This should help contain any contamination of surface water with leachate.

Remedial works were undertaken during quarter 2, 2009 to protect the surface water drain / ditch in the vicinity of SW20A. A 50 m length of the drain/ditch was excavated and cleaned prior to lining with low-permeability clay and a HDPE liner pinned and stabilised to the underlying clay bank. These two layers of impermeable material serve to minimise inputs into the drainage ditch. The ditch adjacent to SW20a was re-graded with stone fill, which allows the movement of water through the gravel. A manhole access point was built to facilitate visual assessment and the required periodic environmental sampling. There is no flow into the estuary from SW20a as the outfall point is bunged.

Completion of the vertical barrier adjacent to SW20a across the entrance of the facility may mitigate contamination at SW20a.

4.1.7 Additional Surface Water Monitoring

Additional surface water monitoring was carried out on-site. FINGAL COUNTY COUNCIL is conducting additional conductivity readings at monitoring locations SWV1, SWFD and SW20a.

Following a dedicated campaign of sampling during 2013 to establish a dataset, control and trigger levels for Ammoniacal nitrogen were proposed to The Agency for quarterly monitoring at OF1-4 and SWV1.

The results of additional monitoring conducted during 2013 are presented in Table 4.5.

Please note that SWMH7 was previously (up until Quarter 2, 2012) referred to as Manhole SWV1. The 6" Pump Chamber was previously (up until Quarter 2, 2012) referred to as P2 Pump Chamber.

A flow meter was installed adjacent to SWMH7 during the first quarter of 2013. This data assisted in the investigation of contamination at SWV1.

Sample Identity		SWV1	P2 Manhole	MHSW7	6"pump chamber	Leachate chamber
		27/02/2013				
Ammoniacal Nitrogen as N	mg/l	11.8	58.3	54	6.16	156
BOD, unfiltered	mg/l	<2	5.16	3.57	2.24	9.62
COD, unfiltered	mg/l	33.1	120	71.1	62.7	225
Chloride	mg/l	130	165	142	104	304
Conductivity @ 20 deg.C	mS/cm	1.5	2.52	1.96	2.03	4.17
Fluoride	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrogen, Total	mg/l	22.5	71.3	45.2	10.5	173
pH	pH Units	7.81	7.79	7.88	7.83	7.54
Phosphate (ortho) as PO4	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/l	230	398	305	782	501
Suspended solids, Total	mg/l	7.5	26	25.5	45.5	23
Total Oxidised Nitrogen as N	mg/l	8.77	3.14	7.27	3.13	1.65
Mercury (tot.unfilt)	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphorus (tot.unfilt)	µg/l	41.5	226	127	54.2	592

Table 4.5: Additional Surface Water Monitoring Results

Sample Identity		SWV1	P2 MANHOLE	MHSW7	6" PUMP CHAMBER	LEACHATE CHAMBER
		29/01/2013				
Ammoniacal Nitrogen as N	mg/l	13.3	35.8	31.4	6.66	392
BOD, unfiltered	mg/l	2.45	4.61	4.47	2.99	28.9
COD, unfiltered	mg/l	49.4	118	122	69	492
Chloride	mg/l	124	128	120	99.5	636
Conductivity @ 20 deg.C	mS/cm	1.63	2.1	2.05	1.78	5.77
Fluoride	mg/l	<0.5	<0.5	<0.5	<0.5	0.571
Nitrogen, Total	mg/l	21.1	39.9	33.3	10.3	380
pH	pH Units	7.78	7.54	7.7	7.43	7.38
Phosphate (ortho) as PO4	mg/l	<0.02	<0.02	<0.02	<0.02	1.04
Sulphate	mg/l	372	527	533	649	480
Suspended solids, Total	mg/l	121	286	368	162	16.5
Total Oxidised Nitrogen as N	mg/l	6.37	3.06	3.5	2.07	0.118
Mercury (tot.unfilt)	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01

Sample Identity		SWV1	P2 MANHOLE	SWMH7	6" PUMP CHANMBER	LEACHATE CHAMBER
		26/03/2013				
Ammoniacal Nitrogen as N	mg/l	14	35.6	28.7	7.27	335
BOD, unfiltered	mg/l	2.89	4.45	4.47	2.85	26.5
COD, unfiltered	mg/l	108	137	155	52.3	470
Chloride	mg/l	124	146	135	99.2	438
Conductivity @ 20 deg.C	mS/cm	1.6	2.21	2	2.13	4.78
Fluoride	mg/l	<0.5	<0.5	<0.5	<0.5	<2.5
Nitrogen, Total	mg/l	21.7	41.1	35.1	11	321
pH	pH Units	7.81	7.65	7.62	7.7	8.4
Phosphate (ortho) as PO4	mg/l	<0.05	<0.05	<0.05	<0.05	<0.25
Sulphate	mg/l	339	523	491	688	447
Suspended solids, Total	mg/l	259	198	290	19.5	100
Total Oxidised Nitrogen as N	mg/l	7.12	3.72	4.43	2.87	<1
Mercury (tot.unfilt)	µg/l	0.0473	0.0283	0.0537	<0.02	<0.02
Phosphorus (tot.unfilt)	µg/l	377	219	374	57.4	2830

Sample Identity	April				
	SWV1	P2 MANHOLE	SWMH7	6" PUMP CHAMBER	LEACHATE SUMP
	16/04/2013				
Ammoniacal Nitrogen as N (mg/l)	16.9	81.2	55.1	0.276	238
BOD (mg/l)	<2	8.79	4.99	2.49	16.4
Chloride	175	198	178	188	526
COD (mg/l)	50.4	209	137	43.1	328
Electrical Conductivity (at 20 deg.C) (Laboratory) (mS/cm)	1.54	2.44	2.05	1.43	4.92
Fluoride	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrogen, Total	26.3	81.3	61.6	4.58	242
pH	7.93	7.82	7.87	7.88	7.53
Phosphate (ortho) as PO4	<0.05	0.051	<0.05	<0.05	0.664
Sulphate (soluble) (mg/l)	226	322	343	504	437
Suspended solids, Total	33.5	217	175	10	21.5
Total Oxidised Nitrogen as N (mg/l)	8.66	3.11	6.58	2.89	0.544
Mercury (diss.filt)	<0.02	<0.02	<0.02	<0.02	<0.02
Phosphorus (tot.unfilt)	55.5	287	144	48	1250

Sample Identity	May				
	SWV1	P2 MANHOLE *	SWMH7	6" PUMP CHAMBER	LEACHATE SUMP
	30/05/2013				
Ammoniacal Nitrogen as N (mg/l)	4.39	-	75	0.818	238
BOD (mg/l)	<1	-	5.34	3.25	24.8
Chloride	191	-	210	77.1	489
COD (mg/l)	110	-	124	188	362
Electrical Conductivity (at 20 deg.C) (Laboratory) (mS/cm)	1.2	-	1.71	1.04	3.89
Fluoride	0.19	-	0.408	0.27	0.715
Nitrogen, Total	14.3	-	63.7	5.25	317
pH	7.7	-	7.78	7.85	7.65
Phosphate (ortho) as PO4	<0.05	-	<0.05	<0.05	0.056
Sulphate (soluble) (mg/l)	181	-	221	448	259
Suspended solids, Total	366	-	75.5	756	25
Total Oxidised Nitrogen as N (mg/l)	10.3	-	14.1	4.41	2.82
Mercury (diss.filt)	<0.01	-	<0.01	<0.01	<0.01

*Note: P2 Manhole was inaccessible at time of sampling

Sample Identity	June				
	SWV1	P2 MANHOLE	SWMH7	6" PUMP CHAMBER	LEACHATE SUMP
	18/06/2013				
Ammoniacal Nitrogen as N (mg/l)	8.62	12.6	9.79	<0.2	79.5
BOD (mg/l)	3.46	<3	13	2.2	8.76
Chloride	162	54.9	52.4	43.4	192
COD (mg/l)	131	878	1210	49.2	131
Electrical Conductivity (at 20 deg.C) (Laboratory) (mS/cm)	1.32	0.997	0.991	1.02	2.5
Fluoride	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrogen, Total	16.5	18.2	16.3	2.98	76.8
pH	7.93	8.02	7.97	7.66	7.77
Phosphate (ortho) as PO4	0.079	0.084	0.093	0.064	0.152
Sulphate (soluble) (mg/l)	227	280	269	458	439
Suspended solids, Total	562	5600	20600	110	11
Total Oxidised Nitrogen as N (mg/l)	7.06	5.9	7.33	1.67	3.47
Mercury (diss.filt)	<0.01	<0.01	<0.01	<0.01	<0.01

Sample Identity	LEACHATE SUMP	LEACHATE SUMP	P2 MANHOLE	6" PUMP CHAMBER	SWMH7	SWV1
	28/08/2013	26/09/2013				
Conductivity @ 20 deg.C (mS/cm)	11.6	11.3	1.13	2.5	1.87	1.91
Ammoniacal Nitrogen as N (mg/l)	950	888	25.1	55.5	46.1	26.5
Fluoride (mg/l)	0.841	<2.5	<0.5	<0.5	<0.5	<0.5
pH (pH Units)	7.79	7.93	8.02	7.76	7.89	7.78
Sulphate (mg/l)	192	110	130	501	151	163
COD, unfiltered (mg/l)	1500	1750	290	270	80.4	53.8
Chloride (mg/l)	1430	1210	162	205	212	276
Nitrogen, Total (mg/l)	895	906	29.8	67.2	53.5	36.9
Phosphate (ortho) as PO4 (mg/l)	12.7	17.2	0.064	<0.05	0.323	0.213
BOD, unfiltered (mg/l)	100	70.5	15.3	6.64	3.5	2.06
Total Oxidised Nitrogen as N (mg/l)	<0.5	<2	3.55	5.86	7.4	7.69
Suspended solids, Total (mg/l)	101	250	938	736	5.56	6
Mercury (diss.filt) (µg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	0.0107
Mercury (tot.unfilt) (µg/l)	-	<0.02	0.0532	<0.02	<0.02	<0.02
Phosphorus (tot.unfilt) (µg/l)	701	8650	1360	616	261	158

Sample Identity	SWV1	P2 MANHOLE	6" PUMP CHAMBER	SWMH7	LEACHATE SUMP	LEACHATE SUMP	LEACHATE SUMP
	23/10/2013					21/11/2013	09/12/2013
Conductivity @ 20 deg.C (mS/cm)	1.72	2.07	1.3	1.6	10.7	6.12	6.37
Ammoniacal Nitrogen as N (mg/l)	11.2	49.7	0.496	5.26	730	341	344
Fluoride (mg/l)	<0.5	<0.5	<0.5	<0.5	0.609	0.507	<0.5
pH (pH Units)	7.81	7.87	7.91	7.68	8.08	7.89	7.61
Sulphate (mg/l)	354	441	528	327	215	376	293
COD, unfiltered (mg/l)	35.1	113	41.3	32.9	1,030	465	456
Chloride (mg/l)	187	150	61.5	327	1,480	644	752
Nitrogen, Total (mg/l)	18.6	56.8	4.13	16.5	36.9	359	374
Phosphate (ortho) as PO4 (mg/l)	0.059	0.078	0.069	0.05	4.55	-	1.44
BOD, unfiltered (mg/l)	2.14	8.16	<1	<1	<30	33.5	<1
Total Oxidised Nitrogen as N (mg/l)	6.53	4.86	3.24	6.86	2.06	0.287	0.185
Suspended solids, Total (mg/l)	10.5	46	17	6.5	10	122	101
Mercury (diss.filt) (µg/l)	-	-	-	-	-	<0.01	<0.01
Mercury (tot.unfilt) (µg/l)	<0.02	<0.02	<0.02	<0.02	<0.02	-	-
Phosphorus (tot.unfilt) (µg/l)	65.5	248	48.8	24.4	3,560	2,250	-

4.1.8 Conclusions

Surface water results indicate that water quality is impacted by both the landfill (which is both a dilute and disperse landfill and an engineered designed landfill) and the nearby estuary, in terms of salinity sources from the estuary.

Some improvements in surface water quality have been noted through the monitoring period although results over MAC levels are also noted.

FINGAL COUNTY COUNCIL has and continues to undertake additional measures in relation to monitoring and on-site works to mitigate the impact in consultation with the EPA.

5. GROUNDWATER MONITORING

This section of the Annual Environmental Report presents the groundwater monitoring results. Balleally Landfill, unlike other landfills e.g. Dunsink Landfill (Reg. No; W0127-01) did not receive a Technical Amendment to its licence relating to the provisions of Article 12 of the European Communities Environmental Objectives (Groundwater) Regulation 2010. The landfill is located in an estuarine setting and not currently mapped as overlaying a groundwater body. The downgradient groundwater monitoring borehole is in an estuarine setting.

5.1.1 Monitoring Locations

Groundwater monitoring was carried out at the locations shown on Drawing DE07-164-03-001-(C), Appendix I. As part of a previous extension to the landfill a number of the boreholes stipulated in W0009-02 are no longer accessible. During July 2004 a revised monitoring schedule was agreed with the Environmental Protection Agency (EPA) on which the present monitoring is based. Details of the groundwater locations now monitored are presented in Table 5.1.

Monitoring location MB18 is located up-gradient, approximately 535 m north of the landfill on private agricultural land. Access to the monitoring location was not granted during the monitoring period.

