

COMHAIRLE CHONDAE AN CABHÁIN
Cavan County Council



Annual Environmental Report

2011

Ballyjamesduff Landfill WL0093-1

<u>Document Title</u>	Annual Environmental Report 2011 Ballyjamesduff Landfill WL0093-1		
<u>Document ID</u>	CCC-03-02-2011		
<u>Revision</u>	<u>Status</u>	<u>Author</u>	<u>Issue Date</u>
01	Draft	BK	30/03/12
02	Checked By	CB/ SF	30/03/12
03	Final Issue	BK/CB	30/03/12

Boylan Engineering (Eng. & Environmental Consultancy) was commissioned by Cavan County Council to prepare the following Annual Environmental Report.

<u>Contents</u>	<u>Page</u>
1.0 INTRODUCTION	5
2.0 REPORTING PERIOD	6
3.0 WASTE ACTIVITIES CARRIED OUT AT THE FACILITY	6
4.0 QUANTITY AND COMPOSITION OF THE WASTE	6
5.0 SUMMARY REPORT ON EMISSIONS	6
5.1 Surface Water	6
5.2 Ground Water	8
5.3 Leachate	15
5.4 Gas	17
6.0 RESULTS SUMMARY & INTERPRETATION OF MONITORING	19
7.0 RESOURCE & ENERGY CONSUMPTION SUMMARY	19
8.0 REPORT ON RESTORATION OF FACILITY	19
9.0 QUANTITIES OF LANDFILL GAS EMITTED FROM FACILITY	19
10.0 PROCEDURES DEVELOPED BY LICENCEE	20
11.0 REPORTED INCIDENTS AND COMPLAINTS SUMMARY	20
12.0 REVIEW OF NUISANCE CONTROLS	20
13.0 REPORT ON TRAINING STAFF	20
14.0 ANY OTHER ITEMS SPECIFIED BY THE EPA	21

List of Tables

Table 5.1	Surface Water Summary Results	7
Table 5.2	Groundwater Summary Results	9
Table 5.3	Leachate Summary Results	15
Table 5.4	Gas Emissions Summary Results	17
Table 12.1	Management Structure 2011	21

List of Graphs

Graph 5.1	Surface Water-Chemical Oxygen Demand	8
Graph 5.2	Ground Water – E.coli	10
Graph 5.3a&b	Groundwater-Ammonia	10
Graph 5.4a&b	Groundwater Total-Coliforms	11
Graph 5.5	Groundwater –Chloride	12
Graph 5.6a&b	Groundwater –Iron	13
Graph 5.7	Groundwater –Potassium	14
Graph 5.8	Leachate- Ammonia	16
Graph 5.9	Leachate- Conductivity	16
Graph 6.0	Gas-Methane	18
Graph 6.1	Gas- Carbon Dioxide	18

List of Appendices

Appendix A	PRTR Emissions Report, Gas Survey
Appendix B	Site Monitoring Locations Map
Appendix C	Quarter 4 Monitoring Report
Appendix D	Declaration of True Copy

1.0 INTRODUCTION

Ballyjamesduff Landfill has been operated as waste disposal facility by Cavan County Council since the late 1960s. It is located off the Derrylurgan road, approximately 600m north of Ballyjamesduff town on the eastern side of the Derrylurgan road. The site is predominantly bog and comprises some 1.62 hectares. The site was operated as a traditional landfill constructed on peat and relies on the properties of the peat bog for attenuation, dilution and dispersal.

A Waste Licence for the facility was issued by the EPA on 7th March 2002, Ref WL 93-1. Condition 11.4 of Waste Licence Ref. 93-1 requires the submission of an Annual Environmental Report (AER) for Ballyjamesduff Landfill facility. This document is produced in order to comply with requirements of Condition 11.4. The reporting period for the purposes of this AER is 1st January 2011 to 31st December 2011.

The site at Ballyjamesduff was closed in early March 2002. Prior to closing the site a temporary cap was placed on site.

The requirements for reporting of Annual Environmental Information arise under individual EPA licences issued under the EPA Acts 1992 – 2008, the Waste Management Acts 1996 – 2008 and other legislation.

This AER will provide information as outlined in Schedule F of the Licence “Content of the Annual Environmental Report”.

2.0 REPORTING PERIOD

The reporting period for the purposes of this AER is 1st January 2011 to 31st December 2011.

3.0 WASTE ACTIVITIES CARRIED OUT AT THE FACILITY

There were no waste activities carried out at the facility.

4.0 QUANTITY AND COMPOSITION OF THE WASTE

There is no longer any waste being accepted at the site. The quantity of waste accepted is zero tonnes.

5.0 SUMMARY REPORT ON EMISSIONS

The PRTR Regulations are the European Communities (European Pollutant Release and Transfer Register) Regulation 2007, S.I. No. 123 of 2007), which signed into Irish Law on 22 March 2007 the E-PRTR Regulation, (EC) No 166/2006, concerning the establishment of a European Pollutant Release and Transfer Register. The summary of emissions is detailed in the (PRTR) Report which appears in Appendix A of this report. The PRTR has been uploaded onto the EPA website in accordance with our responsibility as Licensee.

A register of Environmental Monitoring is now established and shall be maintained. Cavan County Council now carries out the full scope of sampling as required by the Licence. Monitoring had been reduced at the time of the restoration works and the full sampling regime had not been re-established until 2011 when advised by the Agency.

5.1 Surface Water

As detailed by table 5.1 there were slight exceedances in the surface water analysis for parameters COD, Iron and Manganese. Sample SW1 is located upstream of the landfill while SW2 is located downstream. All monitoring locations are detailed in the site map which is presented in Appendix B.

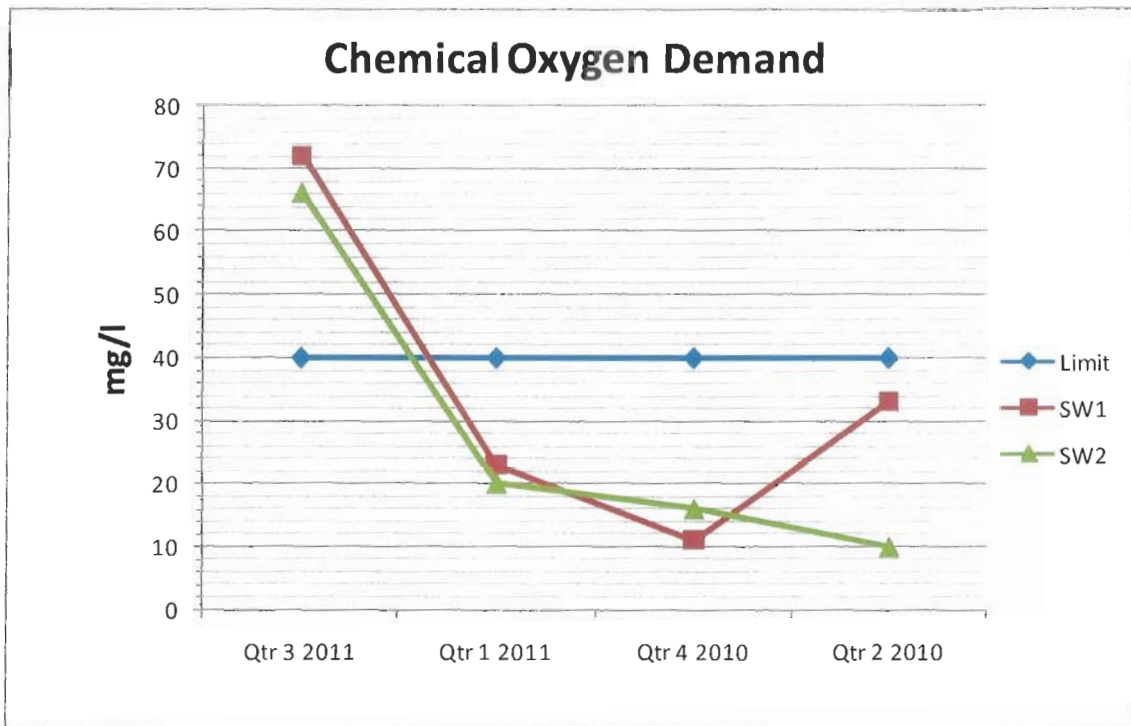
All parameters have been assessed against water limits as outlined in the European Communities (Drinking Water) (No.2) Regulations 2007. Results in Hatched Red indicate where the interim guide value has been exceeded.

Table 5.1 Surface water summary results

	Parameter	COD	Fe	Mn
	Units	mg/l	mg/l	mg/l
SW1	Qtr 4 2011	-	-	-
	Qtr 3 2011	72.00	-	-
	Qtr 2 2011	-	-	-
	Qtr 1 2011	23.00	0.39	-
SW2	Qtr 4 2011	-	-	-
	Qtr 3 2011	66.00	-	-
	Qtr 2 2011	-	-	-
	Qtr 1 2011	20.00	0.39	0.08
S.I No. 294/1989 A1			0.2	0.05

A comprehensive report of all results obtained in 2011 is presented in Appendix C.

Graph 5.1 Chemical Oxygen Demand



All surface water locations were found to be within limits specified in the above regulations with the exception of elevated COD and Iron at SW1 & SW2 and Manganese SW2 during 2011. An elevated level of Mercury was uncovered at location SW 1 during 2010. This was analysed again in Quarter 1 2011 and levels had returned to those as specified by the limits.

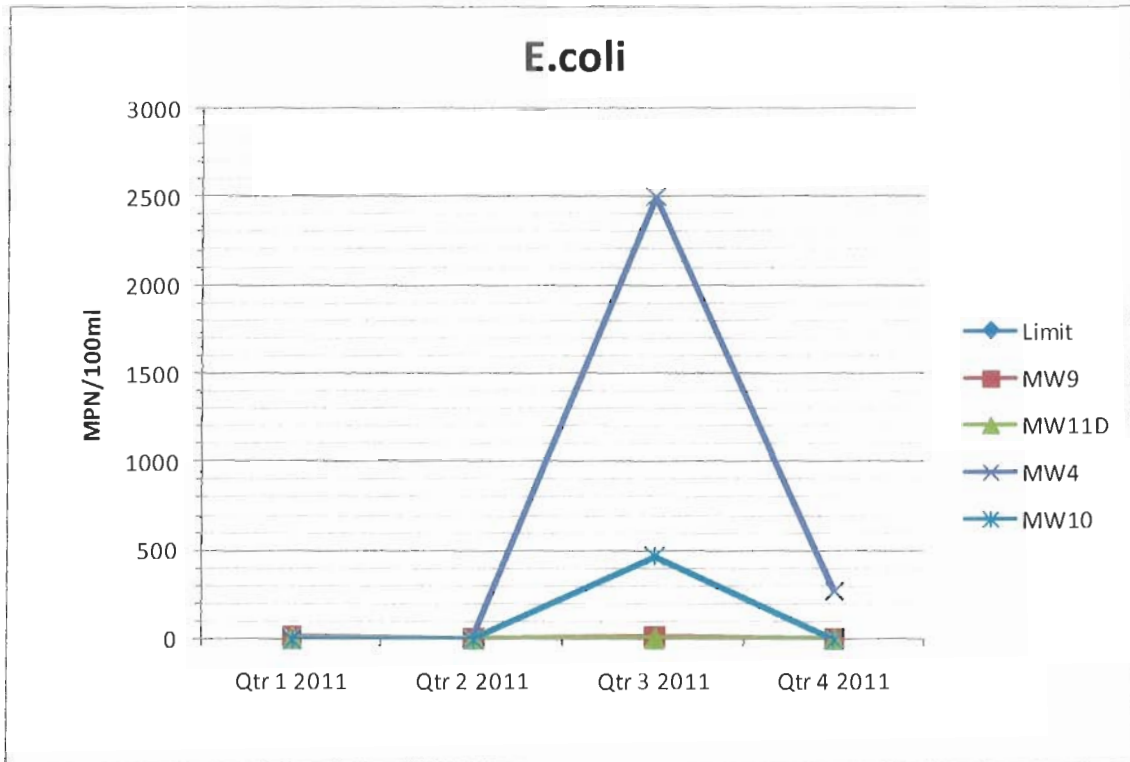
5.2 Groundwater

The following table details all reoccurring exceedances at all groundwater wells during 2011. Results in Hatched Red indicate where the interim guide value has been exceeded when compared to limits stipulated by the Environmental Protection Agency.

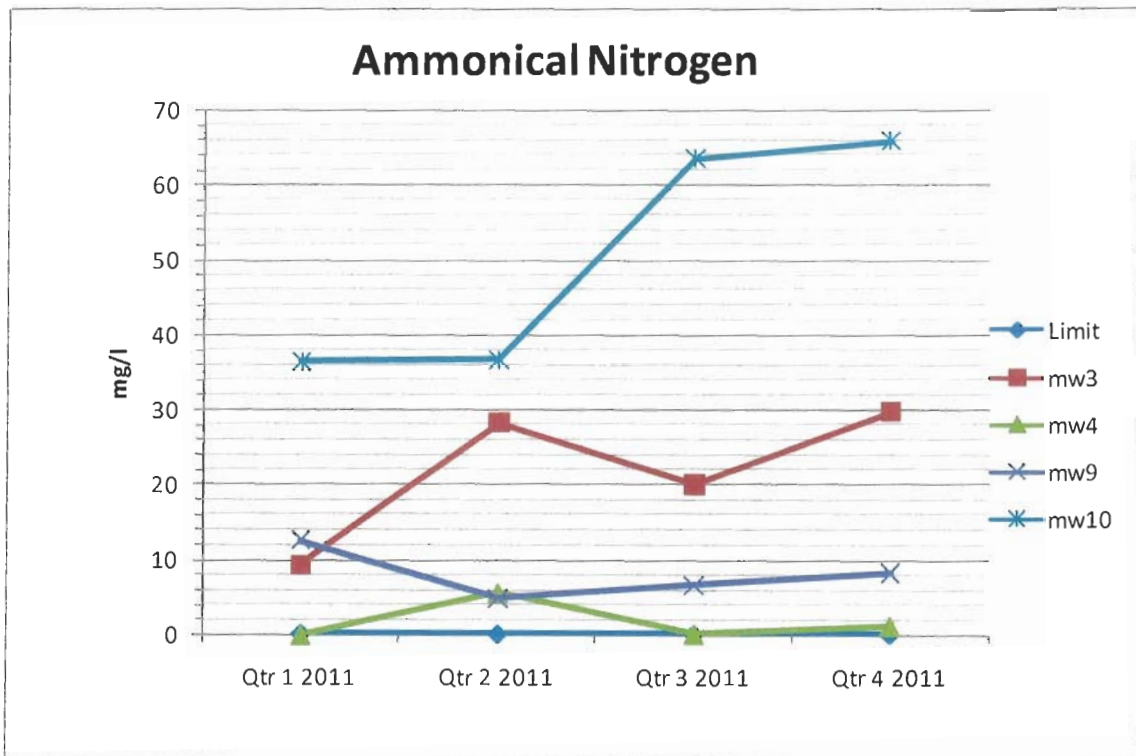
Table 5.2 Groundwater Summary Results

	Parameter	E.Coli	Ammonia	Tot Coliforms	Cl	Fe	K
	Units	MPN/100ml	mg/l N	MPN/100ml	mg/l	mg/l	mg/l
MW 3	Qtr 4 2011	0.00	29.67	<0.000	21.10	45.08	11.60
	Qtr 3 2011	0.00	19.97	120330.00	18.30	26.71	9.70
	Qtr 2 2011	0.00	28.17	0.00	16.60	21940.00	11.00
	Qtr 1 2011	0.00	9.27	3130.00	13.40	58.63	4.44
MW 4	Qtr 4 2011	275.00	1.32	4106.00	18.00	2.40	7.50
	Qtr 3 2011	>2500	0.20	>2500	19.50	0.22	6.40
	Qtr 2 2011	0.00	5.64	0.00	25.20	2852.00	9.30
	Qtr 1 2011	-	-	5950.00	-	-	-
MW9	Qtr 4 2011	0.00	8.34	341.00	13.00	37.17	9.80
	Qtr 3 2011	10.00	6.70	15531.00	4.40	16.86	8.00
	Qtr 2 2011	0.00	4.92	2590.00	4.30	14520.00	9.10
	Qtr 1 2011	13.00	12.49	184.00	5.80	43.37	8.43
Well MW 10	Qtr 4 2011	0.00	65.84	1872.00	94.00	3.78	30.70
	Qtr 3 2011	465.00	63.54	11199.00	152.20	0.14	52.60
	Qtr 2 2011	0.00	36.51	310.00	75.30	47040.00	31.60
	Qtr 1 2011	4.00	36.37	1986.00	60.10	1.23	23.89
WELL 11D	Qtr 4 2011	0.00	0.03	410.00	8.20	0.02	2.20
	Qtr 3 2011	1.00	0.06	>2420	7.40	0.02	2.40
	Qtr 2 2011	0.00	0.02	980.00	7.70	<5.0	2.60
	Qtr 1 2011	1.00	0.02	1203.00	7.10	0.20	1.37
WELL 11 S	Qtr 4 2011	0.00	0.11	6300.00	55.10	0.02	2.40
	Qtr 3 2011	0.00	0.07	>24196	222.40	0.02	2.30
	Qtr 2 2011	0.00	0.05	0.00	48.40	<5.0	3.90
	Qtr 1 2011	0.00	0.06	3020.00	59.10	0.24	1.25
WELL 16 D	Qtr 4 2011	0.00	0.11	31.00	17.50	0.06	2.70
	Qtr 3 2011	0.00	0.08	0.00	16.80	0.05	2.50
	Qtr 2 2011	0.00	0.06	2.00	17.00	45.20	2.40
	Qtr 1 2011	0.00	0.05	1203.00	16.80	0.80	1.58
WELL 16 S	Qtr 4 2011	0.00	0.28	0.00	17.10	0.02	5.90
	Qtr 3 2011	0.00	0.19	>20050	16.80	0.02	4.10
	Qtr 2 2011	0.00	0.08	980.00	16.90	<5.0	4.50
	Qtr 1 2011	0.00	0.03	56.00	20.00	0.34	2.00
WELL 17 D	Qtr 4 2011	0.00	0.35	162.00	16.70	0.30	3.30
	Qtr 3 2011	0.00	0.28	40.00	15.70	0.25	3.10
	Qtr 2 2011	0.00	0.31	0.00	16.40	290.50	3.40
	Qtr 1 2011	0.00	0.29	11.00	16.60	0.23	2.08
WELL 17 S	Qtr 4 2011	0.00	9.19	6867.00	14.10	18.46	3.90
	Qtr 3 2011	0.00	9.71	20.00	14.50	0.53	2.80
	Qtr 2 2011	0.00	8.08	0.00	15.00	16320.00	3.80
	Qtr 1 2011	0.00	8.78	1120.00	14.60	20.11	1.95
WELL 18	Qtr 4 2011	0.00	0.07	22.00	14.30	0.23	3.30
	Qtr 3 2011	0.00	0.10	38.00	14.40	0.21	3.30
	Qtr 2 2011	0.00	0.01	0.00	13.90	117.00	3.40
	Qtr 1 2011	0.00	0.07	62.00	16.70	1.22	2.21
IGV		0	0.15	0	30	0.200	5

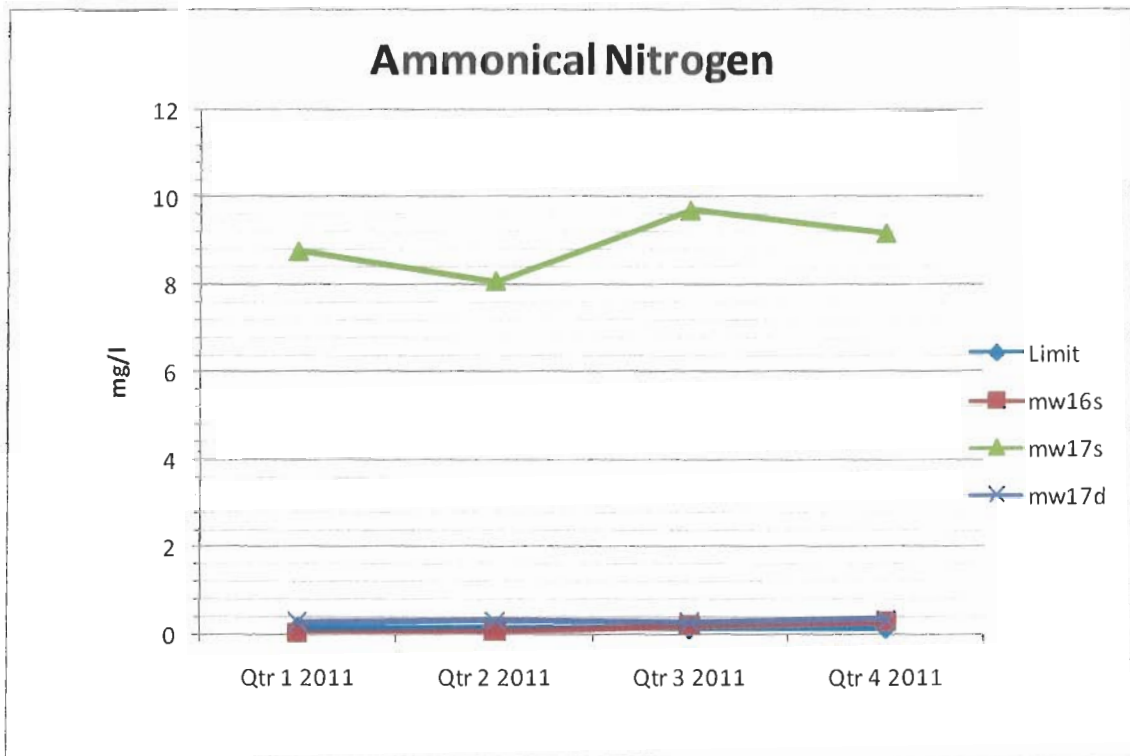
The following graphs detail all groundwater exceedances.
 Comments on these exceedances are at the end of this section.
 Graph 5.2



