

Annual Environmental Report 2013



Derryconnell Landfill and Civic Amenity Site

WASTE LICENCE REGISTRATION NO. W0089-02

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1. INTRODUCTION

1.1 Scope and Purpose of the Report

Waste Licence No. 89-1 was issued to Cork County Council by the Environmental Protection Agency (EPA) for Derryconnell Landfill Site in October 2000. In November 2008, Waste Licence No. W0089-02 was issued by the EPA, replacing 89-1, and is the current Waste Licence relating to the site.

Condition 11.12 of the waste licence states the following:-

'The licensee shall submit to the Agency, by the 31st March of each year, an AER covering the previous calendar year.'

1.2 Reporting Period

This Annual Environmental Report (AER) covers the reporting period 1st January 2013 to 31st December 2013.

1.3 Site Location

The facility address and contact numbers are detailed below:-

Derryconnell Landfill,

Derryconnell,

Schull,

Co. Cork

Tel. (028) 37048

Fax: (028) 37742

The National Grid Reference for the site is 496270E, 533960N.

2. DESCRIPTION OF THE SITE

2.1 Waste Management Activities at the Facility

Waste Activities at the Derryconnell landfill site are restricted to those outlined below: -

Waste Management Act 1996 to 2008: Third Schedule

- Class 1. Deposit on, in or under land (including landfill).
- Class 4. Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
- Class 5. Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
- Class 12. Repacking prior to submission to any activity referred to in a preceding paragraph of this Schedule (Principal Activity).
- Class 13. Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

Waste Management Act 1996 to 2008: Fourth Schedule

- Class 2. Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes).
- Class 3. Recycling or reclamation of metals and metal compounds.
- Class 4. Recycling or reclamation of other inorganic materials.
- Class 13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

In accordance with Schedule A of the Waste Licence, the waste categories and quantities acceptable at the facility are limited to those shown in Table 2.1.

Waste Types		Maximum Tonnes Per Annum
Non-Hazardous Waste	<i>Residual Municipal Waste For disposal</i>	17,000
	<i>Storage of Waste prior to recovery</i>	7,000
Hazardous Waste	<i>Storage of Waste prior to recovery or disposal</i>	152
Total including disposal and recovery		24,152

Table 2.1: Waste Categories and Quantities Acceptable at the Facility

2.2 Management and Staffing Structure of the Facility.

The following staff were employed on site during 2013: -

- One Part Time Facility Manager
- Two General Operatives / Deputy Facility Managers
- In addition there are part-time, relief General Operatives.

Site and managerial staff details are shown in the following table 2.2.

Employee	Position	Duties and Responsibilities	Experience / Qualifications
Mr. Joe Newman	General Operative Deputy Facility Manager	General site operation and maintenance. Collection of gate fees. Administration of on-site records. Implementation of waste acceptance procedures. Coordination and control of customer activities. Deputising as Facility Manager	15 years landfill operation experience. Completed Site Operative modules of FAS Waste Management Course. Trained in operation and management of various on site systems.
Mr. Frank Cronin	General Operative Deputy Facility Manager	General site operation and maintenance. Collection of gate fees. Administration of on-site records. Implementation of waste acceptance procedures. Coordination and control of customer activities. Deputising as Facility Manager	14 years landfill operation experience. Completed Site Operative modules of FAS Waste Management Course. Trained in operation and management of various on site systems.
Mr. Jerry McCarthy; Mr. Patrick Forrester	Relief General Operative	General site operation and maintenance. Collection of gate fees. Implementation of waste acceptance procedures. Coordination and control of customer activities.	7 years landfill operation experience. Completed Site Operative modules of FAS Waste Management Course. Trained in operation and management of various on site systems.
Ms. Mairéad Hales	Executive Engineer Facility Manager		BE (Civil Eng) 10 years landfill management experience. Completed full FÁS Waste Management Course.

Table 2.2: Site Staff

2.3 Waste Quantities and Composition

The quantity and composition of the waste **received and disposed of** offsite from the facility during the reporting period is recorded in table 2.3(a). No waste was deposited directly in the landfill in 2013.

Waste Received at Derryconnell Landfill (Tns) – 2013			
Month	Household Bagged	Bulky	Total
January	22.12	5.94	28.06
February	9.22	7.58	16.80
March	15.70	6.38	22.08
April	20.64	9.74	30.38
May	16.76	10.94	27.70
June	15.36	8.38	23.74
July	25.64	12.38	38.02
August	39.18	13.30	52.48
September	15.54	8.04	23.58
October	16.88	8.82	25.70
November	16.88	9.26	26.14
December	15.88	7.48	23.36
Totals	229.80	108.24	338.04

Table 2.3(a): Quantities of Waste received and disposed during the reporting period January 2013 to December 2013.

The quantity and composition of the waste **received and recovered** during the reporting period, at the facility is recorded in table 2.3(b).

Waste Recovered at Derryconnell Landfill (Tns) – 2013													
Month	Paper Card Plastic	Glass Bottles	Alum. Cans	Steel Cans	Scrap Metal	Timber	Batt.	Aerosl	Textiles	Oils	WEEE	Light Tubes/ Bulbs	Paint
January	13.50	7.30	0.14	0.46	0.00	10.14	0.00	0.00	0.42	0.00	3.44	0.12	0.00
February	5.12	0.00	0.00	0.48	4.82	4.32	0.46	0.08	0.46	0.00	4.26	0.00	0.78
March	8.82	4.62	0.10	0.00	3.54	3.76	0.00	0.00	0.24	0.00	2.32	0.00	0.00
April	13.28	4.62	0.10	0.80	4.16	8.32	0.76	0.00	0.22	1.60	2.96	0.08	0.00
May	9.34	2.94	0.00	0.00	7.84	3.36	0.00	0.08	0.94	0.00	3.48	0.00	1.05
June	9.30	3.68	0.10	0.46	4.74	3.96	0.00	0.00	0.30	0.00	2.60	0.00	0.00
July	13.28	8.46	0.18	0.54	4.72	3.80	0.93	0.11	0.78	0.96	3.24	0.08	1.30
August	18.80	3.58	0.00	0.50	4.62	9.16	0.00	0.11	0.20	0.00	3.92	0.00	1.44
September	8.42	7.38	0.24	0.48	4.36	3.22	0.55	0.00	0.84	0.00	3.50	0.05	0.00
October	9.60	3.54	0.10	0.50	4.62	4.10	0.00	0.09	0.68	0.00	6.24	0.00	1.78
November	9.10	3.24	0.12	0.16	4.08	6.72	0.52	0.00	0.16	1.40	2.00	0.05	0.00
December	8.96	2.86	0.14	0.42	0.00	0.00	0.00	0.0	0.36	0.00	4.14	0.00	0.00
Totals	128.46	52.22	1.22	4.80	47.50	60.86	3.22	0.47	5.60	3.96	42.10	0.16	6.35

Table 2.3(b): Quantity of Waste received and recovered during the reporting period January 2013 to December 2013.

2.4 Site Capacity

The filling sequence outlined shows the sequence of cell to cell filling.

Phase	Available Capacity	Available Capacity	Filling Commencement	Filling Completion	Restoration Completion
	(m3)	Months	Date	Date	Date
Cell 1	0	0	Feb 2004	Nov 2004	March 2005
Cell 2	0	0	Nov 2004	Aug 2006	Temp. Cap Aug 2006
Cell 3	0	0	Sept 2006	Aug 2010	Q2 2011
Total	0	0			

Table 2.4: Phasing of Filling and Restoration Operations

3. SITE DEVELOPMENT WORKS

3.1 Works During 2013

To improve health & safety provisions in the Civic Amenity Site area, additional barriers and hand railings were erected in the following areas:

- Either side of entrance barriers
- Public Toilet
- Waste Oil shed
- Domestic waste compactor area

3.2 Proposed Works for 2014

Installation of floating cover on leachate lagoon.

4. EMISSIONS AND ENVIRONMENTAL MONITORING DATA:

4.1 Monitoring points

All surface environmental monitoring points are shown on drawing no. 01_2013.

These consist of the following:

- **Groundwater Emissions monitoring Points: (7 no.)**
(GW1, GW2, GW4, GW5, GW6, GW7, GW8)
- **Surface Water Emissions monitoring Points: (9 no.)**
(SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8, SW9)
- **Leachate Quality monitoring Points: (8 no.)**
(L1, L2, L3, L4, L5, L6, L7, L8)
- **Gas Emissions monitoring Points: (8 no.)**
(L1, L2, L3, L4, L5, L6, L7, L8)
- **Dust Emissions monitoring Points: (4 no.)**
(D1, D3, D6, D8) – number of points reduced with EPA agreement
- **Noise Emissions monitoring Points: (5 no.)**
(N1, N6, N7, N10, N12) - number of points reduced with EPA agreement
- **Emissions to air monitoring Point: (1 no.)**
Flare Stack

All analysis of sampling on site in 2013 was carried out by Enva Environmental Ltd. personnel. Following the granting of Waste Licence W0089-02, environmental monitoring reporting is now via the AER. This replaces the previous system of reporting via two biannual reports.