Table 5.1: Groundwater Monitoring Locations

Station	Classification	Easting	Northing
MB18	Eastern Up gradient	323 245	252 783
RC3	Western Up gradient	321 906	252 729
MB35	South western Down gradient	322 029	251 906
CD1	Control Drain N/W of Cell 1	322 008	252 356

Location Description

Borehole MB35

This borehole is situated approximately 190 m south of the landfill on the edge of the Inner Rogerstown Estuary, downgradient of the landfill.

Location CD1

The control drain sampling location CD1 is situated approximately 30 m south of Balleally Lane west of the landfill extension. This drain collects groundwater from underneath the newly constructed lined cells.

MB18

This is an upgradient private well of Rogerstown House which lies to the north east of the landfill site along the estuary. No access permitted.

RC3

This upgradient borehole is situated approximately 535 m north of the landfill on private agricultural land.

5.1.2 Monitoring Parameters

Groundwater levels were monitored and a visual assessment was performed on a monthly basis at all groundwater wells. Groundwater monitoring location CD1 is sampled monthly and analysed for quarterly groundwater parameters, listed in Table D.5.1 of the Waste Licence and the results are presented in Table 5.2. MB35 and RC3 are sampled quarterly and analysed for quarterly groundwater parameters, listed in Table D.5.1 of the Waste Licence.

The results of quarterly groundwater monitoring undertaken for CD1, MB35 and RC3 are presented in Table 5.3.

See GW-Soil tab from AER summary templates.doc in Appendix II also.

5.1.3 Interpretation of Results

Table 5.2 presents a summary of the groundwater chemical analysis results.

The groundwater results have been compared to the relevant Interim Guideline Value (IGV) set out in the EPA report '*Towards Setting Guideline Values for the Protection of Groundwater in Ireland*'. It should be noted that the groundwater beneath the landfill is likely to be estuarine in nature and would not generally be considered to be potable water.

Monthly monitoring at CD1 shows that chloride results varied through the reporting period with a generally increasing trend from January to December. Ammoniacal nitrogen, COD and BOD results remained constant through the reporting period.

Quarterly monitoring at groundwater locations indicates that ammoniacal nitrogen levels are lower up gradient at RC3 than down gradient at MB35, suggesting potential landfill impact down gradient.

The quarterly chloride and electrical conductivity plots follow a similar trend to each other. Results from both RC3 and CD1 are broadly similar with elevated chloride and electrical conductivity results found in all samples at MB35.

Both chloride and electrical conductivity levels are lower up-gradient at RC3, increasing slightly on-site at CD1 and then greatly down-gradient at MB35. It is observed that the up gradient chloride levels at RC3 are elevated slightly with the result during Q3 (34.9 mg/L) above the IGV level.

Electrical conductivity results from RC3 are under the IGV level (1 mS/cm) in all quarters. All results for CD1 and MB35 are elevated above the IGV level except at CD1 in Q1.

It is likely that this trend in chloride and electrical conductivity values are indicative of saline water intrusion at location MB35 due to its position within Rogerstown estuary. Saline intrusion may also be influencing CD1 to a degree.

pH levels in all 3 groundwater wells has remained relatively constant over the monitoring period (Figure 3.5).

Table 5.2: Monthly Groundwater Monitoring Results

Parameter	MAC	CD1										
		Feb - 13	Mar - 13	Apr - 13	May - 13	Jun - 13	July - 13	Aug - 13	Sept - 13	Oct - 13	Nov - 13	Dec - 13
pH (pH units) (Field)	≥ 6.5 & ≤ 9.5 ¹	7.3	7.36	7.26	7.01	7.07	7.05	7.13	-	7.46	7.12	7.14
pH (pH units) (Laboratory)	≥ 6.5 & ≤ 9.5 ¹		7.51	-	-	-	7.73	7.54	-	-	7.59	7.71
Temperature (°C) (Field)	25 ¹	10.3	7.1	11.3	17.4	13.4	16.5	16.5	14.5	14.0	10.8	8.2
Ammoniacal Nitrogen (as N mg/l)	0.12 ¹	1.21	1.68	1.89	2.17	2.36	3.08	3.24	2.65	2.93	3.12	2.92
BOD (mg/L)	5 ²	2.54	<2	<2	<1	<1	<1	<1	<1	<1	<1	<1
COD (mg/L)	40 ²	16.3	12.5	13.2	-	14.5	33.3	13.1	14	16.6	15.5	21
Total Suspended Solids (mg/l)	50 ²	<2	2	<2	14.5	2.5	74.5	<2	<2	2.5	5	<2
Dissolved Oxygen (mg/l) (Field)	No abnormal change ¹	2.82	3.76	3.01	2	4.55	4.11	4.18	3.76	4.19	3.68	1.62
Chloride (mg/l)	30 ¹	130	136	172	180	168	183	203	218	176	188	227
Conductivity (mS/cm) (Field)	1 ³	1.374	1.393	1.493	1.26	1.239	1.302	1.434	1.424	1.449	1.428	1.462
Conductivity (25 °C) (mS/cm) (Laboratory)	1 ³	1.3	1.23	1.29	1.25	1.33	1.43	1.5	1.42	1.53	1.4	1.51
Total Organic Carbon (mg/l)	No abnormal change	6.04	-	4.72	5.62	5.69	4.85	5.03	-	6.8	5	7.39

Notes:-¹ = IGV Interim Guideline Values, from EPA, Towards Setting Guideline Values for the Protection of Groundwater in Ireland² = Surface Water Amended (2012) Regulations³ = European Communities Environmental Objectives (Groundwater) Regulations, 2010

Shaded cells are those that exceeded the relevant MAC

Table 5.3: Annual Groundwater Monitoring Results

Groundwater Monitoring 2012		MB35	MB35	MB35	MB35	CD1	CD1	CD1	CD1	RC3	RC3	RC3	RC3
Parameter	MAC	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
pH (Field)	≥ 6.5 & ≤ 9.5 ₁	7.45	7.18	7.28	7.13	7.3	7.01	7.05	7.46	7.49	7.61	7.37	7.38
Temperature (°C) (Field)	25 ¹	10.4	18	17.3	13.6	10.3	17.4	16.5	14.0	9.7	13.9	20.2	14.0
Ammoniacal Nitrogen as N mg/L	0.12 ¹	5.25	5.24	4.97	4.63	1.21	2.17	2.65	2.93	<0.2	<0.2	0.302	0.338
Dissolved Oxygen mg/l (Field)	No abnormal change ¹	3.93	3.98	3.30	3.97	2.82	2.37	4.11	4.19	5.73	0.572	7.55	9.0
Chloride mg/L	30 ¹	14,600	15,500	14,800	16,000	130	180	183	176	22.6	22.1	34.9	22.9
Conductivity (at 25 °C) (mS/cm) (Field)	1 ³	41.9	35.8	34.7	37.6	1.374	1.26	1.302	1.449	0.751	0.572	0.614	0.667
Conductivity (at 25 °C) (mS/cm) (Laboratory)	1 ³	38.2	33.9	36.1	38.4	1.3	1.25	1.42	1.53	0.698	0.585	0.715	0.699
Total Organic Carbon	No abnormal change	6.2	<6	116	490	6.04	5.62	<2	<2	<3	3.19	24.7	130
Suspended solids	50 ²	98	3,960	7.28	7.13	<2	14.5	7.05	7.46	95.5	209	7.37	7.38

Notes:-¹ = IGV Interim Guideline Values, from EPA, Towards Setting Guideline Values for the Protection of Groundwater in Ireland² = Surface Water Amended (2012) Regulations³ = European Communities Environmental Objectives (Groundwater) Regulations, 2010

Shaded cells are those that exceed the relevant MAC

5.1.4 Conclusion

Groundwater results indicate that water quality is impacted by both the landfill (which is both dilute and disperse landfill and an engineered designed landfill) and the nearby estuary (saline intrusion from the estuary). Quarterly monitoring at groundwater locations indicates that ammoniacal nitrogen levels are lower up gradient at RC3 than down gradient at MB35, suggesting potential landfill impact down-gradient.

Groundwater results at MB35 showed impact from saline intrusion in chloride and electrical conductivity results, while saline intrusion may also be influencing CD1 to a degree.

6. FINANCIAL PROVISIONS

Condition 12.2 of the licence requires the establishment of a fund to implement the Restoration and Aftercare Plan. Fingal County Council has provided in its accounts a reserve for the restoration of the site which amounted to €7,005,172 on 31/12/2013

See ELRA tab from AER summary templates.doc in Appendix II.

7. ENVIRONMENTAL MANAGEMENT PROGRAMME

7.1 Environmental Objectives and Targets for 2013

See EMP tab from AER summary templates.doc in Appendix II.

7.2 Environmental Objectives and Targets for 2014

See EMP tab from AER summary templates.doc in Appendix II and Sections 14.1 and Section 14.2.

7.3 Summary of written procedures

There were no new written procedures during the reporting period. The application process for applying for clay tickets was put up online at during quarter 4 2013 and can be found at the following web address:

<http://www.fingalcoco.ie/environment/rubbish-and-recycling/landfills/>

7.4 Communications Programme for Public Information

The Communications Programme for Fingal County Council contains information on Balleally Landfill. The information can roughly be divided into two areas. Background information prior to granting of waste licence, and information concerning the waste licence (W0009-02 & 03). There is also a register of correspondence to and from the Agency, along with the various correspondences relevant to the Licence. This information was updated on a continuous basis. During Q1 a change came about in that correspondence with The Agency was almost exclusively sent through a new online web based system called EDEN. Most correspondence between The Agency and the Licensee may now be accessed through this system.

Environmental Information can be viewed at the following locations:

- At the **Council's Headquarters** between 9.30 a.m. and 12.45 p.m. and 2.00 p.m. and 4.00 p.m. Monday to Friday (excluding public holidays), unless otherwise arranged by prior appointment.
- Permanent facilities for viewing information including a computer to be provided at Balleally Landfill.
- At **Balleally Landfill** by prior appointment with the Landfill Manager.
- Since March 2013, Licence Reports have been submitted through, stored on and available through the Environmental Protection Agency's Website; www.epa.ie or reporting portal, EDEN.

Site Visits

- Site visits to **Balleally Landfill** can be arranged by writing to the Landfill Manager requesting the date and time of the proposed visit and indicating the number of visitors and the purpose of such a visit and whether any presentation is required. The use of cameras and video equipment during the visit must be agreed in advance with Fingal County Council.
- Such requests will be accommodated where possible.

Balleally Landfill Liaison Committee

- Information relating to the restoration and aftercare of Balleally Landfill is presented to the Liaison Committee for comment and adoption.
- Members of the committee during 2013 were:

Mr. John Barrett and Mr Frank Ruigrok of Balleally Residents and Farmers Association.

Cllr Ken Farrell and Cllr. Gerry McGuire.

Mr. John Daly, Mr. Hans Visser and Mr. David Devine - Fingal County Council.

The Committee met four times during 2013. Agendas were set and minutes kept.

7.5 Management Structure

The facility is owned and operated by Fingal County Council. The Environmental Services Department of Fingal County Council manage the landfill facility. Some changes in the management structure occurred during 2013 and are still on-going. A description of the current management structure will be sent to The Agency once it has been finalised.

8. NOISE MONITORING

Noise surveys were undertaken during every quarter of the monitoring period (2013) in order to assess the existing noise emissions from the site and to establish the existing noise environment at potentially sensitive receptors near the site in accordance with Schedule D of Waste Licence W0009-03. Noise monitoring was carried out during daytime hours. The location of noise monitoring points can be seen in Figure DE07-164-03-001-(C), Appendix I and presented in Table 8.1.

Noise measurements were taken for 30 minutes at each location.

Table 8.1: Noise Monitoring Locations

Monitoring Location	Description	Northings	Eastings
NM1	Situated adjacent to the north-eastern boundary of the site.	321 919	252 357
NM2	Situated north east of the site boundary adjacent to Balleally Lane.	321 779	252 415
NM3	Situated East of the landfill 120m along Balleally Lane.	321 459	252 383
NM4	Situated north of the landfill along Rogerstown Lane.	322 604	252 962
NM5	Situated north of the landfill along Rogerstown Lane.	322 970	254 004

Noise emission limits are given in Table C.1 of the waste licence and are reproduced here in Table 8.2.

Table 8.2: Noise Emission Limits

Day dB(A) L_{Aeq} (30 minutes)	Night dB(A) L_{Aeq} (30 minutes)
55	45

8.1.1 Monitoring Results

A summary of the quarterly monitoring results are presented in Table 8.3.

See Noise tab from AER summary templates.doc in Appendix II also.

Table 8.3: Noise Monitoring Results 2013

Location	LAeq			
	Q1	Q2	Q3	Q4
NM1	61	57	61	52
NM2	68	80	68	61
NM3	57	47	60	51
NM4	51	43	47	59
NM5	46	42	47	47

8.1.2 Interpretation of Results

Noise emission limits are presented in Table 8.2 above. There were ten instances during the year during which the EPA limit of 55 dB (A) for daytime noise was breached.

Traffic movements on Balleally and Rogerstown lane are the main contributors to noise levels in the area, which includes noise from trucks travelling to and from the site particularly whilst traversing speed limiting ramps. Noise from site does not have as much impact as traffic movements; however a great number of the traffic movements are related to vehicle movements to the site.

The influence of vehicle movements on the noise results can be seen from the correlation between the L_{Aeq} and the L_{AF10} results. In all cases the L_{Aeq} is closer to the L_{AF10} results than the L_{AF90} results. The L_{AF90} results for all locations are under 55 dB licence limits, while the L_{AF10} results range from 46 to 71 dB(A). This suggests that sound occurring for 10% of the monitoring period, which is greatly influenced by traffic, train, overhead airplane movements (and for this site this would also include bird-scare devices) had a large influence over the final L_{Aeq} levels recorded over the monitoring period and that the background noise, represented by the L_{AF90} is less noisy. The L_{AF10} and L_{AF90} results were presented in each of the quarterly reports.

