



Ballyguyroe Landfill Site
Annual Environmental Report
December 2007 – December 2008



Cork County Council

Waste Licence Reg.

No. W 0002-2

Prepared by:

Aidan Lynch

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BALLYGUYROE LANDFILL SITE
ANNUAL ENVIRONMENTAL REPORT
DECEMBER 2007 - DECEMBER 2008

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Reporting Period:
This report presents the landfill monitoring results for Ballyguyroe Landfill, Co. Cork to the Environmental Protection Agency. The report covers the annual reporting period of 2008.

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1. INTRODUCTION

1.1 Scope and Purpose of the Report

Cork County Council held a waste licence (Register No. 2-1) to operate Ballyguyroe Landfill Site until 15th March 2004 when it obtained a new Waste Licence (Register No. 2-2/ W 0002-2). The aim of this Annual Environmental Report (AER) is to provide a review of activities at Ballyguyroe Landfill Site within the past 12 months. The full scope of the type of report is outlined in Schedule F of the waste licence.

1.2 Background to the Report

The landfill facility at Ballyguyroe North has been in operation since 1990, accepting waste at an annual rate of approximately 20,000 tonnes. The site reached full capacity and closed for the acceptance of waste on Thursday 27th September 2001.

The Environmental Protection Agency (the Agency) issued the site with a waste management licence on December 22nd 1999 (Waste Licence No. 2-2).

In accordance with the requirements of Condition 11.3 of the waste licence, an AER for the facility is submitted to the Agency annually by 31st March.

This is the ninth AER to be submitted and covers the reporting period December 22nd 2007 to December 22nd 2008.

1.3 Site Location

The facility is located at:
Ballyguyroe North
Kildorrery
Mallow
Co. Cork

Tel: (063) 91614
Fax: (063) 91614

The location of the site is shown on Figure 1.1.

The National Grid Reference for the site is: -166250E, 114550N

1.4 Environmental Policy

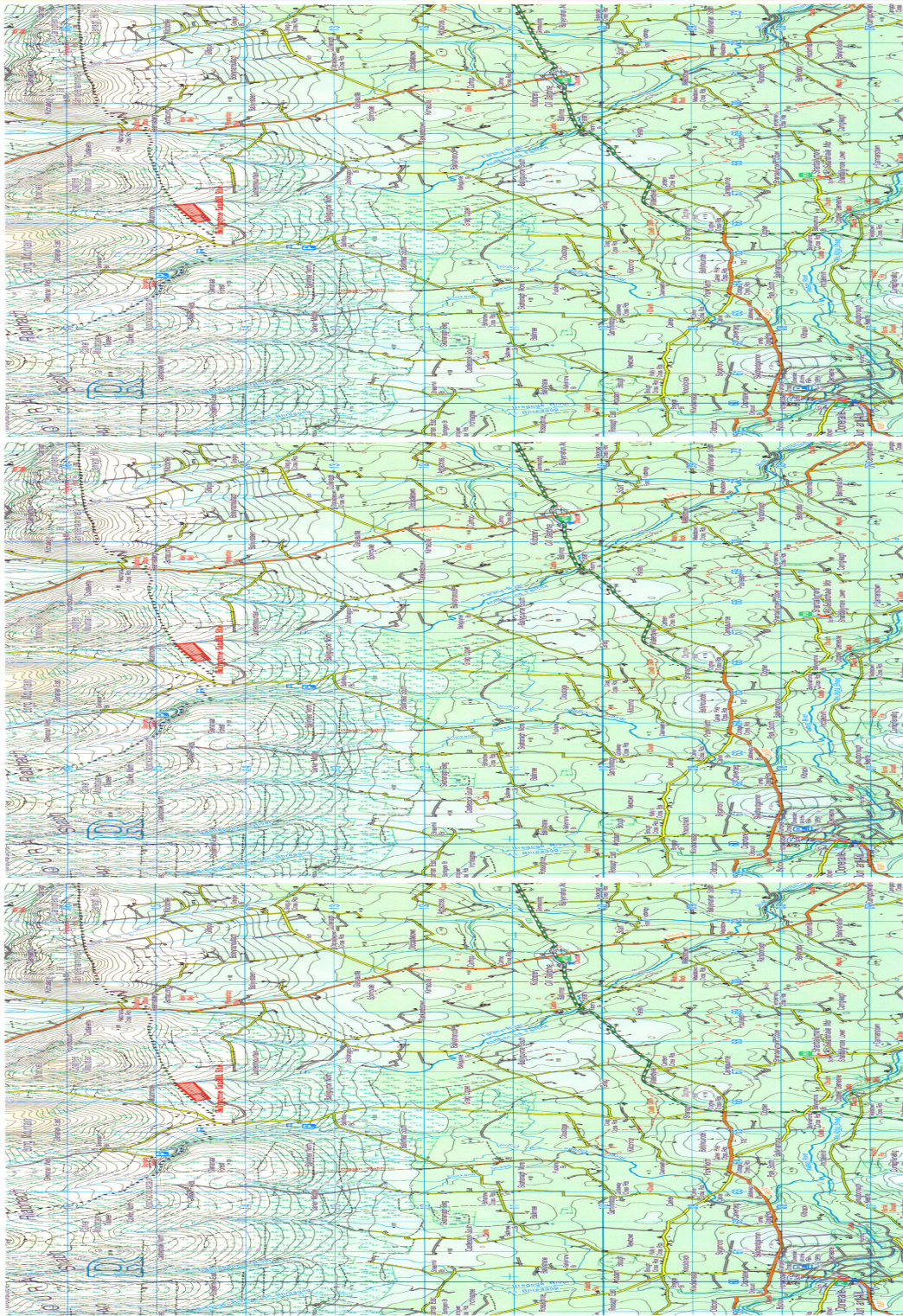
Cork County Council is committed to conducting all activities such that they have a minimal effect on the environment.

The main objectives of the Council are:

- A commitment to comply with the waste licence and all relevant environmental legislation and approved code of practice;
- To reduce negative environmental impacts by continually developing and modifying all procedures;

-
- To provide adequate training and awareness to all employees with regard to minimizing environmental risks; and
 - To ensure that management and all personnel working on the site are familiar with the conditions of the waste licence, the content of the Environmental Management Plan and the Emergency Response Procedures.

Figure 1.1: Location of Ballyguyroe Landfill



2. SITE DESCRIPTION AND ACTIVITIES

2.1 Description of the Site

The Ballyguyroe Landfill Site occupies an area of approximately 15 hectares and is located in the townland of Ballyguyroe North on the southern lower slopes of the Ballyhoura Mountains. It is situated 6 km north-west of the village of Kildorrery.

The site lies in the Blackwater catchment with the Farahy River flowing southwards within a valley outside the eastern boundary. Surface water on the site drains towards this river.

There are no major water abstractions within the immediate catchment of the landfill. Several local residents do depend on water wells for domestic and farm supplies, however, historical monitoring results have confirmed that the landfill is not a threat to these supplies. The groundwater quality is indicative of the overburden geology, being high in manganese, and has not changed in quality over the years.

The meteorological station on site indicates prevailing winds from the southwest. The annual rainfall at the site during 2008 is outlined in Table 2.1.

Table 2.1: Site Rainfall 2008

Month	Rainfall (mm)
January	182.8
February	41.7
March	103.9
April	49.1
May	42.5
June	108.7
July	133.7
August	141.9
September	169.9
October	138.4
November	81.4
December	79.3
Total	1,273.30

The site consists of a total of seven waste cells. Cells 1 to 7 have been completed and the site has reached full capacity. The site closed for the acceptance of waste on September 27th 2001.

