

***Rathroeen Landfill,  
Killala Rd,  
Ballina,  
Co. Mayo.***

***Waste Licence Ref W0067-1***

***Annual Environmental Report  
Covering the period from the 1<sup>st</sup>  
January 2009 to 31<sup>st</sup> December  
2009***

**Owner and Operator**

Mayo County Council owns and operates the landfill at Rathroeen, Killala Rd, Ballina.

**Site Description;**

Rathroeen Landfill is located approximately 5Km north of Ballina Town. The site entrance is located on a minor road 300 meters from the Ballina – Killala regional road (R314). The entire landholding is 18.5 hectares in size. The land filled area covering 9.2 hectares.

The site drains to a stream that flows along its western then northern boundaries. This stream then flows around the northern end of a glacial hill to the east of the site before making its way to the Moy Estuary, approximately 2km east of the site.

Historically excavated material from the lake suggests that there is a grey silty/sandy till beneath the lake deposits. The geology outside the bounds of the former lake comprises of a layer of grey clayey till above limestone bedrock. The bedrock is shallow (1.5 to 3m below the ground) to the north and south of the site and is deeper (9m) to the east of the site. The surrounding area contains glacial hills. The till which forms this hill is brown and more sandy than the under lying grey clayey till.

**Reporting Period**

This Annual Environmental Report is for Rathroeen Landfill, Killala Rd, Ballina, Co. Mayo. It covers the period from the 1<sup>st</sup> January 2009 to the 31<sup>st</sup> of December 2009.

**Details of Activity**

The construction of Cell No. 2 was completed in April of 2006 and we commenced placing waste therein in May 2006. Waste was placed in Cell 2 for all of 2009. We are also operating a recycling center at the landfill site, which has become very busy, (circa 5900 users per month) during 2009.

**Volume and composition of waste received during the year.**

In the year ending 31/12/09, 35,155 tonnes of waste was accepted at Rathroeen Landfill. The landfill is licenced to accept 45,000tonnes per annum. The composition of this total is set out in Table 1.1, below.

**Table 1.1 Volume and composition of waste accepted at Rathroeen Landfill.**

Site: Rathroeen Landfill

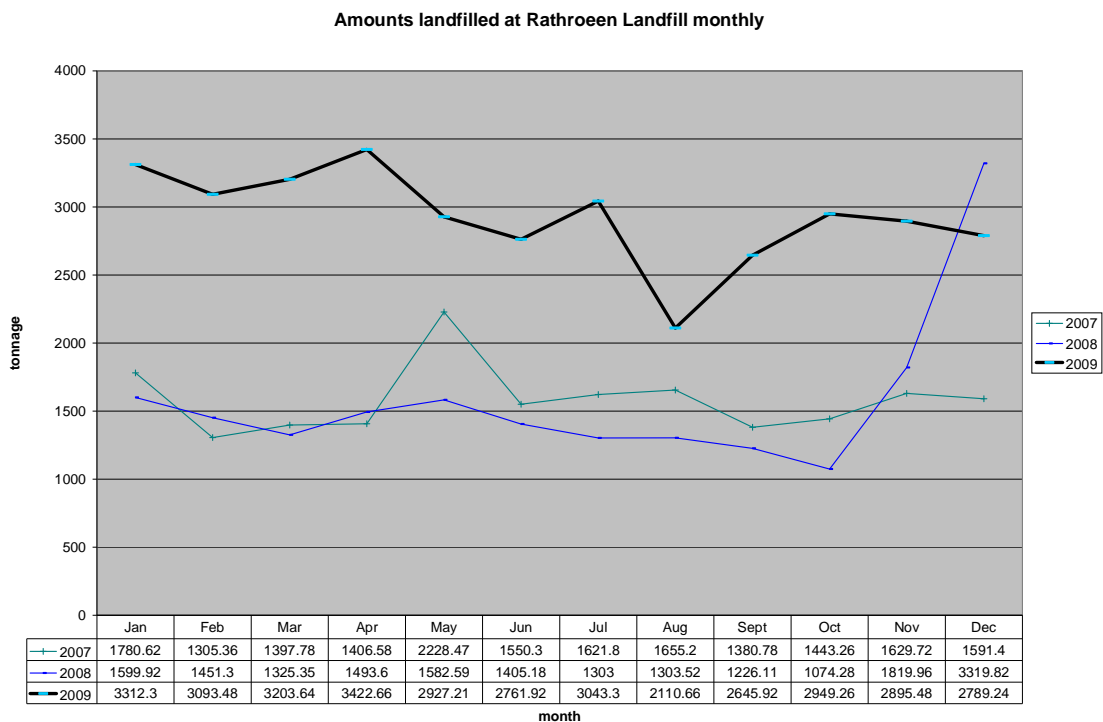
Year: 1<sup>st</sup> January to 31<sup>st</sup> December 2009

		2006	2007	2008	2009
Waste type	EWC Code.	Tonnage	Tonnage	Tonnage	Tonnage
Domestic	20030101	12407.12	12111.15	12708.93	22850
Commercial	20030102	5021.84	5412.05	4618.90	8788
C&D		176.34	0	0	0
Industrial Non Hazardous	20030103	365.08	454.56	439.19	808
Public Cleansing		888.58	1013.98	1137.61	2706
<b>Total</b>		<b>18858.96</b>	<b>18991.74</b>	<b>18904.63</b>	<b>35,155</b>

**Total Accumulated volumes of waste deposited**

There are no historical records of the waste that has been deposited at Rathroeen Landfill. During the application for the waste licence an estimate was made for the volumes of waste being generated in the Mayo area contributing to the landfill. At that time it was estimated that 18,500 tons per annum was being deposited at the landfill. The weighbridge was put in place in April 2001 and since then we have been able to gain a more precise picture of quantities of waste. Table 2 below shows the monthly tonnages of waste accepted at Rathroeen Landfill since April 2001.

Table 2.



**Calculated remaining capacity.**

The most recent design for the landfill available from the consulting engineers shows the following void spaces available:

Cell No. 1	89,000tonnes	111,250m <sup>3</sup>
Cell No. 2	63,500tonnes	79,375m <sup>3</sup>
Cell No. 3	162,000tonnes	202,500m <sup>3</sup>
Total	314,500tonnes	393,125m <sup>3</sup>
Void Space utilised		
Cell No. 1	89,000tonnes	111,250m <sup>3</sup>
Cell No. 2	85,950tonnes	79,375m <sup>3</sup>
Cell No. 3	0tonnes	0m <sup>3</sup>
Total Void Space utilized	139795 tonnes	174743.75m <sup>3</sup>
Total Void Space Remaining 31/12/09.	162,000tonnes	202,500m <sup>3</sup>

**Year in which final capacity will be reached.**

The remaining capacity of the landfill is 202,500 m<sup>3</sup>. In the year ended 31/12/09 we accepted 35,155 tonnes of waste. Cell 2 has been completely filled and we are waiting for the construction of Cell Number 3. There will be no more land filling carried out at Rathreen until Cell 3 is constructed and certified to accept waste.

**2010 Objectives and targets****Objective 1**

To continue to maintain and review the Environmental Management System (EMS) for the facility on an annual basis and work towards accreditation to the European Environmental Standard ISO 14001.

**Target**

To maintain and review the Environmental Management System (EMS) annually and to reach a standard that is above that required by waste licence 67-1.

**Designation of responsibility.**

The landfill manager is responsible for the establishment and maintenance of the EMS.

**Investment in project.**

To be decided.

**Progress to date.**

Original EMS has been agreed with Agency, this is the third set of revised sections to be submitted for approval.

**Objective 2**

To have gas extraction put in place for the completed Cell 2.

**Target.**

To have active landfill gas extraction from the waste in Cell 2 by the end of 2010.

**Designation of responsibility.**

Landfill Manager & Capital Projects section Mayo County Council.

**Investment in project.**

To be decided.

**Progress to date.**

Well locations and collection system layout being discussed.

**Objective 3.**

To have Cell 2 permanently capped in 2010.

**Target.**

To have Cell 2 permanently capped in 2010.

**Designation of responsibility;**

Landfill Manager and Senior Engineer Capital projects Mayo County Council...

**Investment in project.**

To be decided.

**Progress to date.**

Capping of Cell 2 in Rathreen has been established as a priority by the Director of services for environment and Mayo County Council are waiting funding.

## **Engineering Details;**

### **Site preparation and provision of services.**

Rathroeen Landfill is located approximately 5Km north of Ballina Town. The site entrance is located on a minor road 300 meters from the Ballina – Killala regional road (R314). The entire landholding is 18.5 hectares in size. The land filled area covers 9.2 hectares.

In order to continue the deposition of waste and to mitigate against any further adverse environmental impacts at Rathroeen Landfill, it was proposed to construct three lined cells on top of the existing waste body. The new cells are designed for both leachate and gas collection. The cells will be capped to prevent migration of gas and infiltration of rainfall thereby minimising the amount of leachate generated. The final capping will allow for the collection of clean surface runoff, which will be diverted to surrounding streams.

In addition the new cells will prevent rainfall entering old waste and therefore reduce leachate generated. The gas will be collected from the old waste and flared.

Construction of Cell No. 1 was completed in July of 2003. Filling of Cell No. 1 with waste commenced on the 15<sup>th</sup> of August 2003. Construction of Cell No.2 commenced in September 2005 and placing of waste therein commenced on 1/5/06. The permanent capping of the unlined area of waste at the northern end of the waste body was completed in March 2005, the capping of Cell 1 was completed in November 2006 and the spreading of clay thereon was delayed due to bad weather but eventually completed early in 2007. Land filling of waste in Cell 2 was completed in January 2010.

### **Leachate drainage, collection and treatment.**

All leachate generated in cells 1 & 2 is draining to the southwest corners of the cells. It is pumped to an under ground leachate lagoon. From this lagoon the leachate will pass through a methane stripping plant and into the main pump sump. It is then pumped via rising main to Ballina wastewater treatment plant.

A leachate interceptor drain has been constructed along the western edge of the old waste body. The invert level of the interceptor drain is just above the high water level in the reed beds to the west. The collected leachate drains to a sump from which it is pumped to the leachate lagoon.

The surface water collection system from the civic waste facility and the sorting shed also flows to the leachate lagoon and is sent for treatment in Ballina.

### **Landfill gas abatement, collection and flaring details.**

A landfill gas flare has been installed at Rathroeen Landfill as part of the development of the site. The flare was commissioned in March of 2004. Since early December 2005 the flare has been running 24hrs daily. It has only been switched off for services and or repair. Gas is being collected from the following areas.

3 No. horizontal wells under cell no.1,  
11 no vertical wells under cell no.2,  
8 No. vertical wells in the north of the site which was permanently capped early in 2006,  
And 9 No. vertical wells into cell no.1, cell no. 1 is to be permanently capped during the summer of 2006.

### **Site access roads and secondary roads**

Site access roads within Rathroeen Landfill are constructed with 75mm stone laid 300mm deep on a geotechnical material or compacted waste and cover material. The main access road to the landfill from the regional road R314 has recently been upgraded. It now consists of a 7m carriageway of dense bitumen macadam, which is surfaced with asphalt.

### **Current landscaping and tree planting**

Landscaping has been carried out along the Ballina/Killala road to the west of the landfill and along the Rosserk Road to the north of the landfill. The original planting scheme was to be carried out on the boundary line landfill but it would have taken a long time for the benefits of such planting to become apparent. It was therefore decided that the planting along the roads as stated would be more effective.

The entrance road to the landfill has also been landscaped with grass verges a line of hedging and semi-mature trees on either side. We are maintaining all the planted areas as necessary. Permanently capped areas have been grassed and the south and north facing embankments have all been planted with a mix of gorse and whitethorn.

### **Wheel cleaning**

The permanent wheel wash system was installed in June 2003 and has been operational since. Regular cleaning and inspections of the equipment are carried out.

### **Weighbridge**

The weighbridge in use at the landfill is a pit mounted 18m pit mounted precast concrete.

## **Operational Matters**

### **Description of the operations;**

The main activity at Rathroeen Landfill is the deposition of household and non-hazardous commercial and industrial refuse into an un-lined un-engineered area. The refuse is placed using a steel wheeled compactor in layers not exceeding 2m and is covered at the end of each day with hession/polypropylene.

Water coming into contact with the waste is deemed contaminated and called leachate. Leachate is collected and pumped to Ballina wastewater treatment plant.

The anaerobic breakdown of the organic fraction of the waste produces landfill gasses. The main constituents of these are methane and carbon dioxide. The gasses are flammable and toxic in high concentrations. At present Mayo County Council monitors gas levels at various points within the site. Monitoring is also carried out at several locations around the perimeter to ensure there is no migration of these potentially dangerous gasses.

There are presently 8 employees of Mayo County Council working full time at Rathroeen. The duties are as follows; the deputy landfill manager has responsibility for all monitoring and reporting to the EPA. There are two clerical staff that are responsible for the operation of the weighbridge and maintaining records of all site operations. There is an outdoor staff supervisor, foreman and three general operatives. They are responsible for maintaining the site in an appropriate manner. Keeping roads free of litter and dust, regulation of all traffic movements within the site and keeping the tip head in a safe and tidy state. Any windblown litter is collected immediately by the outdoor staff or if not then first thing the following day.

### **Phasing of filling;**

Placing of waste into cell no.1 commenced in August 2003. Construction of Cell No.2 started in Autumn 2005, as did the permanent capping of the unlined area of waste to the north end of the site. Filling of Cell No.2 commenced on the 1<sup>st</sup> of May 2006. The permanent capping of cell No. 1 commenced early in 2006 and was completed in July 2006. We completed the filling of Cell 2 in January 2010.

### **Report on development works undertaken in the reporting period**

The following works were carried out during the year:  
2009

- Northern area of Cell 2 completed profiled and temporarily capped.
- Installation of horizontal gas collection network through the waste body of cell 2.



### **Water, leachate and gas control measures;**

All water from the lined cells, the civic amenity area and road drainage within the site will be diverted to the leachate lagoon to be pumped for treatment. Other collected waters such as roof water will be diverted to the surface water drain. Efforts will be made to divert as much water as possible from the lagoon. These waters will be tested regularly and agreement reached with the agency before they are diverted permanently.

### **Measures for the control of environmental nuisances;**

#### **Noise**

Any equipment or plant that is deemed to exceed noise limits will be fitted with noise attenuation measures.

#### **Dust and/or mud**

Measures that are taken to alleviate problems with mud and dust are as follows;

1. The installation of a wheel wash.
2. Regular maintenance and cleaning of all site roads.
3. Where there are dry and windy conditions the site roads will be damped down to prevent windblown dust.

#### **Odour**

Odour emissions from the landfill site are reduced by a number of measures such as;

1. The minimisation of the size of the working face.
2. Adequate compaction of the waste once it has been placed.
3. Use of a mineral soil layer to cover the waste at different stages.
4. The use of a misting system combined with odour neutraliser
5. The extraction and flaring of landfill gas.

#### **Litter**

Windblown litter is kept to a minimum by keeping the working face as small as possible and working in a netted area. The approach to the landfill is checked on a daily basis and cleared of any litter. All vehicles entering the site are required to have the waste covered properly or they are refused entry.

## **Birds**

Nuisances caused by birds is controlled on the site by use of birds of prey in conjunction with keeping a small working face and covering the waste daily.

## **Vermin**

There is no vermin problem on the site at present. A specialist company are retained to monitor the vermin population.

## **Insects and pests**

At present there is no problem with insects and flies. Insecticide sprays are kept in storage to be utilised immediately if any problem is noticed.

## **Site opening and operating hours;**

The opening hours at Rathroeen Landfill have to comply with the following conditions of our licence;

### **1.7 Waste acceptance hours and hours of operation**

#### **1.7.1. Landfill**

1.7.1.1. Waste shall only be accepted at the facility for disposal at the landfill between the hours of 9.00am to 6.00pm Monday to Friday inclusive and 9.00am to 1.00pm on Saturdays.

1.7.1.1.1. The landfill at the facility shall only be operated during the hours of 8.00am to 6.30pm Monday to Friday inclusive and between 8.00am to 2.00pm on Saturdays.

1.7.1.1.2. Waste shall not be accepted at the landfill on bank holidays or on Sundays.

1.7.1.1.3. Civic waste facility

1.7.1.1.4. Waste shall only be accepted at the civic waste facility between the hours of 8.00am to 6.00pm Monday to Friday inclusive and 8.00am to 5.00pm on Saturdays.

The operational hours currently being used at the landfill are as follows;

Landfill;	Waste accepted 9.00am to 5pm Monday to Friday inclusive. The landfill is closed on Saturdays.
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Civic Waste Facility; waste accepted 9am to 5pm Monday to Friday inclusive and 9.00am to 3.00pm on Saturdays.