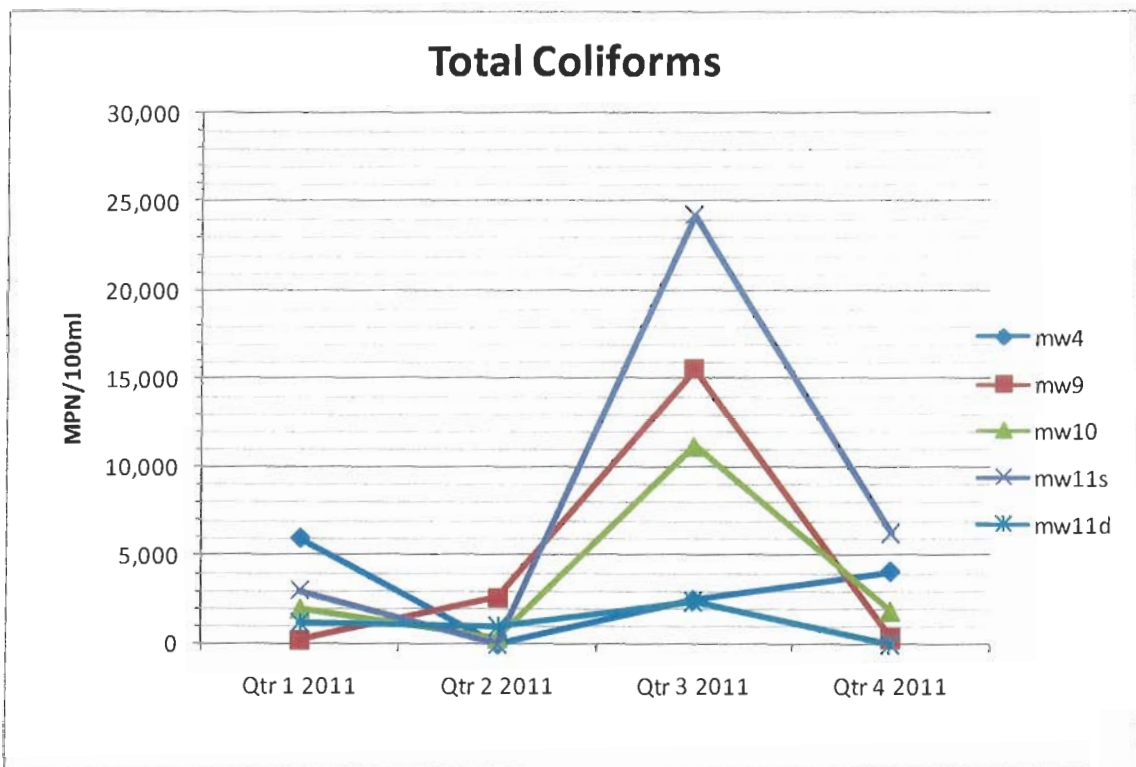
Graph 5.3a



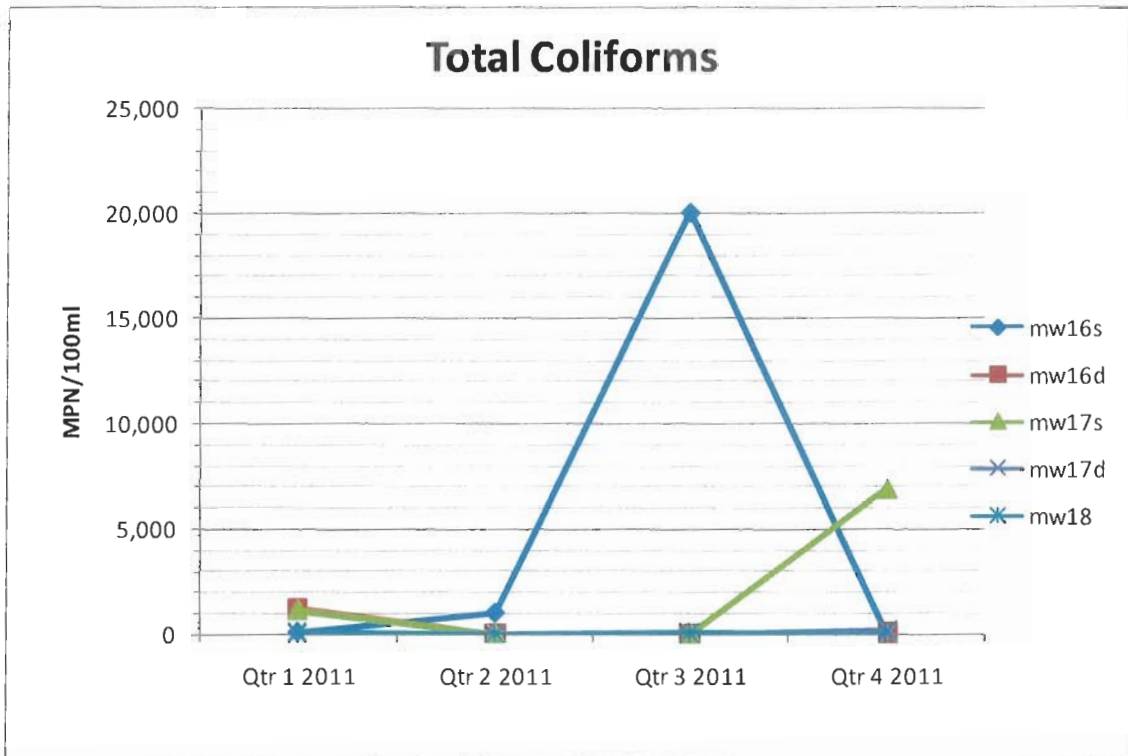
Graph 5.3b



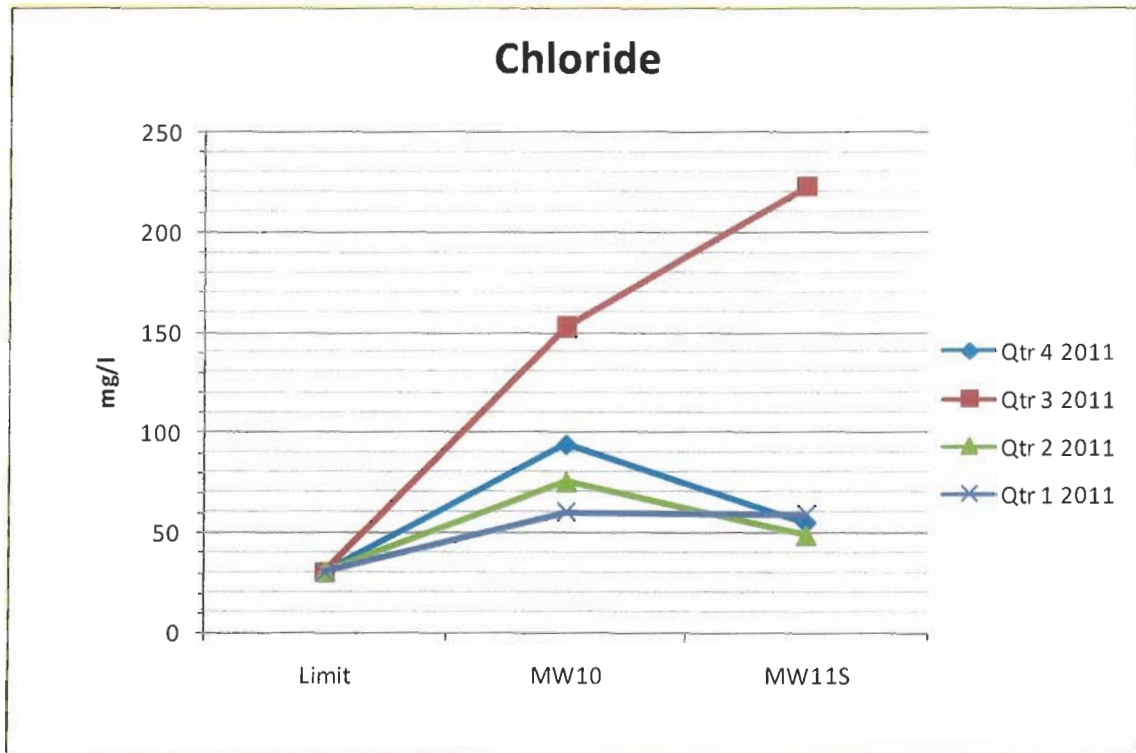
Graph 5.4a



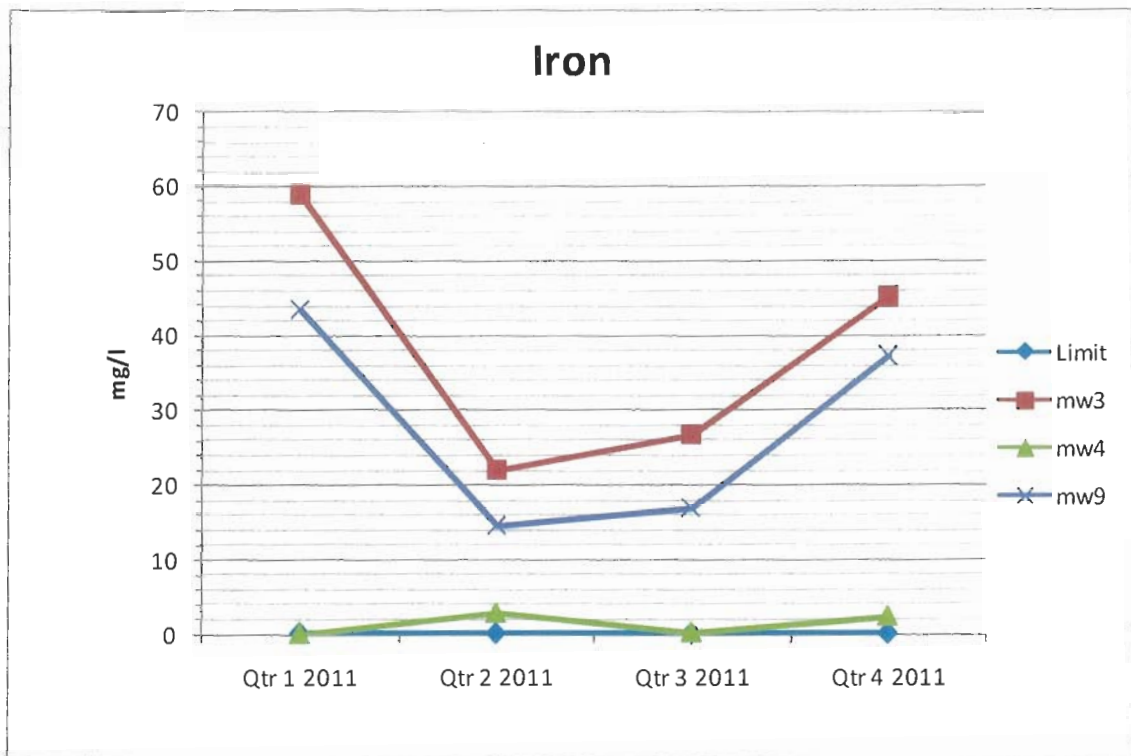
Graph 5.4b



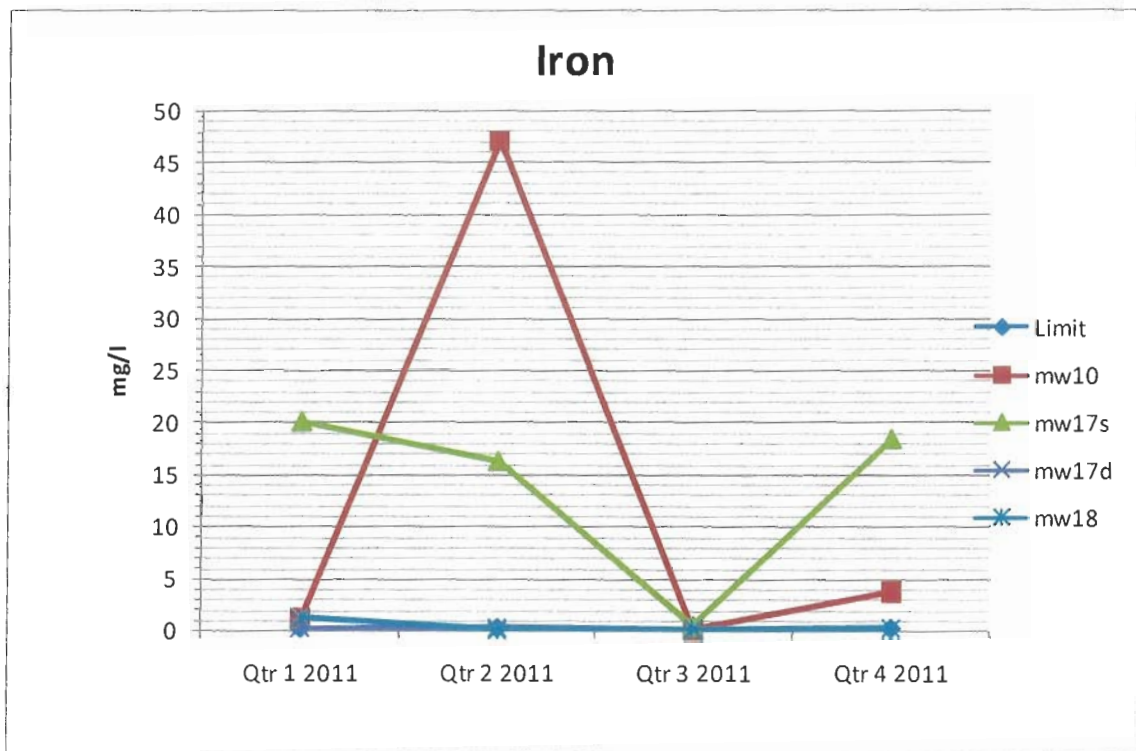
Graph 5.5



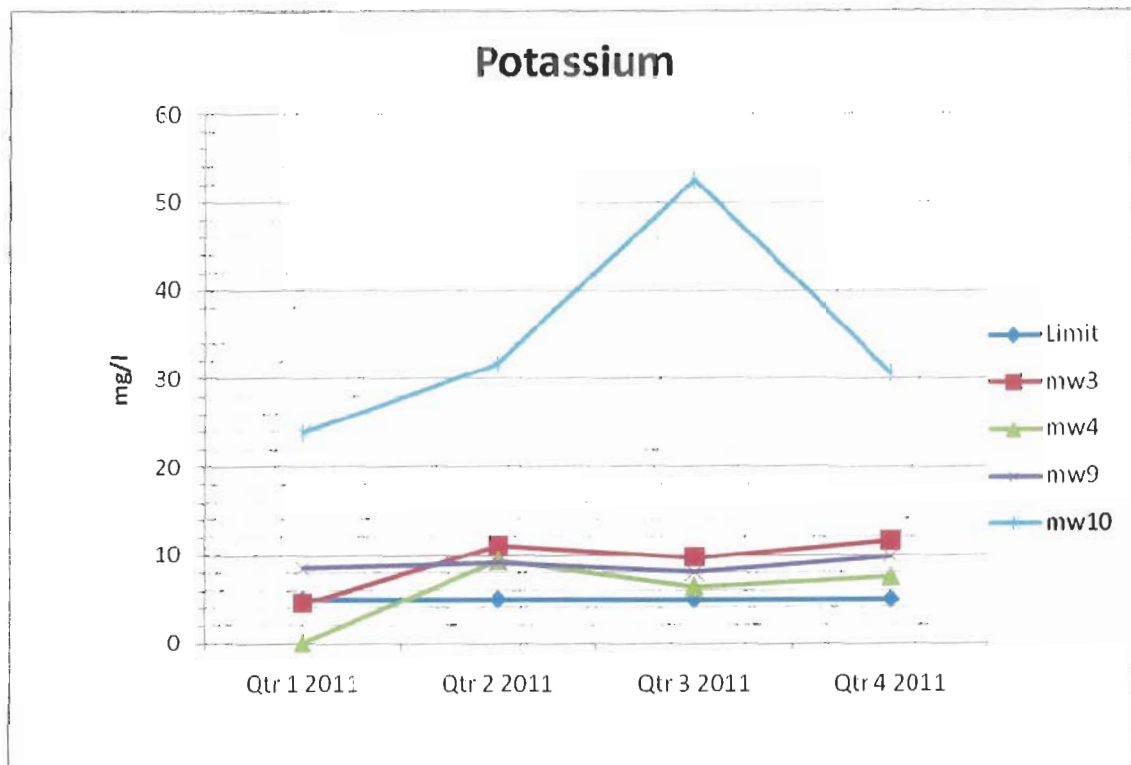
Graph 5.6a



Graph 5.6b



Graph 5.7



As detailed in the above graphs, there were numerous ground water exceedances at his landfill during 2011.

Exceedances occurred in the following parameters:

- *Escherichia coli*: Elevated levels of this parameter were found in samples MW4, MW9, MW10 & MW11D. It is not uncommon for wells in the vicinity of a landfill to be contaminated with *E. coli*. This contamination was only found in one well during Quarter 4 monitoring and will be closely monitored during 2012.
- Ammonia: Elevated levels of this parameter were prevalent during 2011. Elevated levels of ammonia are strongly associated with pollution from waste water treatment systems and so contamination of these wells by the landfill cannot be definitively concluded.
- Total Coliforms: elevated levels of this parameter can be attributed to contamination from organic matter; therefore exceedances in this parameter may not be directly linked to the landfill.
- Iron; Although increased iron levels can be attributed to contamination from landfills, it is also strongly associated with the native soils of the Cavan area and therefore cannot be directly linked to the landfill

- Chloride: Historical results obtained from this parameter show frequent exceedances. However, during 2011 the exceedances in this parameter were isolated to only two wells, MW10 and MW11S. Contamination of well 11S from the landfill is impossible due to MW11S being located up gradient of the landfill. Therefore chloride contamination should be concluded to be from an alternative source in this instance.
- Potassium: Elevated levels of potassium can be associated with landfill contamination but it can also be associated with contamination from agricultural sources such as fertilizers. Therefore direct contamination from the landfill cannot be concluded.

5.3 Leachate Monitoring

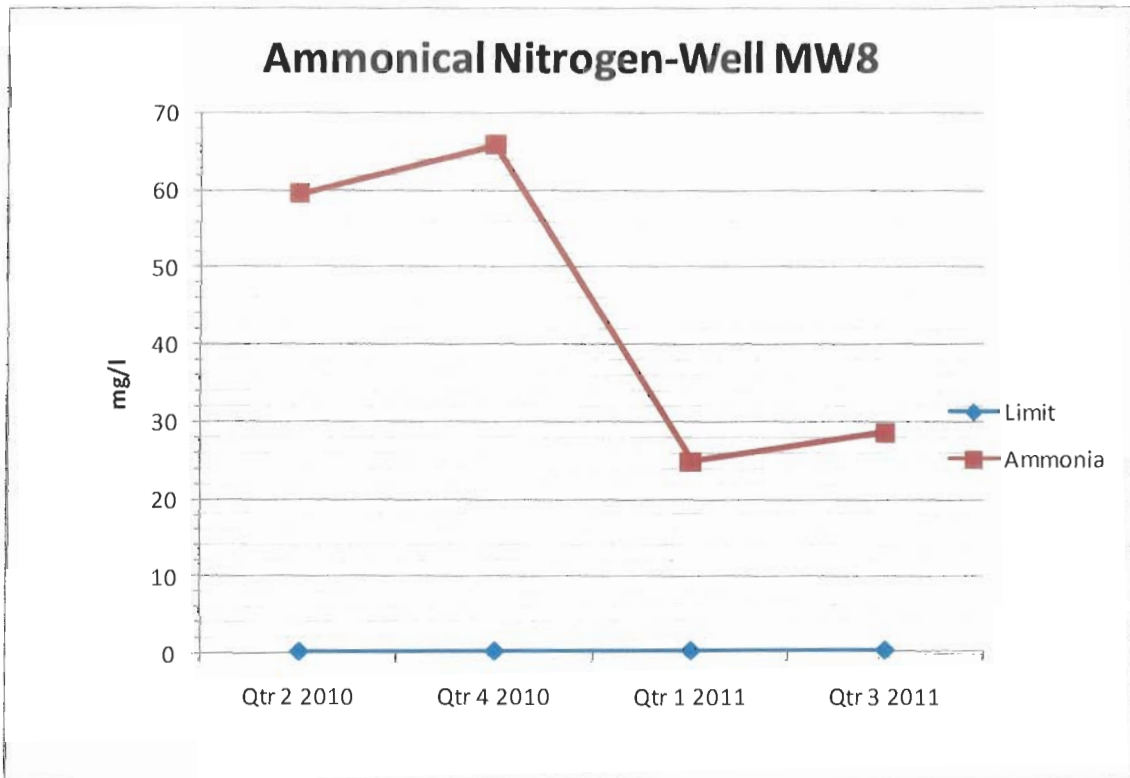
Leachate monitoring is carried out biannually in accordance with the licence. A second leachate sample was unobtainable from well MW7 during Quarter 2011 due to the well being dry.