The results of all environmental monitoring carried out on site during 2013 are tabulated in appendix 1.

4.2 Leachate

The leachate lagoon was operational throughout 2013. The total volume of leachate removed from the lagoon in 2013 was 6,536.36M³. All leachate extracted was transported to Bandon Waste Water Treatment Plant. Quantities extracted monthly are shown in table 4.2.

<i>Month</i>	<i>Vol (L)</i>
January	935,420
February	1,122,760
March	392,480
April	508,260
May	0
June	334,000
July	363,820
August	462,150
September	545,120
October	1,178,250
November	1,498,420
December	921,980
Total Leachate	8,280,660

Table 4.2: Leachate Disposal per Month 2013

4.3 Continuous Monitoring Systems utilised on site:

4.3.1 Surface water emissions monitoring (SCADA):

Surface water emissions from site are continuously analysed by means of a SCADA system that measures the following: TOC (Total Organic Carbon), pH, Conductivity, Ammonia as N, Temperature and Flow. A full record of hourly SCADA results is kept electronically and in hard copy on site.

4.3.2 Flare Emissions Monitoring:

A 500 M³/Hr Flaring system was in operation on site up to February 2012. Since March 2012, a 250 M³/Hr Flaring system has been in operation on site. Gas quality and emissions are continuously analysed for the following: Methane %, Carbon Dioxide %, Oxygen %, Carbon Monoxide, Combustion Temperature, Flow & Pressure.

Flare monitoring results and emissions analysis are tabulated in appendix 2.

5. ENERGY CONSUMPTION

5.1 General

- Water supply to the site is not yet metered.
- Average daily energy usage at the site during 2013 was 129.42 kWh per day.

6. ENVIRONMENTAL INCIDENTS, NON-COMPLIANCES AND COMPLAINTS

6.1 Environmental Incidents reported to EPA in 2013

A schedule of reported incidents and corrective action is detailed in the following table 6.1.

Date	Nature of Incident	Corrective Action
27/11/13	Exceedance of Carbon Dioxide ELV at monitoring boreholes L6 & L7 on 13/08/13	None.
27/11/13	Exceedance of Carbon Dioxide ELV at monitoring boreholes L6 & L7 on 19/11/13	None.
19/12/13	Exceedance of Carbon Dioxide ELV at monitoring borehole L7 on 17/12/13	None.

Table 6.1: Environmental Incidents

6.2 Agency Notifications of Non-Compliance in 2013

A schedule of non-compliance's and corrective action is detailed in the following table 6.2.

<i>Date</i>	<i>Nature of Non Compliance</i>	<i>Corrective Action</i>
05/12/13	Leachate lagoon is uncovered contrary to Condition 3.24.2 of licence	Commitment given to install floating cover as soon as practicable
05/12/13	Indications of leachate contamination at monitoring location SW6 – not reported to agency in accordance with Condition 11.5 of licence	Notification submitted to Agency. Temporary diversion of contaminated waters to leachate lagoon. Investigation into source of contamination is in process.

Table 6.2: Non-Compliances.

6.3 Complaints Summary

There were no complaints received in 2013. An odour log kept on site has not indicated any notable problems with odours during 2013.

6.4 Nuisance Controls

6.4.1 Litter

There were no serious littering incidents during 2013. Litter can become apparent on site during periods of high wind but this is always dealt with in a timely fashion by site staff.

6.4.2 Birds

Following initial capping works in August and September 2010 where waste was no longer exposed on site, professional bird control was no longer deemed necessary on site.

6.4.3 Vermin & Flying Insects

Vermin and fly control is carried out under contract with pest specialists and a record of same kept on site as required under condition 11.3 of the Waste Licence.

6.4.4 Scavenging

Scavenging did not occur on site during 2013. A CCTV system is operational on site to deter and record any potential scavenging incidents.

6.5 Programme for Public Information

6.5.1 Information Available to the Public

A site notice at the facility entrance states the following displays information on the facility including the following:-

- Facility name and address and telephone number
- Emergency contact information
- Opening hours
- Waste Licence information

Personnel associated with the facility are also available by appointment to meet with members of the public and answer queries regarding the facility if requested.

7. ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

An Environmental Management Plan was prepared for the site in accordance with EPA guidance documents. A copy is kept on site and acts as a manual for the operation of Derryconnell Landfill. It outlines the requirements of the Waste Licence and sets out a programme for achieving the schedule of objectives and targets.

7.1 Schedule of Objectives and Targets for Year 2014

Objective 1: Installation of Floating Cover and associated works

7.2 Implementation of Objectives and Targets From 2013

Objective 1: Installation of Floating Cover and associated works

The materials for this installation have been procured and a contractor appointed. The leachate lagoon must be empty for installation works to proceed. A suitable weather period did not present in 2013.

7.3 Update of Procedures Associated with the Facility

General Site procedures associated with the facility remained unchanged throughout 2013. Additional Health & Safety procedures were drawn up and implemented.

7.4 Financial Provision

Cork County Council has the ability to meet any financial commitments or liabilities incurred by the carrying out of the disposal activities relating to the Derryconnell Landfill. These commitments include compliance with the waste management licence (No. W00089-02) and restoration and aftercare of the site as specified in Condition 8 of the licence.

Under Section 38 of the Waste Management Act, 1996, Cork County Council ‘‘shall provide and operate, or arrange of, such facilities as may be necessary for the recovery and disposal of household waste arising within the functional area’’. Compliance with Section 38 and all other relevant sections of the Waste Management Act, 1996 is a statutory obligation of Cork County Council. Cork County Council annually, in the preparation of budget estimates and the passing of these estimates, shall make provision for any capital works and maintenance works required to fulfil conditions of the waste licence for the Derryconnell Landfill.

APPENDICES

APPENDIX 1

SUMMARY OF ENVIRONMENTAL MONITORING

- On site monitoring and sampling was carried out by Cork County Council Personnel and Enva Ireland Ltd., Rafeen Industrial Estate, Ringaskiddy, Co. Cork – INAB Accreditation Reg. No. 185T.
- All Surface Water, Groundwater and Leachate analysis was carried out by Enva Ireland Ltd., Rafeen Industrial Estate, Ringaskiddy, Co. Cork - INAB Accreditation Reg. No. 185T.
- All Dust analysis was carried out by Southern Scientific Services Ltd., Dunrine, Killarney, Co. Kerry – INAB Accreditation Reg. No. 194T.
- (Note: Blank results indicate monitoring location was dry at time of sampling)
- Noise Monitoring was carried out by Complete Laboratory Solutions, Rosmuc, Connemara, Co. Galway – INAB Accreditation Reg. No. 108T

LANDFILL GAS MONITORING

The Waste Licence specifies monitoring of landfill gas emissions on a monthly basis.

Additional monitoring is carried out by the Licencee for informational purposes.

ELV exceedances are highlighted.

L1 – L2 MONITORING RESULTS

L1							L2					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	3.96	10.20	1003	-	-	-	5.98	11.30	1003	-	-	-
28/02/2013	3.84	8.40	110	-	-	-	5.72	8.90	1010	-	-	-
28/03/2013	3.72	8.40	1011	-	-	-	5.64	8.70	1011	-	-	-
26/04/2013	3.79	10.80	1015	-	-	-	5.68	11.20	1015	-	-	-
28/05/2013	4.10	11.20	995	-	-	-	5.81	10.60	995	-	-	-
25/06/2013	4.00	-	-	-	-	-	5.83	-	-	-	-	-
18/07/2013	4.20	-	-	-	-	-	6.30	-	-	-	-	-
13/08/2013	4.02	-	-	-	-	-	5.99	-	-	-	-	-
19/09/2013	4.11	-	-	-	-	-	6.13	-	-	-	-	-
25/10/2013	3.71	-	-	-	-	-	5.62	-	-	-	-	-
19/11/2013	3.93	-	-	-	-	-	5.68	-	-	-	-	-
17/12/2013	3.89	-	-	-	-	-	5.71	-	-	-	-	-