2.2 Waste Activities carried out at the Facility

Waste Disposal activities at Ballyguyroe Landfill Facility are restricted to those outlined in the waste licence as specified below. The only main activity at the site when open was the land-filling of non-hazardous domestic and commercial waste only.

Class 4. Surface impoundment, including placement of liquid or sludge discards into pits, ponds, or lagoons

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.

The Waste Recovery Activities permitted are outlined below:

Class 4. Recycling or reclamation of other inorganic materials

Class 10. The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system

2.3 Waste Quantity and Composition

The site ceased accepting waste on the 27th September 2001. No waste was accepted at the facility during the reporting period.

The weighbridge was installed at the site in 1997. Therefore, accurate tonnages are only available from 1998 onwards. It is estimated that approximately 20,000 tonnes per annum were landfilled during the period 1990 to 1997.

Table 2.2: Quantities of waste received and disposed of during the lifetime of the site

Year	Quantity of Waste (tonnes)
1990-1997	160,000
1998	18,577
1999	20,207
2000	22,892
2001	16,523
2002	0
2003	0
2004	0
2005	0
2006	0
2007	0
2008	0
Total	238,199

2.4 Remaining Capacity

The site reached full capacity on September 27th 2001. The landfill facility ceased to accept waste on this date.

2.5 Methods of waste deposition

No waste was accepted at the site during the reporting period.

2.6 Tank Pipeline and Bund Testing

Integrity testing of the new Leachate lagoon was carried out between December 2002 and June 2003. Results were submitted to the Environmental Protection Agency on September 19th 2003.

A successful structural integrity test was carried out on the new Leachate lagoon by consultants Fehily Timoney and Company in June 2008. Copies of this report have been forwarded to the EPA. (Ref EPA-080901)

A permanent Automatic Pneumatic Leachate Extraction System was commissioned during 2003. The leachate is removed under contract by Cork County Council. The contractor has a site specific risk assessment and operating procedure to ensure any spillages during removal are effectively controlled.

3. SUMMARY OF MONITORING AND EMISSIONS

3.1 Landfill Gas

Condition 8 and Schedule D.2 of the Licence Register 2-2 requires that the licensee conducts monthly monitoring in the gas borehole/vents/wells in order to detect offsite gas migration and weekly monitoring in the site office, shed and canteen in order to detect accumulation of landfill gas.

The gas is monitored using "GA94" automatic infra-red analyser, which detects levels of carbon dioxide, methane, and oxygen. This analyser is calibrated in accordance with manufacturer's specifications.

All monitoring locations are illustrated in Drawing NC-09014-01, attached Appendix 1.

3.1.1 Gas Monitoring Results

3.1.1.1 Site Buildings

In September 2008 new gas detectors and alarms were fitted in the office, canteen and the storage container. There was no evidence of landfill gas in site buildings.

3.1.1.2 Gas Wells outside Filled Cells

Elevated levels of gas were detected in gas wells GS1, GS4, GS5, GS8, GS10 and GS12. The levels and dates of these exceedences are illustrated in Table 3.1.

3.1.2 Long Term Proposals

The installation of a permanent gas collection system at the site was carried out during 2003. The gas flaring system has been operating since January 2004. The unit is maintained quarterly under contract.

Table 3.1: Gas Monitoring Exceedences for 2008

Date	Location	Methane (CH ₄) % v/v	Carbon Dioxide (CO ₂) % v/v
04/01/2008	GS1	52.8	15.9
	GS4	0.04	12.1
	GS5	0.02	2.6
	GS10	1.4	4.6
11/01/2008	GS1	17.7	5.5
	GS4	0.04	10.6
	GS5	0.2	2.5
	GS10	0.7	3.5
18/01/2008	GS1	13.4	5.4
	GS4	0.5	11.2
	GS5	0.1	2.8
	GS10	1.9	4.8

25/01/2008	GS1	7.2	4.8
	GS4	0.3	9
	GS5	0.2	2.2
	GS10	1.9	4.8
01/02/2008	GS1	4.2	4.8
	GS4	0.4	7.3
	GS5	0.2	1.8
	GS10	2.1	5
08/02/2008	GS1	3.7	3.9
	GS4	0.4	7.1
	GS5	0.2	2.6
	GS10	1.8	4.3
	GS12	0.3	1.8
15/02/2008	GS1	1.1	1.6
	GS4	0.5	6.7
	GS10	2	4.7
22/02/2008	GS1	2.8	5.1
	GS4	0.5	7
	GS5	0.3	2
	GS10	1.8	4.2
29/02/2008	GS1	6.6	2.3
	GS4	0	3
	GS5	0	2.4
	GS10	2.1	4.6
07/03/2008	GS4	0.1	2.7
	GS10	2.3	4.9
14/03/2008	GS4	0.1	2.4
	GS5	0.1	2
	GS10	3.8	5.1
	GS12	0	2.2
21/03/2008	GS4	0.2	2
	GS10	2.8	4.5
28/03/2008	GS1	8.3	4.5
	GS4	0	2.2
	GS10	2.5	4.2
04/04/2008	GS4	0	1.5
	GS10	2.1	4
11/04/2008	GS1	30.4	5.7
	GS4	0	2.4
	GS10	2.3	4.2
18/04/2008	GS1	17.1	8
	GS10	2	4.4
25/04/2008	GS1	56.5	12.2
	GS4	0	2
	GS10	2.2	4.6
02/05/2008	GS1	50.8	8.2
	GS10	1.9	4.2
09/05/2008	GS1	57.1	8.4
	GS10	2.1	4
16/05/2008	GS1	60.1	12.7
	GS10	2	4.3
23/05/2008	GS1	67.2	16.3
	GS10	1.8	4
30/05/2008	GS1	66.4	15.1

	GS5	0.3	2
	GS12	2.8	5.2
06/06/2008	GS1	58.3	15.1
	GS4	0.7	2.9
	GS5	51.4	7.2
	GS10	2.9	3.4
13/06/2008	GS1	60.6	15.7
	GS4	0	3.4
	GS5	62.4	7.2
	GS12	1.7	3.1
20/06/2008	GS1	53.7	13.5
27/06/2008	GS1	36.1	11.4
	GS4	0.2	3.2
	GS5	17.6	2.1
04/07/2008	GS1	54.7	16.4
	GS4	0.2	3
	GS5	7.3	2.1
11/07/2008	GS1	55.4	15.5
	GS4	0.2	2
	GS10	1.2	1.8
18/07/2008	GS1	57.2	14.3
	GS4	0.1	2.5
	GS10	1	1.9
	GS12	0.6	1.7
25/07/2008	GS1	64.2	17.3
	GS10	1.2	2.1
01/08/2008	GS1	61.4	18.1
	GS10	3.3	5.1
08/08/2008	GS1	59.8	13.2
	GS4	0	1.6
	GS5	0	4
	GS10	2.7	4.6
15/08/2008	GS10	2.4	4.1
22/08/2008	GS1	28.7	7.8
	GS10	2	3.5
29/08/2008	GS1	42.2	11.8
	GS10	1.6	3
05/09/2008	GS1	49.9	10.3
	GS10	1.3	2.5
15/09/2008	GS1	39.7	7.7
	GS10	2.2	4.1
23/09/2008	GS1	50.1	8.5
	GS10	2.3	3.1
30/09/2008	GS1	48.3	6.4
	GS10	1.6	3.2
07/10/2008	GS1	49.5	4.4
14/10/2008	GS1	40.9	5.1
	GS10	2.7	3.2
20/10/2008	GS1	38.6	6.3
	GS10	2.6	3.1
29/10/2008	GS1	37.1	5.6
	GS10	2.7	5.1
04/11/2008	GS1	16.6	7.1
	GS10	10	8.2

12/11/2008	GS1	32.4	9
	GS10	2.8	4
20/11/2008	GS1	51.1	10.3
	GS10	2.2	3.5
25/11/2008	GS1	54.5	10.9
	GS10	2.5	3.2
04/12/2008	GS1	45.6	7.4
	GS10	2	2.9

3.2 Surface Water

Condition 8 and Schedule D.4 of the waste licence require the licensee to conduct surface water monitoring at various locations throughout the site and at points upstream and downstream on the River Farahy. The frequency of monitoring varies from weekly to quarterly depending on the location.