Re-occurring exceedances are displayed below. Results in Hatched Red indicate where the interim guide value has been exceeded when compared to limits stipulated by the Environmental Protection Agency.

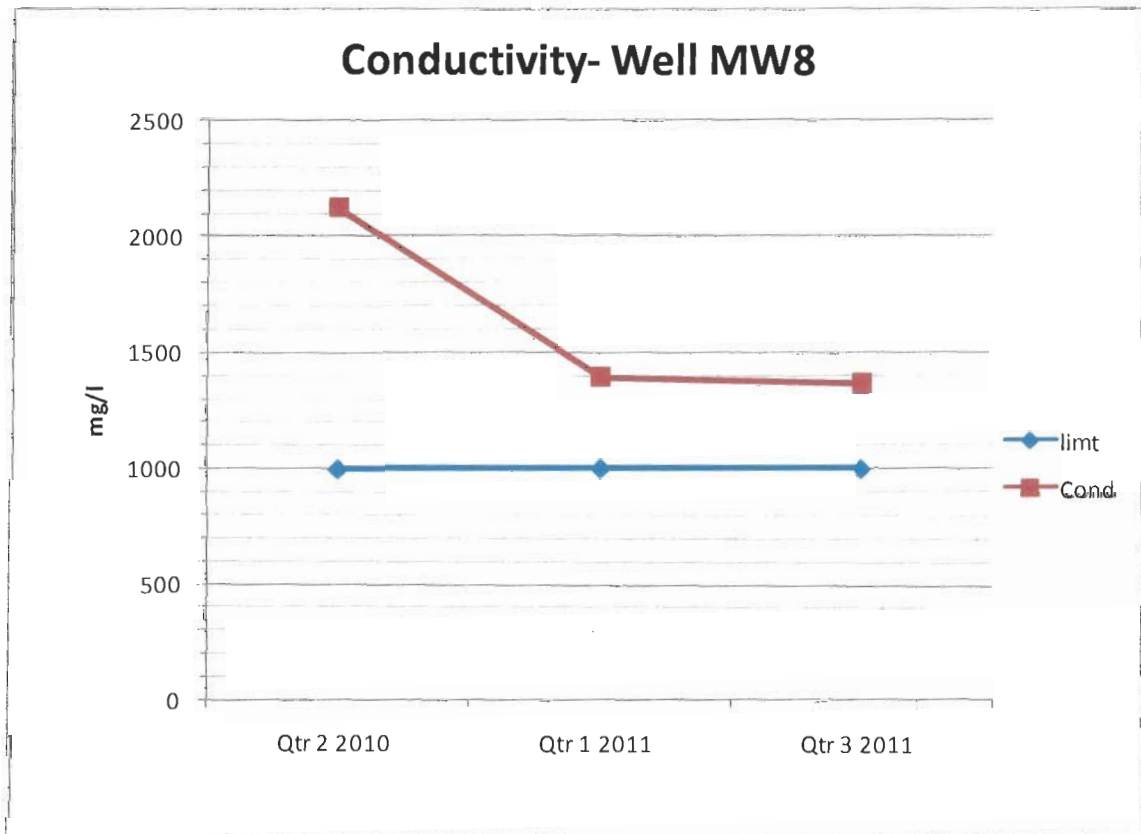
Table 5.3 Leachate Summary Results

	Parameter	Ammonia	Cond
	Units	mg/l N	us/cm
WELL MW 7	Qtr 4 2011		
	Qtr 3 2011	9.5	895
	Qtr 1 2011	-	-
	Qtr 4 2010	-	-
WELL MW 8	Qtr 4 2011		
	Qtr 3 2011	28.7	1369
	Qtr 1 2011	24.9	1393
	Qtr 4 2010	65.7	-
Interim Guide Values		0.15	1000

Graph 5.8



Graph 5.9



As can be seen from the above figures there were no significant elevations in wells MW8 .The results are typical of a mature landfill.

5.4 Gas Emissions

Landfill gas was monitored at five locations both within and outside the landfill mass. The following table details all results during 2011.

Table 5.4 Gas Emissions Summary Results

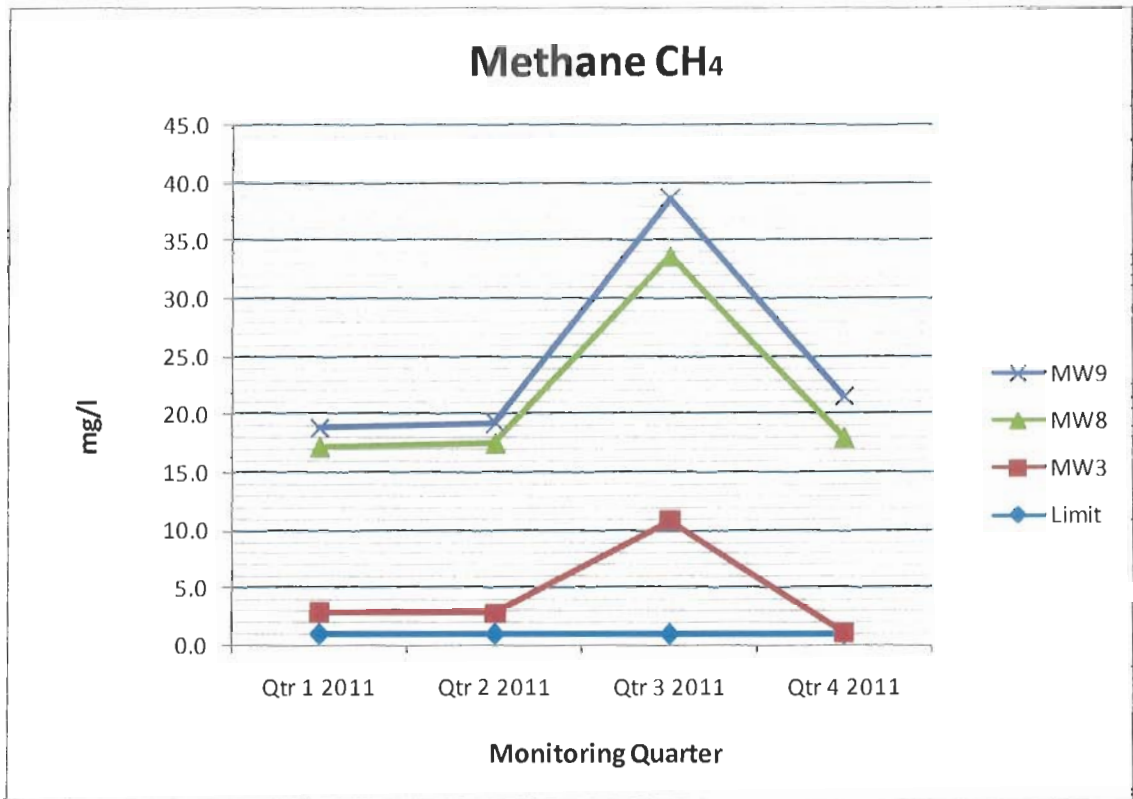
Method		GA 2000	GA 2000	GA 2000	GA 2000	GA 2000
Parameter		CH ₄	CO ₂	O ₂	H ₂ S	Barometric Pressure
Units		1% v/v	1.5 % v/v	%	PPM	mb
Client Ref	Qtr	-	-	-	-	-
MW 2	Qtr 4 2011	0.1	0.0	20.5	0.1	992
	Qtr 3 2011	0.1	0.1	21.8	0	1000
	Qtr 2 2011	0.6	2.1	19.1	0	998
	Qtr 1 2011	0.4	1.7	19.7	0	1003
MW 3	Qtr 4 2011	0.1	0.2	21.0	0.1	992
	Qtr 3 2011	9.8	7.4	16.4	0	1000
	Qtr 2 2011	1.8	2.5	18.5	0	998
	Qtr 1 2011	1.9	2.4	18.94	0	1003
MW 7	Qtr 4 2011	0.4	1.2	21.8	0.0	992
	Qtr 3 2011	0.4	1.1	21.6	0	1000
	Qtr 2 2011	0.4	1.3	19.5	0	998
	Qtr 1 2011	0.4	1.5	19.05	0	1003
MW 8	Qtr 4 2011	16.9	16.2	8.6	18.1	992
	Qtr 3 2011	22.8	16.6	11.3	0	999
	Qtr 2 2011	14.7	10.9	12.8	0	998
	Qtr 1 2011	14.3	9.8	12.94	0	1003
MW 9	Qtr 4 2011	3.5	4.3	17.5	3.9	993
	Qtr 3 2011	5.0	3.2	18.9	0	1000
	Qtr 2 2011	1.7	2.7	18.5	0	999
	Qtr 1 2011	1.6	2.2	18.71	0	1002
Limit		1	1.5			

Exceedance 

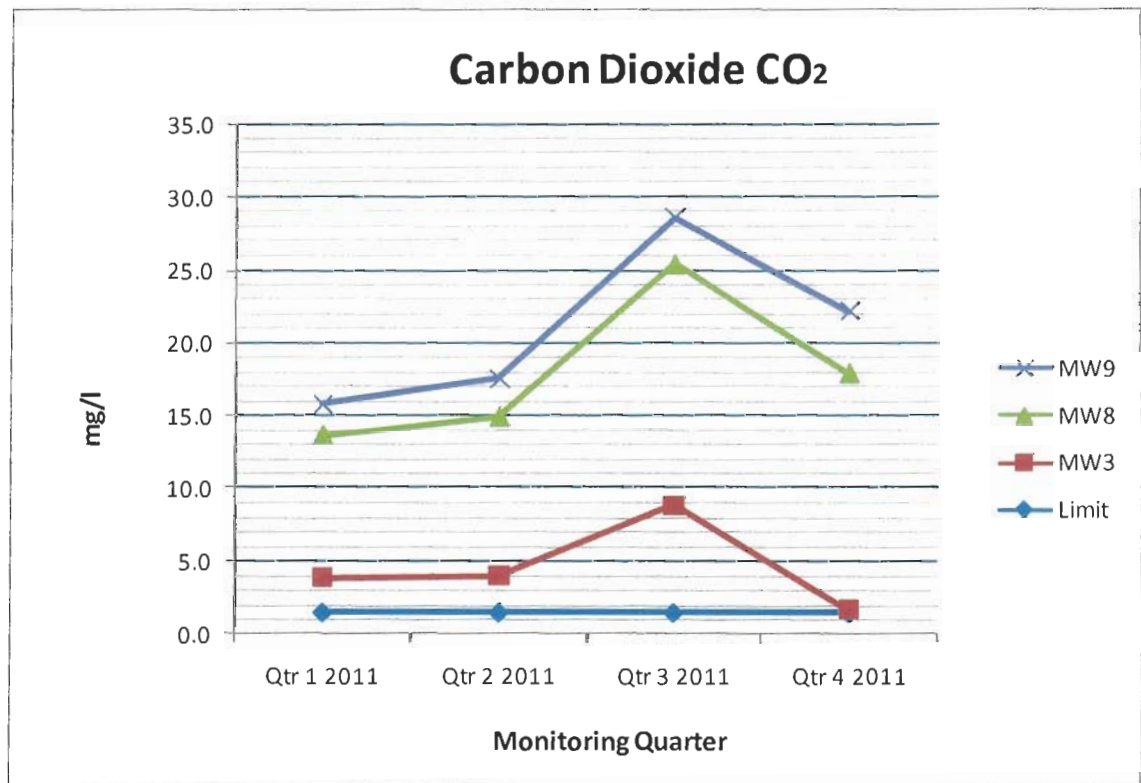
NOTES

- 1 Instrument Serial No: GA 07721
- 2 Limit: Schedule C2, Licence

Graph 6.0



Graph 6.1



Gas Monitoring on the site reveals typical low levels of Methane & Carbon Dioxide and higher levels of Oxygen. Minor elevations occurred giving very slight CO2 elevations. The results are typical of a closed landfill.

6.0 SUMMARY OF RESULTS AND INTERPRETATION OF ENVIRONMENTAL MONITORING

As reported in section 4 there were a number of elevations recorded in 2011. Included in Appendix C is a copy of the quarter 4 monitoring results as reported by Monitoring Company Boylan Engineering. We are satisfied that we are carrying out the environmental monitoring as specified in the Waste Licence. We are also satisfied that there are no major environmental impacts associated with this facility. We will continue to monitor and report as per the licence requirement.

7.0 RESOURCE & ENERGY CONSUMPTION SUMMARY

As there is in-sufficient gas produced to run a gas flare or engine there is no use for the gas resource on site. There is no energy consumed on site.

8.0 REPORT ON RESTORATION OF FACILITY

The site is fully restored and the cap intact. There was some horse grazing on the site in the early summer months in 2011.

9.0 ESTIMATED ANNUAL & CUMULATIVE QUANTITIES OF LANDFILL GAS EMITTED FROM THE FACILITY

Please refer to the Annual PRTR Report included in Appendix A which deals with the landfill gas emissions calculated using GASSIM.

10.0 FULL TITLE & WRITTEN SUMMARY OF ANY PROCEDURES DEVELOPED BY THE LICENSEE IN THE YEAR WHICH RELATES TO THE FACILITY OPERATION

There was no change to or development of any procedures undertaken by the licensee or monitoring contractor in 2011.

11.0 REPORTED INCIDENTS AND COMPLAINTS SUMMARY

There were no incidences in the reporting period 2011. There were no complaints received by the EPA or the Local Authority regarding this facility in the reporting period 2011.

12.0 REVIEW OF NUISANCE CONTROLS

As there are no known nuisances associated with this site there are no nuisance controls in place for parameters such as noise or vermin. There is no odour detectable from the site and as these are the main nuisances associated with landfills the licensee has not reviewed the controls. This is backed up by the absence of any complaints regarding the facility. However if any nuisances arise at the facility the licensee will deal with them using appropriate measures and procedures.

13.0 REPORT ON TRAINING OF STAFF

Landfill Operations Manager Sinead Fox- for Cavan County Council deals with in full with any issues identified by the Agency Inspectors or any other party. Sinead has been fully trained by the FAS Waste Management Training Course, carries a Safe Pass and has been trained in Landfill Gas Management.

Table 13.1 Management Structure 2010 - 2011

Position	Name	Duties
Director of Services, Environment	Eoin Doyle	Oversee and assign responsibilities to staff regarding landfill
Senior Executive Officer	John Brannigan	Oversee general supervision, monitoring and reporting of the site.
Landfill Operations Manager	Sinead Fox	Responsible for general supervision, monitoring and reporting of the site.

Contact Person for Sanitary Authority for 2011/ 2012:

John Brannigan
Senior Executive Officer
Waste Management Section
Cavan County Council
Farnham Street
Cavan

14.0 ANY OTHER ITEMS SPECIFIED BY THE AGENCY

As per the licence we have included in Appendix B a copy of the most recent Map of the site showing all Monitoring locations.

Appendix A

PRTR Emissions Report, Landfill Gas Survey



| PRTR# : W0093 | Facility Name : Ballyjamesduff Landfill | Filename : w0093_2011(1).xls | Return Year : 2011 |

30/03/2012 14:50

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.13

REFERENCE YEAR 2011

1. FACILITY IDENTIFICATION

Parent Company Name	Cavan County Council
Facility Name	Ballyjamesduff Landfill
PRTR Identification Number	W0093
Licence Number	W0093-01

Waste or IPPC Classes of Activity

No.	class name
3.1	Deposit on, in or under land (including landfill).
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.4	Recycling or reclamation of other inorganic materials.
Address 1	Derrylurgan
Address 2	Ballyjamesduff
Address 3	Co Cavan
Address 4	
Country	Cavan
Country	Ireland
Coordinates of Location	-7.20884 53.8687
River Basin District	IEGBNISH
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Sinead Fox
AER Returns Contact Email Address	sfox@cavancoco.ie
AER Returns Contact Position	Landfill Operations Manager
AER Returns Contact Telephone Number	049-4378418
AER Returns Contact Mobile Phone Number	087 980 8507
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

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

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

4.1 RELEASES TO AIR [Link to previous years emissions data](#)

29/03/2012 12:27

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

POLLUTANT	RELEASES TO AIR				Please enter all quantities in this section in KGs			
	MIC/E	Method Code	Method Used	Name	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
03 - Carbon Dioxide (CO2) 01	C	MAB	GAUSSIM			12000.0	44000.0	12000.0
Methane (CH4)	C	MAB	GAUSSIM			0.0	44000.0	44000.0

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

SECTION B : REMAINING PRTR POLLUTANTS

POLLUTANT	RELEASES TO AIR				Please enter all quantities in this section in KGs			
	MIC/E	Method Code	Method Used	Name	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
No. Annex II						0.0	0.0	0.0

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

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

POLLUTANT	RELEASES TO AIR				Please enter all quantities in this section in KGs			
	MIC/E	Method Code	Method Used	Name	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
Pollutant No.						0.0	0.0	0.0

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

Additional Data Requested from Landfill operators

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

Landfill:	Total estimated methane generation (as per site model)	Methane flared	Methane utilised in engines	Net methane emission (as reported in Section A above)	Method Used		Facility Total Capacity m3 per hour
					Method Code	Designation or Description	
Ballyjamesduff Landfill	44000.0	0.0	0.0	44000.0			N/A
T (Total) kg/Year							N/A

A survey of landfill sites to determine the quantity of methane flared and or recovered in utilisation plants for 2011

Please choose from the drop down menu the license number for your site

Please choose from the drop down menu the name of the landfill site

Please enter the number of flares operational at your site in 2011

Please enter the number of engines operational at your site in 2011

Total methane flared

Total methane utilised in engines

W0093

Ballyjamesduff Landfill

Select

Select

0 kg/year

0 kg/year

Please note that the closing date for receipt of completed surveys is 31/03/2012

Introduction

The Office of Climate Licensing and Resource Use (OCLR) of the Environmental Protection Agency acts as the inventory agency in Ireland with responsibility for compiling and reporting national greenhouse gas inventories to the European Commission and the United Nations Framework Convention on Climate Change. In addition to meeting international commitments Ireland's national greenhouse gas inventory informs national agencies and Government departments as they face the challenge to curb emissions and meet Ireland's targets under the Kyoto Protocol. The national inventory also informs data suppliers, making them aware of the importance of their contributions to the inventory process and a means of identifying areas where input data may be improved.