Noise levels at NM2 during Q2 were particularly high. This was mostly influenced by the passing of 2 fire brigade trucks as well as a period of very heavy traffic within a very short time period. The high L_{Aeq} score is a result therefore of off-site traffic.

9. RESOURCE USAGE

See Resource-Energy tab from AER summary templates.doc in Appendix II.

Resources consumed at Balleally Landfill include diesel fuel, electricity, hydraulic oil and lubricating oil. Table 3.17 presents a summary of the quantities of each used on site for the period of this report. Electricity consumed on site was used for the purpose of heating, lighting, the operation of office equipment and the leachate treatment plant. The largest consumer of electricity was the leachate treatment plant until it was mothballed during 2009. There was a sustained and significant drop in energy usage since 2008 peak.

Diesel and petrol consumption in 2013 was down on 2012 reflecting the fact that a number of items of plant transferred to other depots or off-hired following closure for the acceptance of waste during 2012.

Water Consumption in Balleally was significantly higher in 2013 than 2012. This was due to filling of leachate tanks SBR1 & 2 with water during commissioning tests of the new leachate pipeline to sewer on Rogerstown Lane.

Table 9.1: Summary of resources used on site 2013

Resource	Fingal CoCO	BPS
Electricity	74,906 KWh	814 kWh
Diesel *	103,844 litres	3,100 litres
Petrol*	364litres	NA
Lube Oil	1000 litres (Estimate)	15,850 litres
Water	3742 m3	NA
Off-site Leachate Transport	See Section 9.1.1	NA

*Estimates based on average weekly usage

9.1.1 Off-Site transfer of Leachate

One of the main energy requirements over the lifetime of the facility has been for the treatment and management of leachate. During 2013, a large volume of diesel was used in transporting 35,737 tonnes of leachate 21 km off-site from Balleally Landfill to Ringsend Waste Water Treatment Plant. Previously before the leachate treatment plant was mothballed over 200,000 kWh of electricity was consumed (2008).

There will be an opportunity to increase energy efficiency when leachate is delivered to Portrane Waste Water Treatment Plant. Electricity usage may increase again, through additional pumping required once Technical Amendment for delivery to Portrane Waste Water Treatment Plant is secured. The energy implications of this will be addressed in Fingal County Council's long term proposals for the plant.

Table 9.2: Electricity consumption on site for the period January 2000 to December 2013

Year	Site 900109623	Site 901532286 3706699877	Leachate Treatment Plant 902446909 3968799118	KWHr Total
2013	Ceased	67,450	7,456	74,906
2012	Ceased	58,075	7,423	65,498*
2011	Ceased	59,100*	5,109*	64,209*
2010	Ceased	71,575*	6,460*	78,035*
2009	Ceased	82,950*	101,367*	184,317*
2008	1,832*	91,350*	202,739*	295,921*
2007	1,726*	84,900*	202,669*	289,295*
2006	2,109*	97,600*	73,420*	173,129*
2005	1,033*	115,050*	N/R	115,050*
2004	NR	66,250*	N/R	66,250*
2003	NR	NR	N/R	89,155 @
2002	NR	NR	N/R	76,529 @
2001	NR	NR	N/R	55,453 @
2000	NR	NR	N/R	49,016 @

- * Data derived from Website for three accounts registered to Balleally.
- N/R: Accounts not set up at these times.
- @ Data sourced from AER 2006.

Note:

- 1) There was a significant increase in electricity consumption in the period 2006 – 2008, from previous years as can be observed from Table 3.14. This was attributable to the operation of site leachate treatment plant. The decrease in 2009 was attributable to the mothballing of the leachate treatment plant. The leachate treatment plant remained closed during 2011.
- 2) The electricity consumption increased each year from 2000 (exception 2004) to 2008 and decreased through to 2011. 2011 decrease may in part be due to milder winter (less heating), direr conditions (less pumping) and the move from an automated to manual wheel wash. The decrease in 2011 was largely sustained during 2012. There has been an increase during 2013.

Table 9.3: Equipment and Plant list at Balleally Landfill and quantities 2013

Type of Item	Item	Quantity
Transport	05 D 81788 Isuzu 4X4*	1
	02D76224 mazda	1
	04 D 68456 Ford Fiesta Van*	1
	01 D 72074 Renault Twin Cab Pick Up*	1
	Minidigger	1
Plant	04 D 64948 John Deere 4X4 Tractor*	1
	07 D 7332 Same Tractor*	1
Heavy Plant		1
	Cat excavator 330* / Dozer Package	1
	30 Ton Vibrating Roller*	1
	Diesel H/P power washer and Bowser*	1
Auxiliary Plant	Wacker Plate*	1
	CONSAW*	1
	6 inch pump*	1
	6.5 KVA diesel generator*	1
Equipment	Extrusion welder*	1
	Wedger Seam Welder*	1
	Lyster heater / welder*	1
Survey	Sokkisna level and tripod*	1
	Sokkisna theodolite & Tripod*	1
	NIKON auto level*	1
	Garmen GPS*	1
	GMI gas monitor*	1
	GAS DATA LMSXi	1
Type of Item	Item	Quantity
	GMI FI 2000*	1
	30 Metre steel Tape*	1
	30m dip meter*	1
	Various P.C.s and printers*	1

10.LANDFILL GAS UTILISATION

See Waste tab from AER summary templates.doc in Appendix II.

Landfill gas is actively extracted by means of a series of wells and a collection pipe network in the waste body. The gas is pumped through two main lines to the site utilisation plant. The utilisation plant comprises three generators grouped into two operating units AER1 and AER3. To achieve maximum design power output from the station the inlet gas must contain 50% methane and the minimum available gas volume must be 3,340 m³/hr. At present the 50% methane gas concentration is achieved, but the gas volume is not measured at the landfill.

The power station/utilisation plant operators, Bioverda Power Systems Limited, regulate the inflow of gas to the station in order to achieve the 50% Methane target. The total power output from the station for the period is shown in Tables 10.1 & 10.2.

Currently sufficient gas is being extracted to run 3 engines.

Table 10.1: Electricity output (MWhr) from the on site power station at Balleally Landfill per year 2003-2013

YEAR	ELECTRICITY OUTPUT (MWhr)
2003	30,194
2004	21,636
2005	21,234*
2006	20,529*
2007	23,762
2008	27,117
2009	25,429
2010	21,909
2011	20,534
2012	20,928
2013	16,693

* Corrected data for 2005-2006 reported by Bioverda Power Systems.

Table 10.2: Electricity output (MW) from the on site power station at Balleally Landfill 2013

Month	Combined BY01-BY03 (MWhrs)
January	1,747
February	1,414
March	1,505
April	1,411
May	1,589
June	1,475
July	1,231
August	1,401
September	1,125
October	1,187
November	1,282
December	1,325
Total	16,693

11.ENVIRONMENTAL INCIDENTS & COMPLAINTS

11.1 Reported Incidents

Please See Complaints and Incidents tab from AER summary templates.doc in Appendix II.

12. WASTE SUMMARY

12.1 Total Quantity of Waste Accepted and Deposited

Waste received at Balleally to be disposed of at the landfill is weighed at the weighbridge on entry. Construction and demolition (C&D) material is stockpiled or used immediately in Specified Engineering Works (SEW). The quantity and composition of waste received, disposed of and recovered during the reporting period is detailed in Table 12.1.

Table 12.1: Quantity and composition of waste received at the facility 2013

Table does not include materials used in specified engineering works.

Location & Waste Type	Waste Deposited							
	2006	2007	2008	2009	2010	2011	2012*	2013*
Tipface								
Household	62,056	63,708	50,489	37,789	30,770	24,007	8,406	0
Commercial/Trade	63,819	61,773	46,248	54,093	56,867	60,579	15,667	0
Sewage Sludge	4,623	7,466	5,091	315	361	281	86	0
Industrial Non-Hazardous Sludge	6,825	7,061	6,660	6,363	6,690	6,967	0	0
Civic Amenity				CLOSED	CLOSED	CLOSED	CLOSED	CLOSED
Household	4,891	4,867	3,959					
Local Fly Tipped		62	10					
Total	142,214	144,937	112,457	98,560	94,687	91,834	24,160	0

* Closed to waste other than soil and stones 11th May 2012.

12.2 Remaining Landfill Capacity

As part of the Waste Management Strategy for the Dublin Region an extension to the landfill facility was applied for by reviewing the then current licence Reg. WL 9-2. This was granted on 8th January 2003 (W0009-02) and Priority Construction Ltd. under the supervision RPS-MCOS were appointed to construct 6 No. lined cells at Balleally to provide an additional capacity of 1.29 million m³. Filling of Cell 1 started on 1st April, 2004, see Table 12.2 for information on inputs to date.

Filling of:

- Cell 1 commenced – 1st April, 2004.
- Cell 2 commenced – 8th June, 2004.
- Cell 3 commenced-22nd June, 2005.
- Cell 4 commenced – 6th October, 2006.
- Cell 5 commenced – 23rd August, 2007.
- Cell 6 commenced – 15th December, 2008.
- Cell 5 & 6 Piggybacking – 2009-May 2012.

Table 12.2: Air space reconciliation for the facility for 2013

Table does not include materials used in specified engineering works.

Description	Tonnes	Cubic Metres
Waste Inputs Jan – Mar 2004	48,802	61,003
Landfill Extension	Tonnes	Cubic Metres
Total Inputs Apr-Dec 2004	145,223.10	
Total Inputs Jan-Dec 2005	131,236.81	
Total Inputs Jan-Dec 2006	142,215.75	
Total Inputs Jan-Dec 2007	144,937.00	
Total Inputs Jan-Dec 2008	112,457.00	
Total Inputs Jan-Dec 2009	98,560.00	
Total Inputs Jan-Dec 2010	96,459.28	
Total Inputs Jan-Dec 2011	91,834.47	
Total Inputs Jan-Dec 2012	24,159.92	
Total Inputs Jan-Dec 2013	0	
TOTAL	987,083.33	1,233,854
LICENCE LIMIT WL0009-03	1,032,000	1,290,000
Remaining Licence Limit	44,916.67	56,146

Waste density of 0.8 tonnes/m³ used for above calculations

Void Space: Total Filled + Total Remaining
1,290,000m³ = 1,233,854m³ + 56,146m³

12.2.1 Balleally Landfill - Short Term Extension

The extension to the facility is approximately 98,200 m² (surface area) with composite liner system and leachate collection system including leachate collection chambers. It provided for approximately 1.04 million tonnes of waste.

Table 12.3: Void Space at Balleally Landfill Extension

Cell	Plan Area m ²	Surface Area m ²	Void Space m ³	Void Space Tonnes
Cell 1	15000	18000	193,373.00	164,367.05
Cell 2	18200	19000	306,338.00	260,387.30
Cell 3	13600	14300	204,001.00	173,400.85
Cell 4	15300	16500	265,933.00	226,043.05
Cell 5	16200	17300	283,991.00	241,392.35
Cell 6	12200	13100	160,101.00	136,085.85
Total	90,500	98,200	1,413,737	1,201,676.45

Assumptions:

- Geosynthetic Capping of 1.06 m.
- 10% Daily cover to be absorbed by settlement
- Waste density of 0.85 tonnes/ m³

The remaining capacity in the landfill was surveyed in January 2012. See Table 2.4. for remaining capacity at the end of 2012. The landfill closed to waste on 11th May 2012.

Table 12.4: Remaining void space at beginning of January 2012 and upon closure May 2012 (From Revised Survey of Remaining Void Space; Jan 2012)

Void Space	Remaining Void Space (tonnes)
JAN 2012	26,374
May 2012	2,214

For tonnages of soil and stone and construction and demolition material used on site during 2013 in landfill restoration, see Resource-Energy tab from AER summary templates.doc in Appendix II.

13.METEOROLOGICAL MONITORING

Condition 8 and Schedule D.6.1 of Waste Licence W0009-03 require daily monitoring of precipitation volume, temperature (max. /min.), wind force and direction, and atmospheric pressure.

July and August were warmest with the highest maximum mean monthly temperatures. Monthly Rainfall was highest during February and October when highest volumes of rainfall were registered. The site was predominantly affected by south westerly winds. Evaporation and potential evapo-transpiration were highest in May and June.

Condition 8 and Schedule D.6.1 of Waste Licence W0009-03 require daily monitoring of precipitation volume, temperature (max. /min.), wind force and direction, and atmospheric pressure.

Meteorological data is obtained from Met Eireann for Dublin Airport's Met. Station. Please see Table 13.1 below for monthly averages of this data. Other meteorological parameters and daily data are available to view in Fingal County Hall and on Site.

Table 13.1: Average Monthly Data for meteorological parameters: Dublin Airport (Source Met Eireann).