Surface water results for the report period have been submitted to the Agency in four quarterly reports and have been compared to limits outlined in the Surface Water Regulations S.I. No. 294 of 1989 (implementing the Surface Water Directive (75/440 EEC)).

The iron levels (Figure 3.1) indicate high levels of iron that are naturally occurring due to the iron rich geology of the site.

The suspended solids are monitored monthly at locations SS2 and SS5, from figure 3.2 it is apparent that there was No exceedances of the 35 mg/l limit outlined by the EPA.

Figure 3.1: Surface water Iron Levels

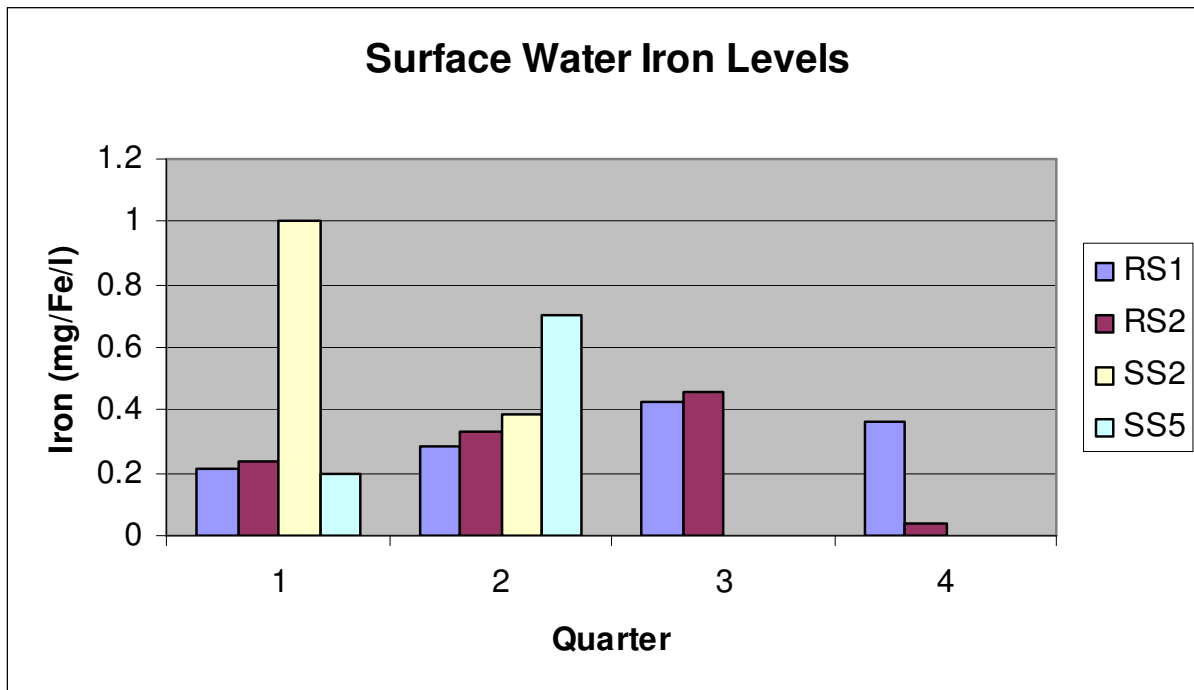
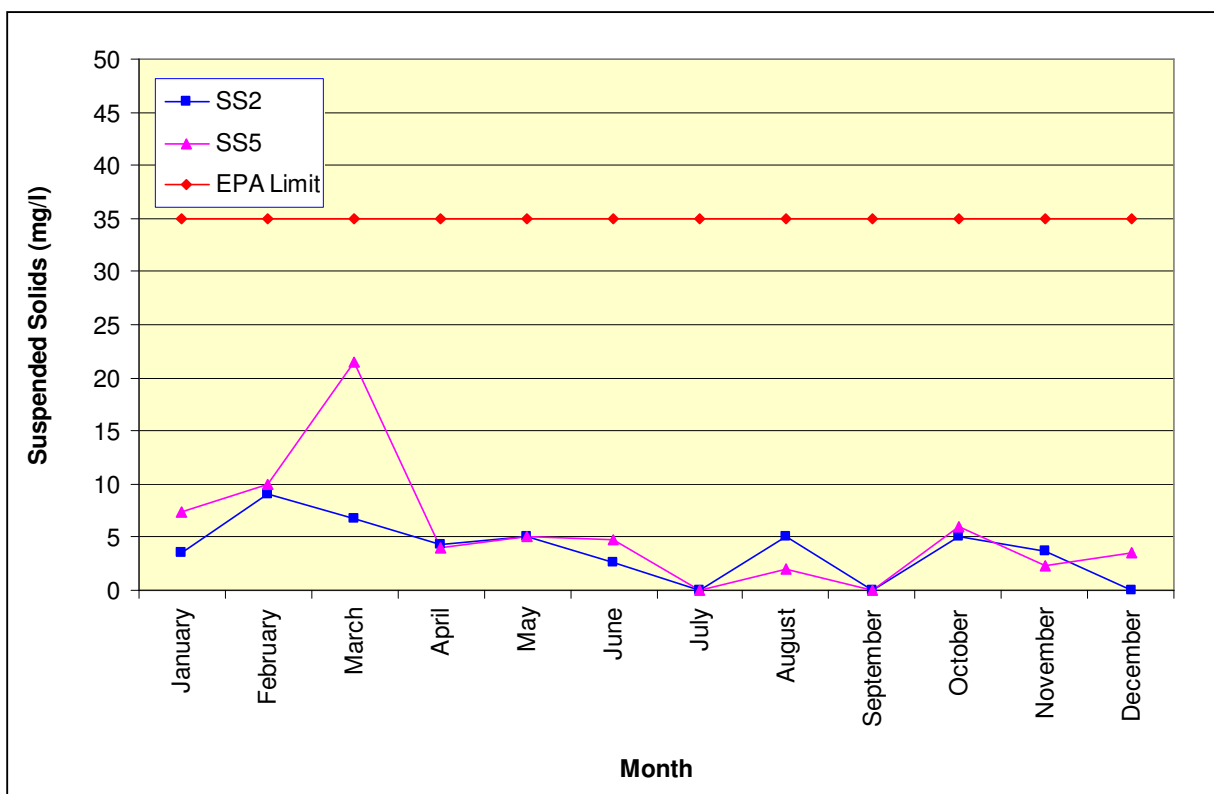


Figure 3.2: Suspended Solids SS2 and SS5



3.2.1. Long Term Trends

Levels of ammonical nitrogen, chloride, pH, BOD, and COD in the upstream sampling location RS1 and the downstream sampling location RS2 have been compared in order to detect any impact the landfill site may be having upon the surface water. These comparisons are illustrated graphically in Figures 3.3 to 3.7 inclusive.

Levels of ammonical nitrogen (Figure 3.3) are similar upstream and downstream of the landfill site and are consistently below the limit of 0.2 mg/l as set out in the Surface Water Regulations.

Chloride levels upstream and downstream are similar (Figure 3.4) and are significantly below the Surface Water Regulation limits of 250 mg/l in each quarter.