### **Access control;**

There are three main streams of waste entering the Rathroeen Landfill during 2009,

1. The waste collected by Mayo County Council and Ballina Town Council.
2. Waste brought to the site by contractors under the Waste Management Act, 1996 and,
3. Private individuals who bring their waste for disposal.

Each load of waste arriving at the landfill must be accompanied by a waste transfer document (DS 002 REV 1). All open topped skips are checked prior to tipping to ensure that waste is as outlined in documentation presented. All enclosed units have their load inspected at the tip head after they tip. Should any of the waste be unacceptable then arrangements are put in place to have the waste removed from the site. A rejection notice is issued and all details of load recorded.

### **Equipment used on site;**

A 35 tonne steel-wheeled compactor, Bomag, is to be used for compacting the waste. In addition to the compactor a tracked excavator is used at the tip head at all times. This is to keep the tipping area tidy and to keep the waste in front of the compactor for final placement.

Other equipment used at the site include a tractor with trailer for covering, a water tanker which is also attached to the tractor used for dust control and a transport box which is used for moving small items around site. Also on site is a skid steer, which is used for placing the recycling material into the baler in the sorting shed. It can also be fitted with forks for lifting palletized materials or with a road-sweeping brush to keep the recycling center tidy. Other items of machinery are hired in as required.

### **Cover requirements;**

At the end of each working day the active tipping face is covered using a hessian/polypropylene material. When the area is to be covered for a period of weeks or months then the intermediate cover will consist of subsoil's spread to a depth of approximately 100mm and a 3-400mm layer of timber shavings. At the commencement of filling an area, as much of the intermediate cover as possible will be removed before waste is placed. Procedures for final capping are outlined in the section for restoration and aftercare.

### **Area occupied by waste.**

The area of the Rathroeen Landfill site is 18.75 Hectares, of this area 9.4 Hectares has been land filled at some stage of the development. We are currently placing waste in Cell No. 2 which has an area of 15,000m<sup>2</sup>.

### **Methods of deposition of waste.**

The deposition of waste is currently being done in a lined cell. Waste vehicles reverse to an elevated tipping area to deposit the waste. This ensures that nobody has to walk on the waste. There is an excavator at the tip head that places the waste and it is then compacted by 32 tonne Bomag Compacter. Members of the public are not allowed to access the tipping area, they are provided with skips at the recycling center.

### **Civic Amenity.**

In September 2003 the recycling center at Rathroeen Landfill was opened to the public. Prior to this there had always been glass and aluminium can banks at the site. The new center increased the range of items that could be recycled.

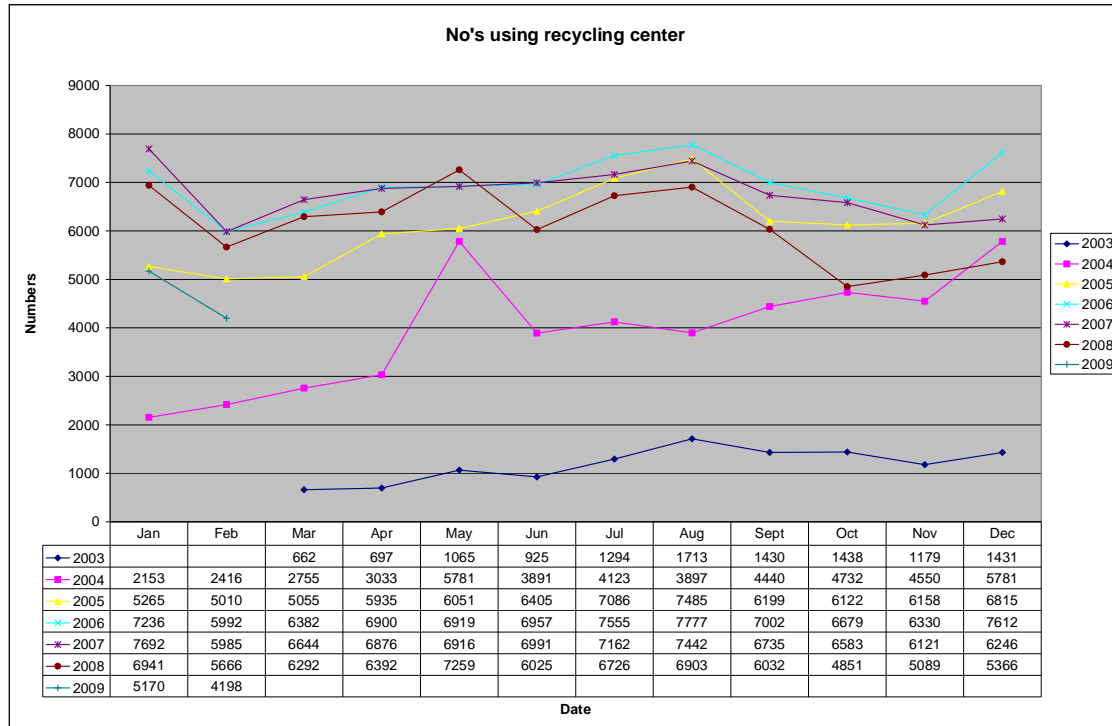
At the end of December 2009 the following items were being accepted at the recycling center:

1. Papers and magazines.
2. Cardboard.
3. Tetra-paks.
4. Plate glass.
5. Aeroboard / polystyrene
6. Glass - Clear, Brown, Green
7. Scrap metal
8. Tin / steel cans
9. White goods - Dishwashers, Cookers, Tumble dryers, Washing machines
10. Florescent tubes and light bulbs
11. Brown goods - Televisions, Computers, Keyboards and hard drives
12. Batteries - Household and car
13. Engine oil
14. Cooking Oil
15. Textiles
16. Plastics - PET and HDPE
17. Timber
18. Fridges and freezers
19. Tyres
20. Household hazardous wastes; Aerosols, Waste Medicines, Waste veterinary medicines, Pesticides, Herbicides, Paint, Household corrosives

Outlined on Table 3 appendix A .are the quantities of recycled material removed from the site by registered contractors in 2009.The contractors we had agreed with the agency for 2009 were as follows:

<b>Re-cyclable Waste (Charge)</b>	<b>Contractor</b>	<b>Waste Collection No</b>	<b>Waste Licence No</b>
Cardboard*	Greyhound	CW047	WPR-050/W0095-02
Aluminium cans*			
Type 1 Plastic			
Type 2 Plastic			
Steel Cans*	Erin recyclers	CW206	WP SO-05-51
Scrap metal	Galway Metal	WCP/LK/08/589/01	WR 05/4
Tetra-pack*()	ENVA	CW-030	W0184-01
Paper	WERS	CW -107	WR 84
Textiles	Textile recycling ltd.	Exempt	WPR-014
Glass Bottles	Rehab recycling	Exempt	03//02
Tyres	TBA		
Polystyrene	Bourke Waste	CW-050	PER-4
Plasterboard	TBA		
Waste Paint	Indaver	CW029	W036-02
Waste Pesticides			
Aerosols	ENVA	CW-030	W0184-01
Cooking Oil (Agri- energy)			
Waste Motor Oil			
Waste Medicine			
Filament light bulbs			
Window Glass			
Waste Oil filters	RILTA	WCP/CW/421	W0192-01
White Goods (FOC)	KMK- Metal	CW-093	W113-2
TV's and Computers (FOC)			
Small electrics (FOC)			
Electric Fence Batteries (FOC)			
Household Batteries (FOC)			
Flourescent tubes (FOC)			
Car Batteries (FOC)			
Fridge Freezers (FOC)			
OXFAM Bank	Oxfam	Exempt	Exempt
Mobile Phones	Jack and Jill foundation	Exempt	Exempt
Print cartridges	Jack and Jill foundation	Exempt	Exempt
* Repak subsidies apply			

For the year ended 31/12/09, 59,499 people availed of the facilities at the recycling center. Graph No.1. below shows the numbers attending the center on a monthly basis through 2009.



### Summary of environmental monitoring. Monitoring and maintenance procedures;

Monitoring at the landfill site is carried out in accordance with schedule D of Waste licence 67-1.

The main elements of the monitoring programme are as follows;

1. Groundwater monitoring
2. Surface water monitoring
3. Landfill gas monitoring
4. Leachate monitoring
5. Noise and dust monitoring
6. Meteorological monitoring
7. Ecological monitoring

## Landfill Gas Monitoring.

Monitoring was carried out on a monthly basis as required by our waste licence. There were a few occasions when levels exceeded trigger levels as outlined in the licence. Mainly these were high levels of CO<sub>2</sub> in areas outside the waste body.

A permanent gas detection system has been installed in the site buildings and it is tested and calibrated twice annually as set out in maintenance procedures.

Monthly gas monitoring sheets are included in Appendix B.

- The computerised gas model used was “Land SIM”,

Details for the emissions for 2009 are as follows;

Complete Landfill LFG	408.17m <sup>3</sup> /hr
Complete Landfill CH <sub>4</sub>	163.27m <sup>3</sup> /hr
Complete Landfill CH <sub>4</sub>	972568kg/yr
Complete Landfill CO <sub>2</sub>	244.9m <sup>3</sup> /hr
Complete Landfill CO <sub>2</sub>	4247836kg/yr

## Dust Monitoring

At Rathroeen Landfill we are required to carry out dust monitoring three times a year, twice between the months of May to September and once in the remainder of the year.

The results from each period are outlined below in Table 2.1.

Table 2.1 Total dust emissions during 2009

	<b>Up- 24/03/09 Down- 20/04/09</b>	<b>Up- 1/07/09 Down- 30/07/09</b>	<b>Up- 1/08/09 Down- 30/08/09</b>
	<b>Total Dust Mg / m<sup>2</sup> / day</b>	<b>Total Dust Mg / m<sup>2</sup> / day</b>	<b>Total Dust Mg / m<sup>2</sup> / day</b>
<b>D1</b>	<b>47</b>	<b>65</b>	<b>60</b>
<b>D2</b>	<b>128</b>	<b>1205</b>	<b>250</b>
<b>D3</b>	<b>86</b>	<b>101</b>	<b>110</b>
<b>D4</b>	<b>59</b>	<b>451</b>	<b>285</b>

## **Groundwater Monitoring**

Analysis of groundwater samples has shown that levels of ammonia have been elevated in each sampling period. Coliforms have also been found at most of the wells during this period, this indicates that there has been contamination due to sewage or industrial waste. Sampling dates for 2009 were, 23/03/09, 19/05/09 and 12 & 19/08/09.

Prior to the granting of our waste licence there were 6 No. monitoring points, MW 1,2,3,4D, 4S and MW5. In December '02 five more wells were drilled to comply with condition 3.18.1. This condition required that one well be drilled in the bedrock down gradient of the site and two more is drilled in the overburden to the north and east of the site. These were labelled MW7D, MW6 and MW8S. While the drilling rig was in these areas, we also had two more wells drilled in the overburden to the west, MW7S and in the bedrock up gradient of the site, MW8D. During the construction phase on site monitoring wells MW1, MW4D and MW4S were destroyed. These were replaced in October 2003 with wells that have been agreed with the agency and labeled as follows MW9, MW10D and MW10S.

With the completion of cells one and two plus the construction of the leachate interceptor drain there should be significant improvement in the groundwater quality.

Details of groundwater analysis are attached in Appendix C.

## **Surface water Monitoring**

Monitoring of the five surface water points is carried out on a quarterly basis as per schedule D.5.1. On each occasion that the samples have been taken one or more of the limits set for A1 waters has been exceeded. Dates of sampling in 2009 were, 23/03/09, 5/05/09 and 12/08/09 and 15/12/09.

The general trend of the samples are as follows, SW1 the upstream point is of poor quality generally, the situation is a lot worse at SW2 which is at the northern end of the site. The quality shows a gradual improvement as the stream makes the 2km journey, through points SW4, 3 and 5 to the river Moy.

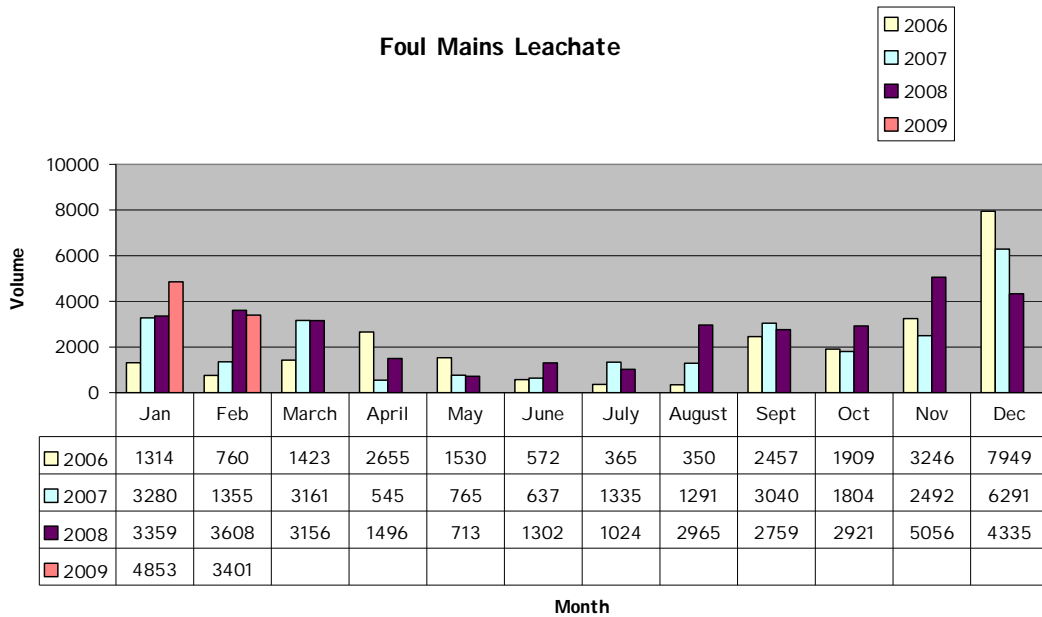
A summary of results for each point is included in Appendix.C.

## **Leachate Monitoring.**

As part of compliance to our waste licence we are sampling leachate monthly from the main pump sump before the rising main leaves the site to the treatment plant. Sampling dates for 2009 were as follows; 13/01/09, 19/02/09, 23/03/09, 28/04/09, 5/05/09, 9/06/09 and 12/08/09 and 15/12/09. Analysis and details on leachate monitoring and levels from the site are attached in Appendix C. Volumes pumped from the site are shown in table below.



### Foul Mains Leachate



Annual Water balance calculation and interpretation.

### Water Balance Return Form

Site: Rathroeen Landfill

Year: 2009

Cell No.2: 14000m<sup>2</sup>

Month	Household Waste (t)	Inert Waste (t)	Effective Rainfall (mm)	Available Absorptive Capacity for Cell (tonnes)	
				Month C	Cumulative C
	<b>H</b>	<b>T</b>	<b>R</b>	<b>Month C</b>	<b>Cumulative C</b>
January	3312.3	0	82	-816.87	-816.87
February	3093.48	0	14	113.34	-703.53
March	3203.64	0	42	-267.63	-971.16
April	3422.66	0	60.4	-503.33	-1474.49
May	2927.21	0	60	-547.27	-2021.76
June	2761.92	0	36	-227.80	-2249.56
July	3043.3	0	101.6	-1118.07	-3367.63
August	2110.66	0	89.6	-1043.33	-4410.96
September	2645.92	0	19.8	-12.6	-4423.56
October	2949.26	0	34.2	-183.87	-4607.43
November	2895.48	0	160.2	-1953.25	-6560.68
December	2789.24	0	71.4	-720.67	-7281.35

Available Absorptive Capacity “C” is defined as:

$$C = (H \times 0.1) + (T \times 0.05) - (RA) \text{ tonnes where}$$

H = the mass in tonnes of household and commercial waste input to the cell for the month;

T = the mass in tonnes of transfer station and general skip waste input to the cell for the month;

R = effective rainfall

A = original plan area of the cell in square meters

### **Biological Assessment**

Mr. Martin McGarrigle of the EPA in Castlebar carried out the biological assessment during Autumn of 2008. We are waiting for his report. He has indicated that there has been little improvement in the stream and that it remains at a Q rating of 2-3. A copy of the report will be forwarded on receipt of it.

### **Noise Monitoring**

The annual Noise survey was carried out in May 2009 the final results are attached in Appendix.D.

### **Meteorological Report**

In August of 2002 a weather station was put in place at the landfill site. It is being used to monitor wind speed, wind direction, rainfall, temperature, humidity and atmospheric pressure. A brief summary of monitoring has been included in Appendix E. Also shown are the rainfall totals that have been collected at Rathroeen.