It is on this basis that the Environmental Protection Agency is asking landfill operators to partake in this survey so that the most up to date information on methane flaring and recovery in utilisation plants at landfills sites is used in calculating the contribution of the waste sector to national greenhouse gas emissions

The Environmental Protection Agency wishes to thank you for partaking in this survey. If you have any questions about the survey and how to complete it please view the "Help sheet" worksheet. If however, your query is not answered by viewing the "Help sheet" worksheet please contact:

LEGProject@epa.ie

Once completed please send the completed file as an attachment clearly stating the name and or license number of the landfill site (e.g. W0000 Xanadu landfill_2010) to:

LEGProject@epa.ie

Appendix B


Site Map

REPRODUCED UNDER OS LICENCE NO. 10004909

Ballyjamesduff Landfill (W1.93-01)
Subject: Monitoring Wells

Monitoring Well	Monitoring Parameter	Installation method	Cover Level (mOD)	Depth (mOD)	Depth (mSD)	Status	National Grid Coordinates
MW1	Gas	Window Sample	94.92	3.4	90.08	Existing/Original	N21352.31 E25202.68
MW2	Groundwater	Driven	92.38	2.8	90.32	Existing	N21377.39 E25208.84
MW3	Groundwater	Driven	94.39	2.9	91.49	Existing	N21369.29 E25210.44
MW4	Groundwater	Driven	93.65	2.2	91.25	Orig/Existing	N21309.79 E25212.14
MW5	Groundwater	Window sample	93.47	0.6	92.87	Existing/Original	N21290.32 E25214.96
MW6	Leachate	Driven	100.89	2.2	98.69	Existing	N21281.15 E25207.76
MW7	Leachate	Driven	97.57	5	92.57	Existing	N21291.69 E25205.41
MW8	Leachate	Driven	96.56	5.3	91.26	Existing	N21346.99 E25204.83
MW9	Leachate	Driven	95.69	4.5	91.19	Existing	N21369.67 E25210.93
MW10	Groundwater	Driven	93.95	3.4	89.28	Existing	N21314.86 E252138.12
MW11S	Groundwater	Rotaryhammer	TBC	5	TBC	Existing/Original	TBC
MW11D	Groundwater	Rotaryhammer	TBC	30	TBC	Existing/Original	TBC
MW12	Gas	Driven	94.38	3.4	90.98	Existing	N21236.30 E252110.18
MW13	Gas	Driven	93.73	3.6	90.13	Existing	N21292.91 E252042.39
MW14	Leachate	Drives	98.77	3.6	95.17	Existing	N21263.92 E252131.54
MW15	Gas	Drives	93.6	2.6	91	Existing	N21280.51 E252147.54
MW16D	Groundwater	Rotaryhammer	94.163	10	84.16	New U/S	N252077.36 E291173.87
MW16S	Groundwater	Rotaryhammer	94.014	5	89.01	New U/S	N252076.89 E291174.85
MW17D	Groundwater	Rotaryhammer	93.63	15	78.63	New D/S	N251997.80 E291376.80
MW17S	Groundwater	Rotaryhammer	93.587	5	88.59	New D/S	N251997.04 E291377.19
MW18D	Groundwater	Rotaryhammer	93.501	21	72.5	New D/S	N251986.57 E291405.39
SW01	Surface water	Grab Sample					
SW02	Surface water	Grab Sample					



<p>OLD BRIDGE HOUSE ST PAUL STREET ATHLONE CO. WICK Wick: +353 (0)90 617 400 Fax: +353 (0)90 617 401 e-mail: athlone@wyg.ie</p> 	<p>CLD 017 CAVAN COUNTY COUNCIL THE COURTHOUSE CAVAN</p>	<p>Project: BALLYJAMESDUFF LANDFILL (W1.93-01)</p>	<p>Drawing Title: MONITORING WELL LOCATIONS</p>	<table border="1"> <tr> <td>Scale: A3</td> <td>Drawn: JMS</td> <td>Checked: JMS</td> <td>Approved: JMS</td> </tr> <tr> <td>2:4000</td> <td>02/13/09</td> <td>02/13/09</td> <td>02/13/09</td> </tr> <tr> <td>Project No: C007214</td> <td>Office: ST</td> <td>Heading No: SK03</td> <td></td> </tr> </table> <p>© WYG Group Ltd</p>	Scale: A3	Drawn: JMS	Checked: JMS	Approved: JMS	2:4000	02/13/09	02/13/09	02/13/09	Project No: C007214	Office: ST	Heading No: SK03	
Scale: A3	Drawn: JMS	Checked: JMS	Approved: JMS													
2:4000	02/13/09	02/13/09	02/13/09													
Project No: C007214	Office: ST	Heading No: SK03														

Appendix C

Quarter 4 Monitoring Report



ENVIRONMENTAL MONITORING REPORT FOR BALLYJAMESDUFF LANDFILL W0093-01

Client: Cavan County Council

Site Location: Derrylurgan, Ballyjamesduff

Report No.: CCC-03-01-04-Rev 0

Produced by: Brona Keating, BSc Hons (Environmental Science & Tech.)

Approved by:

Date: 07th December 2011

Cathal Boylan, BEng, CEng, MIEI
CHARTERED ENGINEER

Boylan Engineering

Company Reg. 430482

Address: Main St., Mullagh, Kells Co. Meath.

Phone: 046 – 928 6000 / 087 – 820 5470

Fax: 046 – 928 6002

Email: info@boylanengineering.ie

Web: www.boylanengineering.ie

Rev.	Date	Description

COPYRIGHT © BOYLAN ENGINEERING (2011)

All rights reserved, no part of this work may be modified, reproduced or copied in any form or by any means – graphic, electronic or mechanical, including photocopying, recording, taping or information and retrieval system, or used for any purpose other than its designated purpose, without the written permission of Boylan Engineering.

I SUMMARY

Boylan Engineering (Eng. & Environmental Consultancy) was commissioned by Cavan County Council to carry out Environmental Monitoring at Ballyjamesduff Landfill (W0093-01), Derrylurgan, Ballyjamesduff, Co Cavan for quarter four 2011.

Brona Keating, Environmental Consultant carried out all monitoring. This report shall document the findings.

Table of Contents

1.0 Introduction	4
2.0 Methodology	6
2.1 Environmental Sampling	6
2.2 Laboratory Analysis	7
2.3 Landfill Gas Analysis	8
2.4 Monitoring Locations	9
2.5 Weather Report	9
3.0 Summary of Results	10
3.1 Ground Water	10
3.2 Landfill Gas	11
4.0 Discussion	12
4.1 Ground Water	12
4.2 Landfill Gas	13
5.0 Conclusion	14
5.1 Environmental Monitoring	14
5.2 Landfill Gas	14

List of Tables

1.0 Ground Water 4 th Quarter Monitoring	10
2.0 Landfill Gas 4 th Quarter Monitoring	11

Appendix

1.0 Historical Data	
2.0 Landfill Gas Breakdown	
3.0 Analysis Methods	
4.0 Field Sheets	
5.0 COC/Sample Submission form	
6.0 Calibration Certificate GA 2000	
Lab Reports	
Landfill Map	

1. INTRODUCTION

Ballyjamesduff landfill is situated approximately 600m from Ballyjamesduff town centre in the town land of Derrylurgan. The site was in operation from the 1960's and comprises some 1.62 hectares. The site was originally peat land which was stripped for commercial purposes and was then operated as a traditional landfill until its closure in March 2002. A waste licence was issued by the Environmental Protection Agency after the closure of the site and remedial works were completed.

Condition 8.1 of the waste licence requires that monitoring be carried out in accordance with Schedule D of the licence. The following reports give details of groundwater, surface water, leachate and landfill gas sampling programme conducted on site and also summarises findings and analytical results for quarter four 2011.

The purpose of environmental and landfill gas monitoring at closed landfills is to:

- Ensure the facility is compliant with the waste license
- Ensure the facility is not causing environmental pollution
- Ensure the facility is not posing a risk to human health
- Ensure the facility is not creating an unacceptable risk to atmosphere, water, soil, plants or animals
- Ensure that the facility is not causing a nuisance through noise or odors
- Ensure the facility is not adversely affecting the countryside or places of interest
- Compare actual site behavior with expected/modeled behavior
- Assess the effectiveness of gas control measures installed at the site
- Establish a reliable database of information for the landfill throughout its life

According to the Response matrix for landfills, Ballyjamesduff landfill is situated in the R2¹ Zone. This zone was categorized using a vulnerability rating combined with the aquifer category for the area. Landfills situated in R2¹ Zones are acceptable subject to guidance in the EPA Landfill Design Manual or conditions of a waste licence- (EPA, groundwater protection responses for landfills). Unfortunately this landfill was constructed prior to this guidance and conditions were issued only after its closure.

Landfill gas is generated by decomposition of organic materials in waste deposited at landfills. Typically, the gas is a mixture of Methane (up to 65% by volume) Carbon Dioxide (up to 35% per volume). It can also contain minor constituents at low concentrations (typically less than 1% volume contains 120-150 trace constituents). The landfill directive requires that appropriate measures are taken in order to control the accumulation and migration of landfill gas.

The generation of Leachate is one of the main hazards to groundwater from the disposal of waste by land filling. The conditions within a landfill vary over time from aerobic to anaerobic thus allowing for different chemical reactions to take place. Most landfill leachates have a high BOD, COD, Ammonia, Chloride, Sodium, Potassium, Hardness and Boron levels - (EPA, groundwater protection Responses for Landfills).

2. METHODOLOGY

2.1 Environmental Sampling

The following procedure was conducted by Boylan Engineering to ensure accurate groundwater, surface water and leachate monitoring:

- ISO 5667: Guidance on sampling of groundwaters was adhered to.
- Prior to sampling, the depth of water in groundwater wells was measured by dipping. Dipping the wells before sampling allows for calculation of the volume of water in the well. This data was recorded on the field sheet for volume calculation which is presented in appendix 4.
- Once the volume was calculated the boreholes were purged three times their volume before sampling.
- Sampling was conducted using a Waterra inertial lift pump and associated tubing, pumping water directly from the borehole to the appropriate sampling bottles.
- Designated tubing was used at each location.
- Having obtained a representative sample the following parameters were measured on-site using a Hanna HI 98129 combination waterproof high accuracy analyser and a Hanna 9164 Dissolved Oxygen meter, respectively.
 - Conductivity
 - Temperature
 - pH
 - DO
- Boylan Engineering operate a Sample Submission/Chain of Custody form, which accompanies the samples at all times. These forms are located in the appendix 5.

2.2 Laboratory Analysis

- Samples were sent to Environmental Laboratory Service (ELS) (Ireland) for analysis of the required parameters in designated cool boxes with ice packs. These boxes insure that samples are maintained at a consistent temperature between 0 °C and 4°C on their journey to the laboratory.
- On arrival at the laboratory, samples were stored between 0 °C and 4 °C.
- All samples received are inspected by Laboratory Manager Mr. Brendan Murray.
- All samples are assigned a unique reference number and are recorded on the Laboratory Information Management System (LIMS)
- All staff involved in the analysis of samples hold a minimum honours science degree.
- In the event of a Quality Control Check failure for a given parameter, a note will be included on the analysis report detailing the QC fail.
- Analysis of samples is conducted under the INAB accreditation and associated quality control procedures are employed in every aspect of analysis.
- Analysis methods are listed in Appendix 3.

2.3 Landfill Gas Analysis

The following procedure was employed by Brona Keating of Boylan Engineering to ensure accurate monitoring:

- EPA, Landfill Manual, landfill monitoring 2nd Edition was adhered to.
- Prior to sampling, a dip meter was used to measure water levels, if present, in the wells.
- GA 2000 landfill gas analyser was used to measure the gas levels.
- The analyser was purged and connected to the sealed well monitoring nozzle.
- The monitoring nozzle was turned to the open position and the analyser measured the gas levels at 60 second intervals for 10 minutes. The analyser was allowed to run for this period of time to allow for a representative average to be obtained.
- All data was recorded on the Gas Analysis field sheet.
- The instrument was removed after 10 minutes and the monitoring nozzle returned to the closed position.
- The GA2000 was switched off between each monitoring location so as to allow the instrument to purge.
- This process was repeated at each monitoring location.
- Data for the GA 2000 was downloaded in the Boylan Engineering office.

2.4 Monitoring Locations

Monitoring Well	Sample Type	Cover Level (TOC)	Depth (mTOC)	National Grid Co-Ordinates
MW1	Gas	94.92	3.4	N291352.31 E252020.68
MW2	Gas	92.92	2.6	N291377.38 E252082.84
MW3	GW	94.39	2.9	N291369.28 E252109.44
MW4	Gas	93.65	2.2	N291309.78 E252129.14
MW8	Leachate	96.56	5.3	N291346.99 E252041.22
MW9	GW	95.69	4.5	N291369.67 E252103.93
MW10	GW	93.95	3.4	N291314.86 E252138.12
MW11S	GW	TBC	5	TBC
MW11D	GW	TBC	30	TBC
MW12	Gas	94.38	3.4	N291236.30 E252110.10
MW14	Gas	98.77	3.6	N291263.92 E252131.54
MW16S	GW	94.02	5	N252076.89 E291174.65
MW16D	GW	94.16	10	N252077.36 E291173.27
MW17S	GW	93.59	5	N251997.04 E291377.19
MW17D	GW	93.63	15	N251997.80 E291376.00
MW18D	GW	93.5	21	N251986.57 E291425.39
SW1	SW			
SW2	SW			
Cap	SW			


2.5 Weather Report

REPORTS FROM BALLYHAISE (A)							
Date	Rainfall	Max	Min	Grass Min Temp	Mean Wind Speed (knots)	Gusts	Sunshine
	(mm)	Temp	Temp	(°C)		(if >= 34 knots)	(hours)
		(°C)	(°C)				
15/11/2011	0	11	4.7	2.4	5.3		
*Met Eireann, Climate Data & reports, Daily Data							

3.2 Landfill Gas

Table 2.0 4th Quarter Landfill Gas monitoring 2011

Method		GA 2000	GA 2000	GA 2000	GA 2000	GA 2000
Parameter		CH ₄	CO ₂	O ₂	H ₂ S	Barometric Pressure
Units		% v/v	% v/v	%	PPM	mb
Date Testing		15/11	15/11	15/11	15/11	15/11
GA 2000 Ref	Client Ref					
1	MW 1	0.1	0.7	19.9	0.0	1004
2	MW 2	0.1	0.3	20.2	0.0	1004
3	MW 12	0.1	0.0	20.7	0.0	1003
4	MW 13	0.1	0.0	20.7	0.0	1003
5	MW 14	17.1	13.0	12.9	0.0	1002
6	MW 15	0.1	0.0	21.5	0.0	1003
	Limit	1	1.5			

Exceedance, outside waste mass 

NOTES

- 1 Instrument Serial No: GA 07721
- 2 Limit: Schedule C2, Licence

4.0 DISCUSSION

4.1 Ground water

Monitoring of groundwater is a common and necessary event in landfill sites both during their active life and post closure. The significance of such monitoring is so the facilities can demonstrate that there is no potential for the migration of hazardous constituents from the unit into the groundwater systems.

Monitoring was conducted on the 15th November 2011. Results in Hatched Red indicate where the interim guide value has been exceeded. Results from the third quarter 2011 show that there were exceedances at various ground water monitoring locations for parameters; Iron, Potassium, Ammonia, Chloride, Conductivity, E-coli and Total Coliforms. Previous results detailed in the historical data show that exceedances for Ammonia, Chloride, Conductivity and Total Coliforms are on par with previous monitoring events.

Elevated Iron levels can be an indication of contamination. The hypothesis that is proposed is that the source of this Iron is not the landfill leachate, but the native soils beneath the landfill. Iron can become mobilised due to changing pH and/or redox conditions in the environment underneath the landfill. Alternatively, the leachate from the non hazardous waste may produce reducing conditions beneath the landfill, allowing the solution of Iron from the underlying deposits. Elevated Iron may also be attributed to the natural composition of this area.

Historical results for comparison purposes are presented in tabular and graphic form in Appendix 1.

4.2 Landfill Gas

The rate of gas generation at a landfill site varies through the life of a landfill and is dependent on several factors such as waste type, depths, moisture content, degree of compaction, landfill pH, temperature and the length of time since the waste was deposited. Landfill gas can move in any direction within the waste body and migrate from a site. The potential for gas migration will depend on the gas quality, volume, the site engineering works, geological characteristics of the surrounding strata and on man-made pathways such as sewers and drains.

Results obtained from monitoring on during quarter four, 2011 show a number of elevated levels of gas at MW 14. These results are relatively consistent with previous results and as these wells are within the waste mass they are not observed as being exceedances. It is preferable that the results are within the limits stipulated within the licence.

5.0 CONCLUSION

5.1 Environmental Monitoring

The groundwater results obtained are relatively consistent with previous monitoring events and do not show any signs of dramatic exceedences. Therefore there is no evidence of any major negative environmental impact associated with this landfill. Information relating to previous results can be seen in the historical data tables in Appendix 1.

5.2 Landfill Gas Monitoring

The results obtained from landfill gas analysis are also relatively consistent with previous monitoring events and do not show any signs of dramatic exceedences; therefore there is no evidence of any major negative environmental impact associated with this landfill. However, it is important to monitor the trend in exceedance of Methane at this landfill and any dramatic increase in the parameter should be regarded as critical. The Methane content of landfill gas is flammable, forming potentially explosive mixtures in certain conditions, which raises concern about its uncontrolled migration and release. The next environmental and landfill gas monitoring will be conducted in the 1st quarter of 2012.

APPENDIX 1- HISTORICAL DATA

Groundwater

Parameter	TOC	E.Coli	Ammonia	TON	Tot Coliforms	pH	Cond	Cl	DO	Total Phenols	Fe	K	Na	
	mg/l	MPN/100ml	mg/l N	mg/l N	MPN/100ml	pH Units	us/cm	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	
MW 3	Qtr 4 2011	32.02	0.00	29.67	0.18	<0.000	7.00	970.00	21.10	2.60	<0.15	45.08	11.60	32.00
	Qtr 3 2011	8.50	0.00	18.97	<0.138	120180.00	7.00	899.00	18.30	<1.0	<0.15	26.71	9.70	34.10
	Qtr 2 2011	11.60	0.00	28.12	0.22	0.00	7.10	901.00	16.60	1.70	<0.15	21940.00	11.00	29.40
	Qtr 1 2011	7.33	0.00	9.27	0.17	2130.00	7.30	605.00	13.40	0.32	<0.15	58.63	4.44	27.59
MW 4	Qtr 4 2011	18.07	275.00	1.32	<0.138	4106.00	7.00	421.00	18.00	8.30	<0.15	2.40	2.50	13.60
	Qtr 3 2011	18.70	>2500	0.20	<0.138	>2500	6.90	425.00	19.50	3.70	<0.15	0.22	6.40	13.70
	Qtr 2 2011	12.09	0.00	5.64	<0.138	0.00	7.20	579.00	25.20	<1.0	<0.15	2852.00	9.30	23.80
	Qtr 1 2011	-	-	-	-	5950.00	-	-	-	-	-	-	-	-
MW9	Qtr 4 2011	10.28	0.00	8.34	<0.138	341.00	6.90	917.00	13.00	5.70	<0.15	37.17	9.80	15.70
	Qtr 3 2011	10.10	10.00	6.70	<0.138	15531.00	7.10	875.00	4.40	5.10	<0.15	16.86	8.00	11.90
	Qtr 2 2011	10.98	0.00	4.92	<0.138	2590.00	7.00	836.00	4.30	5.40	<0.15	14520.00	9.10	9.30
	Qtr 1 2011	8.74	13.00	12.89	0.14	184.00	7.10	882.00	5.80	2.01	<0.15	43.17	8.43	13.80
Well MW 10	Qtr 4 2011	27.28	0.00	65.84	<0.138	1872.00	6.90	1623.00	94.00	4.10	<0.15	3.78	30.70	57.90
	Qtr 3 2011	35.30	465.00	61.54	<0.138	11199.00	6.80	1682.00	152.30	<1.0	<0.15	0.14	52.00	102.10
	Qtr 2 2011	26.67	0.00	16.51	<0.138	310.00	6.70	1331.00	75.30	2.40	<0.15	47040.00	31.60	51.70
	Qtr 1 2011	20.78	1.00	36.37	0.17	1980.00	7.40	1280.00	60.10	3.14	<0.15	1.23	25.80	46.36
WELL 11D	Qtr 4 2011	0.96	0.00	0.03	<0.138	410.00	7.30	407.00	8.20	3.10	<0.15	0.02	2.20	22.20
	Qtr 3 2011	1.39	1.00	0.06	<0.138	>2420	7.40	402.00	7.40	7.30	<0.15	0.02	2.40	23.00
	Qtr 2 2011	1.91	0.00	0.02	<0.138	980.00	7.50	399.00	7.70	6.10	<0.15	<5.0	2.60	23.50
	Qtr 1 2011	1.95	1.00	0.02	0.14	1203.00	7.70	400.00	7.10	8.58	<0.15	0.20	1.37	25.72
WELL 11 S	Qtr 4 2011	1.73	0.00	0.11	0.32	6300.00	6.80	550.00	35.10	7.50	<0.15	0.02	2.40	26.10
	Qtr 3 2011	2.38	0.00	0.07	<0.138	>28106	7.20	1010.00	222.40	8.30	<0.15	0.02	2.30	41.50
	Qtr 2 2011	4.21	0.00	0.05	0.71	0.60	6.80	499.00	48.40	5.30	<0.15	<5.0	3.90	30.00
	Qtr 1 2011	2.53	0.00	0.06	0.74	3020.00	7.00	559.00	59.10	7.12	<0.15	0.24	1.25	28.53
WELL 16 D	Qtr 4 2011	1.16	0.00	0.11	<0.138	31.00	7.30	502.00	17.50	6.50	<0.15	0.06	2.70	21.80
	Qtr 3 2011	0.73	0.00	0.08	<0.138	0.00	8.20	491.00	16.80	3.00	<0.15	0.05	2.50	24.80
	Qtr 2 2011	0.83	0.00	0.06	<0.138	2.00	7.40	485.00	17.00	5.20	<0.15	45.20	2.40	20.60
	Qtr 1 2011	1.06	0.00	0.05	0.18	1793.00	7.60	483.00	16.80	4.78	<0.15	0.80	1.58	25.23
WELL 16 S	Qtr 4 2011	3.16	0.00	0.28	<0.138	0.00	7.30	515.00	17.10	7.90	<0.15	0.02	3.90	25.90
	Qtr 3 2011	1.37	0.00	0.19	<0.138	>20050	7.50	484.00	16.80	7.30	<0.15	0.02	4.10	25.60
	Qtr 2 2011	1.51	0.00	0.08	0.41	980.00	7.40	465.00	16.90	5.20	<0.15	<5.0	4.50	23.50
	Qtr 1 2011	1.53	0.00	0.07	0.27	56.00	7.60	557.00	20.00	7.66	<0.15	0.34	2.00	33.21
WELL 17 D	Qtr 4 2011	1.62	0.00	0.35	<0.138	162.00	7.20	505.00	16.70	7.10	<0.15	0.30	3.30	27.70
	Qtr 3 2011	0.98	0.00	0.28	<0.138	40.00	7.50	498.00	15.70	4.70	<0.15	0.25	3.10	33.50
	Qtr 2 2011	3.73	0.00	0.31	<0.138	0.00	7.50	489.00	16.40	5.50	<0.15	290.50	3.40	29.10
	Qtr 1 2011	2.13	0.00	0.29	0.18	11.00	7.50	484.00	16.60	6.07	<0.15	0.27	2.08	29.16
WELL 17 S	Qtr 4 2011	5.54	0.00	9.19	<0.138	6867.00	6.70	514.00	14.10	1.90	<0.15	18.46	3.90	24.40
	Qtr 3 2011	4.26	0.00	9.71	0.18	20.00	6.80	493.00	14.50	2.60	<0.15	0.53	2.80	27.70
	Qtr 2 2011	5.63	0.00	8.08	<0.138	0.80	6.70	493.00	15.00	4.70	<0.15	16910.00	3.80	25.30
	Qtr 1 2011	4.80	0.00	8.78	0.15	1120.00	6.90	483.00	14.60	4.86	<0.15	20.13	1.95	24.58
WELL 18	Qtr 4 2011	1.18	0.00	0.07	<0.138	22.00	7.30	492.00	14.30	6.00	<0.15	0.23	3.30	27.70
	Qtr 3 2011	4.30	0.00	0.10	<0.138	38.00	7.40	484.00	14.40	3.30	<0.15	0.21	3.30	30.30
	Qtr 2 2011	0.84	0.00	0.01	<0.138	0.00	7.30	477.00	13.90	3.10	<0.15	117.00	3.40	31.10
	Qtr 1 2011	1.44	0.00	0.07	0.16	62.00	7.50	476.00	16.70	5.09	<0.15	1.22	2.21	31.93
IGV		NAC	0	0.15	NAC	0	≥6.5 & ≤9.5	1000	30	NAC	0.0005	0.200	5	150