Year	Month	Mean Temperature (C)	Mean Maximum Temperature (C)	Mean Minimum Temperature (C)	Rainfall (mm)	Mean MSL Pressure (hpa)
2013	1	4.9	7.8	1.9	94.4	1009.9
2013	2	4.3	7.2	1.4	47.3	1018.3
2013	3	3.2	6.0	0.4	85.5	1009.2
2013	4	7.0	11.1	2.8	40.1	1013.3
2013	5	10.2	14.5	5.8	45.8	1012.1
2013	6	12.9	17.9	7.9	60.8	1017.8
2013	7	16.8	21.9	11.7	68.8	1019.2
2013	8	15.7	19.8	11.6	48.5	1016.0
2013	9	13.2	16.9	9.5	35.1	1015.3
2013	10	11.8	14.7	8.8	127.8	1007.9
2013	11	6.3	9.2	3.4	26.6	1018.3
2013	12	7.0	10.0	4.0	83.2	1007.1

14.SITE DEVELOPMENT WORKS

14.1 Work carried out in the reporting period 2013

Table 14.1: Work carried out during 2013

Objective/ Target	Description	Timescale
Objective 1	To minimise environmental impact on the immediate environment	
Target 1	To determine mitigation measures to deal with surface water contamination at SW20a. Some work completed on ditch by SW20a to separate contaminated water from local drainage. Ongoing tankering of liquid from this point.	Ongoing
Target 2	To continue to investigate mitigation measures for the prevention of leachate breakout along the southern boundary of the landfill. Monthly Monitoring of outfalls from Southern Boundary commenced August 2012.	Ongoing.
Target 3	Apply for Technical Amendment of licence to allow leachate discharge to sewer.	Ongoing.
Target 4	To investigate sources of SW contamination in landfill and propose mitigation measures to <i>The Agency</i> . Flow Meter to be installed. Continued monthly monitoring of catchment of SWV1 and of OF1 to OF4.	Complete.
Target 5	Apply for approval to increase Emission Limit Value for CO emissions from engine stacks.	Feb-Sept 2013.
Objective 2	Restoration of the facility.	
Target 1	Grass seeding of capped areas ongoing;	Ongoing
Target 2	Examine the completion of a shallow vertical barrier at the northern boundary for implementation during restoration of site. No Progress to report.	Ongoing

Objective/ Target	Description	Timescale
Target 3	Address Flooding Issue at Entrance. On and Off sets for pumps at P2 changed and laying of new drainage levels opposite entrance partially dealt with this.	Following closure of the landfill for clay.
Target 4	To provide for Leachate Recirculation in Cells 5 & 6 and Piggybacked area. Infrastructure installed.	Ongoing.
Target 5	Fencing along Southern and Eastern Boundary	Complete

14.2 Works for next reporting period (2014)

Table 14.2: Works to be carried out during 2014

Objective/ Target	Description	Timescale
Objective 1	To minimise environmental impact on the immediate environment	
Target 1	To Commence Leachate Recirculation in Cells 5 & 6.	2015.
Target 2	Close out Application for Technical Amendment for leachate treatment plant for connection to sewer.	2014.
Target 3	To prepare final contours, capping and surface water plan for former Civic Amenity Area, offices and entrance area. Specified Engineering Works to be installed in this regard.	2014.
Target 4	To complete GCL Capping in remaining areas of Phase 6, 8, 9 & 12.	2014.
Target 5	To determine final mitigation measures to deal with surface water contamination at SW20a and propose Specified Engineering Works if required.	2014.
Target 6	To continue to monitor surface water outfalls and leachate levels along the southern boundary of the landfill to determine if leachate breakout is prevalent and further proposals required.	Ongoing.

Objective/ Target	Description	Timescale
Target 7	Plans to decommission some foul lines around Gas Utilisation Plant.	2014
Objective 2	Restoration of the facility	
Target 1	Examine the completion of a shallow vertical barrier at the northern boundary during restoration of site.	2014
Target 2	Address remaining flooding issue at Entrance.	2015

14.3 Progress on Site Restoration

The Restoration and Aftercare Plan for the landfill was submitted in July 2003 as per condition 4.1. This plan sets out a framework to successfully restore Balleally Landfill to a condition suitable for use as an amenity for the general public. The plan has been prepared in accordance with the EPA Landfill manual 'Landfill Restoration and Aftercare' (1999), the Council Directive (1999/31/EC) on the Landfill of Waste and Waste Licence W0009-02 & -03. Restoration is being undertaken at Balleally Landfill using a phased approach due to the size of the site and seasonal constraints. On completion of restoration in each phase, the aftercare plan to establish and maintain the after use of the site shall be implemented.

Capping of the site is as per Condition 4.3. The geotextile alternative was investigated and agreed in early 2004 with the EPA. This decreased the number of vehicle movements required for importing soil for the final cap.

Figure 2, Appendix 1, indicates the agreed phases for the capping and restoration of Balleally Landfill. The phasing provides for the restoration of the original landfill initially, and then the landfill extension area.

The total area for capping is 46 Hectares approx.

Between 2004 and December 2012, approx 42 Hectares were capped. During 2013, an additional 2 Hectares approx (GCL) were capped – Some of this included necessary overlap between LLDPE and GCL. The majority of the "Old Landfill" and the new landfill is now 100% capped, see Figure 3 Appendix 1. A total of 43 Hectares is now capped. This equates to 93% of the entire landfill area to be capped. The remaining capping area is the old Landfill (3ha approx), which does not include any overlap between LLDPE and GCL areas.

Inert waste to be used for cover/restoration material at the facility

An estimate of soils required for the final capping of the landfill is as follows:

- Expected subsoil tonnages for restoration = 1,180,000 tonnes
- Expected topsoil tonnages for restoration = 580,000 tonnes

This estimate does not take into account any soil requirements for levelling off the contours prior to the placement of the final capping. However, it is expected that material on the landfill site (berms etc.) will be used which will limit the importation of soil/clay.

See below statistics of capping programme:

Start Date of Capping Programme: May 2004
Progress as of 31st December 2013: 43 ha

The final capping profile is made up of:

1. Topsoil layer of 300 mm thickness.
2. Subsoil layer of 700 mm thickness.
3. Geocomposite Drainage Layer (GDL).
4. Geosynthetic Clay Liner (GCL) / LLDPE membrane liner on New Cells.
5. Geocomposite Gas Collection (GGCL).

See Appendix I, Figures 2 and 3 indicating the areas capped to 2013 and the proposed areas to be capped in 2014.

14.4 Annual Topographical Survey

Condition 8.5.1 of WL W0009-03 requires an annual Topographical Survey to be undertaken in Balleally Landfill. The last full topographic survey was completed on 15/11/2013 and is available to view on site or in Fingal County Hall.

14.5 Slope Stability

As required under Licence Condition 8.8.1. a slope stability survey was undertaken in Balleally Landfill in November 2013 and was submitted to *The Agency* through EDEN. .

The conclusions and recommendations in the survey report are noted and will be implemented.

15. LEACHATE MONITORING

Leachate monitoring was carried out at the monitoring locations as defined in Schedule D of Waste Licence W0009-03 and shown on Figure DE07-164-03-001-(C), Appendix I.

A number of wells were noted to be destroyed or were inaccessible with the result that no sample was obtained for analysis, namely:- LMW2 (covered with soil), LMW8 (blocked on one occasion), LMW15 (destroyed), and LMW 16 (inaccessible due to height of casing). During 2011 additional Leachate wells were drilled to facilitate areas where wells had been destroyed or were deemed to be inaccessible. These wells are shown in shown on Figure DE07-164-03-001-(C), Appendix I.

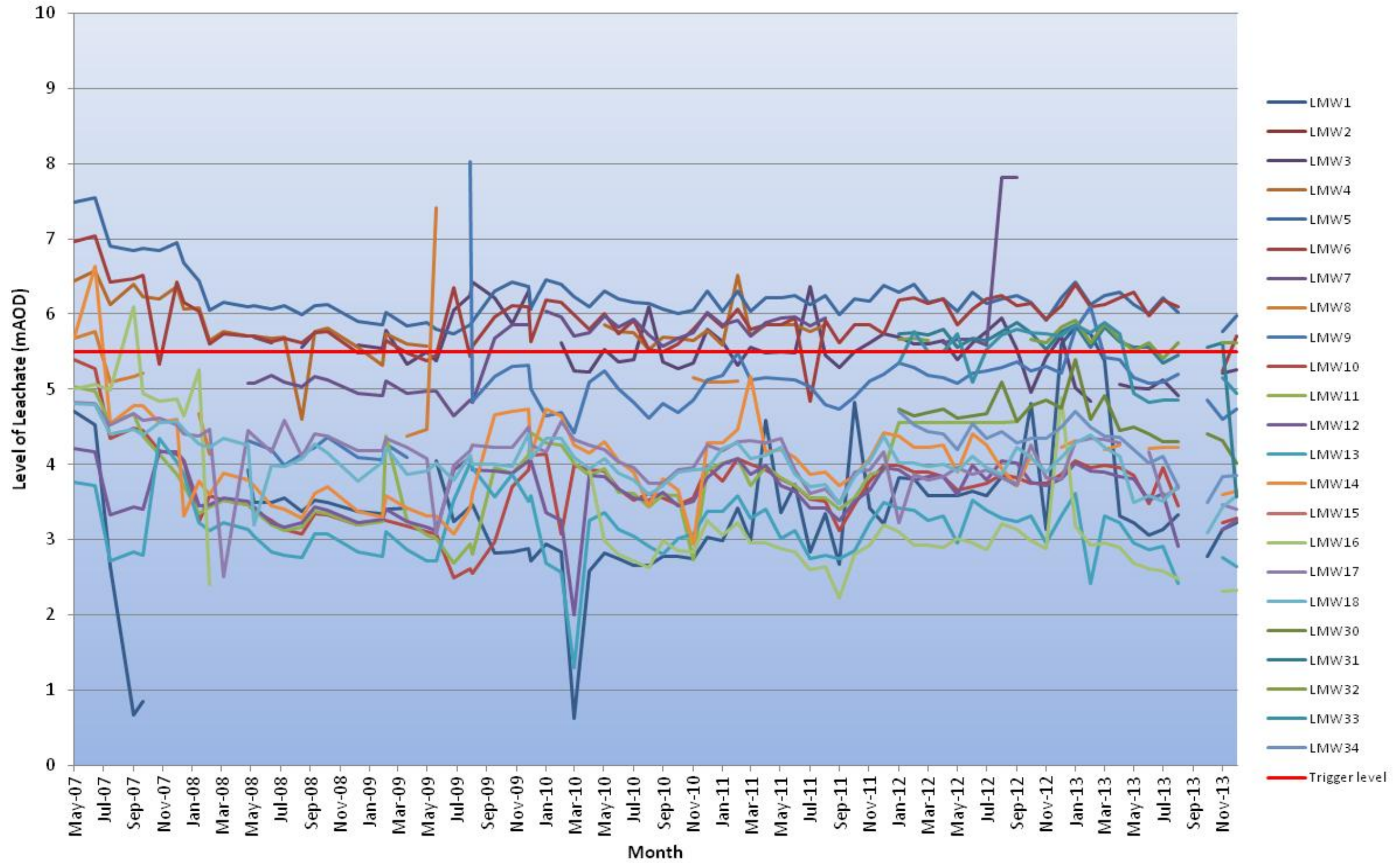
15.1.1 Monitoring Parameters

Waste Licence W0009-03 requires that a visual assessment is undertaken and the leachate level in every second well is monitored and recorded monthly. Chemical analysis of leachate samples is taken annually.

15.1.2 Monitoring Results

Leachate level results since May 2007 are presented in Figure 15.1.

Figure 15.1: Monthly Level of Leachate Recorded in the landfill



15.1.3 Interpretation of leachate level Results

A trigger level of 5.5 meters above ordnance datum (m AOD) for wells between LMW1 to LMW18 has been established to indicate when there is too high a head of liquid in the landfill. Leachate was recorded above the trigger level at a number of locations, highlighted in Figure 15.1.

From the results it can be seen that by the end of the reporting period (December 2013) most leachate wells were under the 5.5 m AOD trigger level apart from LMW5 LMW6 and LMW32 which were above the trigger for the year.

It is observed that P1A and P1B are typically fully open and thus the northern and southern leachate lines are fully open. Therefore leachate should not be building up in the body of the landfill.

Nevertheless, in accordance with the ERP trigger levels, visual assessments are conducted on these slopes and there is no evidence of large scale leachate break-out.

15.1.4 Leachate Quality

This section presents a summary of the chemical results. The results for leachate monitoring are presented in Table 15.1.

The pumping chamber receives leachate from a number of different locations on-site. As it collects leachate from a number of different areas over the site it is representative of general leachate quality over a greater time period than the individual grab samples from each of the leachate wells. The pumping chamber collects leachate from:

- Pipe 1A – New cells
- Pipe 1B – Old northern boundary
- Pipe 1C – Southern boundary

The results of leachate sampled from the pumping chamber are comparable with the results obtained from the individual wells on the landfill.

It is noted that the results for the southern boundary are slightly more concentrated, than the results along the eastern boundary. In general, the reported concentrations for the leachate sampled are consistent with that of leachate sampled from large landfills and in line with the levels presented in the Environmental Protection Agency (EPA) Landfill Manual on Landfill Site Design (2000).