BOD levels upstream and downstream of the site (Figure 3.5) did not exceed the limit of 5 mg/l for A1 waters as outlined in the Surface Water Regulations in the reporting period.

Levels of pH (Figure 3.6) do not differ significantly between the upstream site and downstream site and generally remain between 6 and 8.

COD levels (Figure 3.7) are similar during each sampling date during the reporting period.

In conclusion, surface water monitoring results from the upstream sampling location RS1 and the downstream sampling location RS2 do not indicate that there is any contamination of the Farahy River as a result of activities at the landfill site.

Figure 3.3: Surface Water Ammonia Levels

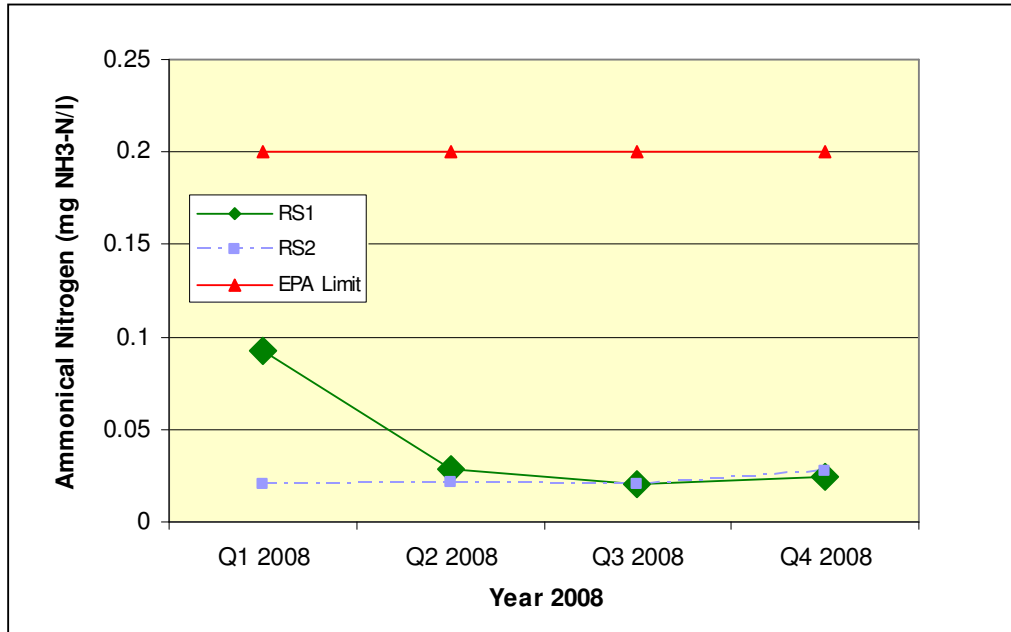


Figure 3.4: Surface Water Chloride Levels

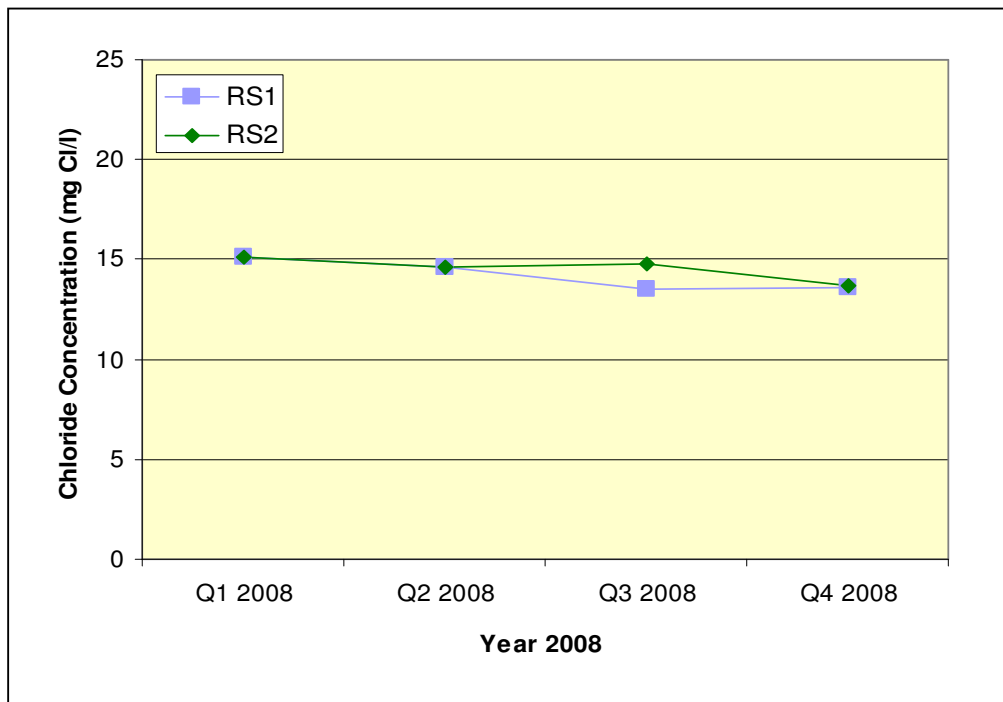


Figure 3.5: Surface Water BOD

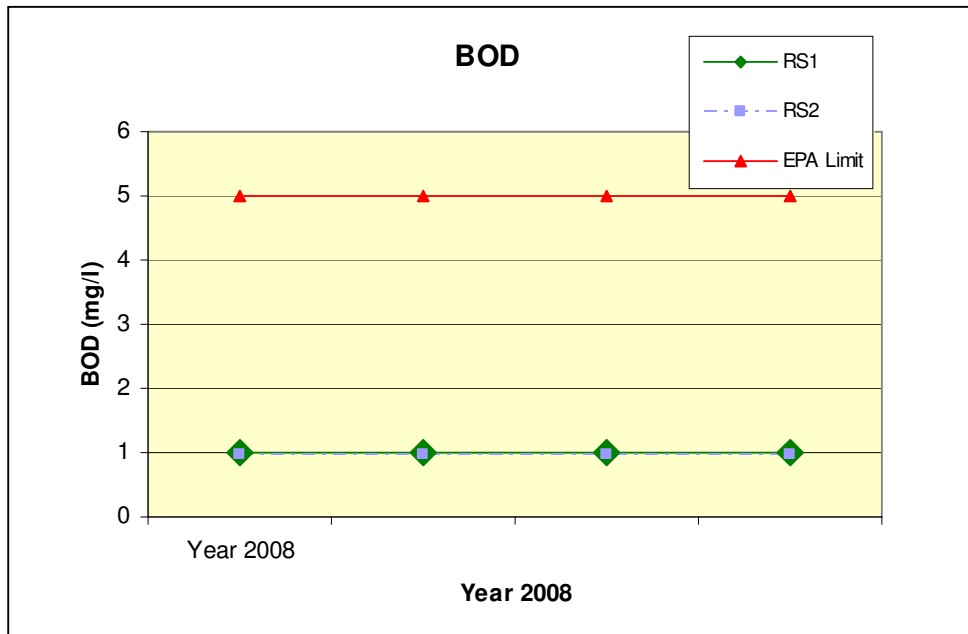


Figure 3.6: Surface Water pH levels

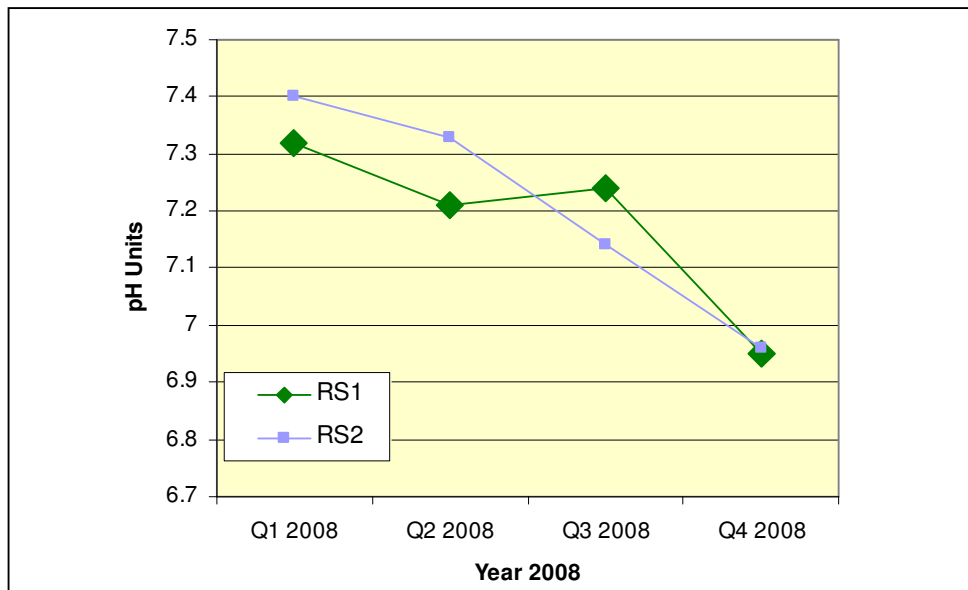
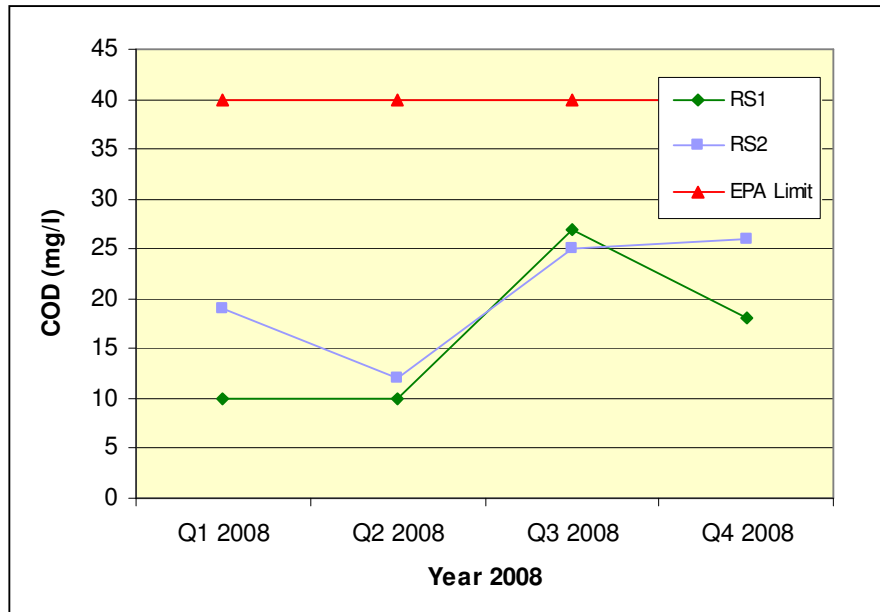


Figure 3.7: Surface Water Chemical Oxygen Demand (COD) Levels



3.3. Groundwater

Condition 8 and Schedule D.4 of the waste licence require the licensee to conduct groundwater monitoring on an annual basis at various locations within the site and outside the site boundary including two domestic wells. The samples were taken in quarter two in 2008. It is envisaged that the testing period would be changed from one year to the next.

The majority of parameters were below the recommended limits in all of the quarterly monitoring events with a few exceptions, which are discussed below.

In some of the wells over the monitoring period the iron level was in exceedances of the Drinking Water Regulations quality standards, as it has been in previous years. This high level of iron has been attributed to the geology of the site. Figure 3.8 shows the levels of iron detected in the various wells over the reporting period.

Total Coliforms levels were detected in five wells sampled during 2008. These are shown in Figure 3.9. The highest level recorded was 1046200 MPN/l in 96-4D. This incident was reported in Incident 1 2009. Cork County Council has retested this well 26th January 2009 – the result was 74 MPN/l. The subsequent investigation came to a conclusion that the pollution was caused by heavy rainfall experienced on the days prior to the test.

Levels of manganese recorded were high. This can also be attributed to the geology of the site. Refer to Figure 3.10. These evaluated manganese results are an established trend as can be seen from previous AER's.

The level of detection for VOCs and pesticides is 10 ug/l and 1 ug/l respectively. All results were below these levels for this monitoring period.