L3 – L4 MONITORING RESULTS

L3							L4					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	Dry	10.80	1003	21.00	0.00	0.00	6.10	9.90	1003	-	-	-
28/02/2013	Dry	7.60	1010	21.00	0.00	0.00	5.47	7.80	1010	-	-	-
28/03/2013	Dry	7.90	1011	21.00	0.00	0.00	5.31	8.20	1011	-	-	-
26/04/2013	Dry	11.60	1015	21.00	0.00	0.00	5.42	10.70	1015	-	-	-
28/05/2013	Dry	10.90	995	21.00	0.00	0.00	6.20	11.30	995	-	-	-
25/06/2013	Dry	13.10	1029	21.00	0.00	0.00	6.10	-	-	-	-	-
18/07/2013	Dry	18.50	1027	21.00	0.00	0.00	6.81	-	-	-	-	-
13/08/2013	Dry	19.70	1015	21.00	0.00	0.00	6.28	-	-	-	-	-
19/09/2013	Dry	12.60	1012	21.00	0.00	0.00	6.42	-	-	-	-	-
25/10/2013	Dry	14.60	992	20.70	0.00	0.00	5.30	-	-	-	-	-
19/11/2013	Dry	6.90	1014	21.00	0.00	0.00	5.79	-	-	-	-	-
17/12/2013	Dry	8.20	1008	20.30	0.00	0.00	5.90	-	-	-	-	-

L5 – L6 MONITORING RESULTS

L5							L6					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	0.34	11.10	1003	20.10	0.20	0.00	1.50	10.50	1003	19.70	1.20	0.00
28/02/2013	0.46	7.80	1010	20.80	0.10	0.20	1.71	8.10	1010	19.80	1.10	0.00
28/03/2013	0.39	8.00	1011	20.90	0.00	0.10	1.65	8.10	1011	20.10	0.80	0.00
26/04/2013	0.40	11.00	1015	20.50	0.20	0.20	1.68	11.20	1015	19.60	1.10	0.10
28/05/2013	0.47	11.30	995	19.80	0.60	0.30	1.81	10.90	995	19.20	1.20	0.40
25/06/2013	0.42	13.60	1029	19.80	0.70	0.00	1.82	13.30	1029	19.60	1.00	0.00
18/07/2013	0.69	18.70	1027	19.80	0.90	0.00	2.41	18.70	1027	19.90	0.80	0.00
13/08/2013	0.44	20.30	1015	19.90	0.70	0.00	2.03	19.00	1015	19.40	2.50	0.00
19/09/2013	0.67	11.80	1012	20.00	0.70	0.00	2.36	12.10	1012	19.20	1.30	0.00
25/10/2013	0.34	13.90	992	20.60	0.10	0.00	1.52	14.10	992	19.30	1.30	0.00
19/11/2013	0.37	5.90	1014	20.00	0.70	0.00	1.76	7.30	1014	16.20	2.40	0.00
17/12/2013	0.40	8.70	1008	20.30	0.00	0.00	1.72	9.10	1008	19.70	0.90	0.00

L7 – L8 MONITORING RESULTS

L7							L8					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	1.23	10.60	1003	19.80	1.10	0.00	3.28	11.00	1003	-	-	-
28/02/2013	1.52	8.80	1010	19.90	1.10	0.00	3.17	8.60	1010	-	-	-
28/03/2013	1.43	8.10	1011	19.70	1.20	0.00	3.01	8.80	1011	-	-	-
26/04/2013	1.49	10.90	1015	20.40	0.30	0.10	3.12	11.40	1015	-	-	-
28/05/2013	1.52	10.70	995	20.00	0.50	0.30	3.41	11.00	995	-	-	-
25/06/2013	1.63	13.30	1029	19.60	0.90	0.00	3.83	-	-	-	-	-
18/07/2013	Dry	18.50	1027	19.60	1.10	0.00	4.41	-	-	-	-	-
13/08/2013	Dry	21.10	1015	17.30	4.00	0.00	4.24	-	-	-	-	-
19/09/2013	Dry	12.30	1012	20.20	0.40	0.00	4.36	-	-	-	-	-
25/10/2013	1.39	14.00	992	19.40	1.10	0.00	3.76	-	-	-	-	-
19/11/2013	1.63	7.00	1014	16.80	3.50	0.00	3.84	-	-	-	-	-
17/12/2013	1.64	9.00	1008	17.70	2.40	0.00	3.98	-	-	-	-	-

GW1 – GW2 MONITORING RESULTS

GW1							GW2					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	1.91	9.20	1003	20.80	0.20	0.00	1.30	8.70	1003	20.10	0.60	0.00
28/02/2013	2.05	6.80	1010	20.70	0.20	0.00	1.29	7.20	1010	20.20	0.40	0.00
28/03/2013	1.98	7.80	1011	20.80	0.10	0.00	1.10	8.10	1011	20.50	0.30	0.00
26/04/2013	2.01	11.10	1015	21.00	0.00	0.00	1.15	10.80	1015	20.80	0.10	0.00
28/05/2013	2.50	10.20	995	21.00	0.00	0.00	1.30	11.30	995	20.90	0.10	0.00
25/06/2013	2.54	13.40	1029	21.00	0.00	0.00	1.37	13.10	1028	20.80	0.10	0.00
18/07/2013	2.71	17.90	1027	20.20	0.40	0.00	1.54	18.20	1027	20.00	0.50	0.00
13/08/2013	2.91	18.50	1015	20.90	0.90	0.00	1.73	20.70	1015	20.10	0.20	0.00
19/09/2013	2.96	10.80	1012	20.10	0.70	0.00	1.82	11.20	1012	20.50	0.30	0.00
25/10/2013	2.13	13.70	992	20.10	0.20	0.00	1.36	14.10	992	20.10	0.10	0.00
19/11/2013	2.45	7.00	1014	19.00	0.60	0.00	1.48	7.20	1014	19.80	0.50	0.00
17/12/2013	2.34	8.90	1008	20.10	0.40	0.00	1.48	8.70	1008	18.70	1.20	0.00

GW4 – GW5 MONITORING RESULTS

GW4							GW5					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	0.48	9.10	1003	20.20	0.70	0.00	0.46	10.00	1003	21.00	0.00	0.00
28/02/2013	0.51	7.80	1010	20.40	0.30	0.00	0.57	7.50	1010	21.00	0.00	0.00
28/03/2013	0.49	7.90	1011	20.70	0.20	0.00	0.45	7.60	1011	21.00	0.00	0.00
26/04/2013	0.51	10.60	1015	21.00	0.00	0.00	0.49	11.00	1015	21.00	0.00	0.00
28/05/2013	0.70	11.10	995	21.00	0.00	0.00	0.56	11.20	995	21.00	0.00	0.00
25/06/2013	0.58	13.10	1029	21.00	0.00	0.00	0.76	13.70	1029	21.00	0.00	0.00
18/07/2013	0.72	18.50	1027	20.70	0.20	0.00	0.91	18.50	1027	21.00	0.00	0.00
13/08/2013	1.35	17.60	1015	21.00	0.00	0.00	1.60	17.40	1015	21.00	0.00	0.00
19/09/2013	1.38	11.60	1012	20.70	0.10	0.00	1.62	12.10	1012	21.00	0.00	0.00
25/10/2013	0.48	14.30	992	20.00	0.20	0.00	0.52	13.90	992	20.80	0.00	0.00
19/11/2013	0.59	6.00	1014	20.40	0.50	0.00	0.67	8.90	1014	20.20	0.70	0.00
17/12/2013	0.59	9.10	1008	19.90	1.30	0.00	0.63	9.00	1008	19.00	1.20	0.00

GW6 – GW7 MONITORING RESULTS

GW6							GW7					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	0.39	9.40	103	20.70	0.00	0.20	0.20	8.70	1003	19.90	0.90	0.00
28/02/2013	0.39	6.90	1010	20.00	0.90	0.00	Full	7.00	1010	21.00	0.00	0.00
28/03/2013	0.31	8.90	1011	20.10	0.70	0.00	Full	9.20	1011	21.00	0.00	0.00
26/04/2013	0.37	10.90	1015	20.60	0.30	0.00	Full	10.80	1015	21.00	0.00	0.00
28/05/2013	0.41	10.70	995	20.70	0.20	0.00	Full	10.90	995	21.00	0.00	0.00
25/06/2013	Full	13.00	1029	20.40	0.30	0.00	Full	13.60	1029	20.80	0.10	0.00
18/07/2013	0.40	18.60	1027	21.00	0.00	0.00	0.38	18.40	1027	21.00	0.00	0.00
13/08/2013	0.45	24.70	1015	20.50	0.00	0.00	0.88	22.20	1015	20.10	0.00	0.00
19/09/2013	0.62	11.80	1012	21.00	0.00	0.00	0.94	11.80	1012	21.00	0.00	0.00
25/10/2013	Full	14.00	992	20.70	0.00	0.00	Full	13.60	992	20.80	0.00	0.00
19/11/2013	0.38	6.30	1014	20.50	0.20	0.10	0.24	6.90	1014	20.60	0.20	0.00
17/12/2013	Full	9.10	108	20.40	0.00	0.00	Full	8.80	1008	20.40	0.00	0.00