Table 15.1: Annual Leachate Monitoring Results

Sample Description	Units	LMW5	LMW6	LMW7	LMW9	LMW10	LMW12	LMW13	LMW30	LMW31	LMW32	LMW33
Ammoniacal Nitrogen as N	mg/l	707	43.7	402	536	459	36.5	144	122	76.4	39.5	5.99
Conductivity @ 20 deg.C	mS/cm	9.88	1.17	3.89	7.3	7.78	0.71	4.32	3.76	3.27	2.53	2
Fluoride	mg/l	0.651	<0.5	0.524	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphate	mg/l	<2	73	<2	<2	<2	33.8	<2	104	<2	359	473
Chloride	mg/l	1510	101	496	695	1100	33	519	543	526	194	76.2
COD, unfiltered	mg/l	1760	556	400	750	676	592	330	2230	602	261	59.7
Cyanide, Total	mg/l	0.077	<0.05	0.059	<0.05	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05
BOD, unfiltered	mg/l	94.1	22.4	8.04	55.7	<15	34.3	11.8	22.9	16.7	13.6	<1.88
Phosphate (ortho) as P	mg/l	0.0388	<0.02	<0.02	0.029	<0.02	2.01	<0.02	<0.02	<0.02	<0.02	<0.02
Total Oxidised Nitrogen as N	mg/l	<0.1	0.946	<0.1	<0.1	0.102	0.122	0.649	<0.1	<0.1	<0.1	<0.1
Boron Ultra low	µg/l	73.2	229	1240	4160	423	111	1880	925	553	587	183
Mercury (diss.filt)	µg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium Ultra low	µg/l	<0.01	0.0109	0.0741	0.125	0.0136	0.0779	0.0581	0.0731	0.066	0.0752	0.086
Calcium (diss.filt)	mg/l	159	162	319	124	141	80.8	116	308	346	420	463
Chromium Ultra low	µg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Sodium (diss.filt)	mg/l	1390	73.4	396	690	950	16.9	376	442	331	160	71.2
Copper Ultra low	µg/l	0.164	0.75	2.28	2.83	0.613	3.45	2.32	2.38	1.78	1.51	1.66
Magnesium (diss.filt)	mg/l	128	12.6	84.4	143	139	6.08	72	75.2	62.9	54	53.9
Iron Ultra low	µg/l	<70	143	231	886	94.1	599	419	2500	2330	134	<70
Potassium (diss.filt)	mg/l	487	32.2	130	339	381	21.6	194	89.9	50.2	62.1	8.73
Manganese Ultra low	µg/l	23.7	1770	2180	260	33.6	860	469	6370	9570	4570	10200
Nickel Ultra low	µg/l	2.28	16.9	23.6	19.4	3.86	6.52	22	35.1	13.7	9.21	1.94
Lead Ultra low	µg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.171	<0.1	<0.1	<0.1
Zinc Ultra low	µg/l	<1	3.98	2.49	1.2	2.35	10.6	41.3	1.77	5.62	13.1	8.59

15.1.5 Volume of Leachate transported off-site for treatment:

A water balance for the reporting period has been prepared and is included as Table 15.2. The water balance calculation is derived from EPA Landfill Manuals "Landfill Site Design" (EPA, 2000; p59) and indicates that there was 22,168 m³ of Leachate Produced at the Landfill. Infiltration rate used was 5% for capped areas and 25% for temporary capped areas.

Leachate tankered off-site during 2013 was recorded at 35,737m³. The volume of leachate tankered off-site was greater than estimated in water balance, but some contaminated water pumped to plant may account for this.

See Waste tab from AER summary templates.doc in Appendix II.

15.1.6 Bund/Pipeline Testing

Condition 3.11 of W0009-03 governs Tank and Drum Storage Areas and the need for testing of same. All tanks are rendered impervious to the materials stored therein as per condition 3.11.1. Condition 3.11.2 stipulates that all tank and drum storage areas are to be banded either locally or remotely, to a volume not less than the greater of the following:

- (a) 110% of the capacity of the largest tank or drum within the banded area; or
- (b) 25% of the total volume of substance which could be stored within the banded area.

There are two areas within the landfill (Landfill Gas Utilisation Plant & Leachate Treatment Plant) that are remotely banded in the sense that as per Condition 3.11.3 the drainage from these banded areas can be diverted for collection and safe disposal – back through the leachate treatment plant and through the leachate storage and treatment tanks tanks.

The Leachate storage and treatment tanks are inspected by Irish Industrial Tanks Limited. As per condition 3.11.5 The Leachate and Storage Tanks are inspected at least once every three years.

Table 15.2: Summary Results of Containment Structure Integrity Tests

Bund/Containment structure ID	Specify Other type	Product containment	Actual capacity	Type of integrity test	Test date	Integrity reports maintained on site?	Results of test	Scheduled date for retest
Treated Leachate Balancing Tank	Tri Fusion Glass Lined Tank	Leachate	341M3	Structural assessment and Liquid Integrity	19/11/2013	Yes	Pass	Nov-14
Sequence Batch Reactor	Tri Fusion Glass Lined Tank	Leachate	2129M3	Structural assessment	19/11/2013	Yes	Pass	Nov-14
Raw Leachate Storage Tank No 1	Tri Fusion Glass Lined Tank	Leachate	1043M3	Structural assessment	19/11/2013	Yes	Pass	Nov-14
Raw Leachate Storage Tank No 2	Tri Fusion Glass	Leachate	1043M3	Structural assessment	19/11/2013	Yes	Pass	Nov-14

Bund/Containment structure ID	Specify Other type	Product containment	Actual capacity	Type of integrity test	Test date	Integrity reports maintained on site?	Results of test	Scheduled date for retest
	Lined Tank			nt				
Picket Fence Thickener	Tri Fusion Glass Lined Tank	Leachate	115M3	Structural assessment	19/11/2013	Yes	Pass	Nov-14
Balance Tank	Tri Fusion Glass Lined Tank	Leachate	1043M3	Structural assessment	19/11/2013	Yes	Pass	Nov-14
Intermediate Leachate Storage Tank	Tri Fusion Glass Lined Tank	Leachate	341M3	Structural assessment	19/11/2013	Yes	Pass	Nov-14

There are mobile bunds on site but they are not in use or intended for future use.

15.1.7 Leachate Treatment Plant

Operation of the leachate treatment plant was suspended during Q2, 2009. During 2009, FINGAL COUNTY COUNCIL applied for a full waste licence review for the site. The waste licence review was seeking to remove Chemical Oxygen Demand (COD) as a leachate treatment plant parameter and to raise the ELV levels for some of the other leachate treatment plant parameters. This application was withdrawn and FINGAL COUNTY COUNCIL sought a technical amendment to existing licence, for discharge of leachate to sewer leading to Portraine Waste Water Treatment Plant

In the interim period the leachate treatment plant operation will remain suspended and leachate will continue to be tankered off-site.

15.1.8 Water Balance Calculation

See table 15.2 for water balance calculation.

Table 15.3: Water Balance Calculation for Balleally Landfill 01/01/2013 – 31/12/2013

Month	Leachate Tankered Offsite	Water Balance Calculation	Rainfall	Rainfall	old landfill		Capped	IR	Temp	IR	new landfill		Capped	Temp	Active	sewage sludge	sewage sludges	Waste	Absorptive Capacity	
	M3	M3	mm	M		m2	m2	%	m2	%	acres	m2	m2	m2	m2	tonnes	m3	Tonnes	m3/tonne	
January	5737	2739	94.4	0.0944		340028	310028	5	30000	25		120359	120359	0	0				0.025	
February	5262	1373	47.3	0.0473		340028	310028	5	30000	25		120359	120359	0	0				0.025	
March	4610	2481	85.5	0.0855		340028	310028	5	30000	25		120359	120359	0	0				0.025	
April	3574	1164	40.1	0.0401		340028	310028	5	30000	25		120359	120359	0	0				0.025	
May	3120	1329	45.8	0.0458		340028	310028	5	30000	25		120359	120359	0	0				0.025	
June	2430	1764	60.8	0.0608		340028	310028	5	30000	25		120359	120359	0	0				0.025	
July	930	1997	68.8	0.0688		340028	310028	5	30000	25		120359	120359	0	0				0.025	
August	1380	1407	48.5	0.0485		340028	310028	5	30000	25		120359	120359	0	0				0.025	
September	2991	1019	35.1	0.0351		340028	310028	5	30000	25		120359	120359	0	0				0.025	
October	2760	3709	127.8	0.1278		340028	310028	5	30000	25		120359	120359	0	0				0.025	
November	1920	772	26.6	0.0266		340028	310028	5	30000	25		120359	120359	0	0				0.025	
December	1023	2414	83.2	0.0832		340028	310028	5	30000	25		120359	120359	0	0				0.025	
	35737	22168	763.9	0.7639							22					0	0	0		

Old Landfill Capped + New Landfill Capped + Old Landfill Temp Cap.

Leachate Produced Landfill = $\{(.7639 * 310028 *.05) + (.7639 * 120359*.05) + (.7639 * 30000 * .25)\}$

Leachate Produced Landfill m3 **22,16834,088**
Leachate Tankered Off-Site 35,737

16.LANDFILL GAS MONITORING

The licence requires that the licensee conducts monthly monitoring in perimeter gas boreholes/vents/wells in order to detect off-site gas migration. The location of the monitoring positions is shown on Figure DE07-164-03-001-(C), Appendix I.

The locations are presented in Table 16.1. In addition to the perimeter Landfill Gas Monitoring locations two leachate monitoring wells (chosen at random) from each of the southern and eastern boundaries LMW1-LMW18 and two manholes MHL33 and MHL40 (Table 3.14) along Balleally Lane were also monitored. LMW1 – LMW18 boreholes are located on the landfill side of the vertical barrier.

It should be noted that boreholes LMW1-18 are leachate sampling wells and not specifically designed for monitoring landfill gas. See Tables 16.1, 16.2 and 16.3 for grid references.

Table 16.1: Gas Monitoring Locations

Borehole ID	Borehole Description	Easting	Northing	Depth of Borehole (m)	Top of casing level	Ground Level (m O.D.)	Sample
GA1	Northern corner of Cell 1	321 767	252 159	6	4.155	4.0	Perimeter Borehole
GA2	Western corner of Cell 1	321 986	252 383	6	4.314	3.3	Perimeter Borehole
GA3	Northern boundary of Cell 2	322 070	252 414	10	7.076	7.5	Perimeter Borehole
GA4	Northern boundary of Cell 3	322 170	252 415	10	7.370	7.66	Perimeter Borehole
GA5	Northern boundary of Cell 4	322 291	252 440	15	12.287	14.3	Perimeter Borehole
GA6	Northern boundary of Cell 5	322 389	252 467	15	11.864	13.3	Perimeter Borehole
GA7	Northern boundary of Cell 6	322 490	252 498	10	10.749	9.57	Perimeter Borehole
GA8	Northern boundary beside exit to landfill	322 614	252 542	6	5.503	4.981	Perimeter Borehole
GA9	North of cell 1 beside gate	321 942	252 547	-	-	-	Perimeter Borehole
GA10	Residents land opposite gate	321 942	252 393	-	-	-	Outside Perimeter Borehole
GA11	Lands opposite entrance/exit between cell 6 and LMW18	322 039	252 433	-	-	-	Outside Perimeter Borehole
GA12	Lands opposite entrance/exit	322 669	252 575	-	-	-	Outside Perimeter Borehole
GA13	Lands opposite entrance/exit adjacent to SW20a	322 848	252 666	-	-	-	Outside Perimeter Borehole

Table 16.2: Gas Monitoring Locations (outside waste)

Manhole ID	Manhole ID	Easting	Northing
MH L33	Across from Cell 1	322 001	252 416
MH L40	Across from Cell 6	322 654	252 566

Table 16.3: Leachate/Gas Monitoring Locations

Borehole ID	Easting	Northing	Sample
LMW1	322 006	252 143	Leachate/Gas
LMW2	322 077	252 115	Leachate/Gas
LMW3	322 169	252 084	Leachate/Gas
LMW4	322 271	252 053	Leachate/Gas
LMW5	322 368	252 022	Leachate/Gas
LMW6	322 461	251 991	Leachate/Gas
LMW7	322 559	251 958	Leachate/Gas
LMW8	322 651	251 933	Leachate/Gas
LMW9	322 749	251 903	Leachate/Gas
LMW10	322 844	251 877	Leachate/Gas
LMW11	322 846	251 974	Leachate/Gas
LMW12	322 853	252 074	Leachate/Gas
LMW13	322 859	252 175	Leachate/Gas
LMW14	322 863	252 274	Leachate/Gas
LMW15	322 873	252 375	Leachate/Gas
LMW16	322 880	252 473	Leachate/Gas
LMW17	322 885	252 572	Leachate/Gas
LMW18	322 890	252 657	Leachate/Gas
LMW30	322086.2	252111.2	Leachate/Gas
LMW31	322275.4	252055.5	Leachate/Gas
LMW32	322562.5	251959.1	Leachate/Gas
LMW33	322654.7	251932.7	Leachate/Gas
LMW34	322877.6	252375.6	Leachate/Gas

16.1.1 Monitoring Parameters

In accordance with Table D.2.1 of the Waste Licence, gas wells were monitored for Methane (CH₄), Carbon Dioxide (CO₂), Oxygen (O₂) and atmospheric pressure. It should be noted that the boreholes along the estuary were designed and constructed to sample leachate and groundwater and not specifically landfill gas.

16.1.2 Monitoring Results

The Landfill Gas (LFG) monitoring results are summarised in the 2013 quarterly reports submitted to the agency.

16.1.3 Interpretation of Results

CH₄ results for the 2013 monitoring period were generally below the 1% trigger level. However, results elevated above the trigger level for CH₄ at location GA5 are noted in January 2013. GA5 is situated along the northern side of the landfill. Results at GA5 were below the trigger level for all other months during 2013.

It was seen on a number of occasions across the monitoring locations that the CO₂ level results were elevated above the 1.5% trigger level.

High concentrations of CO₂ can occur naturally at shallow depths of up to 2 m due to microbial activity associated with the roots of many types of vegetation.

No CH₄ was recorded above the trigger levels at gas wells adjacent to offsite receptors, GA10 or GA11 during the reporting period.