Figure 3.8: Groundwater Iron Levels

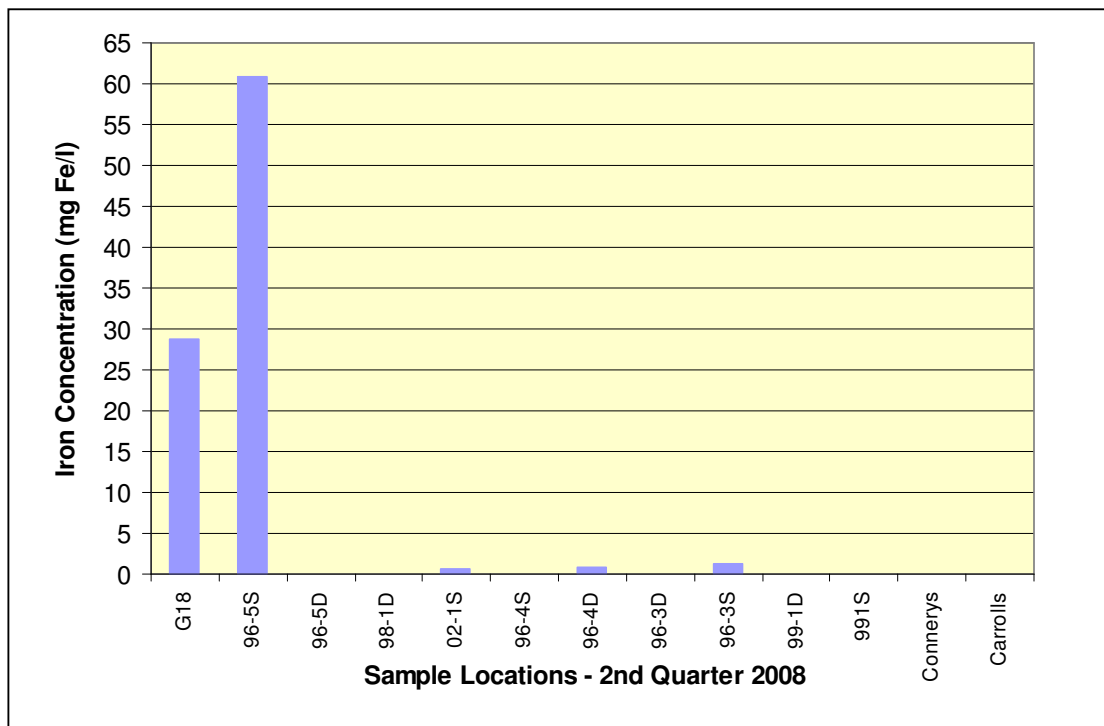


Figure 3.9: Groundwater Coliforms Levels

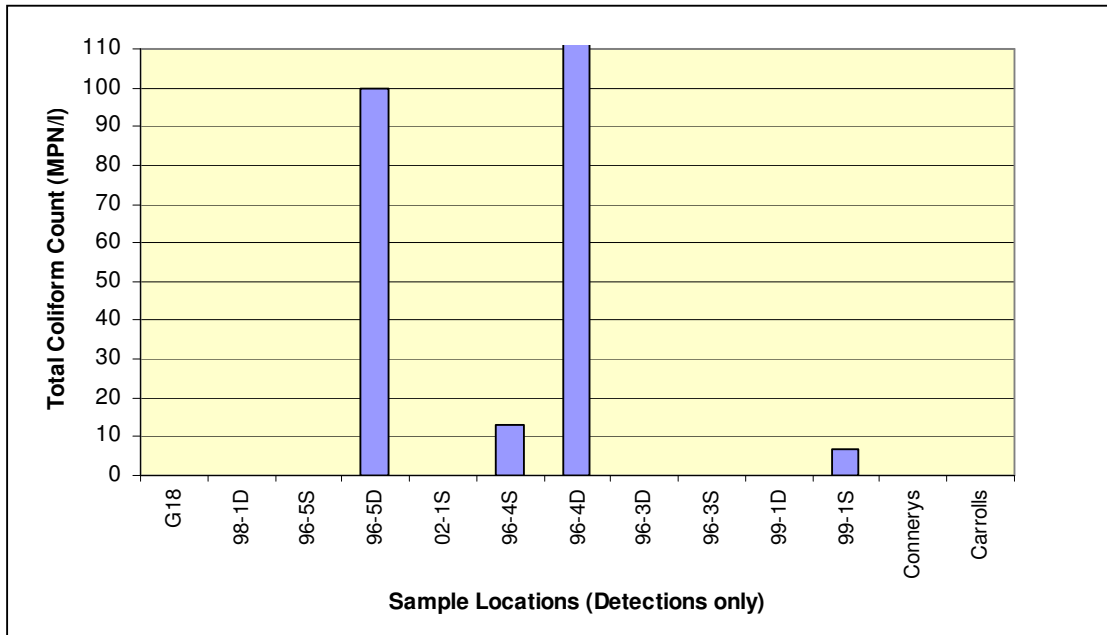
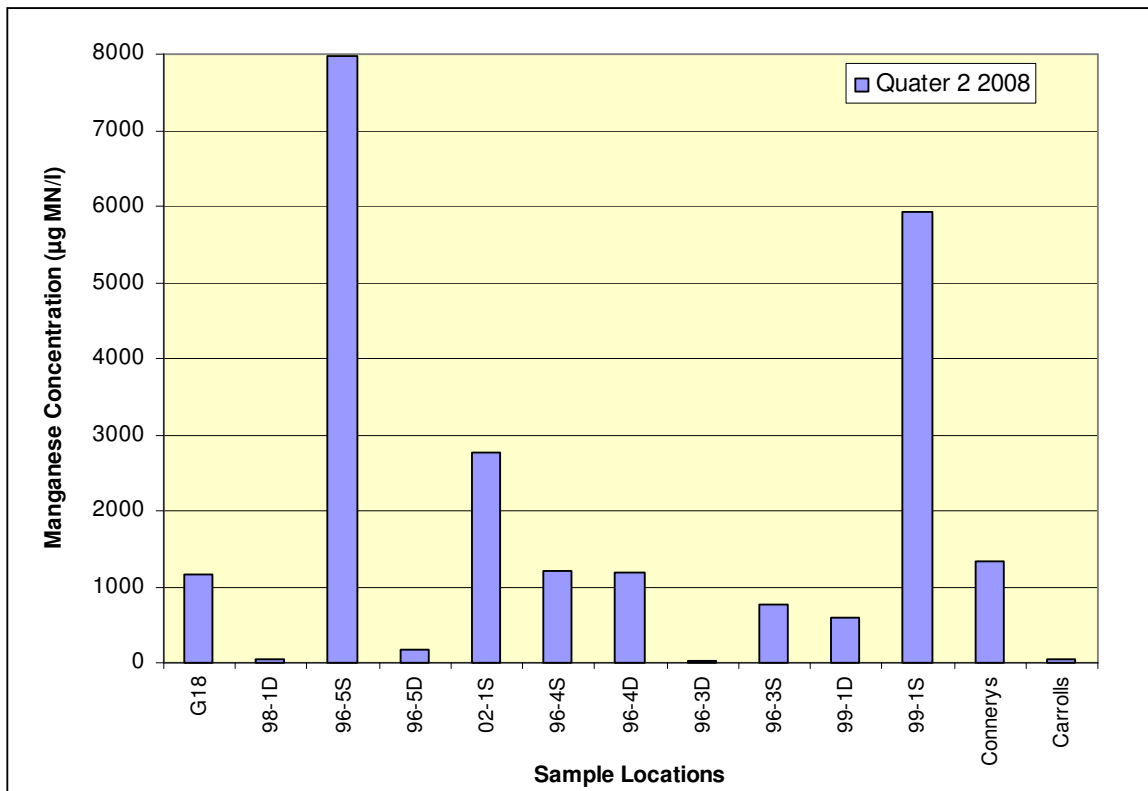


Figure 3.10: Groundwater Manganese Concentrations



3.3.1 Long Term Trends

As discussed above, levels of manganese and iron are naturally elevated in the groundwater as a result of the geology of the site (refer to Figure 3.8).

The normal indicative parameters of leachate contamination in groundwater include ammonia, chloride, total organic carbon (TOC), conductivity, pH, iron and heavy metals such as cadmium, nickel, zinc, copper and lead.

While the method detection limits for TOC, cadmium, copper and lead were above the corresponding standard limits, the levels of these analytes in the upgradient site well 98-1s/d and the downgradient site well 96-3s/d were below method detection limits.

Chloride levels measured in wells, both upgradient and downgradient of the site, throughout the monitoring period were below the Drinking Water Regulations 2000 limit of 250 mg/l.

Cadmium and lead levels upgradient and downgradient of the site are consistently less than 2 ug/l, which are below the limits as set out in the Drinking Water Directive.

Ammonia levels (NH₃-N) did not exceed the Drinking Water Regulations 2000 limit of 0.2 mg/l on any occasion.

3.4 Leachate

There was no testing of leachate during the reporting period. The EPA are contracted to test the leachate every year. There was no access to the leachate lagoon on the testing day of the last quarter.

3.4.1 Leachate Levels

There have been a number of exceedances in leachate levels in the cells. These are outlined in Table 3.2 below.

Table 3.2: Leachate Cell Exceedences for 2008

Date	Cell	Dipped Level	Height
15-Aug-08	2B	5.35	1.874
	2C	4.32	1.632
22-Aug-08	2B	4	3.224
	31-Aug-08	2C	4.12
29-Oct-08	2B	3.82	3.404
	2C	4.03	1.922
5-Sep-08	2B	3.9	3.324
	2C	4.1	1.852
	2A	4.99	2.288
	2B	4.13	3.094
	2C	3.76	2.192
	3B	8.86	-0.337
	5B	5.77	4.2
	7A	17.88	-0.726
	7B	18.62	-0.966
	7C	15.52	1.937
23-Sep-08	7D	15.78	1.423
	7E	15.45	2.792
	2B	4.5	2.724
	2C	4.442	1.51
	3B	5.95	-0.976
	3C	3.33	1.906
	5B	5.48	4.492
	7A	17.55	-0.401
	7B	18.48	-0.826
	7C	15.34	2.124
1-Oct-08	7D	15.66	1.534
	7E	15.37	2.869
	2B	4.34	2.889
	2C	4.36	1.592
	4B	7.55	1.102
	4C	7	-0.137
	5B	5.48	4.497
	5F	6.95	-0.402
7B	17.8	-0.144	
7C	15.6	1.859	
7D	14.85	2.348	
7E	14.75	3.485	