GW8 & SITE OFFICE MONITORING RESULTS

GW8							Site Office					
Date	Depth (m)	Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %		Temp °C	Pressure Mb	O ₂ %	CO ₂ %	CH ₄ %
31/01/2013	1.10	8.20	1003	20.80	0.10	0.00		16.90	103	21.00	0.00	0.00
28/02/2013	1.09	7.40	1010	20.60	0.30	0.00		11.50	1010	21.00	0.00	0.00
28/03/2013	1.00	9.00	1011	20.50	0.40	0.00		10.40	1011	21.00	0.00	0.00
26/04/2013	1.05	10.90	1015	20.90	0.10	0.00		13.40	1015	21.00	0.00	0.00
28/05/2013	1.10	10.60	995	21.00	0.00	0.00		14.60	995	21.00	0.00	0.00
25/06/2013	1.04	13.70	1029	20.70	0.10	0.00		14.40	1029	21.00	0.00	0.00
18/07/2013	1.19	18.50	1027	21.00	0.00	0.00		20.10	1027	21.00	0.00	0.00
13/08/2013	1.26	21.00	1015	20.90	0.00	0.00		17.60	1015	21.00	0.00	0.00
19/09/2013	1.51	12.00	1012	20.80	0.10	0.00		15.50	1012	21.00	0.00	0.00
25/10/2013	1.00	14.30	992	19.90	0.40	0.00		14.50	992	21.00	0.00	0.00
19/11/2013	1.02	7.10	1014	20.10	0.40	0.00		14.50	1014	21.00	0.00	0.00
17/12/2013	0.99	8.80	1008	19.90	0.50	0.00		17.90	1008	21.00	0.00	0.00

SURFACE WATER

SURFACE WATER MONITORING RESULTS

SW1	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.680	2.630	0.303	1.240
Chloride	mg/l	33.500	23.000	2.000	12.000
Conductivity	us/cm	157.000	140.700	190.000	181.000
Dissolved Oxygen	mg/l	-	9.300	-	-
Boron	mg/l	-	1.0174	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	19.400	-	-
Chromium (total)	mg/l	-	<0.003	-	-
Copper	mg/l	-	<0.00085	-	-
Iron	mg/l	-	0.194	-	-
Lead	mg/l	-	0.000038	-	-
Magnesium	mg/l	-	4.250	-	-
Manganese	mg/l	-	0.0147	-	-
Nickel	mg/l	-	0.00167	-	-
Potassium	mg/l	-	2.470	-	-
Zinc	mg/l	-	0.00127	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW2	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	<0.200	0.329	-	<0.200
Chloride	mg/l	25.000	38.000	-	<6.000
Conductivity	us/cm	109.000	150.000	-	126.000
Dissolved Oxygen	mg/l	-	4.800	-	-
Boron	mg/l	-	<0.0094	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	12.700	-	-
Chromium (total)	mg/l	-	0.0150	-	-
Copper	mg/l	-	0.00134	-	-
Iron	mg/l	-	20.000	-	-
Lead	mg/l	-	0.00107	-	-
Magnesium	mg/l	-	5.030	-	-
Manganese	mg/l	-	25.0000	-	-
Nickel	mg/l	-	0.00224	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00490	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	2.850	-	-

SW3	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.337	0.803	<0.200	<0.200
Chloride	mg/l	35.000	20.000	4.000	10.000
Conductivity	us/cm	160.000	41.000	186.000	160.000
Dissolved Oxygen	mg/l	-	8.900	-	-
Boron	mg/l	-	0.0162	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	13.100	-	-
Chromium (total)	mg/l	-	<0.003	-	-
Copper	mg/l	-	0.000893	-	-
Iron	mg/l	-	0.328	-	-
Lead	mg/l	-	<0.00002	-	-
Magnesium	mg/l	-	3.700	-	-
Manganese	mg/l	-	0.00308	-	-
Nickel	mg/l	-	0.00135	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00105	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW4	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.401	1.370	0.301	0.417
Chloride	mg/l	27.000	26.000	2.000	14.000
Conductivity	us/cm	139.000	352.900	211.000	154.000
Dissolved Oxygen	mg/l	-	6.400	-	-
Boron	mg/l	-	0.0161	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	15.400	-	-
Chromium (total)	mg/l	-	0.0044	-	-
Copper	mg/l	-	<0.00085	-	-
Iron	mg/l	-	0.273	-	-
Lead	mg/l	-	0.000032	-	-
Magnesium	mg/l	-	4.400	-	-
Manganese	mg/l	-	0.00702	-	-
Nickel	mg/l	-	0.000893	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.000648	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	0.470	-	-

SW5	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	<0.200	0.739	-	<0.200
Chloride	mg/l	33.000	22.000	-	10.000
Conductivity	us/cm	164.000	250.000	-	159.000
Dissolved Oxygen	mg/l	-	9.200	-	-
Boron	mg/l	-	0.0153	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	12.300	-	-
Chromium (total)	mg/l	-	<0.003	-	-
Copper	mg/l	-	<0.00085	-	-
Iron	mg/l	-	0.295	-	-
Lead	mg/l	-	<0.00002	-	-
Magnesium	mg/l	-	3.370	-	-
Manganese	mg/l	-	0.00855	-	-
Nickel	mg/l	-	0.00134	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.000773	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SW6	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	5.100	72.600	-	16.000
Chloride	mg/l	44.000	118.000	-	32.000
Conductivity	us/cm	484.000	172.500	-	543.000
Dissolved Oxygen	mg/l	-	5.000	-	-
Boron	mg/l	-	0.338	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	106.000	-	-
Chromium (total)	mg/l	-	0.00666	-	-
Copper	mg/l	-	0.001	-	-
Iron	mg/l	-	0.0479	-	-
Lead	mg/l	-	0.000023	-	-
Magnesium	mg/l	-	22.400	-	-
Manganese	mg/l	-	2.170	-	-
Nickel	mg/l	-	0.00442	-	-
Potassium	mg/l	-	58.200	-	-
Zinc	mg/l	-	0.00245	-	-
Mercury	mg/l	-	0.0000219	-	-
Sulphate	mg/l	-	26.200	-	-
Total Phosphorous	mg/l P	-	<0.100	-	-

SURFACE WATER MONITORING RESULTS

SW7	Units	23-Jan-13	26-Feb-13	26-Mar-13	24-Apr-13	28-May-13	06-Jun-13	30-Jul-13	27-Aug-13	27-Sep-13	15-Oct-13	16-Nov-13	12-Dec-13
pH	pH units	6.813	7.035	6.401	6.840	6.880	6.480	-	7.641	-	6.800	7.700	6.500
Ammoniacal N	mg/l N	0.350	0.300	0.210	0.550	0.260	<0.200	0.338	0.200	0.379	0.450	0.550	0.460
Conductivity	us/cm	127.000	148.400	126.500	177.700	166.900	178.400	157.000	244.000	218.000	188.000	147.000	160.000
Suspended Solids	mg/l	<10.000	<10.000	12.000	<10.000	<10.000	<10.000	-	32.000	-	<10.000	<10.000	<10.000
COD	mg/l	27.000	<2.000	20.000	<10.000	<10.000	15.000	-	73.000	-	47.000	17.000	17.000
Chloride	mg/l	20.000	28.500	24.500	32.000	10.000	0.000	27.000	2.000	2.000	4.000	14.000	12.000
Dissolved Oxygen	mg/l	-	-	-	-	-	7.300	-	-	-	-	-	-
Boron	mg/l	-	-	-	-	-	0.0124	-	-	-	-	-	-
Cadmium	mg/l	-	-	-	-	-	<0.0001	-	-	-	-	-	-
Calcium	mg/l	-	-	-	-	-	12.200	-	-	-	-	-	-
Chromium (total)	mg/l	-	-	-	-	-	<0.003	-	-	-	-	-	-
Copper	mg/l	-	-	-	-	-	<0.00085	-	-	-	-	-	-
Iron	mg/l	-	-	-	-	-	0.154	-	-	-	-	-	-
Lead	mg/l	-	-	-	-	-	0.000027	-	-	-	-	-	-
Magnesium	mg/l	-	-	-	-	-	3.630	-	-	-	-	-	-
Manganese	mg/l	-	-	-	-	-	0.00439	-	-	-	-	-	-
Nickel	mg/l	-	-	-	-	-	0.000988	-	-	-	-	-	-
Potassium	mg/l	-	-	-	-	-	<2.340	-	-	-	-	-	-
Zinc	mg/l	-	-	-	-	-	0.000742	-	-	-	-	-	-
Mercury	mg/l	-	-	-	-	-	<0.00001	-	-	-	-	-	-
Sulphate	mg/l	-	-	-	-	-	<2.000	-	-	-	-	-	-
Total Phosphorous	mg/l P	-	-	-	-	-	0.130	-	-	-	-	-	-