Exceedance █

NOTES

- 1 Sub-contract analysis denoted by *
- 2 ND - Concentration was below the limit of detection
- 3 NAC- No Abnormal Change
- 4 IGV - Interim Guide Value

Landfill Gas

Method		GA 2000	GA 2000	GA 2000	GA 2000	GA 2000
Parameter		CH ₄	CO ₂	O ₂	H ₂ S	Barometric Pressure
Units		% v/v	% v/v	%	PPM	mb
Client Ref	Qtr	-	-	-	-	-
MW 1	Qtr 4 2011	0.1	0.7	19.9	0.0	1004
	Qtr 3 2011	0.0	0.34	20.06	0.0	1006
	Qtr 2 2011	0.0	1.0	19.5	0.0	1006
	Qtr 1 2011	0.0	1.0	19.5	0.0	1006
MW 2	Qtr 4 2011	0.1	0.3	20.2	0.0	1004
	Qtr 3 2011	0.0	0.0	21.04	0.0	1007
	Qtr 2 2011	0.0	0.0	20.9	0.0	1002
	Qtr 1 2011	0.0	0.0	20.945	0.0	1006
MW 12	Qtr 4 2011	0.1	0.0	20.7	0.0	1003
	Qtr 3 2011	0.0	0.0	21.13	0.0	1007
	Qtr 2 2011	0.0	0.7	20.7	0.0	1002
	Qtr 1 2011	0.0	0.1	20.6	0.0	1006
MW 13	Qtr 4 2011	0.1	0.0	20.7	0.0	1003
	Qtr 3 2011	0.0	0.01	21.36	0.0	1007
	Qtr 2 2011	0.0	0.1	20.4	0.0	1002
	Qtr 1 2011	0.0	1.4	19.61	0.0	1006
MW 14	Qtr 4 2011	17.1	13.0	12.9	0.0	1002
	Qtr 3 2011	16.25	14.49	11.67	0.0	1006
	Qtr 2 2011	2.8	2.4	19.8	0.0	1002
	Qtr 1 2011	3.0	2.3	19.15	0.0	1006
MW 15	Qtr 4 2011	0.1	0.0	21.5	0.0	1003
	Qtr 3 2011	0.0	0.0	20.9	0.0	1007
	Qtr 2 2011	0.0	0.1	20.5	0.0	1002
	Qtr 1 2011	-	-	-	-	-
Limit		1	1.5			

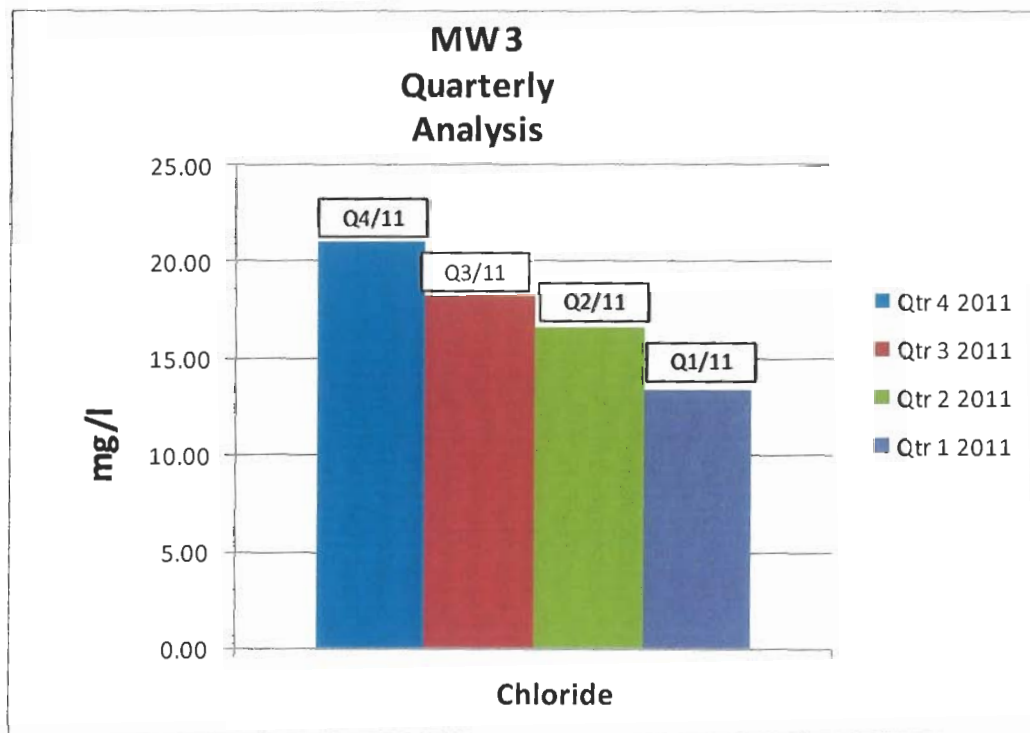
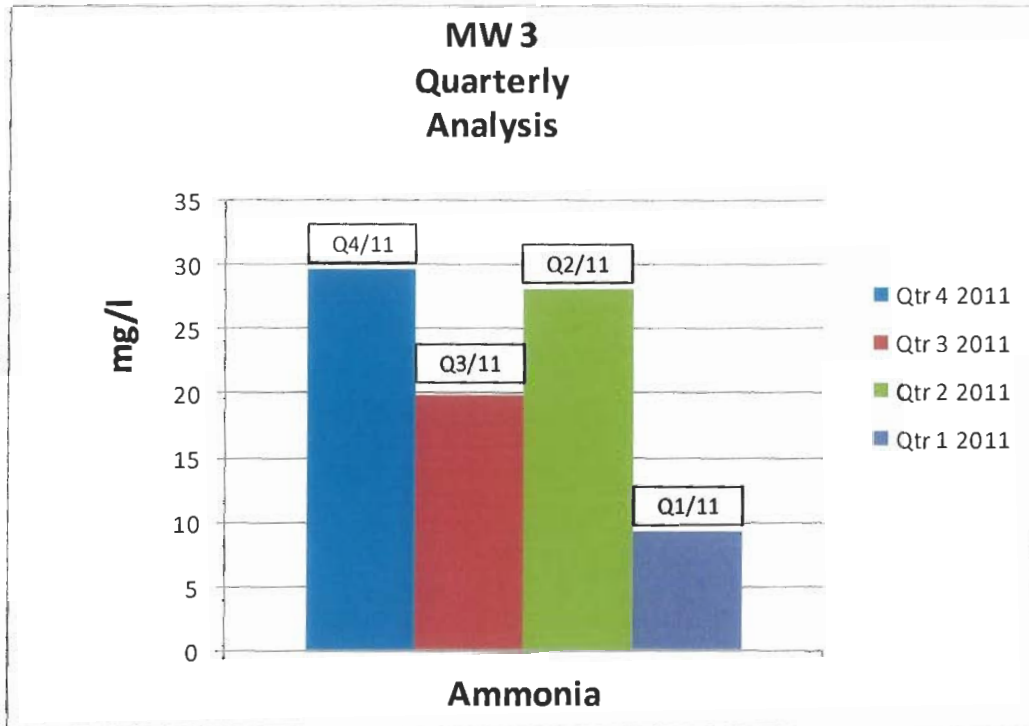
Exceedance 

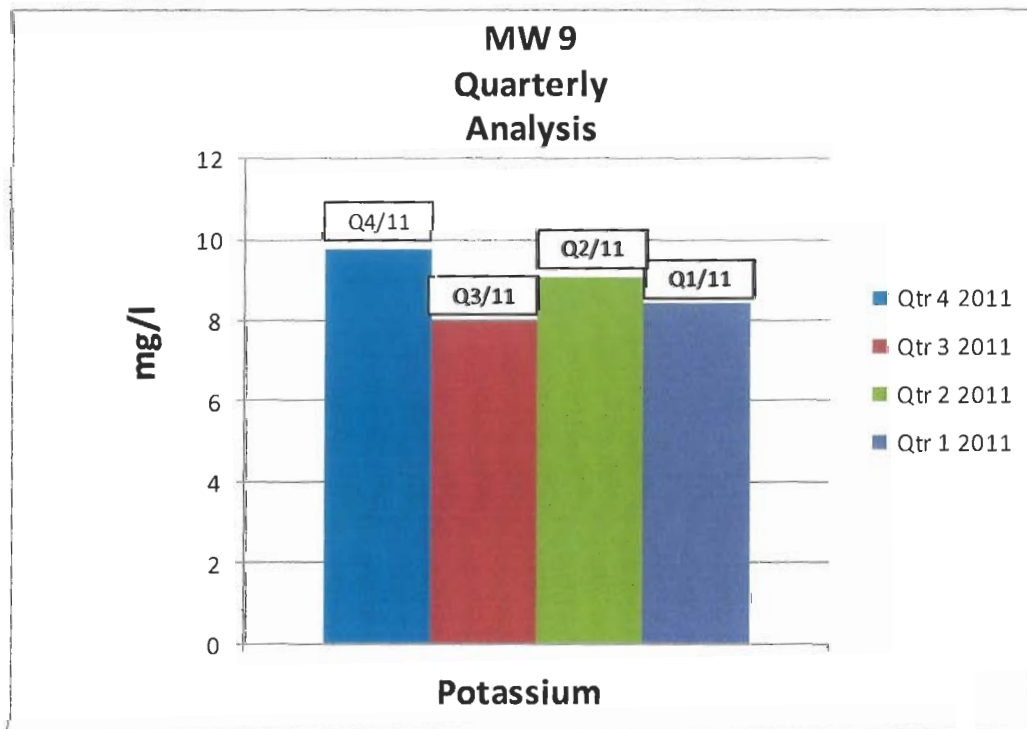
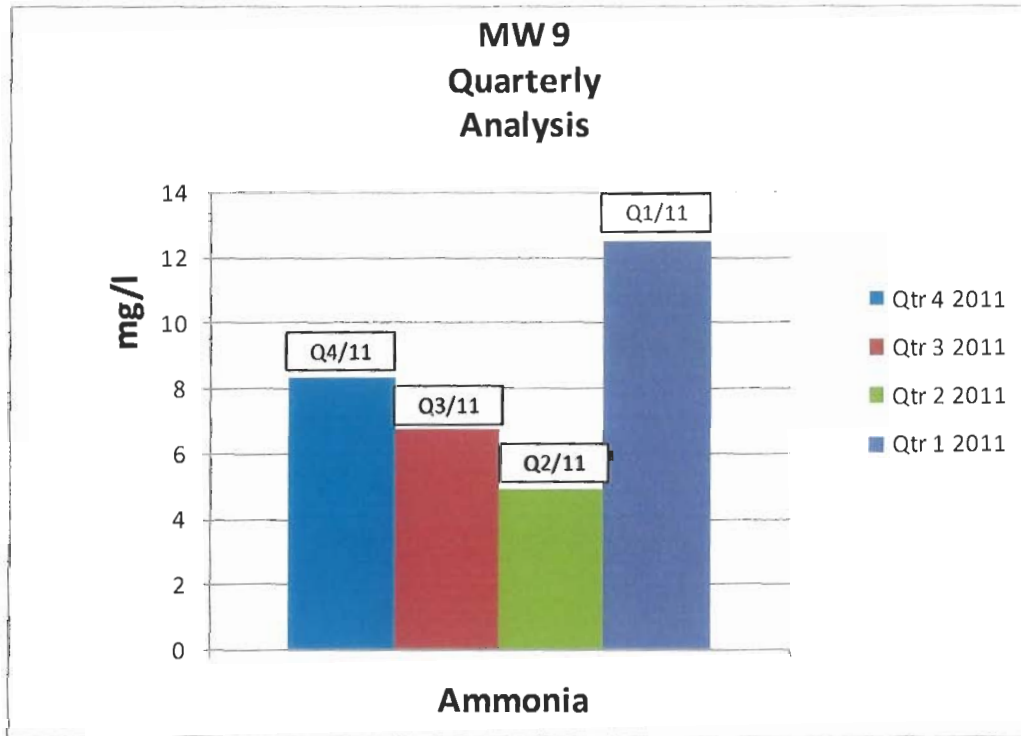
NOTES

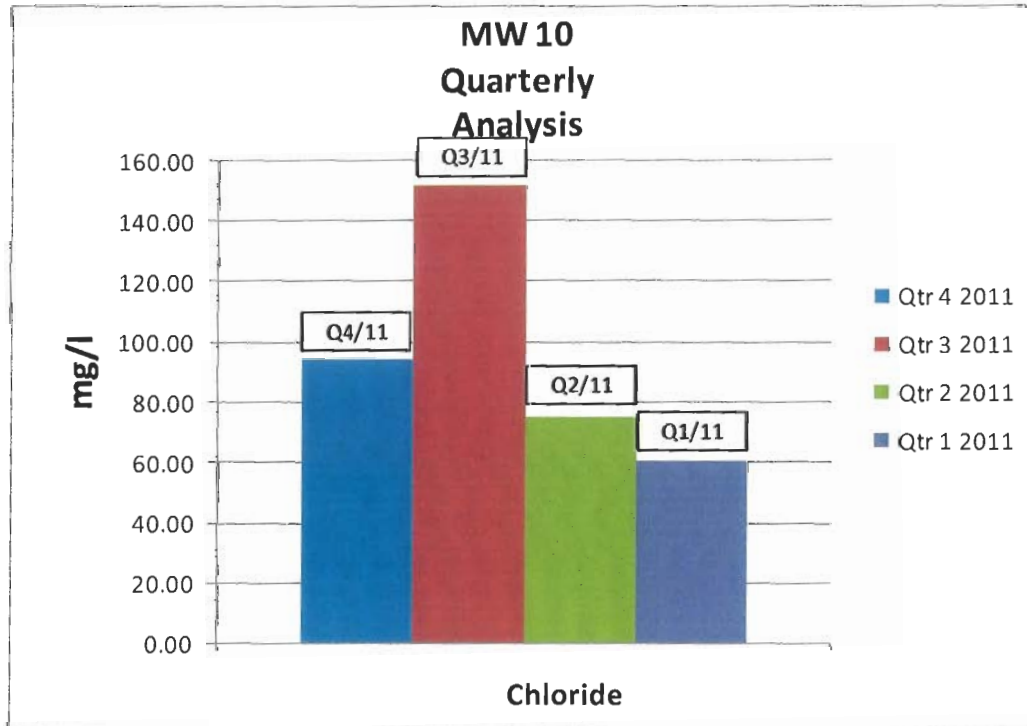
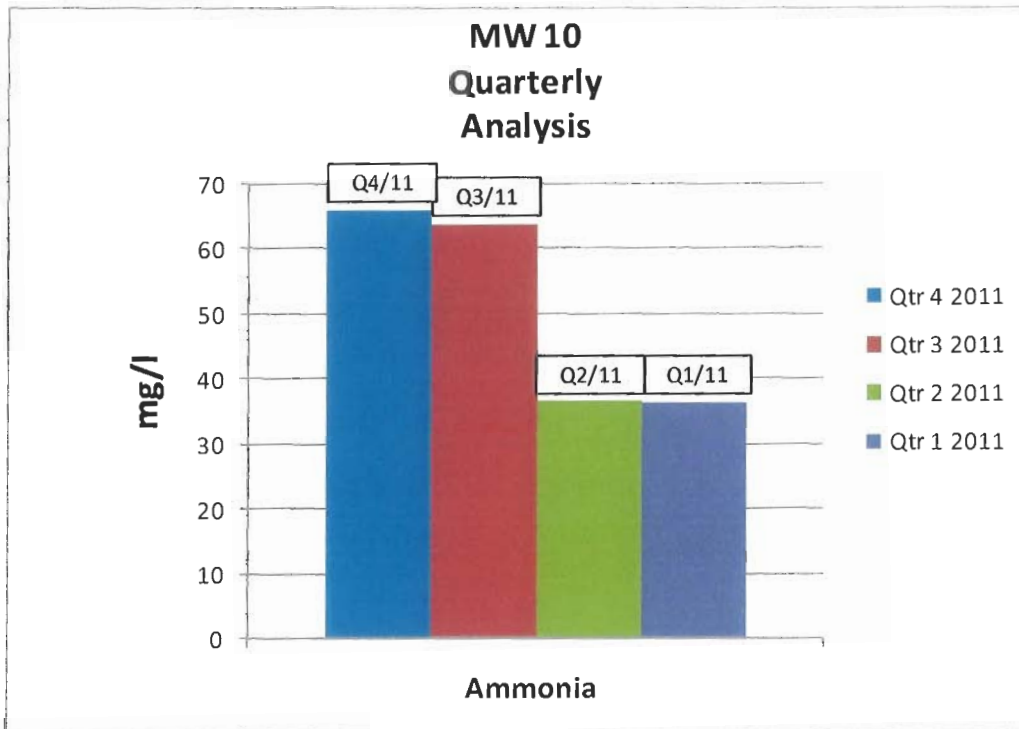
- 1 Instrument Serial No: GA 07721
- 2 Limit: Schedule C2, Licence