7-Oct-08	2B	4.26	2.967
	2C	4.22	1.732
	4B	7.62	1.036
	5B	8.78	1.196
	7B	17.66	-0.004
	7D	15.36	1.843
	7E	17.14	1.102
14-Oct-08	2B	4.25	2.974
	2C	4.26	1.692
	4B	7.64	1.016
	4C	6.89	-0.025
	5B	8.7	1.277
	5E	7.78	-0.117
	7C	16.16	1.304
	7D	15.95	1.248
21-Oct-08	2B	4.33	2.899
	2C	4.29	1.667
	4C	6.88	-0.02
	5B	8.9	1.072
	6B	13.95	-0.228
	7D	16	1.459
29-Oct-08	2B	4.36	2.864
	2C	4.3	1.657
	5B	8.87	1.107
	7C	16.13	1.334
5-Nov-08	1A	4.15	1.277
	2B	4.3	2.929
	2C	4.32	1.637
	5B	8.77	1.207
	7C	16.23	1.229
	7E	17.23	1.007
11-Nov-08	1B	4.18	1.082
	2B	4.32	2.904
	2C	4.28	1.672
	4C	6.89	-0.023
	7C	16.1	1.359
20-Nov-08	2B	4.28	2.944
	2C	4.27	1.682
27-Nov-08	2B	4.22	3.004
	2C	4.24	1.712
4-Dec-08	2B	4.15	3.074
	2C	4.21	1.742
10-Dec-08	2B	4.25	2.974
	2C	4.29	1.662
18-Dec-08	2B	4.2	3.024
	2C	4.25	1.702

23-Dec-08	2B	4.17	3.054
	2C	4.21	1.742
31-Dec-08	2B	4.22	3.004
	2C	4.27	1.682

Note:

Exceedances in cells 2B and 2C have been highlighted to EPA, ref. Incident 1 2008 and Incident 2 2008.

All other exceedances are due to a misreading of the depth indicator. This is very clearly indicated with minus values for some of the readings. All of the exceedances occurred when the site caretaker (D. Daly) was on leave and was replaced by temporary cover (D. Flynn).

3.5 Biological Monitoring

The closest EPA monitoring point (Station No 200 – Bridge near Ballyguyroe North) has a Q value of 4 (unpolluted) according to the EPA's National Monitoring Program.

As per testing carried out through out the year the landfill has had no discernable impact on the river Farahy.

4. SITE DEVELOPMENT WORKS

The landfill site has been in operation since 1990, prior to the application for a waste licence, and therefore much of the infrastructure of the site was already complete by the time the licence came into being.

Site development works that were carried out in accordance with the conditions of the licence, during 2003 are outlined below:

- Installation of leachate management system.
- Replacement of gas boreholes and installation of a gas flare system.

4.1 Progress towards Site Restoration

The Cells 1 to 6 inclusive have been grassed at this stage and a landscaping proposal has been approved by the Agency. The final cap has been applied to Cell 7 during works carried out in 2002. A surface water settling pond was created in 2004.

4.2 Site Survey

In accordance with Condition 8.3 of the licence, a topographical survey of the site including the void space was conducted in March 2009 and is submitted within this report (Appendix 1).

Cell 7 settled and as a result a depression formed in the landfill cap. This depression had the effect of gathering rainfall as leachate. Remedial works to cell 7 were commenced in 2006 and completed and re-seeded in 2007.

4.3 Landfill Gas Quantities

The gas flare has been installed and is currently operational. Steady state conditions have not yet been arrived at. Landfill gas emissions will not exceed the capacity of the flare which is 250 m³/hr.

4.4 Indirect Emissions to Groundwater

There are no direct or indirect emissions to groundwater from the site for the following reasons:

- all of the cells are underlain by a very low permeability clay layer (cells 1-6) or are lined with a HDPE liner (cell 7).
- all leachate levels in the cells are kept within limits set by the Agency.
- surface water and groundwater monitoring data indicates that there is no direct or indirect emission to the groundwater from the landfill site.

4.5 Monthly Water Balance Calculations

The monthly water balance calculations have been calculated as outlined in Appendix 2. The results are summarized in Table 4.1. The predicted amount of leachate can be compared with the actual amount tankered off site for each month.

The differences in actual and predicted quantities month to month can be explained by the absorptive capacity of the waste mass, which has a balancing effect. That is, high rainfall in one month, which would lead to a high-predicted leachate quantity, may only be realized in actual leachate quantity the following month after the water has percolated down through the waste mass.

Table 4.1 Water Balance Calculations 2008

Month	Predicted Leachate m³	Actual Leachate m³
January	1,238	2,623
February	282	796
March	704	1,596
April	333	926
May	288	297
June	736	806
July	906	1,521
August	961	2,434
September	1,151	1,554
October	938	1,622
November	551	1,950
December	537	1,363
Total	8,625	17,488
		8,862

Predicted leachate (8,625) — Actual leachate (17,488) = -8,862 m³.

It is a condition of the waste licence that the level of leachate in Cells 1 to 7 has to remain within 1m above the base of the cell. As a pumping system is in place on site all efforts are made to maintain the leachate level below 1m above the base of the cell. In order to keep the leachate at this level excess volumes have to be removed.

In conclusion, the volume of leachate tankered off the site in 2008 was 102.75% more than the predicted volume.

5. WASTE RECEIVED BY THE FACILITY

Ballyguyroe Landfill Facility provided a final disposal point for municipal solid waste up to September 27th 2001, at which stage it ceased to accept waste. No waste was accepted by the facility during the reporting period.

6. ENVIRONMENTAL INCIDENTS AND COMPLAINTS

6.1 Incident Summary

Condition 9 of the waste licence requires that the licensee shall make written records of environmental incidents. The incidences that occurred during this reporting period are similar to those that occurred during 2006 and 2007 (see previous AERs), i.e. they consisted largely of gas exceedances in boreholes caused by the migration of landfill gas from the cells. A new issue with occurrences of high leachate levels in Cells 2B and 2C.

Corrective actions taken in response to incidents and complaints are in accordance with the requirements of the licence and with the site Corrective Action Procedure.

Table 6.1: Recordable Incidents during the Reporting Period

Date	Incident	Cause	Corrective Action
15/08/08	leachate trigger level being exceeded – Cells 2B & 2C	The cause of the incident is the high leachate level being detected in leachate wells within Cell 2. As levels in 2A were within specified limits and pump is working satisfactorily, high levels may be the result of a blockage at the base of the well.	To follow, if trigger level continues to be exceeded.
21/08/08	leachate trigger level being exceeded - Cells 2B & 2C	The cause of the incident is the high leachate level being detected in leachate wells within Cell 2. The leachate level in cell 2A was within specified limits and pump is working satisfactorily. The high levels in 2B and 2C are most likely the result of material collected in the base of cell 2B and causing a blockage.	Option 1: Continue to monitor Wells As the high readings in these wells are isolated and surrounded by other wells which show satisfactory readings, no environmental pollution should be caused. Cork County Council could continue to monitor wells to ensure there is no further increase in depth of leachate in these wells. Option 2: Install new electric pump into

well no. 2B (where there is no existing pump)

This would be a costly process, but could effectively reduce the level of leachate within this well. There may be a problem with material at the base of the well sticking to the pump and causing malfunctions. This would require ongoing maintenance.

6.2 Complaints Received During the Reporting Period

No complaints were received during this reporting period.

7. ENVIRONMENTAL MANAGEMENT PROGRAMME

In compliance with Condition 2.3 of the waste licence, an Environmental Management Programme (EMP) has been established for the facility.

The EMP includes the Environmental Management Plan, the Schedule of Drawings, the timescale for achieving the Objectives and Targets and the designation of responsibility for achieving the Objectives and Targets.

7.1 Summary of procedures associated with the facility

Documented procedures governing the operation of the facility are outlined in Table 7.1 below.