Wind has been the most influential weather on the daily operations at Rathroeen landfill. We use an enclosed area of netting for tipping when it is windy. Since moving into Cell No. 2 we have been using a mobile netting system in conjunction with the perimeter netting. This netting can be moved to a new area in approximately half a day. We are therefore operating in an enclosed area at all times.

### **Complaints Summary.**

As part of the agreed management of the Rathroeen Landfill regular meetings are held with the local Cooneal and Ballisokeary Residents Association, four meetings were held in 2009, on the following dates, 25/02/09, 4/06/09, 23/09/09 and 9/12/09. Many of the concerns of the residents are expressed through these meetings and minuted.

### Financial provisions made under licence.

For the year 2009 the cost per ton of waste at Rathroeen Landfill has been as follows, €145 per ton inclusive of the €15 & €20 per tonne government landfill levy.

The running costs for Rathroeen for 2009 were €1.02 million; the current estimated cost for 2010 is €0.98 million.

### Management and staffing structure at Rathroeen Landfill

<b>Rathroeen Landfill Site Management Structure</b>					
Title	Name	Responsibilities/Duties	Qualifications/Experience		
Director of Services	Seamus Granaghan	Directorial responsibilities for the operation of the landfill.	B.E., C.Eng. F.I.E.I.		
Senior Engineer	Noel Burke	Overall responsibility for all aspects of development and management of the landfill.	B.E., C.Eng. M.I.E.I.		
Senior Engineer	Michael Mongan	Overall responsibility for all capital works at the landfill	B.E., C.Eng. F.I.E.I.		
Site Manager	Eddie Munnelly	Overall responsibility for the operation and the management of the landfill and ensuring compliance with the licence.	B.E., C.Eng. M.I.E.I.		
Deputy Site Manager	Michael Hegarty	Carrying out environmental monitoring at Rathroeen Landfill as specified in the waste licence. Deputising for Site Manager.	B.Sc., Dip C.Eng.		
Assistant Staff Officer, Grade 4	Ciaran Commons	Operation of the office system including weighbridge accounts, payments, invoicing, wages, subsistence, information management, public relations.	Suitably Qualified		
Clerical Officer	Patricia Loftus	Operation of the office system including weighbridge accounts, payments, invoicing, wages, subsistence, information management, public relations. Deputising for Administrative Officer.	Suitably Qualified		
A / Foreman	Gerry Bourke	Supervision of works and filling operations at the landfill. Deputising in absence of deputy landfill manager.	Suitably Qualified		
General Operative 1	John Quinn	General Maintenance as directed	Suitably Qualified		

General Operative 2	David McAndrew	General Maintenance as directed	Suitably Qualified	
General Operative 3	Martin McNulty	General Maintenance as directed	Suitably Qualified	

### **Public Information Programme**

All records of environmental monitoring are kept at Rathroeen Landfill. To date there have been no requests to see the information. We have also placed information boxes at the recycling center and have numerous leaflets and brochures available to the public at the reception area of the landfill. In addition to this we are also running a number of school tours. These are from both primary and secondary schools generally from the local area.

### **Operational and safety procedures, including Emergency Response Procedures;**

Refer to the guidelines for safe tipping procedures at the landfill site and Emergency Response procedure in the current EMS.

### **Assessment of settlement in finished areas;**

A topographical survey has been carried out at the landfill each year since the grant of the licence. A number of fixed benchmarks have been installed on the area to the north of the graded and these are being monitored for settlement.

### **Closure and aftercare;**

#### **Final contours of the site;**

The final contours of the site are as set out on drawing No. 0020405/01/609 submitted as part of the licence application in September 1999.

#### **The restoration plan;**

The finalised restoration and aftercare programme for the facility has not yet been fully decided upon, however the following issues will be dealt with;

- On cessation of filling each cell will be capped with an impermeable liner and soil layer;

- Gas extraction and leachate treatment will continue post closure;
- Monitoring of gas, surface and groundwater and leachate quality will continue post closure.

### **Phases for closure and restoration of completed areas;**

The filling of cell no.1 was completed in April 2006; it was permanently capped winter 2006 and spring 2007. Cell.2 has been filled from May 2006 onwards; its capacity was exhausted in January 2010, it is planned to be permanently capped within 12 months of reaching its capacity.

### **Aftercare monitoring and other control measures;**

#### **Post closure monitoring will be as follows;**

##### **Landfill gas;**

Monitoring of gas levels will be continuous in the site buildings, and will continue on a monthly basis at the monitoring points around the site, unless circumstances arise that requires more frequent monitoring. This will continue until it is shown that conditions on the site are stable. At this stage it is hoped that the gas monitoring may be continued on a biannual basis with the agreement of the agency.

##### **Surface water;**

The post closure-monitoring programme of the surface water will be based on the results of the monitoring programme over the remaining operating life of the landfill. All monitoring will aim to comply with the compliance monitoring as set out in the EPA manual on Landfill Monitoring, or as required by the Agency. The monitoring programme will consist of a minimum of twice yearly sampling at points upstream and downstream of the facility. All results and interpretations of it shall be included in the annual status report on Rathroeen Landfill.

##### **Ground water;**

The post closure-monitoring programme of the Ground water will be based on the results of the monitoring programme over the remaining operating life of the landfill. All monitoring will aim to comply with the compliance monitoring as set out in the EPA manual on Landfill Monitoring, or as required by the Agency. The monitoring programme will consist of a minimum of twice-yearly sampling from points up gradient and down gradient of the facility in the overburden and in the bedrock. The water levels will also be measured at these intervals. All results and interpretation s of it shall be included in the annual status report on Rathroeen Landfill.

**Leachate;**

Following closure, leachate levels and flow rates will continue to be recorded at the pump sumps. Leachate composition will be sampled and analysed on a six monthly basis in conjunction with the ground and surface water sampling. It shall be analysed for the same parameters as outlined for pre-closure.

**Noise;**

Noise monitoring is not expected to be required following completion of the landfill activities at Rathroeen Landfill.

**Odours;**

The need to monitor odours may arise due to complaints. However proper management of the facility and installation of a gas extraction plant will ensure that odour problems are kept to a minimum.

**Dust;**

Following the completion of the final landscaping dust monitoring will not be applicable at the facility.

**Meteorology;**

The weather station will remain in place at the facility following completion of the operations.

**Ecology;**

The vicinity of the landfill shall be monitored once approximately six months after completion of final landscaping. No further monitoring of the ecology is expected thereafter.

**Maintenance programme for aftercare phase;**

The management programme being established for the running of the landfill facility will continue post closure, with particular emphasis being placed on leachate, landfill gas emissions, surface and groundwater systems to ensure that the potential for environmental damage is minimised or eliminated. Mayo County Council will oversee the restoration plan and if the need arises, a landscape architect will be engaged to advise on how best to return the site to proposed condition. Attention will also be given to security of the facility in order to safeguard the integrity of the management systems put in place. The management programme will continue until such time as the agency dictates.

# ***Appendix A.***

	<b>2009 Totals</b>
<b>Glass(Clear, Green, Brown)</b>	137.18
<b>Aluminium Cans</b>	6.96
<b>Paper</b>	288.42
<b>Cardboard</b>	138.64
<b>Tetra Paks</b>	14.64
<b>Tin/steel Cans</b>	27.94
<b>Plastics (PE + HDPE)</b>	46.1
<b>Timber</b>	617.68
<b>Metal</b>	192.76
<b>Textiles</b>	55.86
<b>Waste oil</b>	4.04
<b>Waste Veg oil</b>	5.38
<b>Batteries -Nickel/cad</b>	3.9
<b>Batteries - lead acid</b>	17.82
<b>Window Glass</b>	14.82
<b>Flourescent tubes</b>	0.59
<b>White goods</b>	105.54
<b>TVs</b>	7.2
<b>Small Electrical Goods</b>	123.92
<b>Fridges/Freezers</b>	8.24
<b>Christmas Trees</b>	0
<b>Polystyrene</b>	2.32
<b>Tyres</b>	9.76
<b>Hse Haz. Waste ( Medicine )</b>	0.32
<b>Hse Haz. Waste ( Paint )</b>	10.78
<b>Hse Haz. Waste (Aerosols)</b>	2.02
<b>Gypsum / Plasterboard</b>	21.64
<b>Totals</b>	1865.67



# ***Appendix B.***

<i>Rathroeen Landfill</i>									<i>Address: Killala Rd, Ballina</i>
<i>:30/01/09</i>									<i>Analytical Range:</i>
<i>Personnel: Gerry Bourke</i>									<i>Instrument: GA2000</i>
<i>Temperature: as shown</i>									<i>Pressure: As Shown</i>
Well No.	CH4	CO2	O2	H2S	CO	Temp.	Rel	Barometric	Comments
	%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure	
BALLGW08	0.1	1.4	17	0	0	<<<	-0.16	990	perimeter
BALLGW09	0	1.4	19.1	0	0	<<<	0.89	991	perimeter
BALLGW12	0.1	1.7	14.4	0	0	<<<	-0.18	990	perimeter
BALLGW13	0.1	0	20.6	0	0	<<<	-0.22	990	perimeter
SWDRAIN1									perimeter
BALLGW14	13.8	21	5.1	1	0	<<<	-0.33	990	Horizontal gas collection pipe
BALLGW15									Horizontal gas collection pipe
BALLGW16	37.4	27.7	1.7	4	0	<<<	-28.08	990	Horizontal gas collection pipe
BALLGW17	0.1	10	6.6	0	0	<<<	-0.22	990	perimeter
BALLGW18	0.1	2.4	19.4	0	0	<<<	-0.19	990	perimeter
BALLGW19	26.6	20.6	0.1	0	0	<<<	-0.1	990	perimeter
BALLGW20	52.2	31.3	2.5	1	6	<<<	-27.22	989	Northern permanent capped area
BALLGW21	62.9	37	0.2	5	33	<<<	-27.18	989	Northern permanent capped area
BALLGW22	0.1	0	20.4	1	0	<<<	-12.33	989	Northern permanent capped area
BALLGW23	62.5	35	0.8	4	5	<<<	-27.18	989	Northern permanent capped area
BALLGW24	34.2	21.7	7.8	3	2	<<<	-27.42	989	Northern permanent capped area
BALLGW25	60.5	32.9	1.6	1	99	<<<	-2.57	989	Northern permanent capped area
BALLGW26	56.8	34.3	0	0	14	<<<	-27.47	989	Northern permanent capped area
BALLGW27	66.3	35.2	0	3	200	<<<	-27.37	989	Northern permanent capped area
BALLGW28	36.4	20.9	6.5	0	20	<<<	-27.68	989	Vertical wells into Cell 1
BALLGW29	66	35.4	0.1	1	4	<<<	-27.66	990	Vertical wells into Cell 1
BALLGW30	66.2	36.1	0	12	17	<<<	-27.64	989	Vertical wells into Cell 1
BALLGW31	66.1	36.2	0	0	42	<<<	-27.6	989	Vertical wells into Cell 1
BALLGW32	66.8	35.6	0	7	17	<<<	-27.64	989	Vertical wells into Cell 1
BALLGW33	49.8	30.6	0.1	5	34	<<<	-27.67	989	Vertical wells into Cell 1
BALLGW34	65.3	37.2	0	3	73	<<<	-27.72	989	Vertical wells into Cell 1
BALLGW35	61.2	32	1.5	3	12	<<<	-27.69	989	Vertical wells into Cell 1
BALLGW36	64.3	38.3	0	6	32766	<<<	-27.65	989	Vertical wells into Cell 1
BALLGW37	63.1	39.6	0	7	24	<<<	-32.82	989	Vertical wells Under Cell 2
BALLGW38	62	38.7	0.3	3	18	<<<	-32.83	990	Vertical wells Under Cell 2
BALLGW39	60	35.6	1.1	6	21	<<<	-32.8	990	Vertical wells Under Cell 2
BALLGW40	61.2	41.4	0	3	133	<<<	-32.84	990	Vertical wells Under Cell 2
BALLGW41	64.7	37.5	0	3	15	<<<	-32.92	990	Vertical wells Under Cell 2
BALLGW42	61.8	41.1	0	3	55	<<<	-32.84	990	Vertical wells Under Cell 2
BALLGW43	63.4	39.2	0	1	40	<<<	-32.77	991	Vertical wells Under Cell 2
BALLGW44	62.7	40.2	0	8	53	<<<	-32.86	990	Vertical wells Under Cell 2
BALLGW45	63.1	39.6	0	3	38	<<<	-32.76	990	Vertical wells Under Cell 2
BALLGW46	63.1	39.4	0	8	49	<<<	-32.84	991	Vertical wells Under Cell 2
BALLGW47	63.3	39	0	5	42	<<<	-32.8	990	Vertical wells Under Cell 2

**Monthly Gaswell Monitoring Record**

Site name: Rathroeen Landfill

Address: Killala Rd, Ballina

Date: 25/02/09

Analytical Range:

Personnel: Gerry Bourke

Instrument: GA2000

Temperature: as shown

Pressure: 1004mbar

Well No.	CH4	CO2	O2	H2S	CO	Temp.	Rel	Barometric	Comments
	%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure	
BALLGW08	0.1	2.5	11.5	0	0	<<<	-0.1	1019	perimeter
BALLGW09	0.1	1.4	19.1	1	0	<<<	0.05	1019	perimeter
BALLGW12	0.1	2.1	13.4	0	0	<<<	2.63	1019	perimeter
BALLGW13	0.1	0	20.4	0	0	<<<	16.7	1024	perimeter
BALLGW14	17.8	23.3	1.6	0	0	<<<	-0.07	1019	Horizontal gas collection pipe
BALLGW15	0.1	0	20.3	0	0	<<<	-0.34	998	Horizontal gas collection pipe
BALLGW16	32.3	24.8	2.6	3	0	<<<	-26.12	1018	Horizontal gas collection pipe
BALLGW17	0.2	5.4	11.4	0	0	<<<	-0.02	1018	perimeter
BALLGW18	0.1	2.2	18	0	0	<<<	-0.02	1018	perimeter
BALLGW19	51.2	19.6	0	0	0	<<<	-0.13	1019	perimeter
BALLGW20	56.4	31.5	1.8	0	6	<<<	-21.87	1016	Northern permanent capped area
BALLGW21	63.9	36.3	0.3	5	36	<<<	-21.55	1016	Northern permanent capped area
BALLGW22	62.8	34.2	1	3	33	<<<	-0.35	1016	Northern permanent capped area
BALLGW23	62.4	34.2	0.7	0	3	<<<	-19.92	1016	Northern permanent capped area
BALLGW24	43.3	26	4.8	1	2	<<<	-19.72	1016	Northern permanent capped area
BALLGW25	50.3	26.7	4.6	0	81	<<<	-1.19	1016	Northern permanent capped area
BALLGW26	48.3	31.5	0	2	11	<<<	-19.38	1016	Northern permanent capped area
BALLGW27	66.7	32.6	0	3	164	<<<	-19.27	1016	Northern permanent capped area
BALLGW28	33.4	18.8	7.4	0	7	<<<	-18.96	1016	Vertical wells into Cell 1
BALLGW29	66.8	34.1	0	0	34	<<<	-18.92	1015	Vertical wells into Cell 1
BALLGW30	67.2	35.3	0	7	17	<<<	-18.74	1015	Vertical wells into Cell 1
BALLGW31	67.6	35.1	0	1	36	<<<	-18.67	1015	Vertical wells into Cell 1
BALLGW32	67.8	34.4	0	6	16	<<<	-18.65	1015	Vertical wells into Cell 1
BALLGW33	45.3	28.2	0.1	0	28	<<<	-18.54	1015	Vertical wells into Cell 1
BALLGW34	64.4	36	0	2	80	<<<	-18.47	1015	Vertical wells into Cell 1
BALLGW35	68.6	33.1	0	3	11	<<<	-18.46	1015	Vertical wells into Cell 1
BALLGW36	65.6	37.2	0	3	32766	<<<	-18.36	1015	Vertical wells into Cell 1
BALLGW37	63.9	39	0	7	23	<<<	-24.32	1015	Vertical wells Under Cell 2
BALLGW38	64.2	38.2	0	2	26	<<<	-24.13	1016	Vertical wells Under Cell 2
BALLGW39	62.4	35.4	0.6	5	21	<<<	-24.07	1016	Vertical wells Under Cell 2
BALLGW40	62.1	40.5	0	1	130	<<<	-24.19	1016	Vertical wells Under Cell 2
BALLGW41	65.8	37	0	2	15	<<<	-24.04	1016	Vertical wells Under Cell 2
BALLGW42	62.7	40.3	0	2	56	<<<	-23.95	1016	Vertical wells Under Cell 2
BALLGW43	63.7	38.6	0	4	40	<<<	-24.12	1016	Vertical wells Under Cell 2
BALLGW44	63.5	39.2	0	8	59	<<<	-24.03	1017	Vertical wells Under Cell 2
BALLGW45	63.9	38.7	0	6	9	<<<	-24.03	1017	Vertical wells Under Cell 2
BALLGW46	63.4	38.7	0	1	41	<<<	-23.8	1016	Vertical wells Under Cell 2
BALLGW47	62.1	37.5	0.2	6	2	<<<	-23.82	1017	Vertical wells Under Cell 2