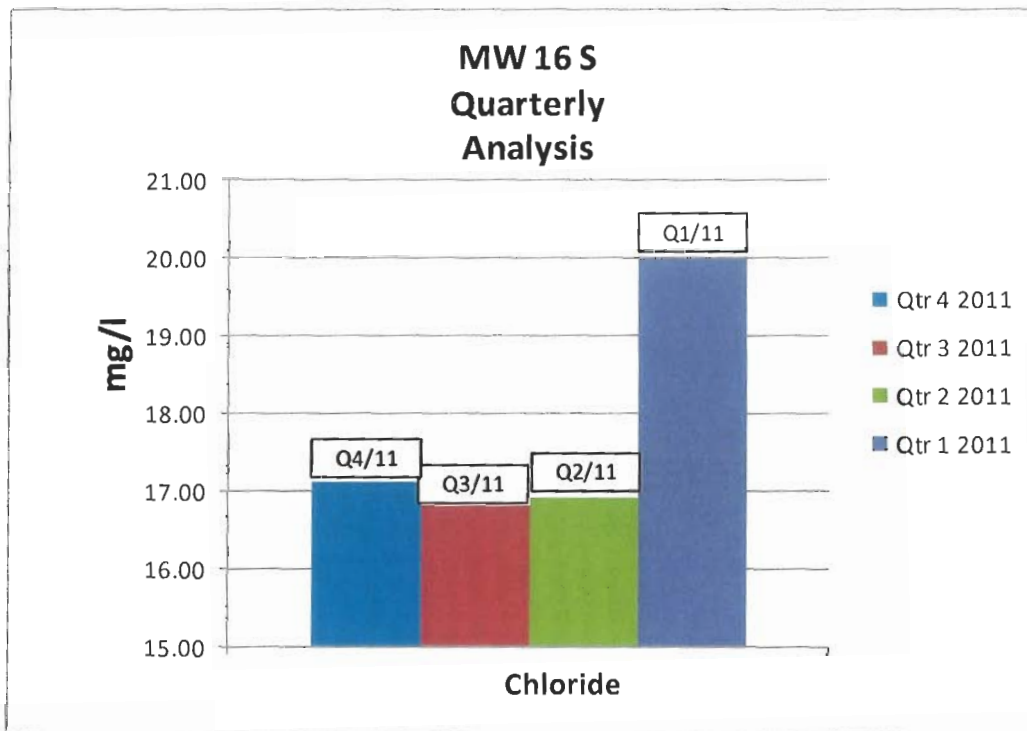
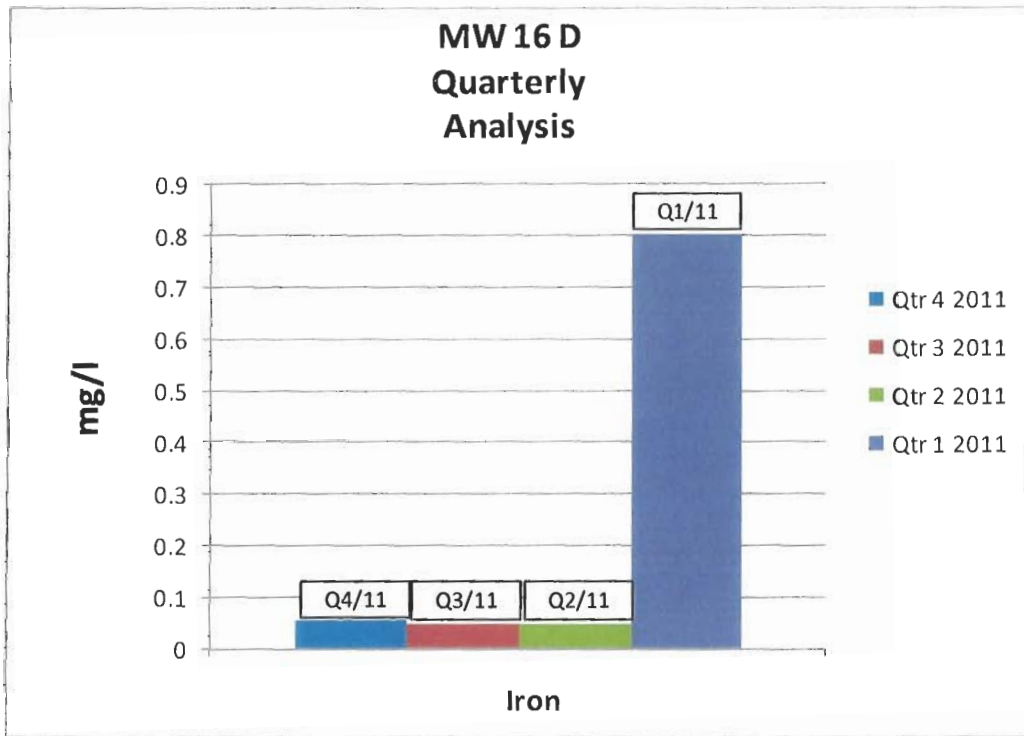
HISTORICAL DATA

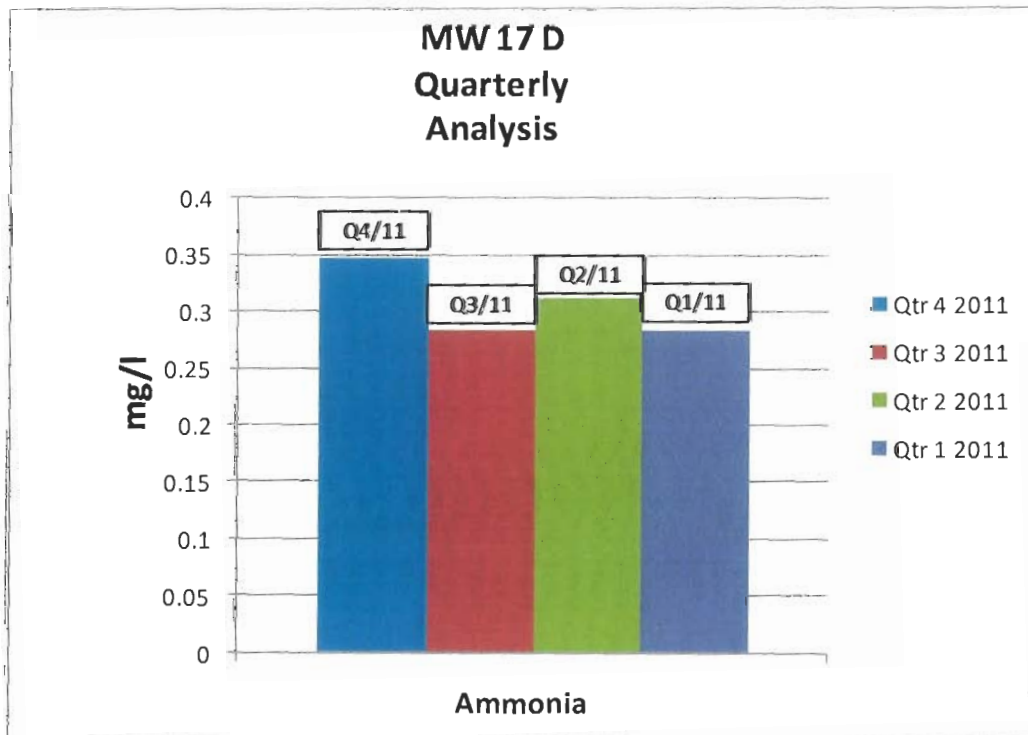
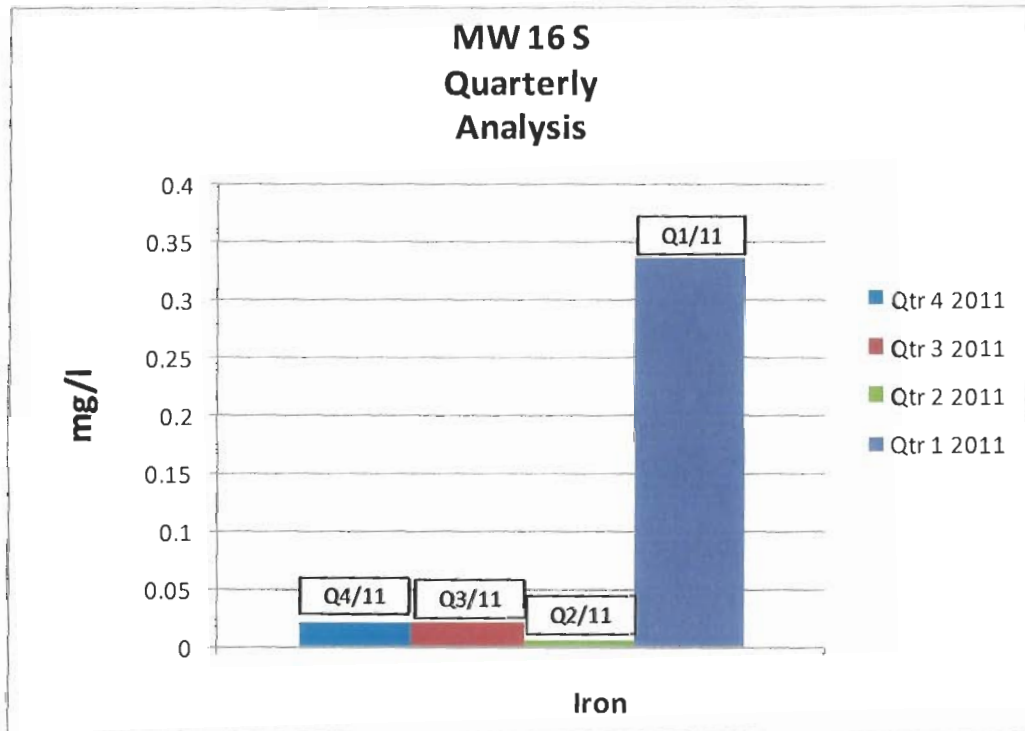
Groundwater

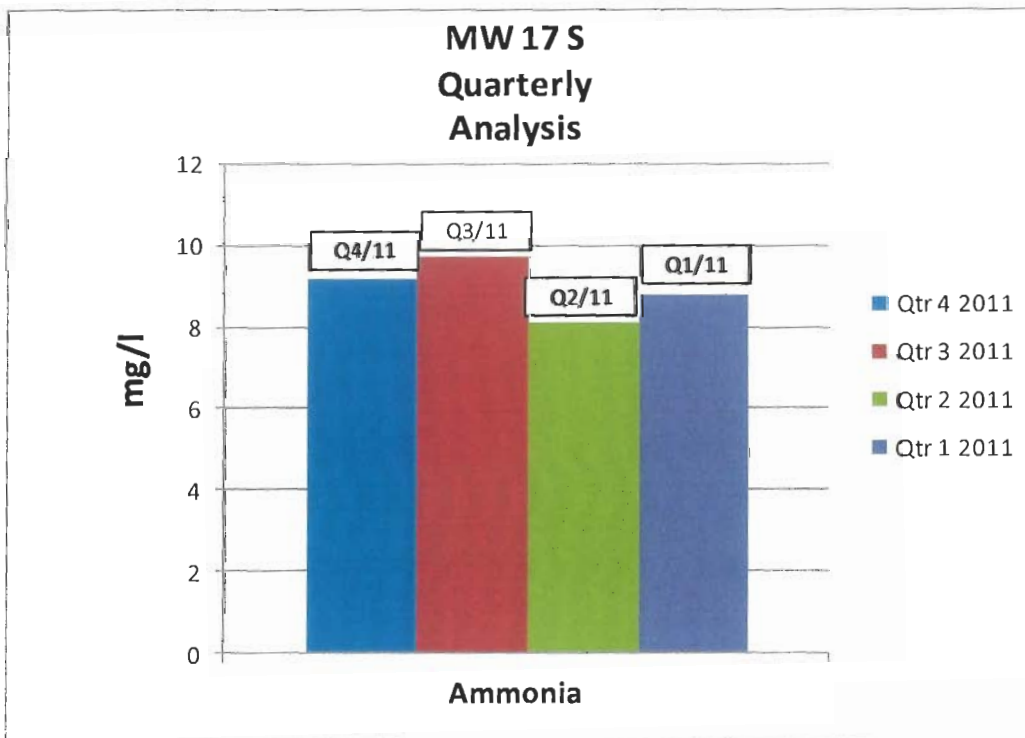
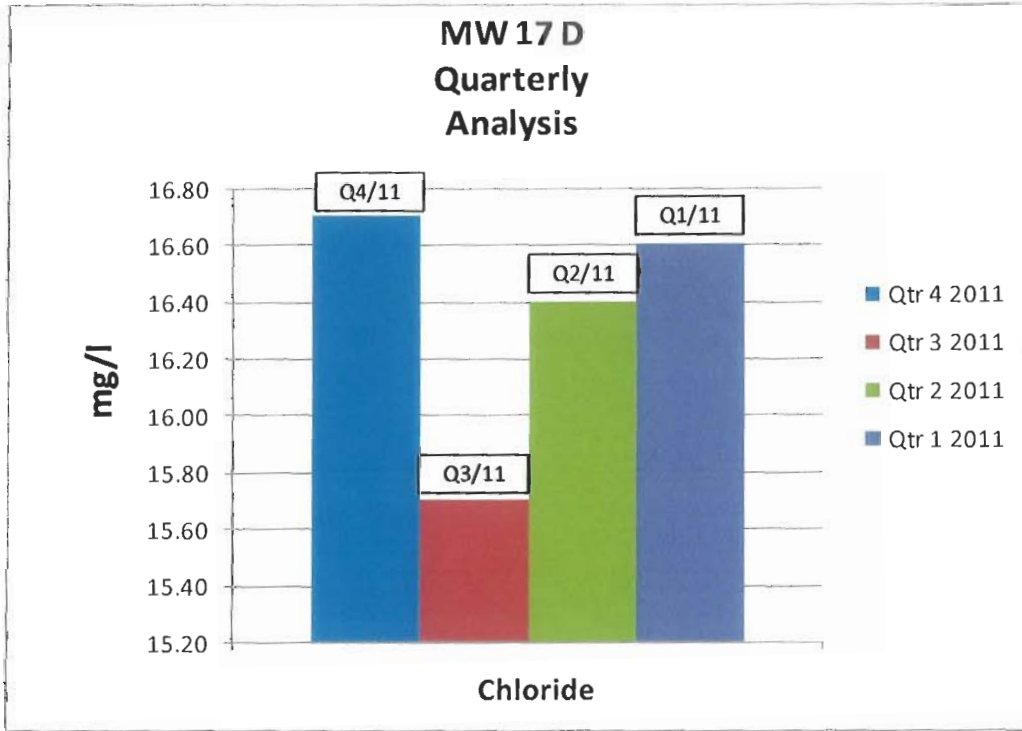


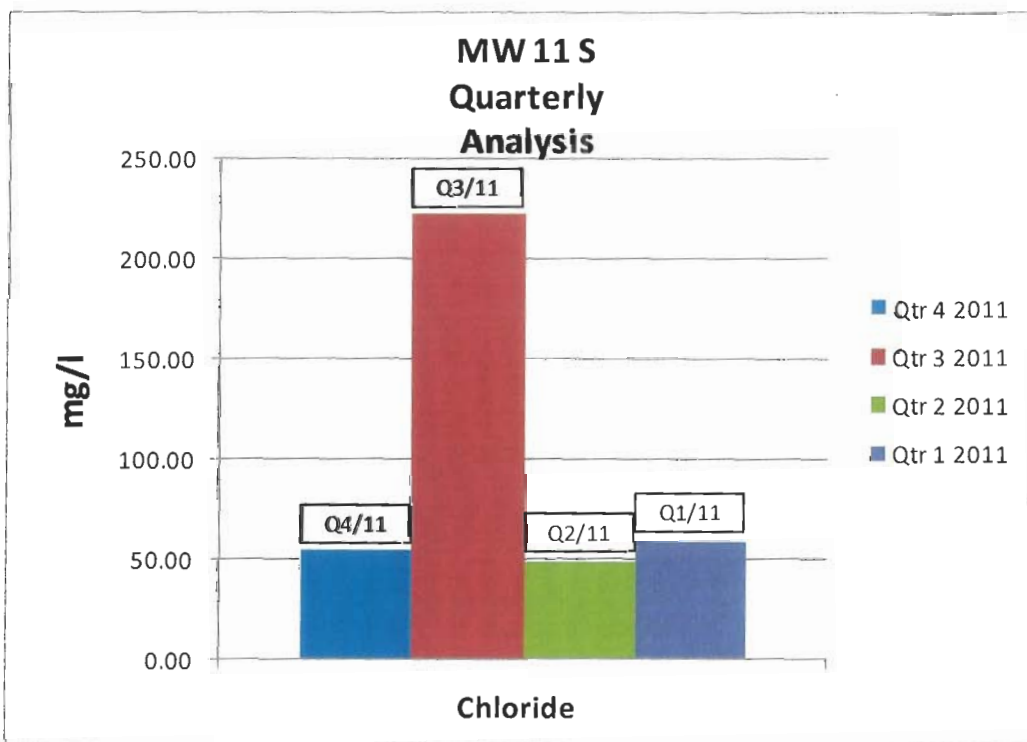
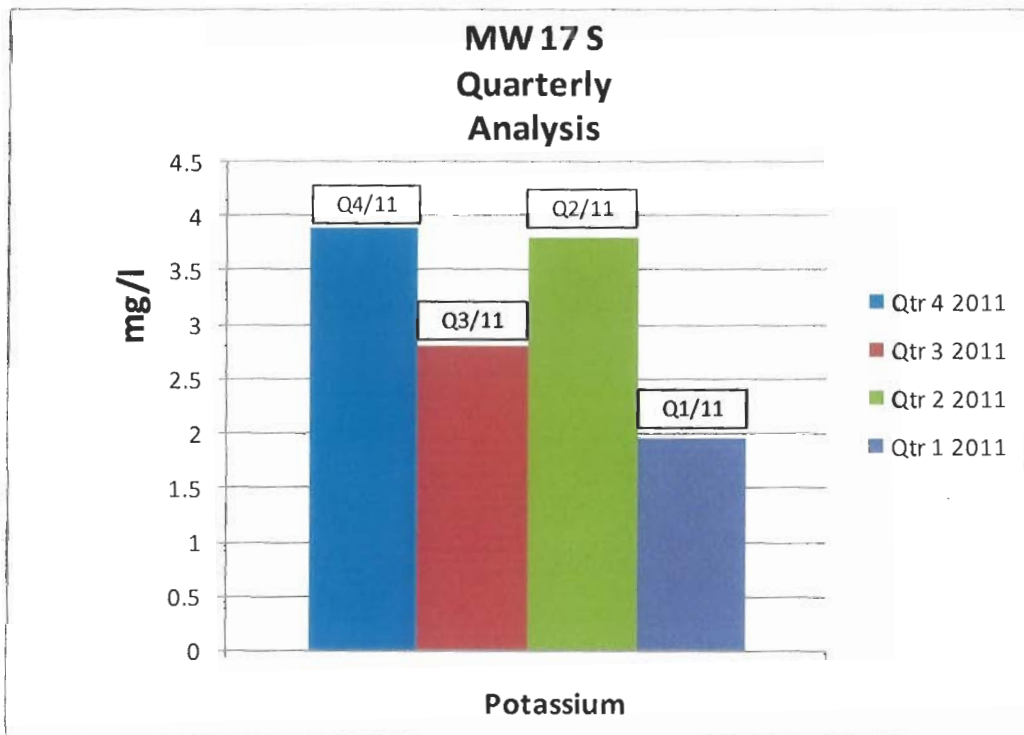


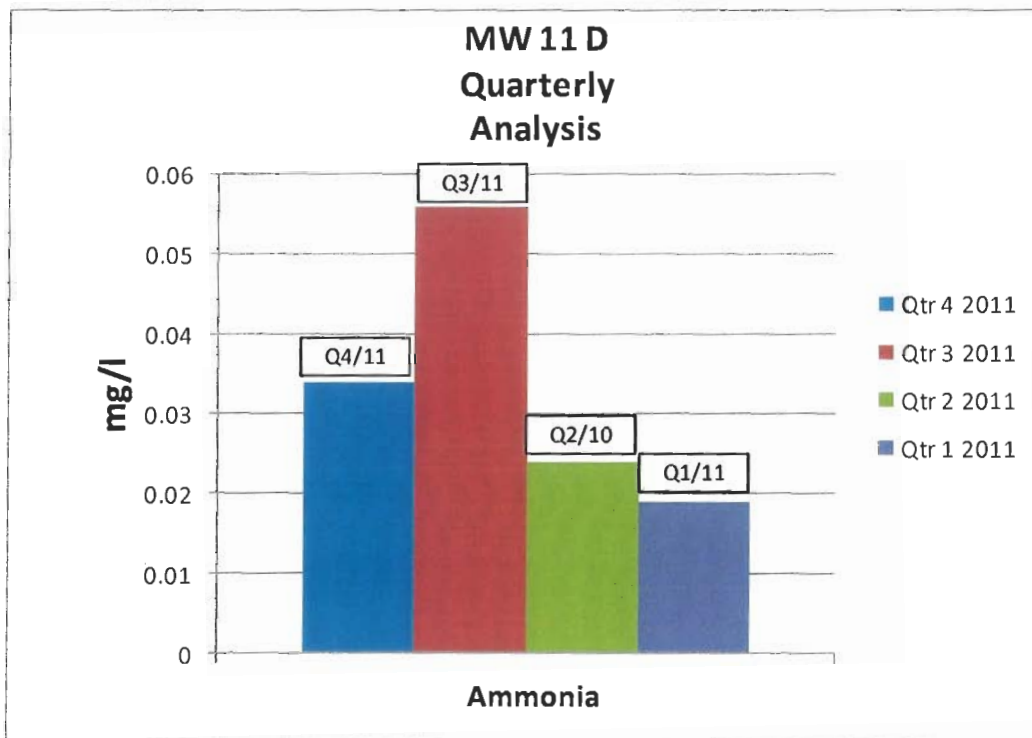
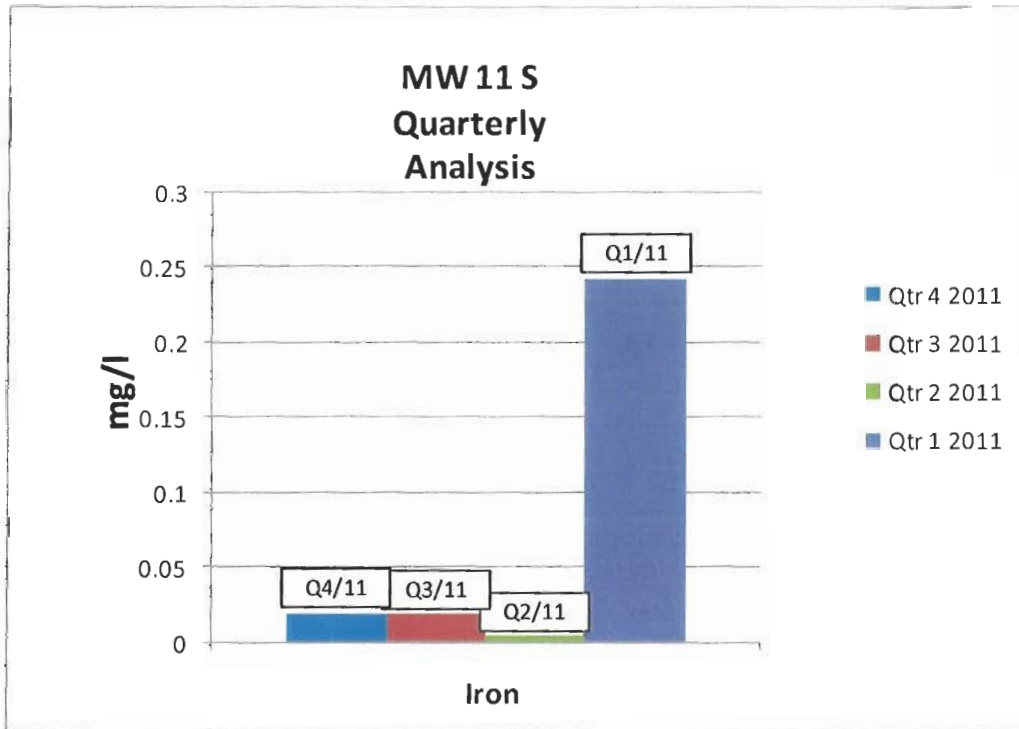