16.1.4 Conclusion

Apart from the one occasion, CH₄ levels are below the trigger level throughout the rest of the monitoring period.

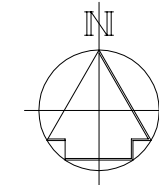
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APPENDIX I

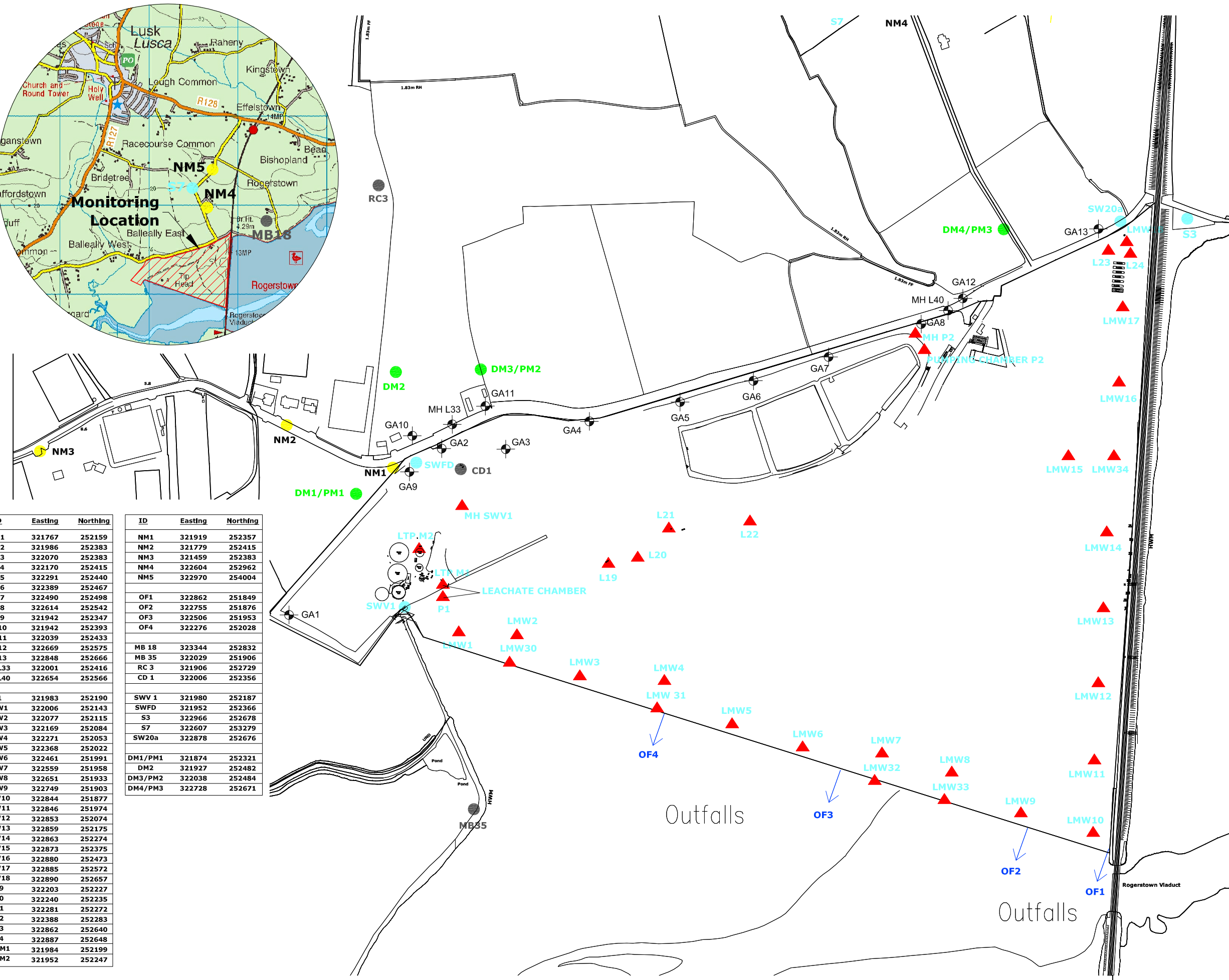
DRAWINGS



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- KEY**
- NSL1 Noise Monitoring Location
 - AD1 Dust Monitoring Location
 - OF1 Outfall Location
 - 3d Groundwater Monitoring Location
 - SW1 Surface Water Monitoring
 - MG1 Gas Well Monitoring Locations
 - ▲ LM1 Leachate Monitoring Locations



ID	Easting	Northing
GA1	321767	252159
GA2	321986	252383
GA3	322070	252383
GA4	322170	252415
GA5	322291	252440
GA6	322389	252467
GA7	322490	252498
GA8	322614	252542
GA9	321942	252347
GA10	321942	252393
GA11	322039	252433
GA12	322669	252575
GA13	322848	252666
MH L33	322001	252416
MH L40	322654	252566
P1	321983	252190
LMW1	322006	252143
LMW2	322077	252115
LMW3	322169	252084
LMW4	322271	252053
LMW5	322368	252022
LMW6	322461	251991
LMW7	322559	251958
LMW8	322651	251933
LMW9	322749	251903
LMW10	322844	251877
LMW11	322846	251974
LMW12	322853	252074
LMW13	322859	252175
LMW14	322863	252274
LMW15	322873	252375
LMW16	322880	252473
LMW17	322885	252572
LMW18	322890	252657
L19	322203	252227
L20	322240	252235
L21	322281	252272
L22	322388	252283
L23	322862	252640
L24	322887	252648
LTP M1	321984	252199
LTP M2	321952	252247

ID	Easting	Northing
NM1	321919	252357
NM2	321779	252415
NM3	321459	252383
NM4	322604	252962
NM5	322970	254004
OF1	322862	251849
OF2	322755	251876
OF3	322506	251953
OF4	322276	252028
MB 18	323344	252832
MB 35	322029	251906
RC 3	321906	252729
CD 1	322006	252356
SWV 1	321980	252187
SWFD	321952	252366
S3	322966	252678
S7	322607	253279
SW20a	322878	252676
DM1/PM1	321874	252321
DM2	321927	252482
DM3/PM2	322038	252484
DM4/PM3	322728	252671

Rev.	Drawn	Checked	App'd	Date	Description	
B	MM/c	TM	DD	DD	10.01.08	ISSUE FOR INFORMATION
A	MM/c	TM	DD	DD	05.07.07	ISSUE FOR INFORMATION

Name of Client
 Fingal County Council
 (Dublin City Council, Fingal County Council, Dún Laoghaire-Rathfynham Borough Council, South Dublin County Council)

Name of Job
 ENVIRONMENTAL MONITORING
 BALLEALLY

Title of Drawing
 ENVIRONMENTAL MONITORING
 LOCATIONS

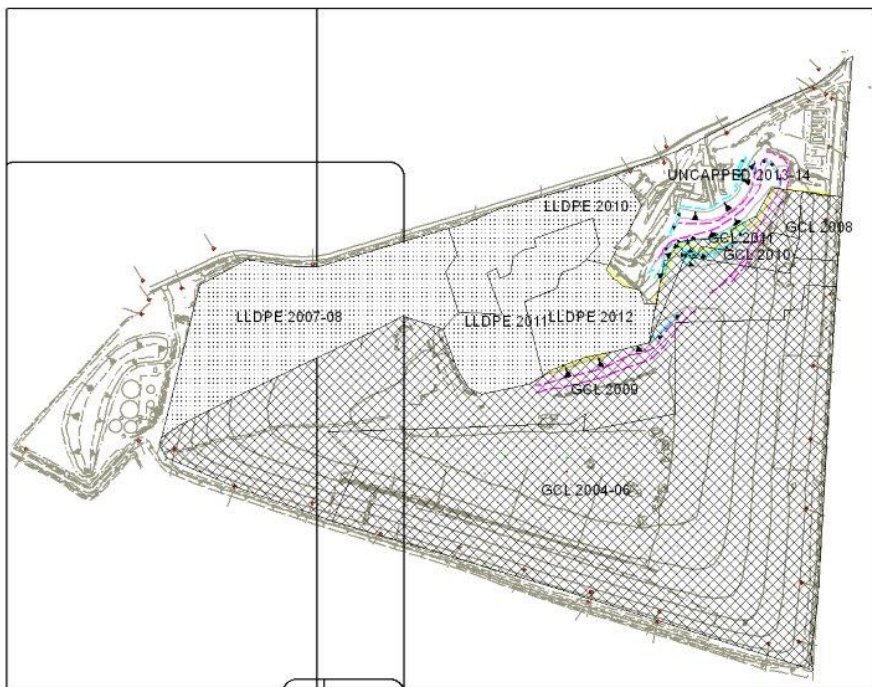
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
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Balleally Capping Detail

Capping 2013 AER

Id

-  TO BE DETERMINED
-  GCL CAPPING
-  LLDPE CAPPING



FINGAL COUNTY COUNCIL
BALLEALLY LANDFILL

CAPPING PROGRESS DRAWING

DRN. M. LOFTUS

20-02-2013

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APPENDIX II

AER SUMMARY TEMPLATES



1 Does your site have licensed emissions direct to surface water or direct to sewer? If yes please complete table W2 and W3 below for the current reporting year and answer further questions. If you do not have licensed emissions you only need to complete table W1 and or W2 for storm water analysis and visual inspections

Yes

Additional information
Leachate taken to Rinsend Treatment plant during 2013 so no licence emissions to wastewater during 2013. Treatment plant has not been operational since 2009.

2 Was it a requirement of your licence to carry out visual inspections on any surface water discharges or watercourses on or near your site? If yes please complete table W2 below summarising only any evidence of contamination noted during visual inspections

Yes

No visual contamination evident during 2013.

Table W1 Storm water monitoring

Location reference	Location relative to site activities	PRTR Parameter	Licensed Parameter	Monitoring date	ELV or trigger level in licence or any revision thereof*	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Comments
SWV1	downstream		pH	26/03/2013	5.5-8.5	SELECT	7.66	pH units	yes	
SWV1	downstream		Temperature	17/07/2013	no abnormal change		17.2	degrees C	yes	
SWV1	downstream		Ammonia (as N)	26/03/2013	0.23		13.8	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SWV1	downstream		BOD	30/05/2013	5		3.46	mg/L	yes	
SWV1	downstream		COD	26/03/2013	40		131	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SWV1	downstream		Suspended Solids	30/05/2013	50		562	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SWV1	downstream		Dissolved Oxygen	26/03/2013	no abnormal change		6.48	mg/L	yes	
SWV1	downstream		Conductivity	26/03/2013	1000		1882	µS/cm @20oC	no (if no please enter details in comments box)	Presented within text of AER
SWFD	downstream		pH	26/03/2013	5.5-8.5		8.05	pH units	yes	
SWFD	downstream		Temperature	30/05/2013	no abnormal change		14.9	degrees C	yes	
SWFD	downstream		Ammonia (as N)	30/05/2013	0.23		<0.2	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SWFD	downstream		BOD	30/05/2013	5		2.4	mg/L	yes	
SWFD	downstream		COD	30/05/2013	40		47	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SWFD	downstream		Suspended Solids	30/05/2013	50		89	mg/L	no (if no please enter details in comments box)	Presented within text of AER
SWFD	downstream		Dissolved Oxygen	30/05/2013	no abnormal change		8.26	mg/L	yes	
SWFD	downstream	SELECT	Conductivity	26/03/2013	1000	SELECT	1534	µS/cm @20oC	no (if no please enter details in comments box)	Presented within text of AER

*Trigger values may be agreed by the Agency outside of licence conditions

Table W2 Visual inspections-Please only enter details where contamination was observed.

Location Reference	Date of inspection	Description of contamination	Source of contamination	Corrective action	Comments
			SELECT		
			SELECT		

Licensed Emissions to water and /or wastewater(sewer)-periodic monitoring (non-continuous)

3 Was there any result in breach of licence requirements? If yes please provide brief details in the comment section of Table W3 below

SELECT

Additional information

4 Was all monitoring carried out in accordance with EPA guidance and checklists for Quality of Aqueous Monitoring Data Reported to the EPA? If no please detail what areas require improvement in additional information box

External/Internal Lab Quality Assessment of results checklist

SELECT

Table W3: Licensed Emissions to water and /or wastewater (sewer)-periodic monitoring (non-continuous)

Emission reference no:	Emission released to	Parameter/ Substance>Note 1	Type of sample	Frequency of monitoring	Averaging period	ELV or trigger values in licence or any revision thereof>Note 2	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Method of analysis	Procedural reference source	Procedural reference standard number	Annual mass load (kg)	Comments
	SELECT	SELECT	SELECT		SELECT		SELECT			SELECT	SELECT	SELECT			

Note 1: Volumetric flow shall be included as a reportable parameter

Note 2: Where Emission Limit Values (ELV) do not apply to your licence please compare results against EQS for Surface water or relevant receptor quality standards

Continuous monitoring

5 Does your site carry out continuous emissions to water/sewer monitoring?

No

Additional Information

AER Monitoring returns summary template-WATER/WASTEWATER(SEWER) Lic No: W0009-03 Year 2013

If yes please summarise your continuous monitoring data below in Table W4 and compare it to its relevant Emission Limit Value (ELV)

6 Did continuous monitoring equipment experience downtime? If yes please record downtime in table W4 below

SELECT	
--------	--

7 Do you have a proactive service contract for each piece of continuous monitoring equipment on site?

SELECT	
--------	--

8 Did abatement system bypass occur during the reporting year? If yes please complete table W5 below

SELECT	
--------	--

Table W4: Summary of average emissions -continuous monitoring

Emission reference no:	Emission released to	Parameter/ Substance	ELV or trigger values in licence or any revision thereof	Averaging Period	Compliance Criteria	Units of measurement	Annual Emission for current reporting year (kg)	% change +/- from previous reporting year	Monitoring Equipment downtime (hours)	Number of ELV exceedences in reporting year	Comments
	SELECT	SELECT		SELECT	SELECT	SELECT					
	SELECT	SELECT		SELECT	SELECT	SELECT					

note 1: Volumetric flow shall be included as a reportable parameter.