Table 7.1: Operational Procedures

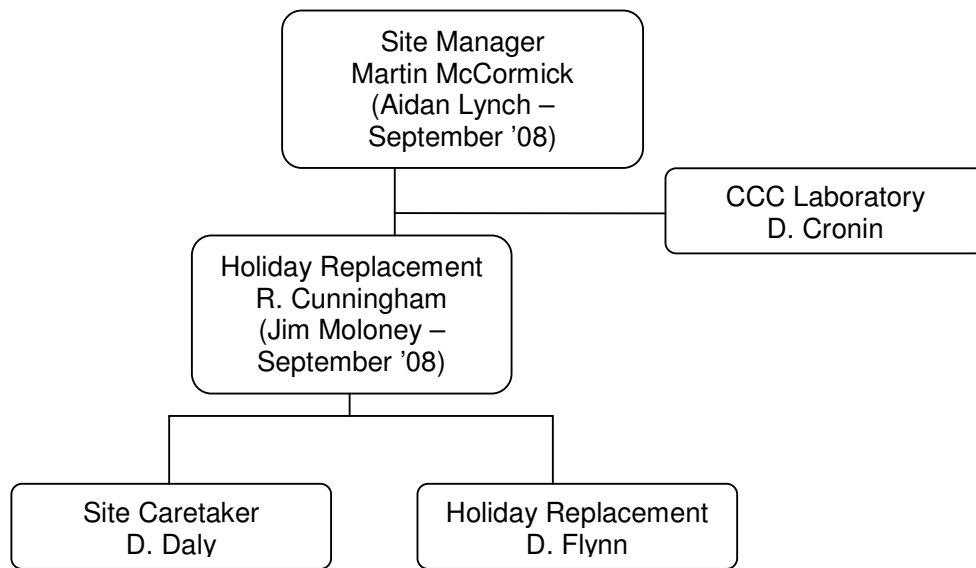
Procedure No.	Procedure Title
2	Smoking rules on site.
3	Rules for the refuse drivers entering the site.
4	Pumping of leachate on site.
5	Leachate levels on site.
7	Gas monitoring on site.

8	Use of absorbent material on site.
9	Site security and site fencing.
10	Loading of leachate.
11	Collection of litter.
12	Water ponding on cells.
14	Filling of the diesel tank
15	Loading of leachate from Cells 1 to 4
16	Discharging of leachate at Charleville Sewage Works
17	Spraying of flies

7.2 Management and Staff Structure

Cork County Council operates the landfill facility under the management structure illustrated in Figure 7.1 below.

Figure 7.1: Management Structure



- **Site Manager: Martin McCormick**

Responsibilities: Entire management of the facility
 Qualifications: B.E.

Martin McCormick was replaced by Aidan Lynch (B.E.) in September 2008.

- **Holiday Replacement Site Manager: Roy Cunningham**

Responsibilities: Entire management of the facility
 Qualifications: B.E

Roy Cunningham was replaced by Jim Moloney (B.E.) in September 2008.

- **Laboratory: Diarmuid Cronin**

Responsibilities: Sampling, analysis and interpretation of all in-house sampling on the landfill site.
Qualifications: Technician Grade I

- **Site Caretaker: D. Daly**

Responsibilities: Control of access to site, all weighbridge duties, canteen/storage container, machinery hire, leachate levels, measurement of stream discharges, gas measurement, well level measurement, daily environmental records.

Experience: Seven years as Site Caretaker on Ballyguyroe Landfill Site

- **Holiday Replacement: Denis O'Flynn**

Responsibilities: As above when substituting for D. Daly

The contingency arrangements for the absences of the main persons from the facility are outlined below:

Person Absent	Replacement
M. McCormick (A. Lynch)	R. Cunningham (J. Moloney)
D. Daly	D. O'Flynn
D. O'Flynn	Operative is supplied by a County Council area office.

7.3 Budget

The budget for 2008 was €435,000 including contact capital works and operational costs.

7.4 Staff Training

No training was carried out in this reporting period.

7.5 Nuisance Controls

The nuisance control methods that were in place during the monitoring period have been reviewed and have been deemed as adequate. These include litter fencing, a silt discharge pond and gas detection metres.

7.6 Any Other Items Specified by the Agency

The Agency has not specified any additional items to be included in this report.

8. RESOURCE CONSUMPTION

During the reporting period the following resources were utilised at the site:

- Electricity 34,600 kilowatt hours

Water use on site was for domestic use only.

APPENDIX 1
Topographical Survey Contour Drawing

APPENDIX 2
Water Balance Calculations

Ballyguyroe Landfill

Monthly Leachate Prediction for Year 2008

Month	Active Cell No.	Active Area (m ²)	Waste Input (t)	Rainfall (mm)	Evapotranspiration (mm)	Active Infiltration (m ³)	Restoration Cell No.	Restored Area No. 1 (m ²) 1 to 4	Restored Area No. 2 (m ²) 5 & 6	Restored Area No. 3 (m ²) 7	Restored Infiltration Area No. 1 (m ³)	Restored Infiltration Area No. 2 (m ³)	Restored Infiltration Area No. 3 (m ³)	Liquid Waste (m ³)	Total Leachate (m ³)	Cummulative Leachate (m ³)	Absorptive Capacity (m ³)	Cummulative Absorptive Capacity (m ³)	Monthly Leachate Generation (m ³)	Monthly Leachate Generation (gallons)
1	7	0	0.00	182.8	0.0	0	1 to 7	29,820	15,810	14,400	818	289	132	0	1238	1238	0	5,850	1,238	326,908
2	7	0	0.00	41.7	0.0	0	1 to 7	29,820	15,810	14,400	187	66	30	0	282	1521	0	5,850	282	74,574
3	7	0	0.00	103.9	0.0	0	1 to 7	29,820	15,810	14,400	465	164	75	0	704	2225	0	5,850	704	185,808
4	7	0	0.00	49.1	0.0	0	1 to 7	29,820	15,810	14,400	220	78	35	0	333	2557	0	5,850	333	87,807
5	7	0	0.00	42.5	0.0	0	1 to 7	29,820	15,810	14,400	190	67	31	0	288	2845	0	5,850	288	76,004
6	7	0	0.00	108.7	0.0	0	1 to 7	29,820	15,810	14,400	486	172	78	0	736	3581	0	5,850	736	194,392
7	7	0	0.00	133.7	0.0	0	1 to 7	29,820	15,810	14,400	598	211	96	0	906	4487	0	5,850	906	239,101
8	7	0	0.00	141.9	0.0	0	1 to 7	29,820	15,810	14,400	635	224	102	0	961	5448	0	5,850	961	253,765
9	7	0	0.00	169.9	0.0	0	1 to 7	29,820	15,810	14,400	760	269	122	0	1151	6599	0	5,850	1,151	303,838
10	7	0	0.00	138.4	0.0	0	1 to 7	29,820	15,810	14,400	619	219	100	0	938	7537	0	5,850	938	247,506
11	7	0	0.00	81.4	0.0	0	1 to 7	29,820	15,810	14,400	364	129	59	0	551	8088	0	5,850	551	145,571
12	7	0	0.00	79.3	0.0	0	1 to 7	29,820	15,810	14,400	355	125	57	0	537	8625	0	5,850	537	141,815
																			8,625	2,277,088

Density of in-situ waste = 0.75 t/m³

Absorptive Capacity = 0.075 m³/t

Final Infiltration = 15% of Effective rainfall p.a. in cells 1 to 4

Final Infiltration = 10% of Effective rainfall p.a. in cells 5 & 6

Final Infiltration = 5% of Effective rainfall p.a. in cell 7

Active Infiltration = Total rainfall

Liquid waste input = 0 t/year