**Monthly Gaswell Monitoring Record**

**Site name: Rathroeen Landfill**

**Date; 6/08/09**

**Personnel:Gerry Bourke**

**Temperature:as shown**

**Address: Killala Rd, Ballina**

**Analytical Range:**

**Instrument: GA2000**

**Pressure:AsShown**

Well No.	Monitored	CH4	CO2	O2	CO	H2S	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08	Y	0	0.6	20.3	0	0	<<<	0.07	1004		perimeter
BALLGW09	Y	0	3.1	17.8	0	0	<<<	0.18	1004		perimeter
BALLGW12	Y	0	3.9	11.8	0	0	<<<	0.12	1004		perimeter
BALLGW13	Y	0	0	20.8	0	0	<<<	0	1002		perimeter
SWDRAIN1											perimeter
BALLGW14											Horizontal gas collection pipe
BALLGW15											Horizontal gas collection pipe
BALLGW16	Y	48.2	31.5	2.2	7	2	<<<	0.97	1012		Horizontal gas collection pipe
BALGW16A	Y	19.1	13.2	6.9	1	0	<<<	0.93	1012		Horizontal well South East Corner
BALLGW17	Y	0	5	14.6	0	0	<<<	0.04	1002		perimeter
BALLGW18	Y	0	3.2	18.2	0	0	<<<	0.05	1003		perimeter
BALLGW19	Y	62.3	29.9	0.4	4	0	<<<	0.35	1003		perimeter
FLARE001	Y	39.9	28.2	3	10	10	<<<	16.3	1012		
FLARE002											
VALVE002											
BALLGW20	Y	54.9	34.7	0.7	8	20	<<<	-72.44	1008		Northern permanent capped area
BALLGW21	Y	54.9	33.7	1.4	10	25	<<<	-72.55	1008		Northern permanent capped area
BALLGW22	Y	63.3	36.5	0	10	21	<<<	36.03	1008		Northern permanent capped area
BALLGW23	Y	42.7	30.5	0.2	9	10	<<<	-72.94	1009		Northern permanent capped area
BALLGW24	Y	57.7	35.7	0	6	20	<<<	-72.89	1008		Northern permanent capped area
BALLGW25	Y	55.6	31.4	2.3	2	70	<<<	-35.37	1009		Northern permanent capped area
BALLGW26	Y	52.1	33.1	0	7	1	<<<	2.8	1009		Northern permanent capped area

BALLGW27	Y	43.3	25.7	5.6	3	70	<<<	-72.48	1009		Northern permanent capped area
BALGW27A	Y	52.8	33.7	0.4	5	27	<<<	-72.57	1009		Manifold to Northern Area
BALLGW28	Y	62	34.4	3.3	2	9	<<<	-73.34	1008		Vertical wells into Cell 1
BALLGW29	Y	0	0	20.7	1	0	<<<	-72.82	1008		Vertical wells into Cell 1
BALLGW30	Y	62.6	36.6	0.3	11	17	<<<	-72.95	1008		Vertical wells into Cell 1
BALLGW31	Y	62.6	36.8	0.1	10	40	<<<	-73.19	1008		Vertical wells into Cell 1
BALLGW32	Y	63	37.2	0	5	6	<<<	-72.98	1008		Vertical wells into Cell 1
BALLGW33	Y	62.5	36.2	0	6	41	<<<	-72.97	1008		Vertical wells into Cell 1
BALLGW34	Y	31.1	18.4	10.1	6	26	<<<	-72.75	1008		Vertical wells into Cell 1
BALLGW35	Y	54.4	32.8	2.2	6	0	<<<	-73.04	1008		Vertical wells into Cell 1
BALLGW36	Y	62	37.5	0	6	32766	<<<	-72.68	1008		Vertical wells into Cell 1
BALGW36A											Manifold to Cell 1
BALLGW37	Y	60.7	36.9	0.3	16	32	<<<	-62.71	1012		Vertical wells Under Cell 2
BALLGW38	Y	60.4	38.1	0.2	12	30	<<<	-74.74	1012		Vertical wells Under Cell 2
BALLGW39	Y	44.8	27.5	5.2	24	24	<<<	-74.71	1012		Vertical wells Under Cell 2
BALLGW40	Y	59.2	39.8	0.2	18	80	<<<	-74.79	1012		Vertical wells Under Cell 2
BALLGW41	Y	59.8	38.9	0.2	11	27	<<<	-74.58	1012		Vertical wells Under Cell 2
BALLGW42	Y	58.8	40	0.2	13	68	<<<	-74.71	1012		Vertical wells Under Cell 2
BALLGW43	Y	60	38.6	0.3	14	46	<<<	-74.78	1012		Vertical wells Under Cell 2
BALLGW44	Y	59	40.3	0.2	17	36	<<<	-74.71	1012		Vertical wells Under Cell 2
BALLGW45	Y	58.1	39.9	0.2	11	37	<<<	-74.85	1012		Vertical wells Under Cell 2
BALLGW46	Y	59.6	39.2	0.2	15	45	<<<	-74.58	1012		Vertical wells Under Cell 2
BALLGW47											Vertical wells Under Cell 2
BALGW47A											Manifold to Cell 2
BALLGW48	Y	31.4	25.4	2.8	5	0	<<<	-0.97	1009		Horizontal well into cell 2
BALLGW49	Y	42.2	29.7	1.8	11	0	<<<	-1.24	1009		Horizontal well into cell 2
BALLGW50	Y	56.3	32.8	1.2	11	66	<<<	-1.66	1009		Horizontal well into cell 2
BALLGW51	Y	11.7	7.4	16.4	5	0	<<<	-1.83	1009		Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroeen Landfill

Date: 13.03.09

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: 1004mbar

Well No.	Monitored	CH4	CO2	O2	H2S	CO	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08	Y	0.1	2.5	11.5	0	0	<<<	-0.1	1019		perimeter
BALLGW09	Y	0.1	1.4	19.1	1	0	<<<	0.05	1019		perimeter
BALLGW12	Y	0.1	2.1	13.4	0	0	<<<	2.63	1019		perimeter
BALLGW13	Y	0.1	0	20.4	0	0	<<<	16.7	1024		perimeter
SWDRAIN1											perimeter
BALLGW14	Y	13.4	19	4.3	0	0	<<<	-0.23	1004		Horizontal gas collection pipe
BALLGW15	Y									Closed	Horizontal gas collection pipe
BALLGW16	Y	34	26.6	1.6	3	0	<<<	-28	1004		Horizontal gas collection pipe
BALGW16A	Y										
BALLGW17											perimeter
BALLGW18		0.1	0	20.1	4	0	<<<	-38.89	1017		perimeter
BALLGW19											perimeter
FLARE001	Y	40									
FLARE002											
VALVE002											
BALLGW20	Y	49.1	29.5	3.4	0	2	<<<	-27.29	1003		Northern permanent capped area
BALLGW21	Y	63	36.4	0.2	8	28	<<<	-27.29	1002		Northern permanent capped area
BALLGW22	Y	65.4	36.2	0	4	31	<<<	5.42	1002	Increased extraction rate	Northern permanent capped area
BALLGW23	Y	59.1	33.6	1.3	0	8	<<<	-27.23	1002		Northern permanent capped area
BALLGW24	Y	41.3	24.7	5.9	0	4	<<<	-27.27	1002		Northern permanent capped area
BALLGW25	Y	53.8	28.6	3.6	0	87	<<<	-0.25	1002		Northern permanent capped area
BALLGW26	Y	51	32.1	0	5	13	<<<	-27.29	1002		Northern permanent capped area
BALLGW27	Y	64.6	33.6	0.4	2	119	<<<	-27.29	1001		Northern permanent capped area
BALGW27A	Y										
BALLGW28	Y	32.8	20.4	6.2	2	21	<<<	-27.46	1001	Low CH4 check for condensate	Vertical wells into Cell 1
BALLGW29	Y	51.3	28.9	3.5	1	18	<<<	-27.5	1001		Vertical wells into Cell 1
BALLGW30	Y	66.3	36.3	0	9	16	<<<	-27.31	1001		Vertical wells into Cell 1
BALLGW31	Y	66.7	35.6	0	4	37	<<<	-27.49	1001		Vertical wells into Cell 1
BALLGW32	Y	66.9	35.2	0	5	16	<<<	-27.39	1001	Low CH4 check for condensate	Vertical wells into Cell 1
BALLGW33	Y	45.6	29.3	0.2	3	27	<<<	-27.36	1001	Low CH4 check for condensate	Vertical wells into Cell 1
BALLGW34	Y	65.5	36.3	0	9	55	<<<	-27.41	1001		Vertical wells into Cell 1
BALLGW35	Y	64.1	32.5	0.9	0	10	<<<	-27.28	1001		Vertical wells into Cell 1
BALLGW36	Y	64.8	37.4	0	4	32766	<<<	-27.45	1001		Vertical wells into Cell 1
BALGW36A	Y										
BALLGW37	Y	64.2	39.2	0	4	22	<<<	-0.1	1002		Vertical wells Under Cell 2
BALLGW38	Y	63.8	38.8	0	6	16	<<<	-32.44	1002		Vertical wells Under Cell 2
BALLGW39	Y	57.6	33.8	2.1	1	18	<<<	-32.56	1002		Vertical wells Under Cell 2
BALLGW40	Y	61.5	40.9	0	5	122	<<<	-32.4	1002		Vertical wells Under Cell 2
BALLGW41	Y	65.2	37.1	0	3	14	<<<	-32.6	1002		Vertical wells Under Cell 2
BALLGW42	Y	62	41.1	0	3	56	<<<	-32.61	1002		Vertical wells Under Cell 2
BALLGW43	Y	63.5	39.4	0	5	40	<<<	-32.33	1002		Vertical wells Under Cell 2

BALLGW4	Y	62.7	40.1	0	7	66	<<<	-32.6	1002		Vertical wells Under Cell 2
BALLGW5	Y	63.2	39.1	0	7	51	<<<	-32.28	1001		Vertical wells Under Cell 2
BALLGW6	Y	62.8	39.5	0	8	153	<<<	-32.53	1002		Vertical wells Under Cell 2
BALLGW7	Y	62.9	38.9	0	6	27	<<<	-32.34	1001		Vertical wells Under Cell 2
BALGW47A	Y										Manifold to Cell 2
BALLGW8	Y										Horizontal well into cell 2
BALLGW9	Y										Horizontal well into cell 2
BALLGW50	Y										Horizontal well into cell 2
BALLGW51	Y										Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroeen Landfill

Date:14.04.09

Personnel:Gerry Bourke

Temperature:as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure:1004mbar

Well No.	Monitored	CH4	CO2	O2	H2S	CO	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW8	Y	0	1.8	16.3	2	0	<<<	2.33	999		perimeter
BALLGW9	Y	0.1	1.9	17.9	0	0	<<<	-0.87	998		perimeter
BALLGW12	Y	0	1.2	16.6	3	0	<<<	-0.72	999		perimeter
BALLGW13	Y	0	0	20.1	0	0	<<<	-17.59	1002		perimeter
SWDRAIN1											perimeter
BALLGW14	Y	18.5	21.6	1.7	3	0	<<<	0.08	999	Very Low CH4 Drawing very little	Horizontal gas collection pipe
BALLGW15	Y									Closed no CH4	Horizontal gas collection pipe
BALLGW16	Y	62.3	37.8	0.2	4	9	<<<	0.14	999		Horizontal gas collection pipe
BALGW16A	Y	3.5	2	18.3	0	0	<<<	-0.32	1004		
BALLGW17	Y	0	4.4	13.9	0	0	<<<	0.3	998		perimeter
BALLGW18	Y	0	3.5	17	0	0	<<<	0.33	999		perimeter
BALLGW19	Y	64.4	20.9	0.4	0	0	<<<	-0.26	997		perimeter
FLARE001	Y	41.3	27.6	3	6	8	<<<	21.22	1001		
FLARE002											
VALVE002											
BALLGW20	Y	44.7	27.2	4.5	1	0	<<<	-101.32	996		Northern permanent capped area
BALLGW21	Y	48.3	32.3	2	4	16	<<<	-101.48	996		Northern permanent capped area
BALLGW22	Y	66.2	36	0	3	30	<<<	27.5	996		Northern permanent capped area
BALLGW23	Y	53.1	33.1	1	7	2	<<<	-101.14	996		Northern permanent capped area
BALLGW24	Y	0.1	0	20.1	3	0	<<<	-101.18	996	Closed	Northern permanent capped area
BALLGW25	Y	0.1	0	20.3	0	0	<<<	-7.31	996	Fully open	Northern permanent capped area
BALLGW26	Y	15.9	20.7	2.5	7	0	<<<	-101.32	996	Closed	Northern permanent capped area
BALLGW27	Y	15.6	9	15.1	0	2	<<<	-101.3	996	Closed	Northern permanent capped area
BALGW27A	Y	56.1	33.2	0.9	1	18	<<<	-27.28	1001		
BALLGW28	Y	54.1	29.4	1.9	0	22	<<<	-101.9	996		Vertical wells into Cell 1
BALLGW29	Y	55.9	31	2.7	2	20	<<<	-101.91	996		Vertical wells into Cell 1
BALLGW30	Y	64.6	36.1	0	10	16	<<<	-101.62	996		Vertical wells into Cell 1
BALLGW31	Y	65	36.1	0	6	25	<<<	-101.62	996		Vertical wells into Cell 1
BALLGW32	Y	65	36.4	0	1	11	<<<	-101.8	996		Vertical wells into Cell 1
BALLGW33	Y	63.2	33.6	0.1	0	22	<<<	-101.67	997		Vertical wells into Cell 1
BALLGW34	Y	66.2	35.7	0	8	38	<<<	-101.5	996		Vertical wells into Cell 1

BALLGW35	Y	49.2	27	4.6	5	0	<<<	-101.85	996		Vertical wells into Cell 1
BALLGW36	Y	64.8	37.1	0	1	32766	<<<	-102.08	996		Vertical wells into Cell 1
BALLGW36A	Y										
BALLGW37	Y	62.4	38.6	0.1	13	20	<<<	-105.63	999		Vertical wells Under Cell 2
BALLGW38	Y	63.5	37	0.1	5	30	<<<	-105.72	999		Vertical wells Under Cell 2
BALLGW39	Y	40.2	25.1	6.7	5	12	<<<	-105.94	999	CH4 15-20% (lower than others)	Vertical wells Under Cell 2
BALLGW40	Y	60.2	40.8	0.2	8	129	<<<	-106.05	999		Vertical wells Under Cell 2
BALLGW41	Y	63.1	37.3	0.1	7	16	<<<	-105.59	999		Vertical wells Under Cell 2
BALLGW42	Y	60.3	40.6	0.2	10	58	<<<	-105.58	999		Vertical wells Under Cell 2
BALLGW43	Y	61.1	39.5	0.1	7	37	<<<	-105.54	999		Vertical wells Under Cell 2
BALLGW44	Y	60.3	40.4	0.2	14	39	<<<	-105.58	999		Vertical wells Under Cell 2
BALLGW45	Y	58.9	42.2	0.1	6	22	<<<	-105.62	999		Vertical wells Under Cell 2
BALLGW46	Y	60.8	40.3	0.1	13	58	<<<	-105.62	999		Vertical wells Under Cell 2
BALLGW47	Y	62.2	38.8	0.2	8	25	<<<	-105.58	999		Vertical wells Under Cell 2
BALLGW47A	Y										Manifold to Cell 2
BALLGW48	Y									Adjusted Extraction rate downwards	Horizontal well into cell 2
BALLGW49	Y									Adjusted Extraction rate downwards	Horizontal well into cell 2
BALLGW50	Y									Adjusted Extraction rate downwards	Horizontal well into cell 2
BALLGW51	Y									Adjusted Extraction rate downwards	Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroeen Landfill