SW8	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	<0.200	0.237	<0.200	0.497
Chloride	mg/l	27.000	32.000	0.000	18.000
Conductivity	us/cm	110.000	113.500	128.000	130.000
Dissolved Oxygen	mg/l	-	4.400	-	-
Boron	mg/l	-	<0.0094	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	9.450	-	-
Chromium (total)	mg/l	-	0.00458	-	-
Copper	mg/l	-	<0.00085	-	-
Iron	mg/l	-	7.200	-	-
Lead	mg/l	-	0.000627	-	-
Magnesium	mg/l	-	4.200	-	-
Manganese	mg/l	-	6.960	-	-
Nickel	mg/l	-	0.00113	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00262	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	0.580	-	-

SW9	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.362	0.188	-	0.250
Chloride	mg/l	28.500	20.000	-	112.000
Conductivity	us/cm	121.000	101.500	-	179.000
Dissolved Oxygen	mg/l	-	5.400	-	-
Boron	mg/l	-	0.0150	-	-
Cadmium	mg/l	-	0.000152	-	-
Calcium	mg/l	-	2.200	-	-
Chromium (total)	mg/l	-	0.00750	-	-
Copper	mg/l	-	0.00115	-	-
Iron	mg/l	-	1.110	-	-
Lead	mg/l	-	0.000214	-	-
Magnesium	mg/l	-	2.500	-	-
Manganese	mg/l	-	2.300	-	-
Nickel	mg/l	-	0.001520	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00869	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l P	-	0.410	-	-

GROUNDWATER

GROUND WATER MONITORING RESULTS

GW1	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	<0.200	0.268	-	-
Conductivity	us/cm	265.000	260.000	-	-
Chloride	mg/l	-	6.000	-	-
Boron	mg/l	-	<0.0094	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	38.300	-	-
Chromium (total)	mg/l	-	0.00606	-	-
Copper	mg/l	-	0.00268	-	-
Iron	mg/l	-	0.0199	-	-
Lead	mg/l	-	0.000032	-	-
Magnesium	mg/l	-	6.050	-	-
Manganese	mg/l	-	0.628	-	-
Nickel	mg/l	-	0.00116	-	-
Potassium	mg/l	-	<2.34	-	-
Zinc	mg/l	-	0.000443	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	7.900	-	-
Total Phosphorous	mg/l	-	0.630	-	-

GW2	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.238	0.0757	<0.200	<0.200
Conductivity	us/cm	321.000	300.000	286.000	289.000
Chloride	mg/l	-	8.000	-	-
Boron	mg/l	-	0.0104	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	42.200	-	-
Chromium (total)	mg/l	-	<0.003	-	-
Copper	mg/l	-	0.000989	-	-
Iron	mg/l	-	<0.019	-	-
Lead	mg/l	-	<0.00002	-	-
Magnesium	mg/l	-	3.690	-	-
Manganese	mg/l	-	0.000824	-	-
Nickel	mg/l	-	0.00056	-	-
Potassium	mg/l	-	2.790	-	-
Zinc	mg/l	-	0.00281	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	18.300	-	-
Total Phosphorous	mg/l	-	0.380	-	-

GW4	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.338	0.0863	<0.200	<0.200
Conductivity	us/cm	262.000	260.000	243.000	196.000
Chloride	mg/l	-	14.000	-	-
Boron	mg/l	-	0.00991	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	43.200	-	-
Chromium (total)	mg/l	-	<0.003	-	-
Copper	mg/l	-	0.00208	-	-
Iron	mg/l	-	0.0351	-	-
Lead	mg/l	-	0.000041	-	-
Magnesium	mg/l	-	2.890	-	-
Manganese	mg/l	-	0.427	-	-
Nickel	mg/l	-	0.00198	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00196	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.50	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	5.700	-	-
Total Phosphorous	mg/l	-	0.170	-	-

GW5	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.300	0.113	0.220	<0.200
Conductivity	us/cm	282.000	282.000	243.000	348.000
Chloride	mg/l	-	6.000	-	-
Boron	mg/l	-	<0.0094	-	-
Cadmium	mg/l	-	0.000136	-	-
Calcium	mg/l	-	48.700	-	-
Chromium (total)	mg/l	-	0.00409	-	-
Copper	mg/l	-	0.00118	-	-
Iron	mg/l	-	0.0769	-	-
Lead	mg/l	-	0.000071	-	-
Magnesium	mg/l	-	3.240	-	-
Manganese	mg/l	-	0.0521	-	-
Nickel	mg/l	-	0.00205	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.0677	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	4.2000000	-	-
Total Phosphorous	mg/l	-	0.310	-	-

GW6	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	1.740	0.400	0.530	1.010
Conductivity	us/cm	557.000	555.000	591.000	581.000
Chloride	mg/l	-	32.000	-	-
Boron	mg/l	-	<0.0094	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	72.000	-	-
Chromium (total)	mg/l	-	0.0147	-	-
Copper	mg/l	-	<0.00085	-	-
Iron	mg/l	-	<0.019	-	-
Lead	mg/l	-	0.000028	-	-
Magnesium	mg/l	-	8.100	-	-
Manganese	mg/l	-	2.330	-	-
Nickel	mg/l	-	0.000845	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.00274	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.500	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	9.100000	-	-
Total Phosphorous	mg/l	-	1.510	-	-

GW7	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	25.100	48.300	18.400	18.600
Conductivity	us/cm	1357.000	1356.000	1475.000	1025.000
Chloride	mg/l	-	84.000	-	-
Boron	mg/l	-	0.219	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	156.000	-	-
Chromium (total)	mg/l	-	0.00528	-	-
Copper	mg/l	-	<0.00085	-	-
Iron	mg/l	-	0.0536	-	-
Lead	mg/l	-	0.000022	-	-
Magnesium	mg/l	-	18.700	-	-
Manganese	mg/l	-	7.090	-	-
Nickel	mg/l	-	0.00433	-	-
Potassium	mg/l	-	32.400	-	-
Zinc	mg/l	-	0.0306	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.050	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l	-	0.230	-	-

GW8	Units	26-Feb-13	06-Jun-13	27-Sep-13	26-Nov-13
Ammoniacal N	mg/l N	0.359	0.622	0.240	<0.200
Conductivity	us/cm	327.000	330.000	461.000	203.000
Chloride	mg/l	-	24.000	-	-
Boron	mg/l	-	0.00954	-	-
Cadmium	mg/l	-	<0.0001	-	-
Calcium	mg/l	-	24.100	-	-
Chromium (total)	mg/l	-	<0.003	-	-
Copper	mg/l	-	0.00453	-	-
Iron	mg/l	-	1.500	-	-
Lead	mg/l	-	0.000424	-	-
Magnesium	mg/l	-	5.730	-	-
Manganese	mg/l	-	3.670	-	-
Nickel	mg/l	-	0.00142	-	-
Potassium	mg/l	-	<2.340	-	-
Zinc	mg/l	-	0.0387	-	-
Cyanide (total)	mg/l	-	<0.050	-	-
Fluoride	mg/l	-	<0.050	-	-
Mercury	mg/l	-	<0.00001	-	-
Sulphate	mg/l	-	<2.000	-	-
Total Phosphorous	mg/l	-	<0.100	-	-