Table W5: Abatement system bypass reporting table

Date	Duration (hours)	Location	Resultant emissions	Reason for bypass	Corrective action*	Was a report submitted to the EPA?	When was this report submitted?
						SELECT	

*Measures taken or proposed to reduce or limit bypass frequency

Groundwater/Soil monitoring template	Lic No: W0009-03	Year 2013
---------------------------------------------	------------------	-----------

		Comments
1	Are you required to carry out groundwater monitoring as part of your licence requirements?	yes
2	Are you required to carry out soil monitoring as part of your licence requirements?	no
3	Do you extract groundwater for use on site? If yes please specify use in comment section	no
4	Do monitoring results show that groundwater generic assessment criteria such as GTVs or IGVs are exceeded or is there an upward trend in results for a substance? If yes, please complete the Groundwater Monitoring Guideline Template Report (link in cell G8) and submit separately through ALDER as a licensee return AND answer questions 5-12 below.	no
5	Is the contamination related to operations at the facility (either current and/or historic)	N/A
6	Have actions been taken to address contamination issues? If yes please summarise remediation strategies proposed/undertaken for the site	N/A
7	Please specify the proposed time frame for the remediation strategy	SELECT
8	Is there a licence condition to carry out/update ELRA for the site?	SELECT
9	Has any type of risk assessment been carried out for the site?	SELECT
10	Has a Conceptual Site Model been developed for the site?	SELECT
11	Have potential receptors been identified on and off site?	SELECT
12	Is there evidence that contamination is migrating offsite?	SELECT

Please provide an interpretation of groundwater monitoring data in the interpretation box below or if you require additional space please include a groundwater/contaminated land monitoring results interpretation as an additional section in this AER

See text of AER

See text of AER

See AER report

Table 1: Upgradient Groundwater monitoring results

Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration++	Average Concentration+	unit	GTV's*	SELECT**	Upward trend in pollutant concentration over last 5 years of monitoring data
30/05/2013	RC3	pH	Alcontrol Laboratories Methodology	Quarterly	7	NA	SELECT		6.5 - 9.5	no
17/06/2013	RC3	Temperature	Alcontrol Laboratories Methodology	Quarterly	20.2	NA			25	no
23/10/2013	RC3	Ammoniacal Nitrogen	Alcontrol Laboratories Methodology	Quarterly	0.338	0.3	mg/l		0.12	no
23/10/2013	RC3	Dissolved Oxygen	Alcontrol Laboratories Methodology	Quarterly	9	5.7	mg/l		No Abnormal Change	no
17/06/2013	RC3	Chloride	Alcontrol Laboratories Methodology	Quarterly	34.9	25.6	mg/l		30	no

Groundwater/Soil monitoring template			Lic No: W0009-03		Year 2013					
27/02/2013	RC3	Conductivity	Alcontrol Laboratories Methodology	Quarterly	0.751	0.7				no
23/10/2013	RC3	TOC	Alcontrol Laboratories Methodology	Quarterly	130	52.6	mg/l			no
27/02/2013	RC3	Suspended Solids	Alcontrol Laboratories Methodology	Quarterly	209	79.8	mg/l			no

.+ where average indicates arithmetic mean

.++ maximum concentration indicates the maximum measured concentration from all monitoring results produced during the reporting year

Table 2: Downgradient Groundwater monitoring results

Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration	Average Concentration	unit	GTV's*	SW EQS	Upward trend in yearly average pollutant concentration over last 5 years of monitoring data
27/02/2013	MB 35	pH	Alcontrol Laboratories Methodology	Quarterly	7.5	NA	SELECT		6.5 - 9.5	no
30/05/2013	MB 35	Temperature	Alcontrol Laboratories Methodology	Quarterly	18.0	NA			25	no
27/02/2013	MB 35	Ammoniacal Nitrogen	Alcontrol Laboratories Methodology	Quarterly	5.3	5.0	mg/l		0.12	no
30/05/2013	MB 35	Dissolved Oxygen	Alcontrol Laboratories Methodology	Quarterly	4.0	3.8	mg/l		No Abnormal Change	no
23/10/2013	MB 35	Chloride	Alcontrol Laboratories Methodology	Quarterly	16,000.0	15,225.0	mg/l		30	no
27/02/2013	MB 35	Conductivity	Alcontrol Laboratories Methodology	Quarterly	41.9	37.5				no
23/10/2013	MB 35	TOC	Alcontrol Laboratories Methodology	Quarterly	490.0	204.1	mg/l			no
30/05/2013	MB 35	Suspended Solids	Alcontrol Laboratories Methodology	Quarterly	3,960.0	1,018.1	mg/l			no
23/10/2013	CD1	pH	Alcontrol Laboratories Methodology	Monthly	7.5	NA	SELECT		6.5 - 9.5	no
30/05/2013	CD1	Temperature	Alcontrol Laboratories Methodology	Monthly	17.4	NA			25	no

Groundwater/Soil monitoring template				Lic No:	W0009-03	Year	2013	
29/08/2013	CD1	Ammoniacal Nitrogen	Alcontrol Laboratories Methodology	Monthly	3.2	2.5 mg/l	0.12 no	
17/06/2013	CD1	Dissolved Oxygen	Alcontrol Laboratories Methodology	Monthly	4.6	3.4 mg/l	No Abnormal Change no	
09/12/2013	CD1	Chloride	Alcontrol Laboratories Methodology	Monthly	227.0	180.1 mg/l	30 no	
09/12/2013	CD1	Conductivity	Alcontrol Laboratories Methodology	Monthly	1.5	1.4	no	
09/12/2013	CD1	TOC	Alcontrol Laboratories Methodology	Monthly	7.4	5.7 mg/l	no	
18/07/2013	CD1	Suspended Solids	Alcontrol Laboratories Methodology	Monthly	74.5	16.8 mg/l	no	
						SELECT	no	
<p>*please note exceedance of generic assessment criteria (GAC) such as a Groundwater Threshold Value (GTV) or an Interim Guideline Value (IGV) or an upward trend in results for a substance indicates that further interpretation of monitoring results is required. In addition to completing the above table, please complete the Groundwater Monitoring Guideline Template Report at the link provided and submit separately through ALDER as a licensee return or as otherwise instructed by the EPA.</p> <p style="text-align: right;">Groundwater monitoring template</p>								
<p>More information on the use of soil and groundwater standards/ generic assessment criteria (GAC) and risk assessment tools is available in the EPA published guidance (see the link in G31)</p> <p style="text-align: center;">Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA 2013).</p>								
<p>**Depending on location of the site and proximity to other sensitive receptors alternative Receptor based Water Quality standards should be used in addition to the GTV e.g. if the site is close to surface water compare to Surface Water Environmental Quality Standards (SWEQS), If the site is close to a drinking water supply compare results to the Drinking Water Standards (DWS)</p>						<p>Surface water EQS</p>	<p>Groundwater regulations GTV's standards</p>	<p>Drinking water (private supply) standards</p> <p>Drinking water (public supply) standards</p>

Groundwater/Soil monitoring template Lic No: W0009-03 Year: 2013

Table 3: Soil results

Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration	Average Concentration	unit
							SELECT
							SELECT

Where additional detail is required please enter it here in 200 words or less

Environmental Liabilities template		Lic No:	W0009-03
	Click here to access EPA guidance on Environmental Liabilities and Financial provision		
			Sec 53A Response for year ending 31/12/2012 submitted last year
1	ELRA initial agreement status	Required but not submitted	Sec 53A Response for year ending 31/12/2012 submitted last year
2	ELRA review status	Review required and not completed;	Sec 53A Response for year ending 31/12/2012 submitted last year
3	Amount of Financial Provision cover required as determined by the latest ELRA	Specify	Sec 53A Response for year ending 31/12/2012 submitted last year
4	Financial Provision for ELRA status	SELECT	Sec 53A Response for year ending 31/12/2012 submitted last year
5	Financial Provision for ELRA - amount of cover	Specify	€7,005,172
6	Financial Provision for ELRA - type	Other please specify	Fingal County Council has provided in it's accounts a reserve for the restoration of the site which amounted to €7,005,172 on 31/12/2013.
7	Financial provision for ELRA expiry date	Enter expiry date	Reserve set annually
8	Closure plan initial agreement status	Required but not submitted	
9	Closure plan review status	Review required and not completed	
10	Financial Provision for Closure status	Required but not submitted	
11	Financial Provision for Closure - amount of cover	Specify	€7,005,172
12	Financial Provision for Closure - type	Other please specify	Fingal County Council has provided in it's accounts a reserve for the restoration of the site which amounted to €7,005,172 on 31/12/2013.
13	Financial provision for Closure expiry date	Enter expiry date	See text in AER document

Environmental Management Programme/Continuous Improvement Programme template			Lic No:	W0009-03	Year	2013
Highlighted cells contain dropdown menu click to view			Additional Information			
1	Do you maintain an Environmental Management System (EMS) for the site. If yes, please detail in additional information	Yes	Schedule of Environmental Objectives and Targets			
2	Does the EMS reference the most significant environmental aspects and associated impacts on-site	Yes	2013 saw focus on switching from tankering of leachate to Ringsend to pumping to local sewer for treatment in Portrane WWTP. Complete Capping.			
3	Does the EMS maintain an Environmental Management Programme (EMP) as required in accordance with the licence requirements	Yes	See Below			
4	Do you maintain an environmental documentation/communication system to inform the public on environmental performance of the facility, as required by the licence	Yes	Documentation / Communication system held on site in Balleally and in County Hall Swords. Additionally information stored online through EDEN system.			
Environmental Management Programme (EMP) report						
Objective Category	Target	Status (% completed)	How target was progressed	Responsibility	Intermediate outcomes	
Energy Efficiency/Utility conservation	Construct new leachate pipeline to transfer leachate directly to Portrane Waste Water Treatment Plant rather than tankering to Ringsend.	90	By means of construction contract following public tendering process.	Section Head	Reduced emissions	
Reduction of emissions to Water	Complete Capping Cells 5 & 6	90	Fingal County Council Staff and Construction Quality and Assurance personnel	Section Head	Reduced emissions	
Reduction of emissions to Air	Complete Capping Cells 5 & 6	90	Fingal County Council Staff and Construction Quality and Assurance personnel	Section Head	Reduced emissions	
Additional Improvements	Public Access Works	90	Fingal County Council Staff and Construction Quality and Assurance personnel	Section Head	Installation of infrastructure	

Noise monitoring summary report Lic No: W0009-03 Year 2013

- 1 Was noise monitoring a licence requirement for the AER period?
If yes please fill in table N1 noise summary below
- 2 Was noise monitoring carried out using the EPA Guidance note, including completion of the "Checklist for noise measurement report" included in the guidance note as table 6? [Noise Guidance note NG4](#)
- 3 Does your site have a noise reduction plan
- 4 When was the noise reduction plan last updated?
- 5 Have there been changes relevant to site noise emissions (e.g. plant or operational changes) since the last noise survey?

Table N1: Noise monitoring summary

Date of monitoring	Time period	Noise location (on site)	Noise sensitive location -NSL (if applicable)	LA _{eq}	LA ₉₀	LA ₁₀	LA _{max}	Tonal or Impulsive noise* (Y/N)	If tonal /impulsive noise was identified was 5dB penalty applied?	Comments (ex. main noise sources on site, & extraneous noise ex. road traffic)	Is site compliant with noise limits (day/evening/night)?
04/03/2013	10:05 - 10:35	NM1		61	62	40	NA	No	SELECT	Presented within text of AER and Quarterly Reports	Yes
07/05/2013	11:57 - 12:27	NM2		80	81	75	NA	No		Presented within text of AER and Quarterly Reports	Yes
17/07/2013	11:59 - 12:29	NM3		60	59	35	NA	No		Presented within text of AER and Quarterly Reports	Yes
21/11/2013	13:36 - 14:06	NM4		59	51	41	NA	No		Presented within text of AER and Quarterly Reports	Yes
17/07/2013	13:11 - 13:41	NM5		47	49	33	NA	No		Presented within text of AER and Quarterly Reports	Yes

*Please ensure that a tonal analysis has been carried out as per guidance note NG4. These records must be maintained onsite for future inspection

If noise limits exceeded as a result of noise attributed to site activities, please choose the corrective action from the following options?

**** please explain the reason for not taking action/resolution of noise issues?**
 Incidents were notified to the Agency. Exceedences were attributed to off site sources in all cases.
 During Quarter 4 2012, FCC sought a derogation from the Agency from the provisions of Guidance Note NG4 and to continue noise monitoring as previously undertaken.