Date: 19.05.09

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: 1004mbar

Well No.	Monitored	CH4	CO2	O2	H2S	CO	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08	Y	0	2.2	16.3	1	0	<<<	-3.86	1002		perimeter
BALLGW09	Y	0	2.4	16.7	3	0	<<<	0.81	1003		perimeter
BALLGW12	Y	0	2.1	13.4	3	0	<<<	-0.41	1002		perimeter
BALLGW13	Y	0	0	20.3	0	0	<<<	-1.39	1002		perimeter
SWDRAIN1		0	0	20.4	1	0	<<<	-10.42	1002		perimeter
BALLGW14	Y									Closed	Horizontal gas collection pipe
BALLGW15	Y									Closed	Horizontal gas collection pipe
BALLGW16	Y	23.2	21.1	4.4	11	0	<<<	-25.39	1002		Horizontal gas collection pipe
BALGW16A	Y	39.3	20.9	0.7	0	0	<<<	0.16	1002	Some CH4 still present	Horizontal well South East Corner
BALLGW17	Y	0	4	14.2	2	0	<<<	0.75	1002		perimeter
BALLGW18	Y	0	3.7	15.5	4	0	<<<	0.74	1002		perimeter
BALLGW19	Y	57.7	24.2	0.8	2	0	<<<	0.62	1003		perimeter
FLARE001	Y	37.8	26.1	3.5	8	4	<<<	19.34	1002	Running well	
FLARE002											
VALVE002											
BALLGW20	Y	46.5	28.9	3.8	1	3	<<<	0.42	1001		Northern permanent capped area
BALLGW21	Y	57.2	34.7	1.2	10	19	<<<	-37.55	1001		Northern permanent capped area
BALLGW22	Y	0	0	19.4	2	0	<<<	-37.29	1001	Closed low methane	Northern permanent capped area
BALLGW23	Y	54.3	34.5	0.4	3	11	<<<	-38.07	1001		Northern permanent capped area
BALLGW24	Y	53.2	33.6	1.4	6	4	<<<	-38.28	1001		Northern permanent capped area
BALLGW25	Y	0	0	19.5	2	0	<<<	-38.3	1001	Closed low methane	Northern permanent capped area



BALLGW26	Y	0	0	19.6	3	0	<<<	-33.65	1001		Northern permanent capped area
BALLGW27	Y	61.5	34.4	0.7	8	71	<<<	-39.71	1001		Northern permanent capped area
BALGW27A	Y	52.7	32.6	1.8	10	14	<<<	-40.07	1001		Manifold to Northern Area
BALLGW28	Y	31.9	21.8	4.7	1	24	<<<	-40.67	1001		Vertical wells into Cell 1
BALLGW29	Y	0	0	19.9	1	0	<<<	-40.84	1001	Closed to check will pressure build	Vertical wells into Cell 1
BALLGW30	Y	63	36	0.3	18	18	<<<	-41.18	1001		Vertical wells into Cell 1
BALLGW31	Y	63.6	35.9	0.2	11	30	<<<	-41.14	1001		Vertical wells into Cell 1
BALLGW32	Y	63.8	35.3	0.4	5	12	<<<	-41.07	1001		Vertical wells into Cell 1
BALLGW33	Y	18.1	13	11.2	14	0	<<<	2.24	1001		Vertical wells into Cell 1
BALLGW34	Y	64.2	35.8	0.3	4	38	<<<	0.58	1001		Vertical wells into Cell 1
BALLGW35	Y	51.5	29.2	3.7	9	1	<<<	-41.08	1001		Vertical wells into Cell 1
BALLGW36	Y	62.2	37.4	0.3	10	32766	<<<	-41.12	1001		Vertical wells into Cell 1
BALGW36A	Y										Manifold to Cell 1
BALLGW37	Y	61.7	38.3	0.7	9	15	<<<	-46.4	1002		Vertical wells Under Cell 2
BALLGW38	Y	62.9	37.3	0.5	3	19	<<<	-46.59	1002	Closed to check will pressure build	Vertical wells Under Cell 2
BALLGW39	Y	56.6	35.4	1.7	16	24	<<<	-46.53	1002		Vertical wells Under Cell 2
BALLGW40	Y	59.3	40.6	0.3	8	108	<<<	-46.64	1002		Vertical wells Under Cell 2
BALLGW41	Y	61.7	38.1	0.2	9	19	<<<	-46.55	1002		Vertical wells Under Cell 2
BALLGW42	Y	59.6	40.7	0.3	14	54	<<<	-34.95	1002		Vertical wells Under Cell 2
BALLGW43	Y	61.1	39	0.3	9	42	<<<	-46.6	1002		Vertical wells Under Cell 2
BALLGW44	Y	60	40.1	0.2	16	75	<<<	-46.68	1002		Vertical wells Under Cell 2
BALLGW45	Y	60.3	39.2	0.3	14	48	<<<	-46.73	1002		Vertical wells Under Cell 2
BALLGW46	Y	60.7	39.3	0.7	8	67	<<<	-46.48	1002		Vertical wells Under Cell 2
BALLGW47	Y	60.1	37.2	0.9	14	15	<<<	-46.65	1002		Vertical wells Under Cell 2
BALGW47A	Y										Manifold to Cell 2
BALLGW48	Y	55	33.5	1.5	7	0	<<<	0.63	1002	Increased extraction rate	Horizontal well into cell 2
BALLGW49	Y	43	27.1	5.6	10	0	<<<	-0.29	1001	Increased extraction rate	Horizontal well into cell 2
BALLGW50	Y	64.7	35.6	0.3	7	58	<<<	-2.48	1001	Increased extraction rate	Horizontal well into cell 2
BALLGW51	Y	51.3	20.1	4.8	4	0	<<<	0.83	1001	Increased extraction rate	Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroeen Landfill

Jun-09

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: As shown

Well No.	Monitored	CH4 %v/v	CO2 %v/v	O2 %v/v	H2S ppm	CO ppm	Temp.	Rel Pressure	Barometric Pressure	Comments	Location
BALLGW08											perimeter
BALLGW09	Y	0	2	19.1	0	0	<<<	-9.67	1016		perimeter
BALLGW12	Y	0	3	11.8	0	0	<<<	0.28	1016		perimeter
BALLGW13	Y	0	0	20.3	0	0	<<<	-4.78	1017		perimeter
SMDRAIN1		0	0	20.3	0	0	<<<	-5.02	1017		perimeter
BALLGW14	Y									Valve closed	Horizontal gas collection pipe
BALLGW15	Y									Valve closed	Horizontal gas collection pipe
BALLGW16	Y	23.6	21	4.5	12	0	<<<	-15.92	1016	Reduced extraction rate	Horizontal gas collection pipe
BALGW16A	Y	6.7	5.4	15.5	0	0	<<<	-0.03	1016		Horizontal well South East Corner



Well No.	Monitored	CH4	CO2	O2	H2S	CO	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08	Y										perimeter
BALLGW09	Y										perimeter
BALLGW12	Y										perimeter
BALLGW13	Y										perimeter
SMDRAIN1											perimeter
BALLGW14	Y										Horizontal gas collection pipe
BALLGW15	Y										Horizontal gas collection pipe
BALLGW16	Y	18.1	18.3	5.8	10	0	<<<	-28.72	1010		Horizontal gas collection pipe
BALGW16A	Y	12.5	7	14	0	0	<<<	0.22	1009		Horizontal well South East Corner
BALLGW17	Y										perimeter
BALLGW18	Y										perimeter
BALLGW19	Y										perimeter
FLARE001	Y										
FLARE002											
VALVE002											
BALLGW20	Y	48.2	32.9	1.4	9	9	<<<	-47.29	1009		Northern permanent capped area
BALLGW21	Y	60.6	37.2	0.1	11	24	<<<	-47.1	1009		Northern permanent capped area
BALLGW22	Y	32.1	19.1	9.7	5	13	<<<	-29.13	1009		Northern permanent capped area
BALLGW23	Y	48.7	33.3	0.6	2	9	<<<	-47.09	1009		Northern permanent capped area
BALLGW24	Y	57.3	36.8	0	4	12	<<<	-47.27	1009		Northern permanent capped area
BALLGW25	Y	63.1	36.6	0	3	154	<<<	9.3	1009		Northern permanent capped area
BALLGW26	Y	24.2	16.3	10.7	2	6	<<<	-14.3	1008		Northern permanent capped area
BALLGW27	Y	60.6	38.3	0	7	33	<<<	-47.11	1009		Northern permanent capped area
BALGW27A	Y	54	35.1	0.4	5	17	<<<	-47.22	1009		Manifold to Northern Area
BALLGW28	Y	39.3	29.6	0.5	9	44	<<<	-47.12	1008		Vertical wells into Cell 1
BALLGW29	Y	0	0	20.5	2	0	<<<	-47.19	1008		Vertical wells into Cell 1
BALLGW30	Y	60.7	36.9	0.2	17	7	<<<	-47.04	1008		Vertical wells into Cell 1
BALLGW31	Y	62.2	37.3	0	9	35	<<<	-47.42	1008		Vertical wells into Cell 1
BALLGW32	Y	59.6	36.9	0	13	1	<<<	-47.2	1008		Vertical wells into Cell 1
BALLGW33	Y	29.1	27.8	0	7	1	<<<	-47.19	1008		Vertical wells into Cell 1
BALLGW34	Y	23.9	14.4	12.3	4	14	<<<	-47.22	1008		Vertical wells into Cell 1
BALLGW35	Y	48.8	30.1	3.8	5	3	<<<	-47.24	1008		Vertical wells into Cell 1
BALLGW36	Y	0	0	20.3	6	0	<<<	-15.58	1008		Vertical wells into Cell 1
BALGW36A	Y	61.9	37.9	0	12	32766	<<<	-47.21	1008		Manifold to Cell 1
BALLGW37	Y	61.5	38.2	0	17	19	<<<	-53.08	1010		Vertical wells Under Cell 2
BALLGW38	Y	61.8	37.7	0	14	23	<<<	-53.06	1009		Vertical wells Under Cell 2
BALLGW39	Y	64.1	36.8	0	48	75	<<<	101.19	1009		Vertical wells Under Cell 2
BALLGW40	Y	59.1	40.5	0	23	96	<<<	-49.06	1009		Vertical wells Under Cell 2
BALLGW41	Y	60.7	39	0	17	23	<<<	-39.69	1009		Vertical wells Under Cell 2
BALLGW42	Y	59.4	40.7	0	14	67	<<<	-53.03	1010		Vertical wells Under Cell 2
BALLGW43	Y	60.9	39	0	14	45	<<<	-53.34	1010		Vertical wells Under Cell 2
BALLGW44	Y	58.6	39.9	0.2	19	53	<<<	-52.99	1009		Vertical wells Under Cell 2
BALLGW45	Y	59.6	40.7	0	17	43	<<<	-53.26	1009		Vertical wells Under Cell 2
BALLGW46	Y	60.4	39.9	0	23	70	<<<	-53.15	1009		Vertical wells Under Cell 2
BALLGW47	Y	60.9	38.9	0	18	66	<<<	-53.18	1010		Vertical wells Under Cell 2
BALGW47A	Y										Manifold to Cell 2
BALLGW48	Y	62	35.7	0	8	35	<<<	0.6	1008		Horizontal well into cell 2
BALLGW49	Y	63.2	36.3	0	10	21	<<<	0.7	1008		Horizontal well into cell 2

BALLGW50	Y	64.1	36	0	12	74	<<<	0.68	1008	Horizontal well into cell 2
BALLGW51	Y	63	36.1	0	15	10	<<<	0.61	1008	Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathreen Landfill

Date: 6/08/09

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: As Shown

Well No.	Monitored	CH4	CO2	O2	CO	H2S	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08	Y	0	0.6	20.3	0	0	<<<	0.07	1004		perimeter
BALLGW09	Y	0	3.1	17.8	0	0	<<<	0.18	1004		perimeter
BALLGW12	Y	0	3.9	11.8	0	0	<<<	0.12	1004		perimeter
BALLGW13	Y	0	0	20.8	0	0	<<<	0	1002		perimeter
SMDRAIN1											perimeter
BALLGW14											Horizontal gas collection pipe
BALLGW15											Horizontal gas collection pipe
BALLGW16	Y	48.2	31.5	2.2	7	2	<<<	0.97	1012		Horizontal gas collection pipe
BALGW16A	Y	19.1	13.2	6.9	1	0	<<<	0.93	1012		Horizontal well South East Corner
BALLGW17	Y	0	5	14.6	0	0	<<<	0.04	1002		perimeter
BALLGW18	Y	0	3.2	18.2	0	0	<<<	0.05	1003		perimeter
BALLGW19	Y	62.3	29.9	0.4	4	0	<<<	0.35	1003		perimeter
FLARE001	Y	39.9	28.2	3	10	10	<<<	16.3	1012		
FLARE002											
VALVE002											
BALLGW20	Y	54.9	34.7	0.7	8	20	<<<	-72.44	1008		Northern permanent capped area
BALLGW21	Y	54.9	33.7	1.4	10	25	<<<	-72.55	1008		Northern permanent capped area
BALLGW22	Y	63.3	36.5	0	10	21	<<<	36.03	1008		Northern permanent capped area
BALLGW23	Y	42.7	30.5	0.2	9	10	<<<	-72.94	1009		Northern permanent capped area
BALLGW24	Y	57.7	35.7	0	6	20	<<<	-72.89	1008		Northern permanent capped area
BALLGW25	Y	55.6	31.4	2.3	2	70	<<<	-35.37	1009		Northern permanent capped area
BALLGW26	Y	52.1	33.1	0	7	1	<<<	2.8	1009		Northern permanent capped area
BALLGW27	Y	43.3	25.7	5.6	3	70	<<<	-72.48	1009		Northern permanent capped area
BALGW27A	Y	52.8	33.7	0.4	5	27	<<<	-72.57	1009		Manifold to Northern Area
BALLGW28	Y	62	34.4	3.3	2	9	<<<	-73.34	1008		Vertical wells into Cell 1
BALLGW29	Y	0	0	20.7	1	0	<<<	-72.82	1008		Vertical wells into Cell 1
BALLGW30	Y	62.6	36.6	0.3	11	17	<<<	-72.95	1008		Vertical wells into Cell 1
BALLGW31	Y	62.6	36.8	0.1	10	40	<<<	-73.19	1008		Vertical wells into Cell 1
BALLGW32	Y	63	37.2	0	5	6	<<<	-72.98	1008		Vertical wells into Cell 1
BALLGW33	Y	62.5	36.2	0	6	41	<<<	-72.97	1008		Vertical wells into Cell 1
BALLGW34	Y	31.1	18.4	10.1	6	26	<<<	-72.75	1008		Vertical wells into Cell 1
BALLGW35	Y	54.4	32.8	2.2	6	0	<<<	-73.04	1008		Vertical wells into Cell 1
BALLGW36	Y	62	37.5	0	6	32766	<<<	-72.68	1008		Vertical wells into Cell 1
BALGW36A											Manifold to Cell 1
BALLGW37	Y	60.7	36.9	0.3	16	32	<<<	-62.71	1012		Vertical wells Under Cell 2
BALLGW38	Y	60.4	38.1	0.2	12	30	<<<	-74.74	1012		Vertical wells Under Cell 2
BALLGW39	Y	44.8	27.5	5.2	24	24	<<<	-74.71	1012		Vertical wells Under Cell 2
BALLGW40	Y	59.2	39.8	0.2	18	80	<<<	-74.79	1012		Vertical wells Under Cell 2
BALLGW41	Y	59.8	38.9	0.2	11	27	<<<	-74.58	1012		Vertical wells Under Cell 2

BALLGW2	Y	58.8	40	0.2	13	68	<<<	-74.71	1012		Vertical wells Under Cell 2
BALLGW3	Y	60	38.6	0.3	14	46	<<<	-74.78	1012		Vertical wells Under Cell 2
BALLGW4	Y	59	40.3	0.2	17	36	<<<	-74.71	1012		Vertical wells Under Cell 2
BALLGW5	Y	58.1	39.9	0.2	11	37	<<<	-74.85	1012		Vertical wells Under Cell 2
BALLGW6	Y	59.6	39.2	0.2	15	45	<<<	-74.58	1012		Vertical wells Under Cell 2
BALLGW7											Vertical wells Under Cell 2
BALGW47A											Manifold to Cell 2
BALLGW8	Y	31.4	25.4	2.8	5	0	<<<	-0.97	1009		Horizontal well into cell 2
BALLGW9	Y	42.2	29.7	1.8	11	0	<<<	-1.24	1009		Horizontal well into cell 2
BALLGW50	Y	56.3	32.8	1.2	11	66	<<<	-1.66	1009		Horizontal well into cell 2
BALLGW51	Y	11.7	7.4	16.4	5	0	<<<	-1.83	1009		Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroen Landfill