LEACHATE

LEACHATE MONITORING RESULTS

26-Nov-13	Units	L1	L2	L3	L4	L5	L6	L7	L8
Ammoniacal N	mg/l N	64.700	83.500	-	180.000	-	0.226	-	13.100
BOD	mg/l	34.720	4.250	-	44.880	-	33.370	-	186.000
COD	mg/l	444.000	202.000	-	347.000	-	568.000	-	2380.000
Chloride	mg/l	150.000	160.000	-	270.000	-	280.000	-	260.000
Conductivity	us/cm	1376.000	1665.000	-	3040.000	-	239.000	-	700.000
pH	pH units	7.100	7.100	-	7.300	-	6.300	-	6.700
Boron	mg/l	0.0938	0.0617	-	1.6400	-	0.0303	-	0.0231
Cadmium	mg/l	<0.0001	<0.0001	-	<0.0001	-	<0.0001	-	<0.0001
Calcium	mg/l	49.200	143.000	-	68.200	-	48.200	-	41.500
Chromium (total)	mg/l	<0.03	<0.03	-	<0.03	-	<0.03	-	<0.03
Copper	mg/l	<0.00085	<0.00085	-	0.00118	-	0.00236	-	<0.00085
Iron	mg/l	6.900	35.300	-	6.250	-	0.0381	-	<0.019
Lead	mg/l	0.000104	0.000138	-	0.000021	-	0.000032	-	0.000018
Magnesium	mg/l	9.270	31.800	-	35.500	-	4.540	-	3.870
Manganese	mg/l	4.800	8.570	-	1.870	-	0.017	-	4.160
Nickel	mg/l	0.00602	0.00792	-	0.018	-	0.183	-	0.01930
Potassium	mg/l	33.100	77.300	-	181.000	-	3.510	-	8.360
Zinc	mg/l	0.00278	0.00252	-	0.00169	-	0.00181	-	0.00284
Cyanide (total)	mg/l	<0.050	<0.050	-	<0.050	-	<0.050	-	<0.050
Flouride	mg/l	<0.500	<0.500	-	<0.500	-	<0.500	-	<0.500
Mercury	mg/l	<0.00001	<0.00001	-	<0.00001	-	<0.00001	-	<0.00001
Sulphate	mg/l	<2.000	<2.000	-	<2.000	-	28.300	-	<2.000
Total Phosphorous	mg/l P	2.460	0.359	-	1.080	-	0.702	-	10.300

DUST & NOISE MONITORING RESULTS

DUST MONITORING RESULTS

LOCATION	Units	Jun-13	Aug-13	Oct-13
D1	mg/m ² /day	264	266	10
D3	mg/m ² /day	242	126	146
D6	mg/m ² /day	117	111	440
D8	mg/m ² /day	131	226	148

All results are below licenced ELV of 350 mg/m²/day

NOISE MONITORING RESULTS - SEPTEMBER 2013

LOCATION	Units	L _{Aeq} 30 mins	L _{A90} 30 mins	L _{A10} 30 mins
N1	dB(A)	42	36	44
N6	dB(A)	46	36	46
N7	dB(A)	45	34	46
N10	dB(A)	51	41	52
N12	dB(A)	43	35	45

All results are below licenced ELV of Daytime 55dB(A)

APPENDIX 2

FLARE EMISSIONS MONITORING RESULTS & OPERATIONAL GRAPHS

Biannual Flare Emissions Monitoring was carried out by Air Scientific Limited, (formerly Odour Monitoring Ireland) Unit 32 Degranville Court, Dublin Road, Trim, Co. Meath – INAB Accreditation Reg. No. 319T - in accordance with MCERTS requirements and the Agency's Air Emissions Monitoring Guidance Note 2.

Biannual Flare Emissions Monitoring

FLARE EMISSIONS MONITORING

FLARE STACK	Units	Nov-13	Jan-14	Emission Limit
Residence Time	S	5.28	2.05	>0.30
Nitrogen Oxides (NO_x)	Mg/Nm³	119.43	83.80	150.00
Sulphur Dioxide (SO₂)	Mg/Nm³	69.25	10.75	N/A
Carbon Monoxide (CO)	Mg/Nm³	24.28	10.38	N/A
Temperature	°C	1026	1000	>1000

All results are below licenced ELV of 150mg/m³ Nitrogen Oxides (NO_x)

Residence Time of >0.3s and burn temperature of >1000 °C was achieved.