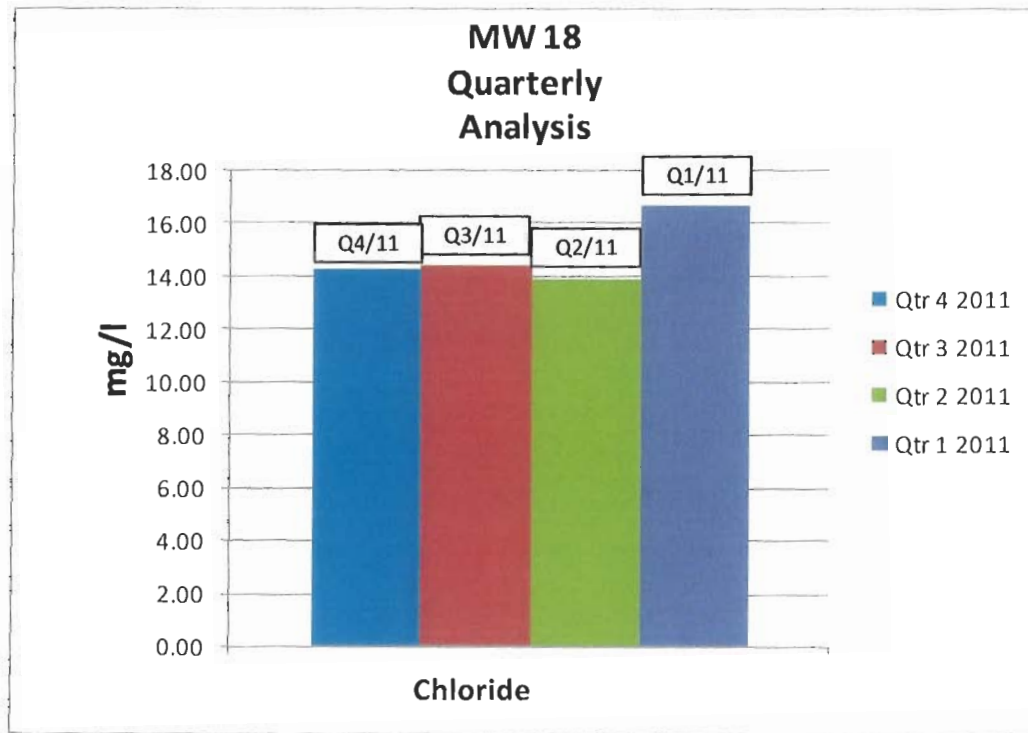




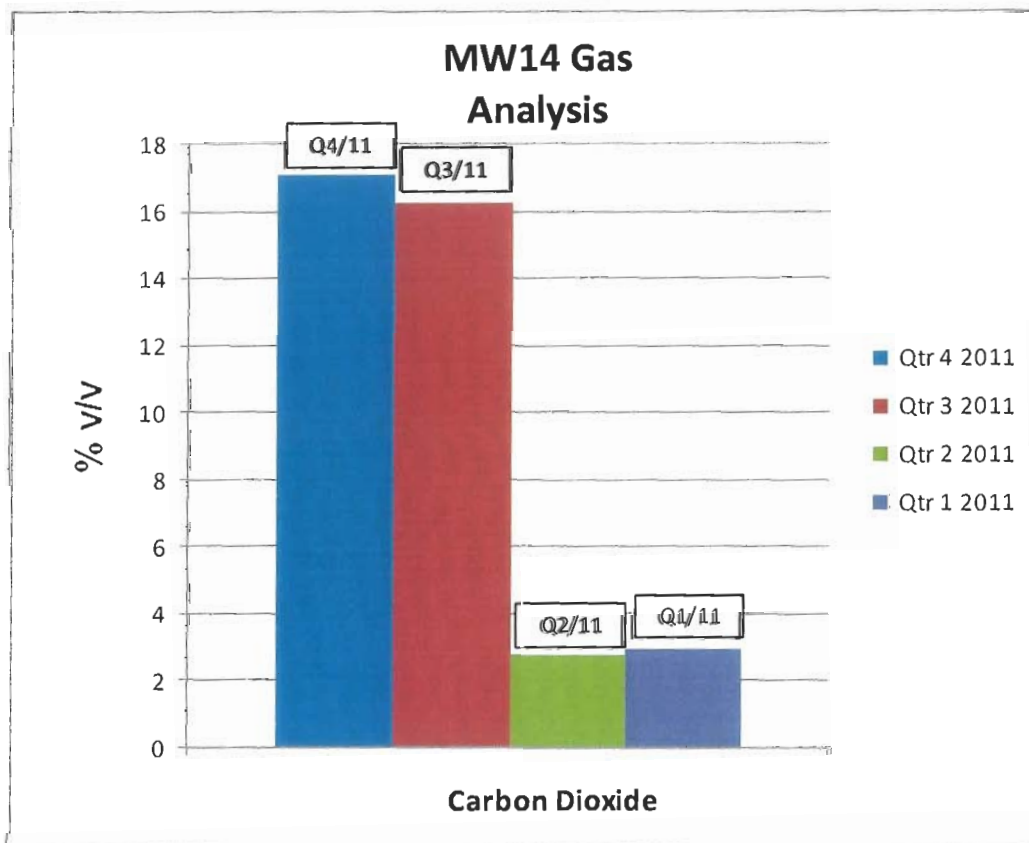
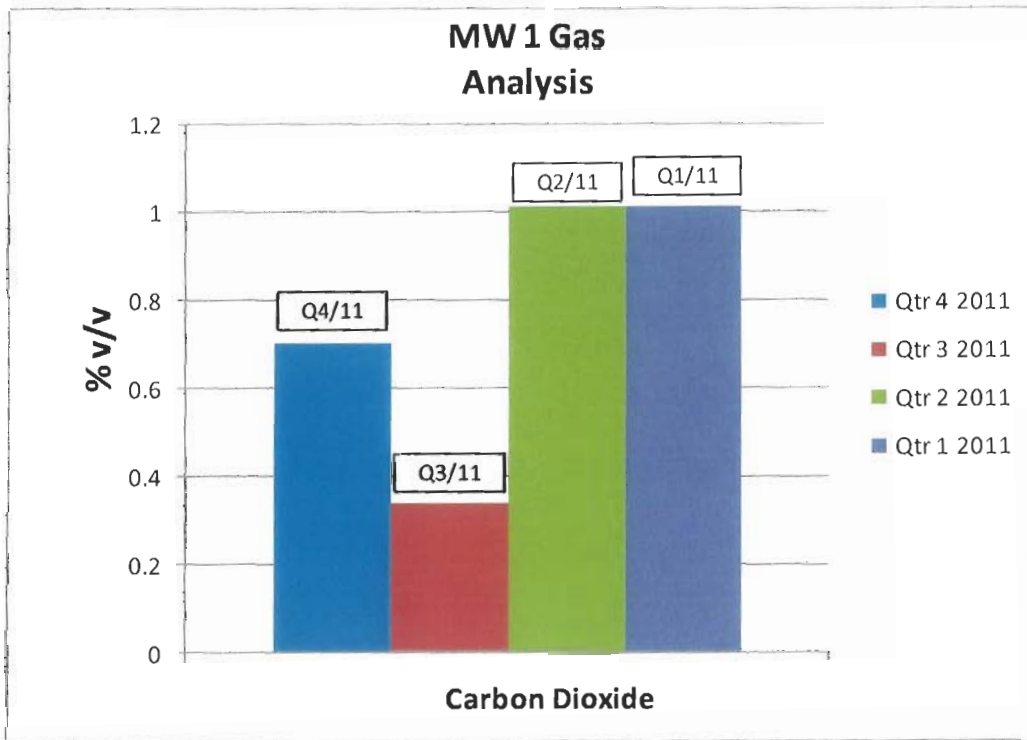








Landfill Gas



APPENDIX 2- LANDFILL GAS BREAKDOWN

MW1

Date/Time	CH4 (%)	CO2 (%)	O2 (%)	H2S (PPM)	Barometric Pressure (mb)
15/11/2011 10:26	0.1	0.6	20.0	0.0	1004
15/11/2011 10:27	0.1	0.9	19.7	0.0	1004
15/11/2011 10:28	0.1	1.3	19.2	0.0	1004
15/11/2011 10:29	0.1	1.3	19.1	0.0	1004
15/11/2011 10:30	0.1	0.7	19.8	0.0	1004
15/11/2011 10:31	0.1	0.5	20.0	0.0	1004
15/11/2011 10:32	0.1	0.5	20.2	0.0	1004
15/11/2011 10:33	0.1	0.5	20.1	0.0	1004
15/11/2011 10:34	0.1	0.5	20.2	0.0	1004
15/11/2011 10:35	0.1	0.4	20.2	0.0	1004
15/11/2011 10:37	0.1	0.4	20.2	0.0	1004

MW 2

Date/Time	CH4 (%)	CO2 (%)	O2 (%)	H2S (PPM)	Barometric Pressure (mb)
15/11/2011 12:06	0.1	0.6	19.7	0.0	1004
15/11/2011 12:07	0.1	0.5	19.9	0.0	1004
15/11/2011 12:08	0.1	0.4	20.0	0.0	1004
15/11/2011 12:09	0.1	0.4	20.1	0.0	1004
15/11/2011 12:10	0.1	0.4	20.1	0.0	1004
15/11/2011 12:12	0.1	0.3	20.2	0.0	1004
15/11/2011 12:13	0.1	0.3	20.3	0.0	1004
15/11/2011 12:14	0.1	0.3	20.2	0.0	1004
15/11/2011 12:15	0.1	0.3	20.3	0.0	1004
15/11/2011 12:16	0.1	0.2	20.3	0.0	1004
15/11/2011 12:17	0.1	0.2	20.4	0.0	1004
15/11/2011 12:18	0.1	0.2	20.5	0.0	1004

MW 12

Date/Time	CH4 (%)	CO2 (%)	O2 (%)	H2S (PPM)	Barometric Pressure (mb)
15/11/2011 13:46	0.1	0.0	20.6	0.0	1003
15/11/2011 13:47	0.1	0.0	20.7	0.0	1003
15/11/2011 13:48	0.1	0.0	20.7	0.0	1003
15/11/2011 13:49	0.1	0.0	20.6	0.0	1003
15/11/2011 13:50	0.1	0.0	20.7	0.0	1003
15/11/2011 13:51	0.1	0.0	20.6	0.0	1003
15/11/2011 13:52	0.1	0.0	20.7	0.0	1003
15/11/2011 13:53	0.1	0.0	20.8	0.0	1003
15/11/2011 13:54	0.1	0.0	20.7	0.0	1003
15/11/2011 13:55	0.1	0.0	20.7	0.0	1003
15/11/2011 13:56	0.1	0.0	20.8	0.0	1003

MW 13

Date/Time	CH4 (%)	CO2 (%)	O2 (%)	H2S (PPM)	Barometric Pressure (mb)
15/11/2011 14:16	0.1	0.0	20.9	0.0	1004
15/11/2011 14:17	0	0.0	20.9	0.0	1003
15/11/2011 14:18	0.1	0.0	21.0	0.0	1003
15/11/2011 14:19	0.1	0.0	20.9	0.0	1003
15/11/2011 14:20	0.1	0.0	21.0	0.0	1003
15/11/2011 14:21	0.1	0.0	21.0	0.0	1003
15/11/2011 14:22	0.1	0.0	21.1	0.0	1003
15/11/2011 14:23	0.1	0.0	21.1	0.0	1003
15/11/2011 14:24	0.1	0.0	21.1	0.0	1003
15/11/2011 14:25	0.1	0.0	21.1	0.0	1003

MW 14

Date/Time	CH4 (%)	CO2 (%)	O2 (%)	H2S (PPM)	Barometric Pressure (mb)
15/11/2011 14:49	10.8	8.9	14.7	0.0	1002
15/11/2011 14:50	10.8	9.1	14.7	0.0	1002
15/11/2011 14:51	13.5	10.9	13.8	0.0	1002
15/11/2011 14:52	15.4	12.1	13.2	0.0	1002
15/11/2011 14:53	16.6	12.9	12.9	0.0	1002
15/11/2011 14:54	18.1	13.7	12.6	0.0	1002
15/11/2011 14:55	18.9	14.1	12.4	0.0	1002
15/11/2011 14:56	19.8	14.7	12.1	0.0	1002
15/11/2011 14:57	20.7	15.0	11.9	0.0	1002
15/11/2011 14:58	21.3	15.5	11.6	0.0	1002
15/11/2011 14:59	22.1	15.9	11.6	0.0	1002

MW 15

Date/Time	CH4 (%)	CO2 (%)	O2 (%)	H2S (PPM)	Barometric Pressure (mb)
15/11/2011 15:05	0.1	0.0	21.4	0.0	1003
15/11/2011 15:06	0.1	0.0	21.4	0.0	1003
15/11/2011 15:07	0.1	0.0	21.4	0.0	1003
15/11/2011 15:08	0.1	0.0	21.4	0.0	1003
15/11/2011 15:09	0.1	0.0	21.6	0.0	1003
15/11/2011 15:10	0.1	0.0	21.5	0.0	1003
15/11/2011 15:11	0.1	0.0	21.6	0.0	1003
15/11/2011 15:12	0.1	0.0	21.6	0.0	1003
15/11/2011 15:13	0.1	0.0	21.6	0.0	1003
15/11/2011 15:14	0.1	0.0	21.6	0.0	1003
15/11/2011 15:15	0.1	0.0	21.6	0.0	1003

APPENDIX 3- ANALYSIS METHODS

ELS LTD INAB ACCREDITATION SCHEDULE SUMMARY SHEET		
<p>Miscellaneous (P,G,W,S) Ammonia Ammonium: 0.007-1mg/l N (EW003) Chloride 0.5-250 mg/l (EW015) Fluoride 0.1 - 2 mg/l (EW137) COD 5-1500 mg/l (EW034) Nitrate 0.12-50 mg/l N (EW034) Nitrite 0.013-1 mg/l N (EW035) pH 4 - 10 pH Units (EW138) Phosphate 0.009-1 mg/l P (EW007) TOC 0.25-100mg/l (EW123) Total Phosphorus 0.03-1 mg/l P (EW002)</p>	<p>Other VOCs EO025 (P,G,S) Bromoacetylene 0.5 - 35 µg/l Ethyl Ether Diethyl Ether 0.5 - 35 µg/l 1,1 Dichloroethane 0.5 - 35 µg/l Iodometane Methyl Iodide 0.5 - 35 µg/l Carbon Disulphide 0.5 - 35 µg/l Allyl Chloride 0.5 - 35 µg/l Methylene Chloride DCM 0.5 - 35 µg/l 2-Propenenitrile Acrylonitrile 2.0 - 35 µg/l Chloromethyl Cyanide 0.5 - 35 µg/l Hexachlorobutadiene 0.5 - 35 µg/l Trans-1,2 Dichloroethene 0.5 - 35 µg/l MIBK 0.5 - 35 µg/l 1,1 Dichloroethane 0.5 - 35 µg/l 1,2 Dichloropropane 0.5 - 35 µg/l Cis-1,2 Dichloroethane 0.5 - 35 µg/l Methyl Acrylate 0.5 - 35 µg/l Bromochloromethane 0.5 - 35 µg/l Tetrachloroethane 0.5 - 35 µg/l 1,1 Trichloroethane 0.5 - 35 µg/l 1-Chlorobutane 0.5 - 35 µg/l Carbon Tetrachloride 0.5 - 35 µg/l 1,1 Dichloropropane 0.5 - 35 µg/l 1,2 Dichloropropane 0.5 - 35 µg/l Dibromochloroethane 0.5 - 35 µg/l Methyl Methacrylate 0.5 - 35 µg/l 1,3 Dichloropropane, cis 2.0 - 35 µg/l MIBK+ Methyl 2-Pentanoate 2.0 - 35 µg/l Toluene 0.5 - 35 µg/l 1,3 Dichloropropane, trans 2.0 - 35 µg/l Ethyl Methacrylate 2.0 - 35 µg/l 1,1,2 Trichloroethane 0.5 - 35 µg/l 1,3 Dichloropropane 0.5 - 35 µg/l 2-Hexanone 1.0 - 35 µg/l 1,2-Dibromoethane 0.5 - 35 µg/l Chlorobenzene 0.5 - 35 µg/l 1,1,1,2-Tetrachloroethane 2.0 - 35 µg/l Ethyl Benzene 0.5 - 35 µg/l m & p-Xylene 0.5 - 35 µg/l O-Xylene 0.5 - 35 µg/l Styrene 2.0 - 35 µg/l Isopropyl Benzene 0.5 - 35 µg/l Bromobenzene 0.5 - 35 µg/l 1,1,2,2-Tetrachloroethane 0.5 - 35 µg/l 1,2,3 Trichloropropane 2.0 - 35 µg/l Propyl Benzene 0.5 - 35 µg/l 2-Chlorotoluene 0.5 - 35 µg/l 4-Chlorotoluene 0.5 - 35 µg/l 1,35-Trimethylbenzene 0.5 - 35 µg/l Tert Butyl Benzene 0.5 - 35 µg/l 1,24-Trimethylbenzene 0.5 - 35 µg/l Sec Butyl Benzene 0.5 - 35 µg/l 1,3-Dichlorobenzene 0.5 - 35 µg/l p-Isopropyltoluene 0.5 - 35 µg/l 1,4-Dichlorobenzene 0.5 - 35 µg/l 1,2-Dichlorobenzene 0.5 - 35 µg/l n-Butyl Benzene 0.5 - 35 µg/l Hexachloroethane 0.5 - 35 µg/l 1,2-Dibromo-3-Chloropropane 2.0 - 35 µg/l 1,24-Trichlorobenzene 0.5 - 35 µg/l 1,23-Trichlorobenzene 0.5 - 35 µg/l</p>	<p>PAH EO120 (P,G,S) Range 0.01 - 0.2 µg/l Acenaphthene Benzo (a) Anthracene Benzo (a) Pyrene Benzo (b) Fluoranthene Benzo (ghi) Perylene Benzo (k) Fluoranthene Chrysene Dibenzo (ah) Anthracene Fluoranthene Fluorene Indeno (1,23-cd) Pyrene Phenanthrene Pyrene Acid Herbicides (P,G,S) Range 0.01 - 0.2 µg/l 2,4,5-T/H 2,4-D/H 2,4-DB/H MCPA/H Picloram/H Organophosphorus Pesticides (P,G,S) Range 0.01 - 0.2 µg/l Fenphos OP Methyl Parathion OP Pirathion OP Triclorfon OP Organochlorine Pesticides (P,G,S) Range 0.01 - 0.2 µg/l Aldrin BHC Alpha isomer OC BHC Beta isomer OC BHC Delta isomer OC Dieldrin OC Endosulphan Alpha isomer OC Endosulphan Beta isomer OC Endosulphan Sulphate OC Endrin OC Heptachlor Epoxide OC Heptachlor OC Lindane OC P,P DDE OC P,P DDD OC P,P DDT OC</p>
<p>Miscellaneous (P,G,S) Bromate 1 to 50µg/l (BR03 (EW137)) Colou 2.5-50mg/l PtCCo (EW021) Conductivity 132-6000 us/cm (EW136) Dissolved Oxygen 1 to 10 mg/l (EW043) Sulphate 1-250mg/l SO4 (EW016) Suspended Solids 5-1000mg/l (EW013) Total Dissolved Solids 1-1000mg/l (EW046) Total Hardness 2-330mg/l CaCO3 (EM009) Total Oxidised Nitrogen 0.133-51mg/l N (EW051)</p>	<p>Metals EM130 (P,G,S) Aluminium 5.0 - 500 µg/l Ammony 0.1 - 10 µg/l Arsenic 0.2 - 20 µg/l Barium 1.0 - 100 µg/l Boron 0.02 - 2mg/l Cadmium 0.1 - 10 µg/l Calcium 1.0 - 100mg/l Chromium 1.0 - 100 µg/l Cobalt 1.0 - 100 µg/l Copper 3 - 400 µg/l Iron 5.0 - 500 µg/l Lead 0.5 - 30 µg/l Magnesium 0.3 - 20 mg/l Manganese 1.0 - 100 µg/l Mercury 0.02 - 2 µg/l Molybdenum 1.0 - 100 µg/l Nickel 0.5 - 50 µg/l Potassium 0.2 - 20 mg/l Selenium 0.2 - 20 µg/l Sodium 0.5 - 50 mg/l Strontium 1.0 - 100 µg/l Tin 1.0 - 100 µg/l Vanadium 1.0 - 100 µg/l Zinc 1.0 - 100 µg/l</p>	<p>SI439 Potable Water VOCs & THM EO025 (P,G,S) Benzene 0.1-35 µg/l 1,2-Dichloroethane 0.1-35 µg/l Tetrachloroethane 0.1-35 µg/l Trichloroethane 0.1-35 µg/l Chloroform 1.0-150 µg/l Bromoform 1.0-35 µg/l Dibromochloromethane 1.0-35 µg/l Bromodichloromethane 2.0-35 µg/l</p>