Date: 02/09/09

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: As Shown

Well No.	Monitored	CH4 %v/v	CO2 %v/v	O2 %v/v	CO ppm	H2S ppm	Temp.	Rel Pressure	Barometric Pressure	Comments	Location
BALLGW8		0	0	20.8	0	0	<<<	-0.1	991		perimeter
BALLGW9		0	3.7	15.7	0	0	<<<	0.09	992		perimeter
BALLGW12		0	3.2	10.7	0	0	<<<	-0.21	991		perimeter
BALLGW13		0	0	20.7	0	0	<<<	-0.18	991		perimeter
SWDRAIN1											perimeter
BALLGW14		51.8	29.1	3.3	4	13	<<<	-62.72	991	25% open	Horizontal gas collection pipe
BALLGW15										Closed	Horizontal gas collection pipe
BALLGW16		38.4	28.8	1.9	5	0	<<<	-12.67	991	5-10% open	Horizontal gas collection pipe
BALGW16A		4.2	5	14.7	0	0	<<<	-0.07	991		Horizontal well South East Corner
BALLGW17		0.2	9.4	5.4	0	0	<<<	-0.33	991		perimeter
BALLGW18		0	4.4	16.3	0	0	<<<	-0.36	991		perimeter
BALLGW19		41.4	28.5	0	0	0	<<<	0.24	991		perimeter
FLARE001		46.6	30.9	2.3	2	16	<<<	13.31	991		
FLARE002											
VALVE002											
BALLGW20		58.7	37.2	0.4	10	23	<<<	-122.36	991	Open	Northern permanent capped area
BALLGW21		44.9	28.4	4.8	7	15	<<<	-122.71	991	Open, check O2 ingress	Northern permanent capped area
BALLGW22		0	0	20.7	3	0	<<<	-86.61	991	5% open	Northern permanent capped area
BALLGW23		50.3	33.6	1	5	45	<<<	-122.59	991	Open	Northern permanent capped area
BALLGW24		56	36.5	0.1	10	15	<<<	-122.78	991	Open	Northern permanent capped area
BALLGW25		0	0	20.7	3	0	<<<	-11.82	991	To be closed	Northern permanent capped area
BALLGW26		55.1	35.2	1.6	6	23	<<<	-8.24	991	Open	Northern permanent capped area
BALLGW27		59	37.7	0.5	9	128	<<<	-92.48	991	Open	Northern permanent capped area
BALGW27A		54.9	34.4	1.4	6	28	<<<	-123.64	992		Manifold to Northern Area
BALLGW28		49.6	31.9	1.8	0	32	<<<	-147.11	991	Open	Vertical wells into Cell 1
BALLGW29		64.7	36.6	0	1	168	<<<	0.76	991	Closed temporarily	Vertical wells into Cell 1
BALLGW30		62	37.8	0.2	11	31	<<<	-147.21	991	Open	Vertical wells into Cell 1
BALLGW31		61.2	36.7	0.5	5	37	<<<	-147.04	991	Open	Vertical wells into Cell 1
BALLGW32		62.1	38.2	0	5	23	<<<	-147.06	991	Open	Vertical wells into Cell 1
BALLGW33		40.2	32.5	0	5	27	<<<	-147.08	991	Open	Vertical wells into Cell 1

BALLGW34		43.5	25.5	5.9	7	39	<<<	-147.18	991	Open	Vertical wells into Cell 1
BALLGW35		47.8	28.8	4.4	2	3	<<<	-147.33	991	Open	Vertical wells into Cell 1
BALLGW36		62.5	38.3	0.1	3	32766	<<<	-147.18	991	Open	Vertical wells into Cell 1
BALLGW36A		53	34.6	1.1	8	32	<<<	-124.63	991		Manifold to Cell 1
BALLGW37		62.9	37.1	0.2	10	13	<<<	-151.1	991	Open	Vertical wells Under Cell 2
BALLGW38		61.5	38.8	0.1	1	27	<<<	-151.4	992	Open	Vertical wells Under Cell 2
BALLGW39		0	0	20.7	0	0	<<<	-151.07	992	Closed temporarily	Vertical wells Under Cell 2
BALLGW40		60.5	40	0.4	3	55	<<<	-151.22	992	Open	Vertical wells Under Cell 2
BALLGW41		61.1	38.8	0.3	4	22	<<<	-151.07	992	Open	Vertical wells Under Cell 2
BALLGW42		60.6	40	0.2	6	58	<<<	-150.89	992	Open	Vertical wells Under Cell 2
BALLGW43		61.6	38.8	0.1	1	41	<<<	-151.28	992	Open	Vertical wells Under Cell 2
BALLGW44		59.8	40.9	0.2	4	32	<<<	-150.9	992	Open	Vertical wells Under Cell 2
BALLGW45		59.6	40.9	0	8	26	<<<	-151.21	992	Open	Vertical wells Under Cell 2
BALLGW46		60.4	40.3	0.1	10	28	<<<	-150.72	992	Open	Vertical wells Under Cell 2
BALLGW47		60.7	39.4	0.1	7	36	<<<	-151.14	992	Open	Vertical wells Under Cell 2
BALLGW47A		61.3	39.3	0.1	8	7	<<<	-151.13	992		Manifold to Cell 2
BALLGW48		64.9	33.2	0	8	36	<<<	0.58	992	Closed temporarily	Horizontal well into cell 2
BALLGW49		65.1	34.7	0	8	26	<<<	0.5	991	Closed temporarily	Horizontal well into cell 2
BALLGW50		45.3	27.2	5	3	16	<<<	-59.98	991	Close slightly tomorrow	Horizontal well into cell 2
BALLGW51		0	0	21	5	0	<<<	-59.78	991	Closed	Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroeen Landfill

Date: 08/10/2009

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: As Shown

Well No.	Monitored	CH4	CO2	O2	CO	H2S	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08	Y	0	1	19.7	0	0	<<<	0.55	1013		perimeter
BALLGW09	Y	0	2.2	19	0	3	<<<	0.24	1013		perimeter
BALLGW12	Y	0	3.9	14.9	0	4	<<<	0.54	1012		perimeter
BALLGW13	Y	0	0	21.2	0	0	<<<	1.34	1012		perimeter
SWDRAIN1	Y	0	0	21	0	0	<<<	-3.52	1012		perimeter
BALLGW14	Y	11.3	8	14.5	0	0	<<<	-8.53	1012		Horizontal gas collection pipe
BALLGW15											Horizontal gas collection pipe
BALLGW16	Y	31.9	25	3.3	0	9	<<<	-9.57	1012		Horizontal gas collection pipe
BALLGW16A	Y	44.1	21.8	0.2	0	0	<<<	-0.07	1012		Horizontal well South East Corner
BALLGW17	Y	0	6.4	12.4	0	0	<<<	0.34	1012		perimeter
BALLGW18	Y	0	3	18.3	0	0	<<<	0.35	1012		perimeter
BALLGW19	Y	51.7	26.1	1.7	0	0	<<<	0.5	1012		perimeter
FLARE001	Y	42.3	28.5	3.6	10	6	<<<	16.45	1013		
FLARE002											
VALVE002											
BALLGW20	Y	56.2	35.4	0.3	15	8	<<<	-58.79	1011		Northern permanent capped area
BALLGW21	Y	37	22.3	8	15	5	<<<	-48.23	1011		Northern permanent capped area
BALLGW22	Y	63.4	35.1	0.3	27	2	<<<	-1.54	1011		Northern permanent capped area
BALLGW23	Y	46.2	31.5	0.5	19	1	<<<	-58.26	1011		Northern permanent capped area
BALLGW24	Y	57.8	35.1	0.2	7	1	<<<	-58.09	1011		Northern permanent capped area
BALLGW25	Y	51.6	29.1	3.6	99	4	<<<	-0.93	1011		Northern permanent capped area

BALLGW26	Y	57.5	34.5	1.2	27	3	<<<	-3.79	1011	Northern permanent capped area
BALLGW27	Y	60.3	35.2	0.2	7	8	<<<	-55.43	1011	Northern permanent capped area
BALGW27A	Y	57.9	34.8	0.1	27	7	<<<	-55.22	1011	Manifold to Northern Area
BALLGW28	Y	45.4	27.7	2.5	30	5	<<<	-34.02	1011	Vertical wells into Cell 1
BALLGW29	Y	47.8	27.5	4.6	1	5	<<<	0.01	1011	Vertical wells into Cell 1
BALLGW30	Y	62.7	37.4	0.2	5	4	<<<	-55.78	1011	Vertical wells into Cell 1
BALLGW31	Y	62.9	37.1	0	45	9	<<<	-55.96	1011	Vertical wells into Cell 1
BALLGW32	Y	62.3	36.3	0	19	10	<<<	-55.99	1011	Vertical wells into Cell 1
BALLGW33	Y	48.5	33	0	36	5	<<<	0.19	1012	Vertical wells into Cell 1
BALLGW34	Y	43.8	25.2	5.8	26	7	<<<	-44.13	1011	Vertical wells into Cell 1
BALLGW35	Y	56	32.9	2	0	10	<<<	-55.84	1011	Vertical wells into Cell 1
BALLGW36	Y	56.1	33	1.9	0	10	<<<	-55.98	1012	Vertical wells into Cell 1
BALGW36A	Y	55	33.5	0.9	35	7	<<<	-55.83	1011	Manifold to Cell 1
BALLGW37	Y	63.3	37.9	0.1	18	6	<<<	-59.64	1012	Vertical wells Under Cell 2
BALLGW38	Y	62.3	38.3	0.2	26	5	<<<	-59.32	1012	Vertical wells Under Cell 2
BALLGW39	Y	62.6	38.1	0.1	42	16	<<<	-1.06	1012	Vertical wells Under Cell 2
BALLGW40	Y	61.5	38.9	0.2	43	9	<<<	-59.4	1012	Vertical wells Under Cell 2
BALLGW41	Y	62.7	38.2	0	26	9	<<<	-59.77	1012	Vertical wells Under Cell 2
BALLGW42	Y	61.6	39.8	0.2	54	6	<<<	-59.81	1012	Vertical wells Under Cell 2
BALLGW43	Y	61.8	38.9	0.1	41	5	<<<	-59.48	1012	Vertical wells Under Cell 2
BALLGW44	Y	60.3	40.7	0.2	36	7	<<<	-59.33	1012	Vertical wells Under Cell 2
BALLGW45	Y	61.4	39.7	0	41	9	<<<	0.18	1012	Vertical wells Under Cell 2
BALLGW46	Y	61.4	39.6	0.1	36	8	<<<	-59.37	1012	Vertical wells Under Cell 2
BALLGW47	Y	60.2	38	0.5	32	7	<<<	-59.53	1012	Vertical wells Under Cell 2
BALGW47A	Y	61.7	38.7	0.1	14	8	<<<	-43.68	1012	Manifold to Cell 2
BALLGW48	Y	58.8	36.5	0.7	0	8	<<<	-0.02	1012	Horizontal well into cell 2
BALLGW49	Y	58.2	35.6	0.4	5	10	<<<	-0.09	1011	Horizontal well into cell 2
BALLGW50	Y	51.1	31.1	1.2	41	9	<<<	-0.26	1011	Horizontal well into cell 2
BALLGW51	Y	39.6	28.6	1.2	3	9	<<<	-0.27	1011	Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroen Landfill

Date: 10/11/09

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: As Shown

Well No.	Monitored	CH4	CO2	O2	CO	H2S	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08		0	0	20.5	0	0	<<<	0.24	1005		perimeter
BALLGW09											perimeter
BALLGW12		0	3.4	5.7	0	0	<<<	-15.43	1005		perimeter
BALLGW13		0	0	20.5	0	0	<<<	-0.65	1005		perimeter
SWDRAIN1		0	0	20.6	0	2	<<<	-13.99	1005		perimeter
BALLGW14		9.9	14.6	8.9	0	0	<<<	-0.32	1006		Horizontal gas collection pipe
BALLGW15											Horizontal gas collection pipe
BALLGW16		35.4	25.9	2.9	0	1	<<<	-16.47	1006		Horizontal gas collection pipe
BALGW16A		0	0.5	19.7	0	0	<<<	-0.41	1006		Horizontal well South East Corner
BALLGW17		0	7.8	5.5	0	1	<<<	0.25	1005		perimeter
BALLGW18		0	2.8	18.4	0	1	<<<	0.27	1005		perimeter
BALLGW19		31.4	19.2	2.8	0	3	<<<	0.17	1004		perimeter

FLARE001		49.3	31.6	2	14	8	<<<	15.69	1006	
FLARE002										
VALVE002										
BALLGW20		57.5	34.1	0.6	16	0	<<<	-92.08	1005	Northern permanent capped area
BALLGW21		0	0	20.2	0	1	<<<	-56.79	1005	Northern permanent capped area
BALLGW22		14.6	8.3	15.5	5	0	<<<	-30.51	1005	Northern permanent capped area
BALLGW23		53.4	33.8	0	46	0	<<<	-92.35	1005	Northern permanent capped area
BALLGW24		54.6	34.8	0.4	6	1	<<<	-92.47	1005	Northern permanent capped area
BALLGW25		0	0	20.3	0	0	<<<	-10.23	1005	Northern permanent capped area
BALLGW26		22.6	13.3	12.8	8	0	<<<	-6.98	1005	Northern permanent capped area
BALLGW27		54.4	32	1.8	44	3	<<<	-92.43	1005	Northern permanent capped area
BALLGW27A		55.9	33.4	1.1	27	3	<<<	-92.64	1005	Manifold to Northern Area
BALLGW28		46.2	28.5	2.4	40	3	<<<	-46.24	1005	Vertical wells into Cell 1
BALLGW29		64.3	34.2	0.4	169	4	<<<	0.22	1005	Vertical wells into Cell 1
BALLGW30		63.4	37.1	0.2	18	6	<<<	-84.29	1005	Vertical wells into Cell 1
BALLGW31		63.5	36.8	0	43	8	<<<	-83.03	1005	Vertical wells into Cell 1
BALLGW32		63.9	36.3	0	25	5	<<<	-79.79	1005	Vertical wells into Cell 1
BALLGW33		52.7	34.4	0	47	7	<<<	-30.07	1005	Vertical wells into Cell 1
BALLGW34		63.7	35	0.1	52	9	<<<	-61.27	1005	Vertical wells into Cell 1
BALLGW35		58	32.8	1.6	4	2	<<<	-82.84	1005	Vertical wells into Cell 1
BALLGW36		63.3	36.9	0.1	32766	9	<<<	-83.05	1005	Vertical wells into Cell 1
BALLGW36A		56.7	34.2	0.7	47	4	<<<	-83.62	1005	Manifold to Cell 1
BALLGW37		62.4	38.5	0.1	24	11	<<<	-95.81	1005	Vertical wells Under Cell 2
BALLGW38		62.1	37.9	0	25	8	<<<	-56.54	1006	Vertical wells Under Cell 2
BALLGW39		57.4	36.6	1.1	48	14	<<<	-16.03	1006	Vertical wells Under Cell 2
BALLGW40		61.6	38.7	0.1	38	4	<<<	-96.58	1006	Vertical wells Under Cell 2
BALLGW41		61.9	38.6	0	32	11	<<<	-96.06	1006	Vertical wells Under Cell 2
BALLGW42		61.1	39.4	0.1	58	8	<<<	-95.66	1006	Vertical wells Under Cell 2
BALLGW43		61.6	38.9	0.1	41	6	<<<	-96.28	1006	Vertical wells Under Cell 2
BALLGW44		59.9	40.8	0	43	8	<<<	-95.82	1006	Vertical wells Under Cell 2
BALLGW45		60.5	40.2	0.2	25	9	<<<	-96.12	1006	Vertical wells Under Cell 2
BALLGW46		61.1	39.8	0	32	8	<<<	-96.06	1006	Vertical wells Under Cell 2
BALLGW47		62.2	38.5	0	42	11	<<<	-96.05	1006	Vertical wells Under Cell 2
BALLGW47A		61.3	39.2	0	11	8	<<<	-47.82	1006	Manifold to Cell 2
BALLGW48		60.1	37.4	0.3	1	8	<<<	-0.75	1006	Horizontal well into cell 2
BALLGW49		62.5	35.9	0	2	9	<<<	-0.97	1005	Horizontal well into cell 2
BALLGW50		65.2	35.4	0	90	9	<<<	-1.32	1005	Horizontal well into cell 2
BALLGW51		65.4	35.1	0	43	9	<<<	-1.48	1005	Horizontal well into cell 2

Monthly Gaswell Monitoring Record

Site name: Rathroen Landfill

Date: 15/12/09

Personnel: Gerry Bourke

Temperature: as shown

Address: Killala Rd, Ballina

Analytical Range:

Instrument: GA2000

Pressure: As Shown

Well No.	Monitored	CH4	CO2	O2	CO	H2S	Temp.	Rel	Barometric	Comments	Location
		%v/v	%v/v	%v/v	ppm	ppm		Pressure	Pressure		
BALLGW08		0	0.3	20.3	0	0	<<<	0.08			perimeter
BALLGW09		0	1.6	18.1	0	0	<<<	0.14			perimeter
BALLGW12		0	2.6	8.3	0	0	<<<	0.63			perimeter



BALLGW13	0.3	0.4	20.6	0	0	<<<	-0.17		perimeter
SWDRAIN1	0	0	20.6	0	0	<<<	-0.17		perimeter
BALLGW14	20.6	19.3	3.1	9	0	<<<	-0.01		Horizontal gas collection pipe
BALLGW15									Horizontal gas collection pipe
BALLGW16	49	31	0.1	11	4	<<<	-12.71		Horizontal gas collection pipe
BALGW16A	0.3	1.6	17.2	10	0	<<<	0.21		Horizontal well South East Corner
BALLGW17	0	2.3	16.9	0	0	<<<	-0.12		perimeter
BALLGW18	0	1.4	19.5	0	0	<<<	1.06		perimeter
BALLGW19	0.1	12.4	5.3	0	0	<<<	1.5		perimeter
FLARE001	49.2	30	2.7	8	10	<<<	18.13		
FLARE002									
VALVE002									
BALLGW20	62.2	33.3	0.8	18	19	<<<	-58.93		Northern permanent capped area
BALLGW21	29.8	17.1	10.7	12	13	<<<	-37.97		Northern permanent capped area
BALLGW22	0	0	20.6	8	0	<<<	-16.67		Northern permanent capped area
BALLGW23	64.1	34.4	0.1	7	49	<<<	-60.81		Northern permanent capped area
BALLGW24	56.4	31.1	1.9	14	15	<<<	-61.35		Northern permanent capped area
BALLGW25	5.5	2.7	18.6	8	0	<<<	-1.14		Northern permanent capped area
BALLGW26	0	0	20.7	5	0	<<<	-5.11		Northern permanent capped area
BALLGW27	63.8	32.4	0.8	15	82	<<<	-61.99		Northern permanent capped area
BALGW27A									Manifold to Northern Area
BALLGW28	48.5	26.9	2.5	11	45	<<<	-28.8		Vertical wells into Cell 1
BALLGW29	66.1	34.5	0.1	9	179	<<<	1.13		Vertical wells into Cell 1
BALLGW30	64.9	35.8	0	13	21	<<<	-48.92		Vertical wells into Cell 1
BALLGW31	65.5	35.1	0	13	42	<<<	-49.81		Vertical wells into Cell 1
BALLGW32	66.3	34.3	0	14	32	<<<	-49.11		Vertical wells into Cell 1
BALLGW33	53.4	31.7	0	11	48	<<<	-19.78		Vertical wells into Cell 1
BALLGW34	66.5	34.2	0	16	49	<<<	-40.84		Vertical wells into Cell 1
BALLGW35	63.8	32.7	0.6	7	11	<<<	-49.32		Vertical wells into Cell 1
BALLGW36	64.9	35.5	0	10	32766	<<<	-49.76		Vertical wells into Cell 1
BALGW36A	58.8	32.4	0.7	15	49	<<<	-48.54		Manifold to Cell 1
BALLGW37	62.6	36.1	0.4	20	30	<<<	-65.57		Vertical wells Under Cell 2
BALLGW38	61.9	38	0.2	9	44	<<<	-65.51		Vertical wells Under Cell 2
BALLGW39	62.4	38	0.1	21	44	<<<	-4.42		Vertical wells Under Cell 2
BALLGW40	62.1	38	0	12	50	<<<	-65.35		Vertical wells Under Cell 2
BALLGW41	63	37.9	0.2	8	29	<<<	-65.37		Vertical wells Under Cell 2
BALLGW42	62.2	38.9	0	12	55	<<<	-64.99		Vertical wells Under Cell 2
BALLGW43	63	38.2	0.1	9	43	<<<	-65.31		Vertical wells Under Cell 2
BALLGW44	61.6	39.9	0	12	44	<<<	-65.6		Vertical wells Under Cell 2
BALLGW45	62.3	38.8	0	12	47	<<<	-65.31		Vertical wells Under Cell 2
BALLGW46	62.5	39.1	0.1	11	41	<<<	-65.4		Vertical wells Under Cell 2
BALLGW47	61.9	36.9	0.4	12	36	<<<	-65.06		Vertical wells Under Cell 2
BALGW47A	62.1	38.1	0.1	15	12	<<<	-65.45		Manifold to Cell 2
BALLGW48	55.4	35.2	1.2	15	0	<<<	-1.66		Horizontal well into cell 2
BALLGW49	54.3	32.2	1.6	9	0	<<<	-2.16		Horizontal well into cell 2
BALLGW50	59.2	31.2	1.6	7	59	<<<	-2.8		Horizontal well into cell 2
BALLGW51	39.1	20.2	8	3	23	<<<	-3.2		Horizontal well into cell 2

# ***Appendix C.***

MW2				
Lab				
Date		19.08.09	19.05.09	24.03.09
	Units			
Temp.				
D.O.	mg/l	7.86	5.35	6
pH		8.16	8.32	7.84
Conductivity	mS/cm	0.814	0.848	0.81
Ammonical Nitrogen	mg/l N	0.28	0.2	0.7
Total Ox Nitrogen	mg/l N	0.1	0.3	0.3
Chloride	mg/l Cl	40	36.9	38
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C	84	7.17	7
Total Coliforms	No/100ml	1200	0	44
Faecal Coliforms	No/100ml		0	4
Phenols	mg/l	0.015	0.025	0.01
Sodium	mg/l	23.4	24.7	27
Potassium	mg/l	3.24	3.44	3.3
Iron	ug/l	885		
Lead	ug/l	2.75		
List 1&2 Organics				
Magnesium	mg/l	16		
Manganeese	ug/l	810		
Mercury	ug/l	0.02		
Total Alkalinity	mg/l CaCO3	285		
Sulphate	mg/l SO4	83.1		
Total Phosphorous	mg/l P		34.9	0.18
Orthphosphate	mg/l PO4			
Residue on evaporation				
Zinc	ug/l	9.91		
Flouride	mg/l F	0.629		
Calcium	mg/l	157		
Cadmium	ug/l	0.1		
Copper	ug/l	8.7		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	132		
Chromium	ug/l	4.82		
Dissolved Nickel	ug/l			
Total Nickel	mg/l	13		
nitrate as no3	mg/l			
nitrite as no2	mg/l			

MW3				
Lab				
Date		19.08.09	19/05/2009	24/03/2009
	Units			
Temp.				
D.O.	mg/l	7.96	5.64	6
pH		7.99	7.15	7.7
Conductivity	uS/cm	1.11	0.96	0.86
Ammonical Nitrogen	mg/l N	0.305	0.2	0.4
Total Ox Nitrogen	mg/l N	0.1	0.3	0.3
Chloride	mg/l Cl	16.6	19.4	22
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C		6.66	9
Mercury	ug/l	0.02		
Faecal Coliforms	No/100ml	27	100	1
Total Coliforms	No/100ml	600	200	5400
Sodium	mg/l	20.8	19.5	47
Potassium	mg/l	9.38	7.62	5
Phenols	mg/l	0.015	0.025	0.01
Total Phosphorous	mg/l P		18.3	0.28
Boron	ug/l	132		
Cadmium	ug/l	0.1		
Calcium	mg/l	272		
Chromium	ug/l	3.35		
Copper	ug/l	15.8		
Iron	ug/l	1700		
Lead	ug/l	0.269		
Magnesium	mg/l	17		
Manganese	ug/l	302		
Dissolved Nickel	ug/l			
Total Nickel	mg/l	18.4		
Zinc	ug/l	4.61		
List 1&2 Organics				
Total Alkalinity	mg/l CaCO3	255		
Sulphate	mg/l SO4	386		
Orthphosphate	mg/l PO4			
Residue on evaporation				
Flouride	mg/l F	0.5		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
nitrate as no3	mg/l			
nitrite as no2	mg/l			

MW6				
Lab				
Date		12.08.09	26/05/2009	24/03/2009
	Units			
Temp.				
D.O.	mg/l	6.57	6.46	3
pH		8.44	7.97	8.3
Conductivity	uS/cm	0.674	0.672	0.67
Ammonical Nitrogen	mg/l N	1.81	0.651	1
Total Ox Nitrogen	mg/l N	0.256	0.489	0.5
Chloride	mg/l Cl	26.2	24.6	24
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C	10.2	7.64	8
Total Coliforms	No/100ml	57	3	1
Faecal Coliforms	No/100ml	38	3	1
Phenols	mg/l		0.025	0.01
Sodium	mg/l	18.1	15.9	17
Potassium	mg/l	3.47	2.34	1.2
Iron	ug/l	13600		
Lead	ug/l	7.62		
List 1&2 Organics				
Magnesium	mg/l	15.8		
Manganese	ug/l	136		
Mercury	ug/l	0.02		
Total Alkalinity	mg/l CaCO3	250		
Sulphate	mg/l SO4	52.3		
Total Phosphorous	mg/l P		0.255	26
Orthophosphate	mg/l P			
Residue on evaporation				
Zinc	ug/l	22.2		
Flouride	mg/l F	0.5		
Calcium	mg/l	184000		
Cadmium	ug/l	0.115		
Copper	ug/l	9.86		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	132		
Chromium	ug/l	6.09		
Dissolved Nickel	ug/l	29		
total Nickel	mg/l			
dissolved potassium	mg/l			
nitrate as no3	mg/l			
nitrite as no2	mg/l			

MW7D				
Lab				
Date		19.08.09	26.05.2009	24.03.2009
	Units			
Temp.				
D.O.	mg/l	6.63	5.45	6
pH		8.23	7.79	8.41
Conductivity	uS/cm	0.891	0.895	0.8
Ammonical Nitrogen	mg/l N	0.513	0.86	0.4
Total Ox Nitrogen	mg/l N	8.1	6.58	4.5
Chloride	mg/l Cl	69.1	60.3	46
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C		10	5
Total Coliforms	No/100ml	20000	0	300
Faecal Coliforms	No/100ml	900	0	50
Phenols	mg/l	0.015	0.025	0.01
Sodium	mg/l	20.8	22.9	22
Potassium	mg/l	50.8	52.9	42
Iron	ug/l	4770		
Lead	ug/l	14.1		
List 1&2 Organics				
Magnesium	mg/l	13.4		
Manganeese	ug/l	315		
Mercury	ug/l	0.02		
Total Alkalinity	mg/l CaCO3	665		
Sulphate	mg/l SO4	45.3		
Total Phosphorous	mg/l P		0.849	0.72
Orthphosphate	mg/l P			
Residue on evaporation				
Zinc	ug/l	556		
Flouride	mg/l F	0.5		
Calcium	mg/l	287		
Cadmium	ug/l	0.618		
Copper	ug/l	26.1		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	132		
Chromium	ug/l	5.5		
Dissolved Nickel	ug/l			
total nickel	mg/l	19.7		
nitrate as no3	mg/l			
nitrite as no2	mg/l			

MW8D				
Lab				
Date		19.08.09	26.05.2009	24.03.2009
	Units			
Temp.				
D.O.	mg/l	5.85	3.85	5
pH		7.46	7.81	8.23
Conductivity	uS/cm	1.11	1.09	1
Ammonical Nitrogen	mg/l N	1.53	0.627	0.8
Total Ox Nitrogen	mg/l N	0.144	0.894	0.7
Chloride	mg/l Cl	66.1	73.7	84
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C		7.12	13
Total Coliforms	No/100ml	9	150	117
Faecal Coliforms	No/100ml	9	2	17
Phenols	mg/l	0.015	0.025	0.01
Sodium	mg/l	41.7	35.6	38
Potassium	mg/l	4.44	3.45	2.4
Iron	ug/l	13300		
Lead	ug/l	2.47		
List 1 & 2 Organics				
Magnesium	mg/l	9.06		
Manganeese	ug/l	132		
Mercury	ug/l	0.02		
Total Alkalinity	mg/l CaCO3	308		
Sulphate	mg/l SO4	162		
Total Phosphorous	mg/l P		19.4	0.55
Orthphosphate	mg/l P			
Residue on evaporation				
Zinc	ug/l	20.1		
Flouride	mg/l F	0.5		
Calcium	mg/l	248		
Cadmium	ug/l	0.138		
Copper	ug/l	14.6		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	132		
Chromium	ug/l	8.13		
Dissolved Nickel	ug/l			
total nickel	mg/l	16.6		
chloride	mg/l			
nitrate as no3	mg/l			
nitrite as no2	mg/l			

MW8S				
Lab				
Date		19.08.09	19.05.2009	24.03.2009
	Units			
Temp.				
D.O.	mg/l	7.85	7.13	5
pH		8.08	8.05	8.22
Conductivity	uS/cm	1.18	0.966	0.93
Ammonical Nitrogen	mg/l N	0.315	0.722	0.6
Total Ox Nitrogen	mg/l N	0.658	0.871	0.6
Chloride	mg/l Cl	29.9	61.2	64
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C		11.1	9
Total Coliforms	No/100ml	2700	100	100
Faecal Coliforms	No/100ml	7	100	100
Phenols	mg/l	0.015	0.025	0.01
Sodium	mg/l	51.5	30.5	32
Potassium	mg/l	8.85	7.17	6.3
Iron	ug/l	4220		
Lead	ug/l	1.08		
List 1 & 2 Organics				
Magnesium	mg/l	14.1		
Manganeese	ug/l	61.8		
Mercury	ug/l	0.02		
Total Alkalinity	mg/l CaCO3	245		
Sulphate	mg/l SO4	243		
Total Phosphorous	mg/l P		18.3	0.14
Orthphosphate	mg/l P			
Residue on evaporation				
Zinc	ug/l	6.24		
Flouride	mg/l F	0.5		
Calcium	mg/l	257		
Cadmium	ug/l	0.1		
Copper	ug/l	13		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	132		
Chromium	ug/l	3.85		
Dissolved Nickel	ug/l			
Total nickel	mg/l	11.4		
nitrate as no3	mg/l			
nitrite as no2	mg/l			



MW9				
Lab				
Date		19.08.09	19.05.09	24.03.2009
	Units			
Temp.				
D.O.	mg/l	1	1	1
pH		8.3	7.76	8.61
Conductivity	uS/cm	0.74	0.772	0.74
Ammonical Nitrogen	mg/l N	0.691	0.729	0.7
Total Ox Nitrogen	mg/l N	0.1	0.3	0.3
Chloride	mg/l Cl	34	36.2	29
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C	64	4.52	3
Total Coliforms	No/100ml	40000	600	1
Faecal Coliforms	No/100ml		0	1
Phenols	mg/l	0.015	0.025	0.01
Sodium	mg/l	33.6	35.1	20
Potassium	mg/l	6.38	5.85	4.8
Iron	ug/l	55200		
Lead	ug/l	7.19		
List 1 & 2 Organics				
Magnesium	mg/l	46.2		
Manganese	ug/l	256		
Mercury	ug/l	0.02		
Total Alkalinity	mg/l CaCO3	360		
Sulphate	mg/l SO4	7		
Total Phosphorous	mg/l P		132	0.82
Orthophosphate	mg/l P			
Residue on evaporation				
Zinc	ug/l	27.7		
Flouride	mg/l F	1.45		
Calcium	mg/l	83.7		
Cadmium	ug/l	0.1		
Copper	ug/l	18.3		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	311		
Chromium	ug/l	13.6		
Dissolved Nickel	mg/l			
Total Nickel	ug/l	18.4		
nitrate as no3	mg/l			
nitrite as no2	mg/l			

MW10S

Lab				
Date		12.08.09	26.05.2009	24.03.2009
	Units			
Temp.				
D.O.	mg/l	7.48	4.84	5
pH		8.3	7.5	8.1
Conductivity	uS/cm	0.691	0.738	0.72
Ammonical Nitrogen	mg/l N	0.2	0.2	0.2
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C	3.47	3.17	3
Faecal Coliforms	No/100ml	0	0	1
Total Coliforms	No/100ml	0	2	2
Sodium	mg/l	17.2	17.2	17
Potassium	mg/l	3.14	2.34	0.9
Total Phenols	mg/l		0.025	0.01
Total Phosphorous	mg/l P		0.252	1.1
Chloride	mg/l Cl	25.2	23.5	25
Orthophosphate	mg/l P			
Total Ox Nitrogen	mg/l N	0.344	0.782	0.7
Iron	ug/l	49400		
Lead	ug/l	57.9		
List 1 & 2 Organics				
Magnesium	mg/l	36.3		
Manganeese	ug/l	590		
Mercury	ug/l	0.0425		
Total Alkalinity	mg/l CaCO3	185		
Sulphate	mg/l SO4	18.6		
Residue on evaporation				
Zinc	ug/l	99.6		
Flouride	mg/l F	0.756		
Calcium	mg/l	2620		
Cadmium	ug/l	1.33		
Copper	ug/l	31.9		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	132		
Chromium	ug/l	22.9		
Dissolved Nickel	mg/l			
Total Nickel	mg/l	0.038		
nitrate as no3	mg/l			
nitrite as no2	mg/l			