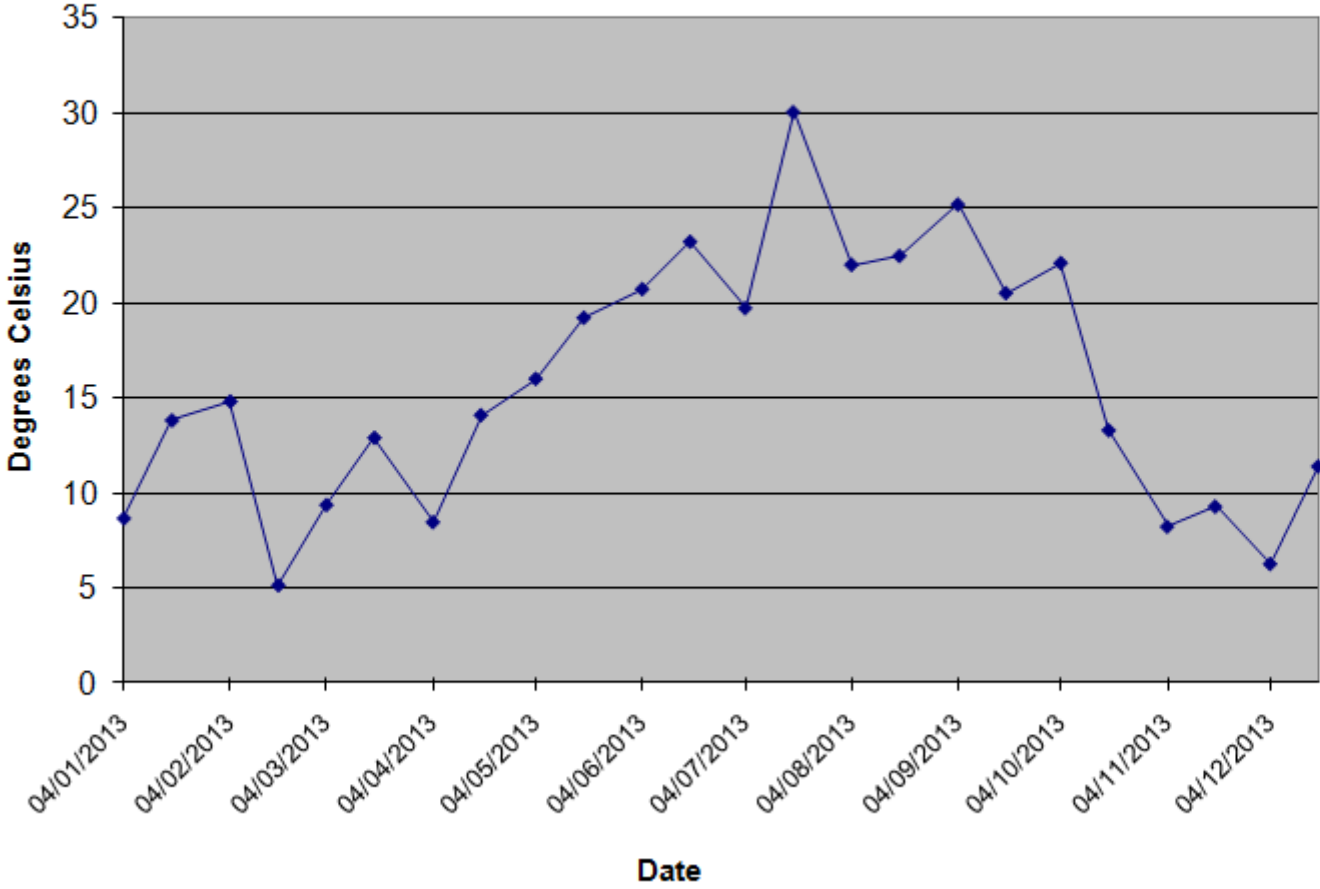
GAS FLARE DATA

Date	Ambient Temp (°C)	Atm. Pressure (Mb)	CO ₂ (%)	CO (%)	Flow (M ³ /Hr)	CH ₄ (%)	O ₂ (%)	Flare Pressure (Mb)	Flare Temp (°C)
04/01/2013	8.65	1009.59	23.86	10.63	115.18	43.17	1.19	5.62	1035.89
18/01/2013	13.81	990.30	23.12	15.36	152.28	42.60	1.21	12.71	1027.87
04/02/2013	14.81	1018.06	20.01	14.64	150.98	32.58	1.26	14.49	1034.79
18/02/2013	5.13	1012.55	18.98	14.85	137.75	32.31	1.25	12.80	1029.43
04/03/2013	9.36	1005.21	18.89	12.56	182.86	30.55	1.25	19.97	1033.33
18/03/2013	12.89	988.94	20.16	18.89	133.51	33.41	1.44	8.86	1018.18
04/04/2013	8.45	1015.44	19.36	24.06	144.85	33.82	1.54	9.81	1021.41
18/04/2013	14.09	1030.18	20.29	18.17	140.64	35.01	1.54	10.18	1031.46
04/05/2013	16.00	1017.26	21.31	24.04	154.90	36.56	1.25	15.56	1033.33
18/05/2013	19.22	1013.60	21.14	18.56	159.14	34.03	1.18	14.62	1033.07
04/06/2013	20.73	1023.79	14.64	17.61	205.05	28.18	1.37	25.70	1015.53
18/06/2013	23.22	1023.32	14.76	15.18	221.89	28.12	1.28	29.69	1023.23
04/07/2013	19.72	1022.25	13.89	18.97	218.90	27.87	1.26	30.06	1006.68
18/07/2013	30.04	1038.00	14.38	18.67	227.19	28.30	1.29	32.21	1008.66
04/08/2013	22.01	1016.51	15.79	12.58	208.16	32.66	1.28	30.96	1032.97
18/08/2013	22.47	1015.21	16.59	29.36	224.57	31.47	1.25	31.79	1034.43
04/09/2013	25.18	1032.26	16.04	25.76	232.33	26.71	1.23	33.83	1012.58
18/09/2013	20.52	1012.12	16.18	13.89	89.34	30.04	1.22	2.15	1025.02
04/10/2013	22.10	1009.89	13.55	16.40	114.18	30.87	1.21	5.55	1013.39
18/10/2013	13.29	999.51	23.03	14.18	58.41	31.38	2.21	0.97	1010.94
04/11/2013	8.22	1029.81	25.72	7.62	65.67	43.08	1.92	0.13	1024.27
18/11/2013	9.27	1018.98	20.86	8.96	105.25	29.88	3.41	1.74	1020.79
04/12/2013	6.25	1029.15	19.45	8.57	118.02	22.81	2.24	2.61	1031.77
18/12/2013	11.39	991.26	25.87	9.60	80.21	41.99	1.32	5.86	1016.88

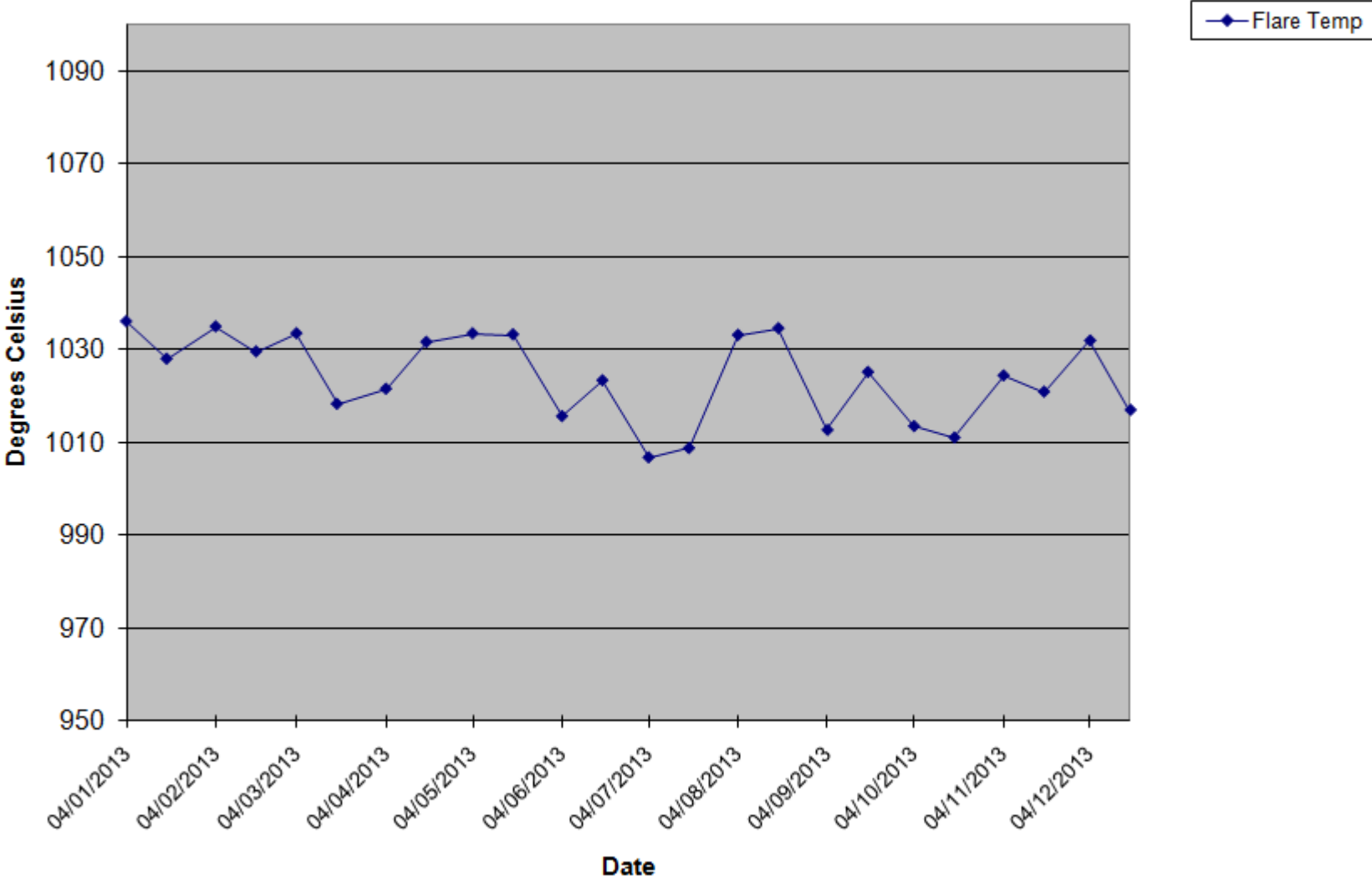
For the purpose of showing representative summary of flare operational parameters, data from 2 days of every month was utilised.