Resource Usage/Energy efficiency summary

Lic No:

W0009-03

Year

2013

Additional information

- 1 When did the site carry out the most recent energy efficiency audit? Please list the recommendations in table 3 below
- 2 Is the site a member of any accredited programmes for reducing energy usage/water conservation such as the SEAI programme linked to the right? If yes please list them in additional information
- 3 Where Fuel Oil is used in boilers on site is the sulphur content compliant with licence conditions? Please state percentage in additional information

Enter date of audit	2006
No	
SELECT	Not Appropriate

Table R1 Energy usage on site				
Energy Use	Previous year	Current year	Production +/- % compared to previous reporting year**	Energy Consumption +/- % vs overall site production*
Total Energy Used (MWHrs)				
Total Energy Generated (MWHrs)				
Total Renewable Energy Generated (MWHrs)				
Electricity Consumption (MWHrs)	65498	75720	15%	
Fossil Fuels Consumption:				
Heavy Fuel Oil (m3)	145.6	123.15	-15%	
Light Fuel Oil (m3)				
Natural gas (m3)				
Coal/Solid fuel (metric tonnes)				
Peat (metric tonnes)				
Renewable Biomass				
Renewable energy generated on site				

* where consumption of energy can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.

** where site production information is available please enter percentage increase or decrease compared to previous year

Table R2 Water usage on site					Water Emissions	Water Consumption
Water use	Water extracted Previous year m3/yr.	Water extracted Current year m3/yr.	Production +/- % compared to previous reporting year**	Energy Consumption +/- % vs overall site production*	Volume Discharged back to environment(m ³ /yr):	Volume used i.e not discharged to environment e.g. released as steam m3/yr
Groundwater						
Surface water						
Public supply	1557	3742				
Recycled water						
Total						

* where consumption of water can be compared to overall site production please enter this information as percentage increase or decrease compared to the previous reporting year.

** where site production information is available please enter percentage increase or decrease compared to previous year

Table R3 Waste Stream Summary					
	Total	Landfill	Incineration	Recycled	Other
Hazardous (Tonnes)					
Non-Hazardous (Tonnes)					

WASTE SUMMARY	Lic No: W0009-03	Year: 2013
SECTION A-PRTR ON SITE WASTE TREATMENT AND WASTE TRANSFERS TAB- TO BE COMPLETED BY ALL IPPC AND WASTE FACILITIES	PRTR facility logon	dropdown list click to see options

SECTION B- WASTE ACCEPTED ONTO SITE-TO BE COMPLETED BY ALL IPPC AND WASTE FACILITIES

Were any wastes accepted onto your site for recovery or disposal or treatment prior to recovery or disposal within the boundaries of your facility?; (waste generated within your boundaries is to be captured through PRTR reporting)

1 If yes please enter details in table 1 below

2 Did your site have any rejected consignments of waste in the current reporting year? If yes please give a brief explanation in the additional information

3 Was waste accepted onto your site that was generated outside the Republic of Ireland? If yes please state the quantity in tonnes in additional information

Additional Information	
Yes	Soil & Stone EWC 17 05 04 and C&D 17-01-07
Yes	Some C&D material brought to site was unsuitable for use in Haul Roads
No	

Table 1 Details of waste accepted onto your site for recovery, disposal or treatment (do not include wastes generated at your site, as these will have been reported in your PRTR workbook)

Licensed annual tonnage limit for your site (total tonnes/annum)	EWC code	Source of waste accepted	Description of waste accepted Please enter an accurate and detailed description - which applies to relevant EWC code European Waste Catalogue EWC codes	Quantity of waste accepted in current reporting year (tonnes)	Quantity of waste accepted in previous reporting year (tonnes)	Reduction/ Increase over previous year +/- %	Reason for reduction/ increase from previous reporting year	Packaging Content (%) only applies if the waste has a packaging component	Disposal/Recovery or treatment operation carried out at your site and the description of this operation	Quantity of waste remaining on site at the end of reporting year (tonnes)	Comments -
63,000	17 05 04	17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	Soil and Stone	116613.5	185286.56	37% Reduction	Facility Closed for Waste October		R5-Recycling/reclamation or other inorganic material		Material used in Recovery and Capping layer and therefore exceeds limit
63,000	17 01 07	17- CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	mixtures of concrete bricks tiles and ceramics	19696.5	31876	38% Reduction	Facility Closed for Waste October		R5-Recycling/reclamation or other inorganic material		Material used in Recovery and Capping layer and therefore exceeds limit

SECTION C-TO BE COMPLETED BY ALL WASTE FACILITIES (waste transfer stations, Composters, Material recovery facilities etc) EXCEPT LANDFILL SITES

4 Is all waste processing infrastructure as required by your licence and approved by the Agency in place? If no please list waste processing infrastructure required onsite

5 Is all waste storage infrastructure as required by your licence and approved by the Agency in place? If no please list waste storage infrastructure required on site

6 Does your facility have relevant nuisance controls in place?

7 Do you have an odour management system in place for your facility? If no why?

8 Do you maintain a sludge register on site?

SELECT	
SELECT	
SELECT	
SELECT	
SELECT	

SECTION D-TO BE COMPLETED BY LANDFILL SITES ONLY

Table 2 Waste type and tonnage-landfill only

Waste types permitted for disposal	Authorised/licenced annual intake for disposal (tpa)	Actual intake for disposal in reporting year (tpa)	Remaining licensed capacity at end of reporting year (m3)	Comments
Household	152,500	0		Landfill Closed May 2012 for this waste
Commercial	200,000	0	N/A	Landfill Closed May 2012 for this waste
Sewage Sludge	30,000	0		Landfill Closed May 2012 for this waste
Construction and Demolition	63,000	131,310	N/A	Material used in Recovery and capping only

Table 3 General information-Landfill only

Area ID	Date landfilling commenced	Date landfilling ceased	Currently landfilling	Private or Public Operated	Inert or non-hazardous	Predicted date to cease landfilling	Licence permits asbestos	Is there a separate cell for asbestos?	Accepted asbestos in reporting year	Total disposal area occupied by waste ha	Lined disposal area occupied by waste ha	Unlined area ha	Comments on liner type
N/A	Apr-04	May-12	No	Public	Non Hazardous	May-12	No	No	No	100000	100000	0	Original Landfill Cells 1-6 and Piggybacking -HDPE

WASTE SUMMARY	Lic No: W0009-03	Year: 2013
----------------------	------------------	------------

Table 4 Environmental monitoring-landfill only [Landfill Manual-Monitoring Standards](#)

Was meteorological monitoring in compliance with Landfill Directive (LD) standard in reporting year +	Was leachate monitored in compliance with LD standard in reporting year	Was Landfill Gas monitored in compliance with LD standard in reporting year	Was SW monitored in compliance with LD standard in reporting year	Have GW trigger levels been established	Were emission limit values agreed with the Agency (ELVs)	Was topography of the site surveyed in reporting year	Has the statement under S53(A)(5) of WMA been submitted in reporting year	Comments
Met Data From Dublin A/Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Landfill Gas Surface Water and Groundwater Results presented within text of AER

..+ please refer to Landfill Manual linked above for relevant Landfill Directive monitoring standards

Table 5 Capping-Landfill only

Area uncapped*	Area with temporary cap	Area with final cap to LD Standard m2 ha, a	Area capped other	Area with waste that should be permanently capped to date under licence	What materials are used in the cap	Comments
3 approx	3 approx	43 approx	n/a		43 Geosynthetic clay liner / HDPE	Will Be Completed during 2014

*please note this includes daily cover area

Table 6 Leachate-Landfill only

9 Is leachate from your site treated in a Waste Water Treatment Plant?

Yes
No

10 Is leachate released to surface water? If yes please complete leachate mass load information below

Volume of leachate in reporting year(m3)	Leachate (BOD) mass load (kg/annum)	Leachate (COD) mass load (kg/annum)	Leachate (NH4) mass load (kg/annum)	Leachate (Chloride) mass load kg/annum	Leachate treatment on-site	Specify type of leachate treatment	Comments
35737	1132	23420	15228	26318	None - Tankered to Ringsend WWTP		Calculated from monthly average

Please ensure that all information reported in the landfill gas section is consistent with the Landfill Gas Survey submitted in conjunction with PRTR returns

Table 7 Landfill Gas-Landfill only

Gas Captured & Treated by LFG System m3	Power generated (MW / KWh)	Used on-site or to national grid	Was surface emissions monitoring performed during the reporting year?	Comments
		National Grid	Yes	Recommendations Implemented

APPENDIX III

PRTR





[Guidance to completing the PRTR workbook](#)

AER Returns Workbook

Version 1.1.18

REFERENCE YEAR 2013

1. FACILITY IDENTIFICATION

Parent Company Name	Fingal County Council
Facility Name	Balleally Landfill
PRTR Identification Number	W0009
Licence Number	W0009-03

Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.1	Deposit on, in or under land (including landfill).
3.10	Release of waste into a water body (including a seabed insertion). Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.12	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.13	Land treatment, including biodegradation of liquid or sludge discards in soils.
3.2	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.4	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
4.10	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.11	Exchange of waste for submission to any activity referred to in a preceding paragraph of this Schedule.
4.12	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.13	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.2	Recycling or reclamation of metals and metal compounds.
4.3	Recycling or reclamation of other inorganic materials.
4.4	Use of any waste principally as a fuel or other means to generate energy.
4.9	
Address 1	Balleally
Address 2	Lusk
Address 3	Co. Dublin
Address 4	
	Dublin
Country	Ireland
Coordinates of Location	-7 26329 55.2542
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Mortimer Loftus
AER Returns Contact Email Address	mortimer.loftus@fingalcoco.ie
AER Returns Contact Position	Acting Executive Scientist
AER Returns Contact Telephone Number	01-8905000
AER Returns Contact Mobile Phone Number	0876872025
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	4
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	Activity Name
5(d)	Landfills
5(c)	Installations for the disposal of non-hazardous waste
5(d)	Landfills
50.1	General

3. SOLVENTS REGULATIONS (S.I. No. 543 of 2002)

Is it applicable?	
Have you been granted an exemption?	
If applicable which activity class applies (as per Schedule 2 of the regulations)?	
Is the reduction scheme compliance route being used?	

4. WASTE IMPORTED/ACCEPTED ONTO SITE

[Guidance on waste imported/accepted onto site](#)

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities)?	No
-----------------------------------------------------------------------------------------------------------	----

This question is only applicable if you are an IPPC or Quarry site

4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

| PRTR#: W0009 | Facility Name : Balleally Landfill | Filename : W0009_2013.xls | Return Year : 2013 |

28/03/2014 11:57

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

POLLUTANT		METHOD			Please enter all quantities in this section in KGs				QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Flare	BY01	BY03	Emission Point 4	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	C	OTH	Total Estimated methane generation minus (methane flared + methane utilised in engine/s)	0.0	0.0	0.0	0.0	3783835.6	0.0	3783835.6
03	Carbon dioxide (CO2)	C	OTH	Testo 350/454 MXL Flue Gas Analyser	3575.0	740867.0	610320.0	0.0	1354762.0	0.0	0.0
02	Carbon monoxide (CO)	M	OTH	Testo 350/454 MXL Flue Gas Analyser	0.86	7222.0	6356.0	0.0	13578.86	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	M	OTH	Testo 350/454 MXL Flue Gas Analyser	6.85	2988.0	2175.0	0.0	5169.85	0.0	0.0
07	Non-methane volatile organic compounds (NMVOC)	M	OTH	Portable Signal 3030PM FID calibrated with Propane in accordance with EN1526:2002 non-methane hydrocarbon cutter	0.0	8.0	6.0	0.0	14.0	0.0	0.0
11	Sulphur oxides (SOx/SO2)	M	OTH	Testo 350/454 MXL Flue Gas Analyser	1.53	4117.0	3928.0	0.0	8046.53	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION B : REMAINING PRTR POLLUTANTS

POLLUTANT		METHOD			Please enter all quantities in this section in KGs				QUANTITY		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	BY01	BY03	Flare	Emission Point 4	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0	0.0	0.0	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

SECTION C : REMAINING POLLUTANT EMISSIONS (As required in your Licence)

POLLUTANT		METHOD			Please enter all quantities in this section in KGs				QUANTITY		
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	BY01	BY03	Flare	Emission Point 4	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
244	Total Particulates	M	OTH	TCR Tecora isokinetic Particulate sample with QMA high temperature filter in accordance with ISO9096:2003	0.0	197.0	175.0	372.0	0.0	0.0	

* Select a row by double-clicking on the Pollutant Name (Column B) then click the delete button

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill:	Balleally Landfill	T (Total) kg/Year	M/C/E	Method Used		Facility Total Capacity m3 per hour
				Method Code	Designation or Description	
Total estimated methane generation (as per site model)		7725531.6	C	OTH	GasSim model	N/A
Methane flared		8053.0	M	OTH	Calculated based on flare flc	2500.0 (Total Flaring Capacity)
Methane utilised in engine/s		3933643.0	M	OTH	Calculated based on engine	1865.0 (Total Utilising Capacity)
Net methane emission (as reported in Section A above)		3783835.6	C	OTH	Calculation	N/A

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR#: W0009 | Facility Name : Balleally Landfill | Filename : W0009_2013.xls | Return Year : 2013 |

28/03/2014 11:57

Please enter all quantities on this sheet in Tonnes

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Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility	Haz Waste : Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility	Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used		Non	Non Haz Waste: Address of Recover/Disposer				
Within the Country	19 07 03	No	35737.0	landfill leachate other than those mentioned in 19 07 02	D9	M	Weighed	Offsite in Ireland	Ringsend Wastewater Treatment Plant,-		Ringsend Wastewater Treatment Plant,-,Dublin,-			,Ireland

* Select a row by double-clicking the Description of Waste then click the delete button

[Link to previous years waste data](#)

[Link to previous years waste summary data & percentage change](#)

[Link to Waste Guidance](#)