## MW10D

Lab				
Date		12.08.09	26/05/2009	24/03/2009
	Units			
Temp.				
D.O.	mg/l	7.36	6	5
pH		8.32	7.71	8.24
Conductivity	uS/cm	0.722	0.738	0.7
Ammonical Nitrogen	mg/l N	0.2	0.2	0.3
Total Ox Nitrogen	mg/l N	0.1	0.3	0.3
Chloride	mg/l Cl	30.4	29.8	30
Total Carbon	mg/l			
Total Inorganic Carbon	mg/l			
Total Organic Carbon	mg/l C	4.75	3	3
Total Coliforms	No/100ml	22	340	1
Faecal Coliforms	No/100ml	39	300	1
Phenols	mg/l		0.025	0.01
Sodium	mg/l	18.8	20.2	19
Potassium	mg/l	3.02	2.34	1.1
Iron	ug/l	2310		
Lead	ug/l	7.56		
List 1 & 2 Organics				
Magnesium	mg/l	16.3		
Manganeese	ug/l	170		
Mercury	ug/l	0.02		
Total Alkalinity	mg/l CaCO3	195		
Sulphate	mg/l SO4	23.6		
Total Phosphorous	mg/l P		0.194	0.36
Orthphosphate	mg/l P			
Residue on evaporation				
Zinc	ug/l	6.77		
Flouride	mg/l F	1.15		
Calcium	mg/l	136000		
Cadmium	ug/l	0.1		
Copper	ug/l	4		
Cyanide	mg/l CN	0.05		
Total Solids	mg/l			
Boron	ug/l	132		
Chromium	ug/l	3		
Nickel	ug/l	3.28		
nitrate as no3	mg/l			
nitrite as no2	mg/l			

SW1					
Lab					
Date		15.12.09	12.08.09	5.05.09	24.03.09
Temp	degrees C				
DO	% sat	8.43	7.8	9.6	8
Ammonical Nitrogen	mg/l N	0.233	1.55	0.263	2.3
BOD	mg/l O2	1	1	1.74	1
COD	mg/l O2	54.3	69.8	57.6	49
Chloride	mg/l Cl	32.8	35.1	33.4	39
Conductivity		0.772	0.774	0.689	0.76
pH	pH units	8.45	8.55	8.03	8.08
Total Suspended Solids	mg/l	4	9	7	6
Total Phosphorous	mg/l P	18.3	0.0416	0.0183	0.25
Orthophosphate	mg/l P	0.14	0.145	0.08	0.08
Cadmium	ug/l		0.1		
Calcium	mg/l		163		
Chromium	ug/l		11.5		
Copper	ug/l		4.18		
Iron	ug/l		855		
Lead	ug/l		0.425		
Magnesium	mg/l		8.28		
Manganese	ug/l		91.6		
Mercury	ug/l		0.02		
Potassium	mg/l	5.9	8.68	6.35	7.7
Sulphate	mg/l SO4		41.5		
Sodium	mg/l	18.7	20	16.7	28
Alkalinity	mg/l CaCO3		290		
Total Oxidised Nitrogen	mg/l N		1.12		
Zinc	ug/l		4.16		
List 1 & 2 Organics					
Nickel	ug/l		7.46		
Total Ammonia as N	mg/l				

SW2					
Lab					
Date		15.12.09	12.08.09	5.05.09	24.03.09
Temp	degrees C				
DO	mg/l	9.76	6.19	9.6	9
Ammonical Nitrogen	mg/l N	2.63	5.61	0.2	2.5
BOD	mg/l O2	2.54	1	1	1
COD	mg/l O2	71.9	87.6	56.2	28
Chloride	mg/l Cl	32.9	57.6	31.1	36
Conductivity		0.642	0.732	0.546	0.68
pH	pH units	8.46	8.64	7.93	8.2
Total Suspended Solids	mg/l	4	19	6	6
Total Phosphorous	mg/l P	36.2	0.505	0.183	0.27
Orthophosphate	mg/l P	0.08	0.417	0.08	0.08
Cadmium	ug/l		0.1		
Calcium	mg/l		92.3		
Chromium	ug/l		10.7		
Copper	ug/l		4		
Iron	ug/l		2180		
Lead	ug/l		1.01		
Magnesium	mg/l		13.1		
Manganese	ug/l		165		
Mercury	ug/l		0.02		
Potassium	mg/l	5.1	19.2	3.898	6.9
Sulphate	mg/l SO4		40.1		
Sodium	mg/l	20.9	46.4	17.6	32
Alkalinity	mg/l CaCO3		280		
Total Oxidised Nitrogen	mg/l N		0.1		
Zinc	ug/l		5.45		
List 1 & 2 Organics					
Nickel	ug/l		4.42		
Total Ammonia as N	mg/l				
dissolved oxygen	mg/l				

SW3					
Date		15.12.09	12.08.09	5.05.09	24.03.09
Temp	degrees C				
DO	% sat	9.89	8.23	9.34	9
Ammonical Nitrogen	mg/l N	1.42	1.03	0.814	2.1
BOD	mg/l O2	1.93	1	1	1
COD	mg/l O2	34.8	71.3	42.3	31
Chloride	mg/l Cl	28.9	35.2	33.3	37
Conductivity		0.709	0.679	0.634	0.68
pH	pH units	8.58	8.66	8.15	8.19
Total Suspended Solids	mg/l	5.5	10	14	6
Total Phosphorous	mg/l P	18.3	0.0498	0.307	0.31
Orthophosphate	mg/l P	0.08	0.228	0.08	0.08
Cadmium	ug/l		0.1		
Calcium	mg/l		136		
Chromium	ug/l		9.34		
Copper	ug/l		4		
Iron	ug/l		425		
Lead	ug/l		0.2		
Magnesium	mg/l		8.79		
Manganese	ug/l		35.9		
Mercury	ug/l		0.02		
Potassium	mg/l	4.23	6.83	5.6	6.8
Sulphate	mg/l SO4		27.4		
Sodium	mg/l	17.6	23	21.1	32
Alkalinity	mg/l CaCO3		290		
Total Oxidised Nitrogen	mg/l N		2.47		
Zinc	ug/l		2.7		
List 1 & 2 Organics					
Nickel	ug/l		3.45		
Total Ammonia as N	mg/l				

SW4					
Date		15.12.09	12.08.09	5.05.09	24.03.09
Lab					
Temp	degrees C				
DO	% sat	9.26	6	9.34	7
Ammonical Nitrogen	mg/l N	4.22	4.04	0.713	8.1
BOD	mg/l O2	2.06	1	1.59	1
COD	mg/l O2	69.5	79.1	39.2	59
Chloride	mg/l Cl	36.8	46.5	33	52
Conductivity		0.636	0.659	0.633	0.75
pH	pH units	8.4	8.83	8.21	7.96
Total Suspended Solids	mg/l	14	8	8	6
Total Phosphorous	mg/l P	67.5	0.317	0.501	0.37
Orthophosphate	mg/l P	0.08	0.586	0.81	0.12
Cadmium	ug/l		0.1		
Calcium	mg/l		96.5		
Chromium	ug/l		8.8		
Copper	ug/l		4		
Iron	ug/l		125		
Lead	ug/l		0.374		
Magnesium	mg/l		10.5		
Manganese	ug/l		152		
Mercury	ug/l		0.02		
Potassium	mg/l	9.42	14	5.58	14
Sulphate	mg/l SO4		43.3		
Sodium	mg/l	25.7	35.6	20.9	31
Alkalinity	mg/l CaCO3		270		
Total Oxidised Nitrogen	mg/l N		0.1		
Zinc	ug/l		2.7		
List 1 & 2 Organics					
Nickel	ug/l		4.06		
Total Ammonia as N	mg/l				

SW5					
Date		15.12.09	12.08.09	5.05.09	24.03.09
Temp	degrees C				
DO	% sat	10.4	7.85	9.78	9
Ammonical Nitrogen	mg/l N	0.965	1.6	0.245	0.8
BOD	mg/l O2	1.24	1	1.33	1
COD	mg/l O2	27.8	44.9	31.7	26
Chloride	mg/l Cl	27.8	32.6	31.3	35
Conductivity		0.709	0.693	0.63	0.72
pH	pH units	8.63	8.54	8.37	8.39
Total Suspended Solids	mg/l	5	6	7	6
Total Phosphorous	mg/l P	18.3	0.0562	0.183	0.3
Orthophosphate	mg/l P	0.08	0.222	0.08	0.08
Cadmium	ug/l		0.1		
Calcium	mg/l		130		
Chromium	ug/l		10.3		
Copper	ug/l		4		
Iron	ug/l		375		
Lead	ug/l		0.248		
Magnesium	mg/l		8.61		
Manganese	ug/l		29.8		
Mercury	ug/l		0.02		
Potassium	mg/l	4.1	6.55	5.31	7.2
Sulphate	mg/l SO4		26.8		
Sodium	mg/l	16.6	22.5	20.1	20
Alkalinity	mg/l CaCO3		285		
Total Oxidised Nitrogen	mg/l N		1.81		
Zinc	ug/l		2.7		
List 1 & 2 Organics					
Nickel	ug/l		3.83		
Total Ammonia as N	mg/l				



Main Sump								
Date		12.08.09	10.06.09	05.05.2009	28.04.09	24.03.09	19.02.2009	14.01.09
BOD	mg/l	25	68.3	107	313	64	133	197
COD	mg/l	810	815	565	978	120	521	433
Ammonia	mg/l		464	232	314	230	208	129.3
Nitrate	mg/l							
Sulphate	mg/l	25						
Alkalinity	mg/l	2630						
Chloride	mg/l	463	668	385	493	370	501	226
Conductivity	uS/cm	6.05	7.3	4.39	5.61	4.3	4.6	3.05
pH		8.87	8.4		8.16	8.11	7.71	7.47
Suspended Solids		No result				98		
Temperature	C							
Boron	B ug/l							
Calcium	Ca mg/l	No Result						
Sodium	Na mg/l	533						
Cadmium	Cd ug/l	0.1						
Chromium	Cr ug/l	46.5						
Copper	Cu ug/l	6.16						
Iron	Fe ug/l	12100						
Lead	Pb ug/l	4.4						
Manganese	Mn ug/l	1190						
Magnesium	Mg mg/l	90.3						
Potassium	K mg/l	320						
Zinc	Zn ug/l	79.4						
Total phosphorous	mg/l P	No Result						
Total Coliforms	No/100ml	150000						
Faecal coliforms	No/100ml	40000						
Cyanide	mg/l	0.05						
Flouride	mg/l F	1.09						
Toluene	ug/l	No result						
Mercury	ug/l	0.02						
Total Ox Nitrogen	mg/l N	0.1	0.3	0.3	0.3	0.3	4.2	0.3
Sulphide	mg/l							
Orthophosphate	mg/l PO4							
Nickel	ug/l	53.8						
Total Phenols	mg/l	0.001						
Ammonical Nitrogen as N		325						

# ***Appendix D.***

## Daytime Noise Measurements.

Monitoring Point	Location	Date/ Time	Sampling Interval (mins)	L(A)eq	L(A)10	L(A)90	Comments
N1	Eastern Boundary	14/05/2009 13.36	30	41	43	37	Noise at this point can be attributed to the movement of landfill site vehicles and private vehicles driving onto the landfill. Interference noise sources were from birds singing, farm animals, dogs barking in the distance and traffic movement on the R314
N4	Southern Boundary	14/05/2009 14.11	30	50	52	47	Noise sources included noise from machinery operating inside the recycling building, vehicles moving within the landfill site. No interference noise was noted at this location during the survey period.
N6	Nearest residence House to north West	14/05/2009 15.47	30	57	48	39	Traffic driving to and from the landfill site was the main source of noise audible at this monitoring location. Interferences included frequent traffic movement on a secondary road and the R314. Interference noise included noise from farm animals and birds singing.
N7	Nearest residence House at entrance To site (on R314)	14/05/2009 14.43	30	75	78	52	Noise originated from vehicles entering and leaving the landfill site. Elevated noise levels were due to the heavy traffic volumes passing on the R314. Other interference noise included dogs barking and birds singing.

## Night time Measurements.

Monitoring Point	Location	Date/ Time	Sampling Interval (mins)	L(A)eq	L(A)10	L(A)90	Comments
N1	Eastern Boundary	14/05/2009 22.04	30	37	37	34	The only noise audible from the landfill facility was a continuous low level noise from the flare operation. Interference noise at this location was a result of traffic movement on the R314 a van door shutting and rain falling on the ground.
N4	Southern Boundary	14/05/2009 22.38	30	47	48	45	A low humming noise could be heard from the gas flare burning approximately 5m from the monitoring point. Interference noise included noise from traffic on the R314, rain falling on the ground.
N6	Nearest residence House to north West	14/05/2009 23.49	30	45	30	27	No noise audible from the landfill site. The slightly elevated noise level was ther interference from passing traffic on a secondary road and rain falling on the ground.
N7	Nearest residence House at entrance To site (on R314)	14/05/2009 23.13	30	53	57	33	A low level rumble was audible from the landfill flare. Interferences included traffic movement on the R314 and rain falling on the ground

# ***Appendix E.***

Temperature Report for Rathroeen Landfill, Killala Road, Ballina Co. Mayo, for 2009.

Year	Month	Total	Dep	Max	Date	Days of Rain		
			form	Obs.		>0.2mm	>2mm	>20mm
			Norm	Day				
2009	1	82	0	11.6	17	22	14	0
2009	2	14	0	2.6	19	14	3	0
2009	3	42	0	6.4	3	22	9	0
2009	4	60.4	0	10.2	9	21	9	0
2009	5	60	0	6.4	15	23	12	0
2009	6	36	0	7.6	14	14	7	0
2009	7	101.6	0	30.6	23	27	14	1
2009	8	89.6	0	13.6	31	29	17	0
2009	9	19.8	0	4.4	1	18	4	0
2009	10	34.2	0	10.6	24	21	5	0
2009	11	160.2	0	19	16	28	19	0
2009	12	71.4	0	13.6	7	25	13	0
		771.2	0	30.6	Jul	264	126	1

Wind speed report for 2009

Year	Month	Average	Hi	Date	Dominant
		speed	speed		
		m/sec	m/sec		Direction
2009	1	5.1	30	17	SE
2009	2	3.8	17.9	5	SSE
2009	3	5.3	28.2	7	WSW
2009	4	4.5	21	6	SSE
2009	5	4.7	23.2	7	SW
2009	6	3.6	19.7	18	NNW
2009	7	3.7	19.7	31	SE
2009	8	4.4	20.1	27	SSE
2009	9	3.9	18.3	21	SW
2009	10	4.1	27.3	24	SSE
2009	11	4.3	25.5	25	SSE
2009	12	3.6	21.5	6	SE
		4.3	30	Jan	SSE

Rathroeen Landfill Killala Road Ballina Co Mayo											
Year	Month	Mean	Mean	Mean	Dep from Norm	Heat Deg Days	Cool Deg Days	Hi	Date	Low	Date
		Max	Min								
2009	1	7.5	2	4.7	0	421	0	13.4	11	-2.9	7
2009	2	8.8	3.5	6	0	344	0	11.8	16	-0.9	9
2009	3	11	4.2	7.7	0	327	0	16.4	18	-0.9	4
2009	4	12.7	5.7	9.2	0	274	0	18.4	16	1	12
2009	5	14.5	7.4	10.9	0	231	2	23.5	31	2.9	10
2009	6	18.4	10.8	14.4	0	130	12	25.7	2	5.7	11
2009	7	17.6	11.5	14.5	0	120	1	21.1	2	7.3	10
2009	8	17.2	11.7	14.3	0	123	0	19.5	18	8.4	22
2009	9	16.2	9.8	12.9	0	162	0	19.8	11	4.6	13
2009	10	14.4	8.9	11.7	0	197	0	16.9	13	3.6	17
2009	11	10.1	5	7.5	0	292	0	13.9	24	-1.6	28
2009	12	6.3	1.1	3.8	0	411	0	11.2	5	-6.9	24
		12.9	6.8	9.8	0	3032	15	25.7	Jun	-6.9	Dec