Notes
 1. Sample Matrix: P=Potable Water (Drinking), G=Ground Water, S=Surface Water, W=Waste Water

APPENDIX 4 – FIELD SHEETS

ON SITE SAMPLING FORM							
Facility Name: <i>Hollymoor diff</i>				Waste Licence No: <i>WV0093</i>			
Report To: <i>Caer county council</i>							
Sampling Date: <i>15/11/11</i>				Sample Type (GW, SW, Leachate)			
Personnel: <i>John Keating</i>				Weather: <i>Dry</i>			
Other Remarks:				GPS:			
Sample Ref No	Sample Type	Time	DO Level ppm	Elec Cond us	pH pH units	Temp °C	Instrument
<i>MW 16D</i>	<i>GW</i>	<i>10:25</i>	<i>6.60</i>	<i>525</i>	<i>7.35</i>	<i>10.0</i>	<i>Hanna</i>
<i>MW 16S</i>	<i>GW</i>	<i>10:40</i>	<i>7.90</i>	<i>562</i>	<i>7.50</i>	<i>11.0</i>	<i>"</i>
<i>MW 17D</i>	<i>GW</i>	<i>11:25</i>	<i>7.21</i>	<i>533</i>	<i>7.23</i>	<i>10.0</i>	<i>"</i>
<i>MW 17S</i>	<i>GW</i>	<i>11:15</i>	<i>3.48</i>	<i>576</i>	<i>6.71</i>	<i>11.1</i>	<i>"</i>
<i>MW 18</i>	<i>GW</i>	<i>12:10</i>	<i>6.20</i>	<i>578</i>	<i>7.28</i>	<i>10.5</i>	<i>"</i>
<i>MW 11S</i>	<i>GW</i>	<i>12:30</i>	<i>7.60</i>	<i>573</i>	<i>6.80</i>	<i>11.3</i>	<i>"</i>
<i>MW 11D</i>	<i>GW</i>	<i>12:45</i>	<i>3.21</i>	<i>425</i>	<i>7.30</i>	<i>10.7</i>	<i>"</i>
<i>MW 3</i>	<i>GW</i>	<i>13:55</i>	<i>3.01</i>	<i>977</i>	<i>7.04</i>	<i>11.2</i>	<i>"</i>
<i>MW 9</i>	<i>GW</i>	<i>14:19</i>	<i>5.25</i>	<i>1025</i>	<i>6.88</i>	<i>11.9</i>	<i>"</i>
<i>MW 4</i>	<i>GW</i>	<i>14:58</i>	<i>7.92</i>	<i>653</i>	<i>7.00</i>	<i>11.0</i>	<i>"</i>
<i>MW 10</i>	<i>GW</i>	<i>15:21</i>	<i>6.98</i>	<i>1675</i>	<i>6.86</i>	<i>11.2</i>	<i>"</i>

COMMENTS:

Cavan County Council Groundwater & Leachate Sampling Ref:

Site Reference: Sallymore Hill Permit No. N0093 Date: 15/11/11 Personnel: 3 reactive

Sample Ref (Shallow /Deep)	Depth of Well (m) A	Depth of water below Ground Level (m) B	Depth of Water column (m) A-B=h	Diameter of Well (m) C	Radius of Well (m) (C/2)=r	Radius Squared (m ²) r ²	Volume of Water in Well (m ³) $\pi r^2 h$	Volume of Water in well - Litres (m ³ x 1000)	Volume of water to purge (Litres x 3)	Time to Purge (mins)
MW 16 D	10	0.5	9.5	0.05	0.025	0.000625	0.000625 x 9.5 = 0.0059375	17.66	55.93	10 min Purge
MW 16 S	41	0.9	32	0.05	0.025	0.000625	0.000625 x 32 = 0.020000	6.28	17.86	5 min
MW 17 S	5	1.17	3.83	0.05	0.025	0.000625	0.000625 x 3.83 = 0.00239375	7.516	22.55	5 min
MW 17 D	15	0.2	14.8	0.05	0.025	0.000625	0.000625 x 14.8 = 0.0092500	24.05	27.13	15 min
MW 18	21	full	21	0.05	0.025	0.000625	0.000625 x 21 = 0.013125	41.21	123.64	22 min

Cavan County Council Groundwater & Leachate Sampling Ref:

Site Reference: *Ballyjamesduff* Permit No. *W0093* Date: *15/11/14* Personnel: *5* *Wet*

Sample Ref (Shallow/Deep)	Depth of Well (m) A	Depth of water below Ground Level (m) B	Depth of Water column (m) A-B=h	Diameter of Well (m) C	Radius of Well (m) (C/2)=r	Radius Squared (m ²) r ²	Volume of Water in Well (m ³) $\pi r^2 h$	Volume of Water in well - Litres (m ³ x 1000)	Volume of water to purge (Litres x 3)	Time to Purge (mins)
MW 11 D	30	11.25	18.75	0.05	0.025	0.000625	0.5625	3679	110.10	20 min
MW 11 S	5	22	2.8	0.05	0.025	0.000625	0.519	5.19	16.48	3 min
MW 3	2.9	1.88	1.02	0.05	0.025	0.000625	0.0017	3.0017	6.01	1 min 30 sec
MW 9	4.5	3.5	1.2	0.05	0.025	0.000625	0.0035	2.35	7.06	2 min
MW 10	3.4	20	14	0.05	0.025	0.000625	0.0014	7.74	8.74	2 min

Cavan County Council Groundwater & Leachate Sampling Ref:

Site Reference: Ballymore Permit No. W0093 Date: 15/11/11 Personnel: B. Keenan

Sample Ref (Shallow /Deep)	Depth of Well (m) A	Depth of water below Ground Level (m) B	Depth of Water column (m) A-B-h	Diameter of Well (m) C	Radius of Well (m) (C/2)=r	Radius Squared (m ²) r ²	Volume of Water in Well (m ³) $\pi r^2 h$	Volume of Water in well - Litres (m ³ x 1000)	Volume of water to purge (Litres x 3)	Time to Purge (mins)
MW 4	2.2	0.6	1.6	0.05	0.025	0.000625	0.00025	316	962	2 min

Landfill Gas Monitoring Form	
Facility Name: <i>Ballyjamesduff</i>	Facility Address: <i>Derryhunger, Ballyjamesduff</i>
Waste Licence No: <i>W0043</i>	
Licensee: <i>Cavin Canty</i>	
Date of Licensing: <i>2003</i>	Date of sampling: <i>15/11/11</i>
Instrument Used: <i>GA 2000</i>	Date next full calibration: <i>2012</i>
	Last field calibration: (inc date & gases) <i>2011</i>
Monitoring Personnel: <i>Franc Hearty</i>	Weather: <i>Dry</i>

Results									
Station Number	Time	GA2000 ID	CH ₄	CO ₂	O ₂	CO	H ₂ S	Barometric Pressure (mbar)	Comments
<i>MW 1</i>	<i>10:26</i>		<i>0.1</i>	<i>0.6</i>	<i>20.0</i>	<i>-</i>	<i>-</i>	<i>1001</i>	
<i>MW 2</i>	<i>12:06</i>		<i>0.1</i>	<i>0.6</i>	<i>19.7</i>	<i>-</i>	<i>-</i>	<i>1004</i>	
<i>MW 12</i>	<i>13:46</i>		<i>0.1</i>	<i>0.0</i>	<i>20.6</i>	<i>-</i>	<i>-</i>	<i>1003</i>	
<i>MW 15</i>	<i>14:16</i>		<i>0.1</i>	<i>0.0</i>	<i>20.9</i>	<i>-</i>	<i>-</i>	<i>1003</i>	
<i>MW 16</i>	<i>14:49</i>		<i>10.8</i>	<i>8.9</i>	<i>16.7</i>	<i>-</i>	<i>-</i>	<i>1002</i>	
<i>MW 5</i>	<i>15:05</i>		<i>0.1</i>	<i>0.0</i>	<i>21.1</i>	<i>-</i>	<i>-</i>	<i>1003</i>	

General Comments:



CAVAN COUNTY COUNCIL
CLOSED LANDFILL MONITORING INTEGRITY FORM

SITE Ballymoreland PERSONNEL John Keefe

DATE 15/11/11

ITEM	CONDITION		COMMENTS
	GOOD	NEEDS MAINTENANCE	
GROUNDWATER MONITORING WELLS			
- Labeled			
- Well cap integrity	✓		
- Water drainage	✓		
- Locks	✓		
LANDFILL GAS VENTS			
- Riser condition	✓		
- Concrete collar condition	✓		
- Screen condition	✓		
LANDFILL GAS MONITORING WELLS			
- Labeled	✓		
- Well cap integrity	✓		
- Water drainage	✓		
- Traffic protection	✓		
- Concrete collar condition	✓		
- Screen Condition	✓		
- Locks	✓		
SURFACE WATER MONITORING LOCATIONS			
- Access	✓		
- Disturbance			

*Agreement -
locks installed
by Boylan Eng dis Ltd*

APPENDIX 5 – CHAIN OF CUSTODY/SAMPLE SUBMISSION

2078

SAMPLE SUBMISSION FORM

DETAILS TO APPEAR ON ANALYSIS REPORT

Contact Name: Baylan Engineering
 Address: C/O Brian Keatinge

Customer Name: Baylan Eng
 PO Number: _____
 NOTE: Use a separate sheet for different PO Numbers. For all customers a PO Number must be provided with the samples.

Environment Laboratory Services Ltd
 5, Whitehouse Lane,
 Miles Industrial Park,
 Blacross,
 Wick,
 Co. Wick, Ireland
 Tel: 01 53 96 941

CONTRACT DETAILS

ELS Quote No: CSN 4105
 NOTE: To reduce potential for error this field must be completed. Use a separate sheet for different Quote Numbers.

Results Due (Check): 10 days 15 days 20 days

NOTE: Standard lead time is 10 working days and 15 working days for test kits content. Deviations should be agreed in advance and may incur an extra charge.

SAMPLE DETAILS

Number	Sample Reference	Tests Requested	Number of bottles submitted	Sample Type
	NOTE: Whatever appears in this section, is the ONLY detail that will appear on the analysis report (Do not write the required detail on the bottles as it is normally not clear)	NOTE: To reduce potential for error please complete this field clearly indicating per quote per sheet attached or list the specific tests below		Drinking Water (DW), Ground Water (GW), Surface Water (SW), Waste Water (WW), Sludge, Silt/Silt, Sediment, Air
1	MW 16S	Full CSN	Full kit	GW
2	MW 16D	"	"	GW
3	MW 17S	"	"	GW
4	MW 17D	"	"	GW
5	MW 18	"	"	GW

ONLY FIVE SAMPLES ALLOWED PER SUBMISSION SHEET

ADDITIONAL INFORMATION AND SIGNATURES

To be filled by the person submitting samples		To be filled by ELS Ltd	
Signature: <u>[Signature]</u>	Phone No: <u>016 92 66 000</u>	Signature: _____	_____
Date: _____	No. samples submitted: <u>11</u> No. of pages: <u>1 of 3</u>	Date: <u>16/11</u> Hour: _____	Condition: <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory (See notes above)
Additional Info: _____		Additional Info: <u>F</u>	

NOTES FOR CUSTOMER

1. Feel free to save this submission sheet to your desktop
2. This form is designed to allow key details to be typed, saved and re-used as necessary
3. Failure to submit the form with samples may lead to errors which may be outside the control of ELS Ltd
- 4.
- 5.

NOTES FOR ELS LTD

1. If the customer details are not on the system or if the name and address differ greatly with that on the system contact the Customer Service Agent
2. Always ensure the "Contact Name" above is used as the report ID that field is blank use the default name on the system
3. Check "No. Req" where samples have been received from County Councils without PO Numbers
4. Always log in samples with different PO Numbers on different requests
5. Do not enter sample details in block capitals on samples of ACORN DRINKING WATER should read Acorn Drinking Water

830
2079

Commercial Laboratory Services Ltd
2007 Business Centre
Merrion Industrial Park,
Blanchard,
Co. Wick
E15 071 450011

SAMPLE SUBMISSION FORM

DETAILS TO APPEAR ON ANALYSIS REPORT

Contact Name: Boylan Electrics
Address: Boylan Eng
Main St Mullagh
Cavan

Customer Name: Boylan Eng
PO Number:
NOTE: Use a separate sheet for different PO Numbers
(For all customers a PO Number must be provided with the samples)

CONTRACT DETAILS

EES Quote No: QW 405
NOTE: To reduce potential for error this field must be completed.
Use a separate sheet for different Quote Numbers.

Results Due (Date):
NOTE: Standard lead time is 10 working days and 15 working days for test sub-contraction.
Delight hours should be agreed in advance and may incur an extra charge.

SAMPLE DETAILS

Number	Sample Reference	Tests Requested	Number of bottles submitted	Sample Type
	<small>NOTE: Whatever appears in this section, is the ONLY detail that will appear on the analysis report. Do not write the required detail on the bottles. ICR is normally not traced.</small>	<small>NOTE: To reduce potential for error please complete this field clearly indicating per quote, per sheet attached or list the specific tests below.</small>		<small>Drinking Water (DW), Ground Water (GW), Surface Water (SW), Waste Water (WW), Sludge, Acet/Site, Solvent, etc.</small>
589774 6	MW 11 S	see QW	full kit	GW
7	MW 11 D	"	"	GW
8	MW 3	"	"	GW
9	MW 9	"	"	GW
10	MW 4	"	"	GW

ONLY FIVE SAMPLES ALLOWED PER SUBMISSION SHEET

ADDITIONAL INFORMATION AND SIGNATURES

To be filled by person submitting samples		To be filled by EES Ltd	
Signature: <u>B. Keating</u>	Phone No: <u>086 9286000</u>	Signature: _____	Date: _____
Date: <u>13/11/11</u>	No. samples submitted: <u>11</u>	Condition: <input type="checkbox"/> Satisfactory <input type="checkbox"/> Unsatisfactory (See notes please)	Additional Info: _____
Additional Info (if any): _____		Additional Info: _____	

NOTES FOR CUSTOMER

1. Free! Free to use this submission sheet to your desktop
2. This form is designed to allow key details to be typed/rev'd and as used as necessary
3. Failure to submit the form with samples may lead to errors which may be outside the control of EES Ltd

NOTES FOR EES LTD

1. If the customer details are not on the system or if the name and address differ greatly with that on the system then call the Customer Service Agent
2. Always ensure the "Contract Name" shown is used on the report. If that field is blank use the default name on the system
3. Check "PO Req" where samples have been received from County Councils without PO Numbers
4. Always log in samples with different PO Numbers on different reports
5. Do not enter sample details in block e.g. (11) eg. sample 100 ACORN DIBBRING, WATER should read Acorn Drinking Water

5310

els

2080

Environmental Laboratory Services Ltd
 3, Green Lane, 21st Floor
 Midland Industrial Park
 Blackley
 Greater Manchester
 M9 6PL

SAMPLE SUBMISSION FORM

DETAILS TO APPEAR ON ANALYSIS REPORT

Contact Name: Boylan Eng
 Address: Boylan Eng
Main St Mulloohy
Co. Caron

Customer Name: Boylan Eng

PO Number: 011
Use a separate sheet for different PO Numbers
 For all customers a PO Number must be provided with the samples

CONTRACT DETAILS

ELS Quote No: Q11405
NOTE: To reduce potential for error this field must be completed
 for a separate sheet for different Quote Numbers

Results Due Date: 11/01/20
NOTE: Standard lead time is 10 working days and 15 working days for first sub-contract
 Deviations should be agreed in advance and may incur an extra charge

SAMPLE DETAILS

5777/2018

Sample Reference	Tests Requested	Number of bottles submitted	Sample Type
<small>NOTE: Whatever appears in this section, is the ONLY detail that will appear on the analysis report (Do not write the required detail on the bottles as it is normally not clear)</small> MW 10	<small>NOTE: To reduce potential for error please complete this field clearly indicating per package sheet attached or list the specific tests being</small> Full See Q11	Full Kit	Drinking Water (DW), Ground Water (GW), Surface Water (SW), Waste Water (WW), Sludge, Soil, Solvent, Air

ONLY FIVE SAMPLES ALLOWED PER SUBMISSION SHEET

ADDITIONAL INFORMATION AND SIGNATURES

<small>To be filled by the person submitting samples</small> Signature: <u>[Signature]</u> Phone No: <u>0116 4286000</u> Date: <u>12/11/18</u> No. samples submitted: <u>11</u> No. of pages: <u>3 of 3</u> Additional Info: <u> </u>		<small>To be filled by ELS Ltd</small> Signature: <u> </u> Date: <u> </u> Time: <u> </u> Satisfactory: <input type="checkbox"/> Satisfactory: <input type="checkbox"/> Unsatisfactory - See notes above Additional Info: <u> </u>	
---	--	---	--

NOTES FOR CUSTOMER

1. Find how to save this submission sheet to your desktop
2. This form is designed for office key details to be prep, saved and re-used as necessary
3. Failure to submit the form with samples may lead to issues which may be outside the control of ELS Ltd
4.
5.

NOTES FOR ELS LTD

1. If the customer details are not on the system or if the name and address differ greatly with that on the system consult the Customer Service Agent
2. Always ensure the "Contact Name" always entered on the report sheet form in black use the default name on the system
3. Check "Pa Bag" where samples have been received from County Councils without PO Numbers
4. Always ring samples with different PO Numbers on different reports
5. Do not enter sample details in block capitals eg sample ref "AL123N" DRINKING WATER should read "Drinking Water"

APPENDIX 6 – CALIBRATION CERTIFICATE-GA 2000



Calibration Certificate

Issued by	Environmental monitoring	Certificate number	1048
Instrument	GA2000 for Boylan	Calibrated by	AI
Serial no	GA 07/21 (asset 505)	Ambient temp	21
Service done	18/01/11	Ambient pressure	1007
Service interval	365 days	Calibration due	18 th Jan 2012
Job number	NA	Linearity check	n/a
Logger	Pass	Battery	Pass
Filter	pass	Overall result	pass

Test Method

The instrument was calibrated by applying a know concentration of gas at a set flow rate and pressure. The results are recorded on this sheet **after** adjustment and a constant reading is obtained. The results are compared to that of a reference certified set of gases.

Test reference	Cert tracability	Instrument reading	pass/fail
CO2	5.0%	5.0%	pass
O2	17.8%	17.8%	pass
CH4	2.5%	2.5%	pass
CO	199ppm	202ppm	pass
H2S	5ppm	5ppm	pass

Address
 environmental monitoring
 Unit 9a
 Lake District Business Park
 Mint Bridge Road
 Kendal
 Cumbria
 Tel 01782 435100
 email : environmonitoring@btconnect.co.uk

Appendix D

Declaration of True Copy



Cavan County Council

Comhairle Chontae an Chabháin

Teach Na Cúirte
An Cabháin



**Courthouse
Cavan**

Declaration

Ballyjamesduff Landfill WL0093/1

Cavan County Council hereby certifies that the content of the full pdf. AER W0093-012011AER.pdf uploaded to the EPA website is a true copy of the original AER.

Signed

Dated

Sinead Fox

Landfill Operations Manager

Cavan County Council