Ambient Temperature

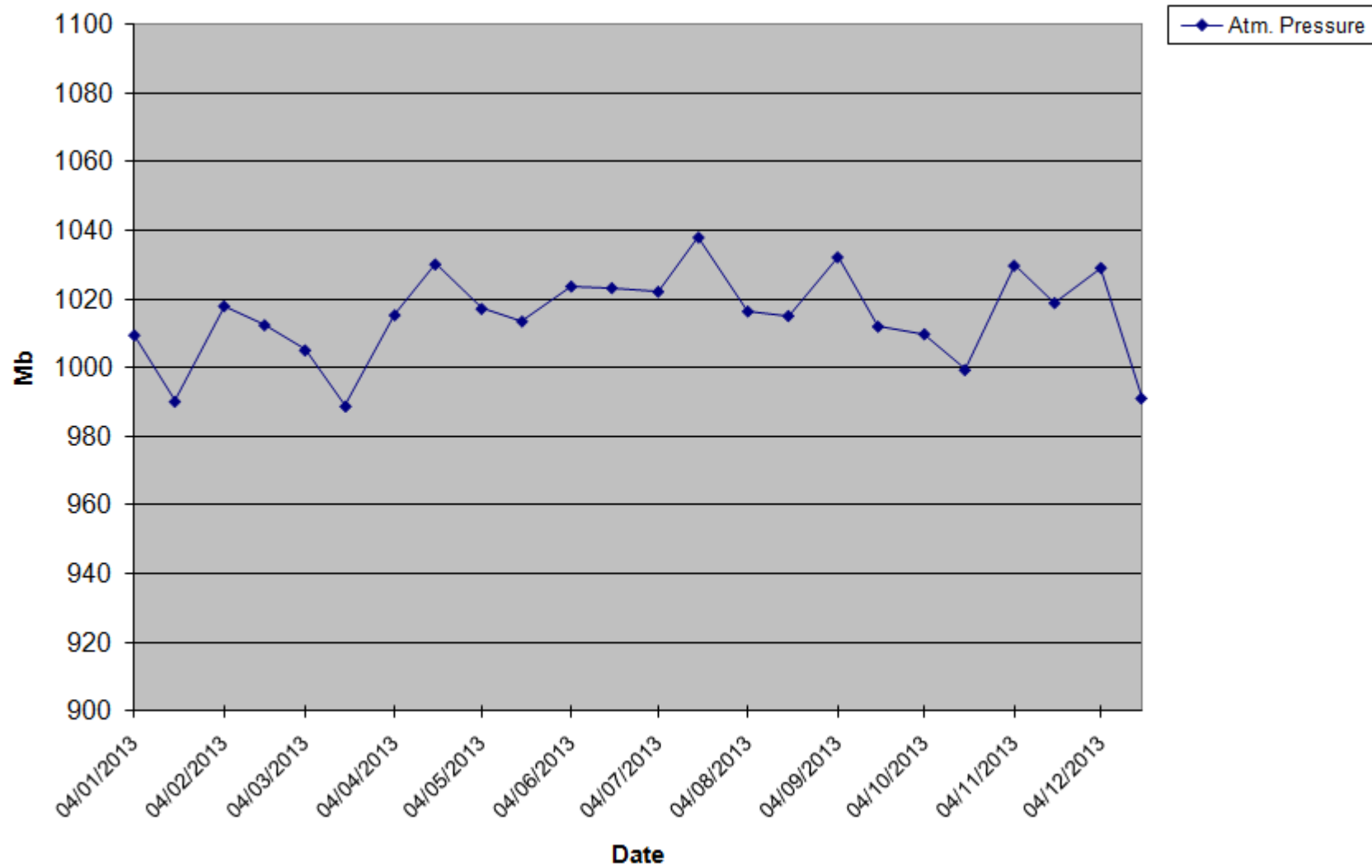
◆ Ambient Temp



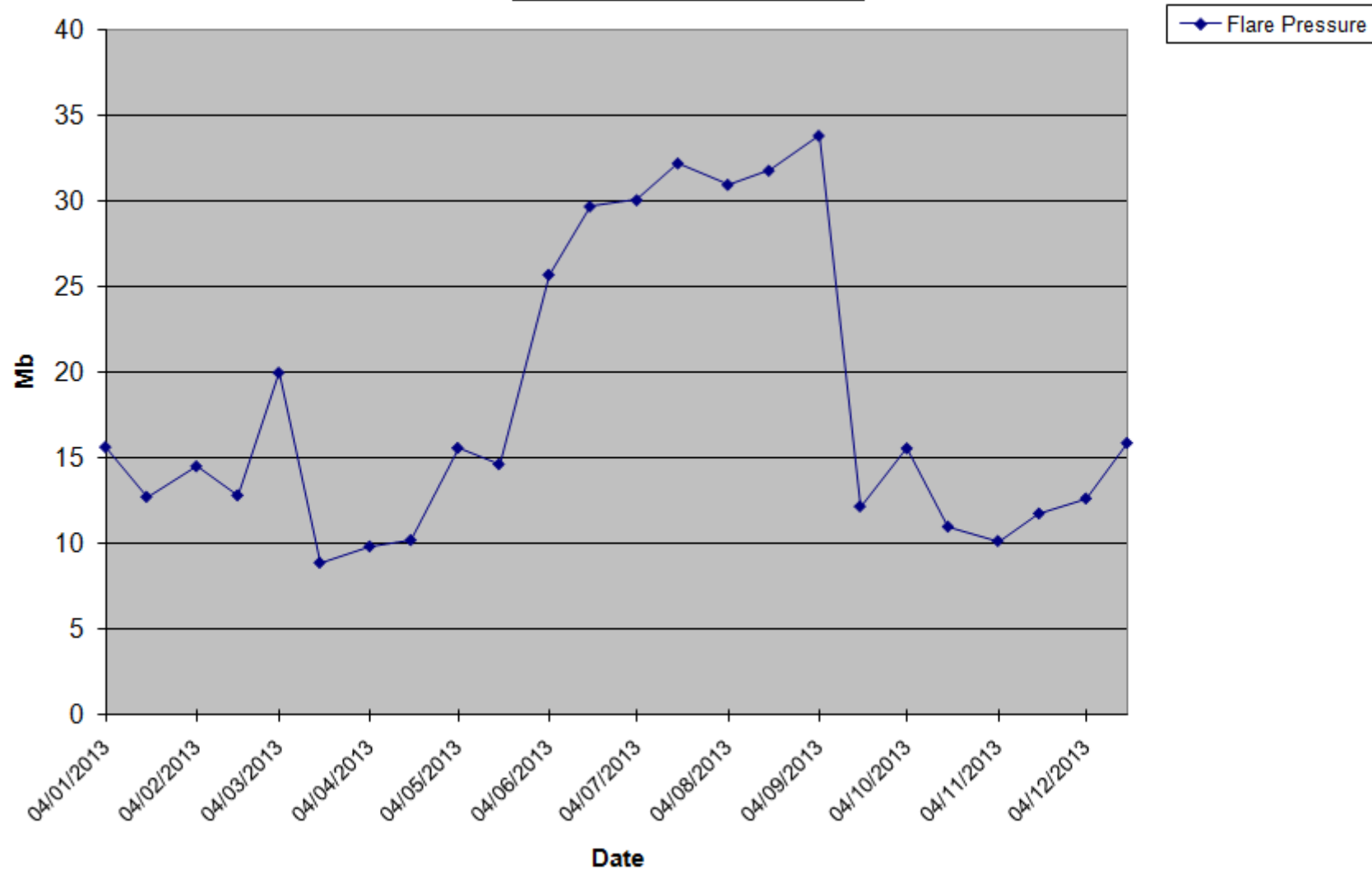
Flare Operating Temperature



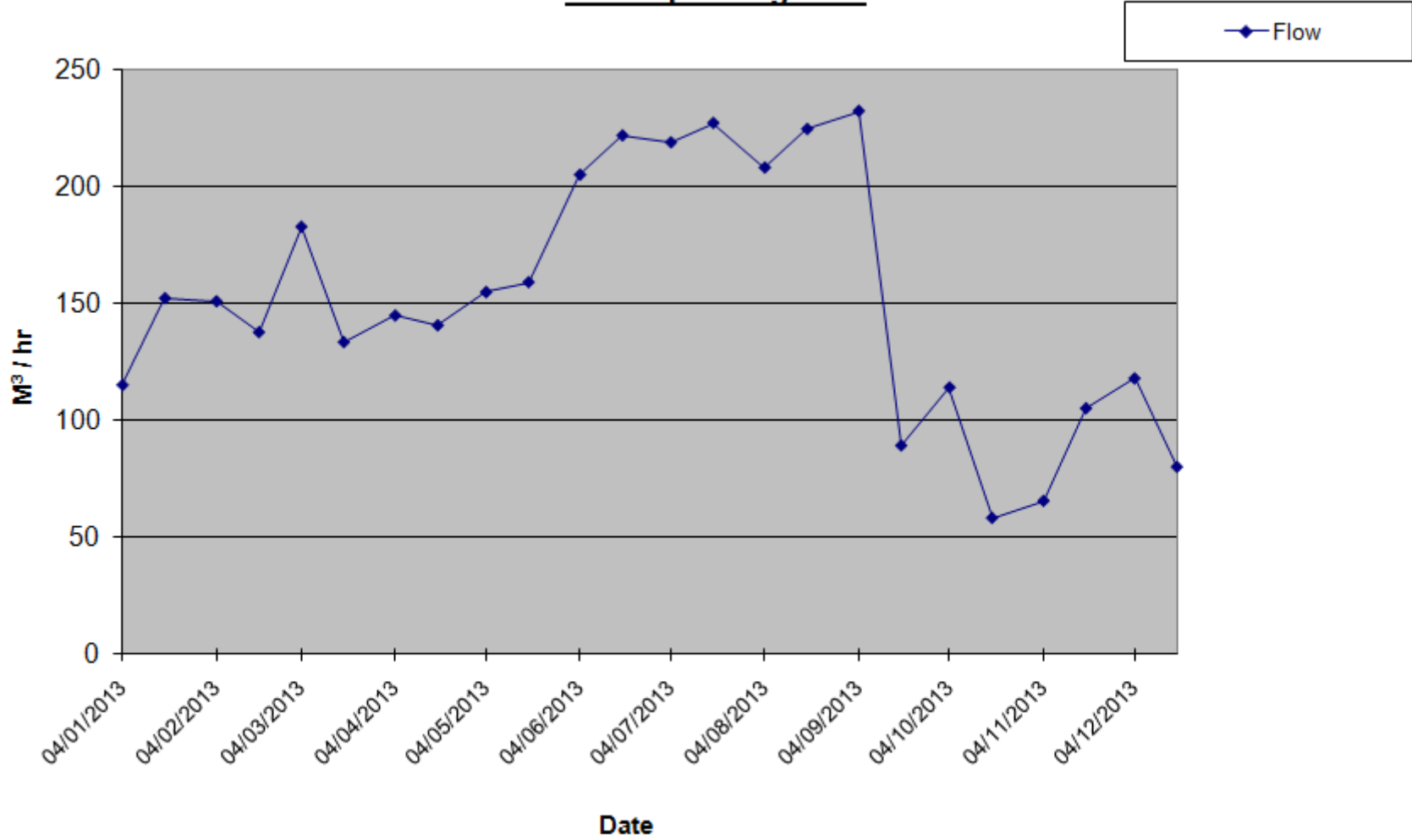
Atmospheric Pressure



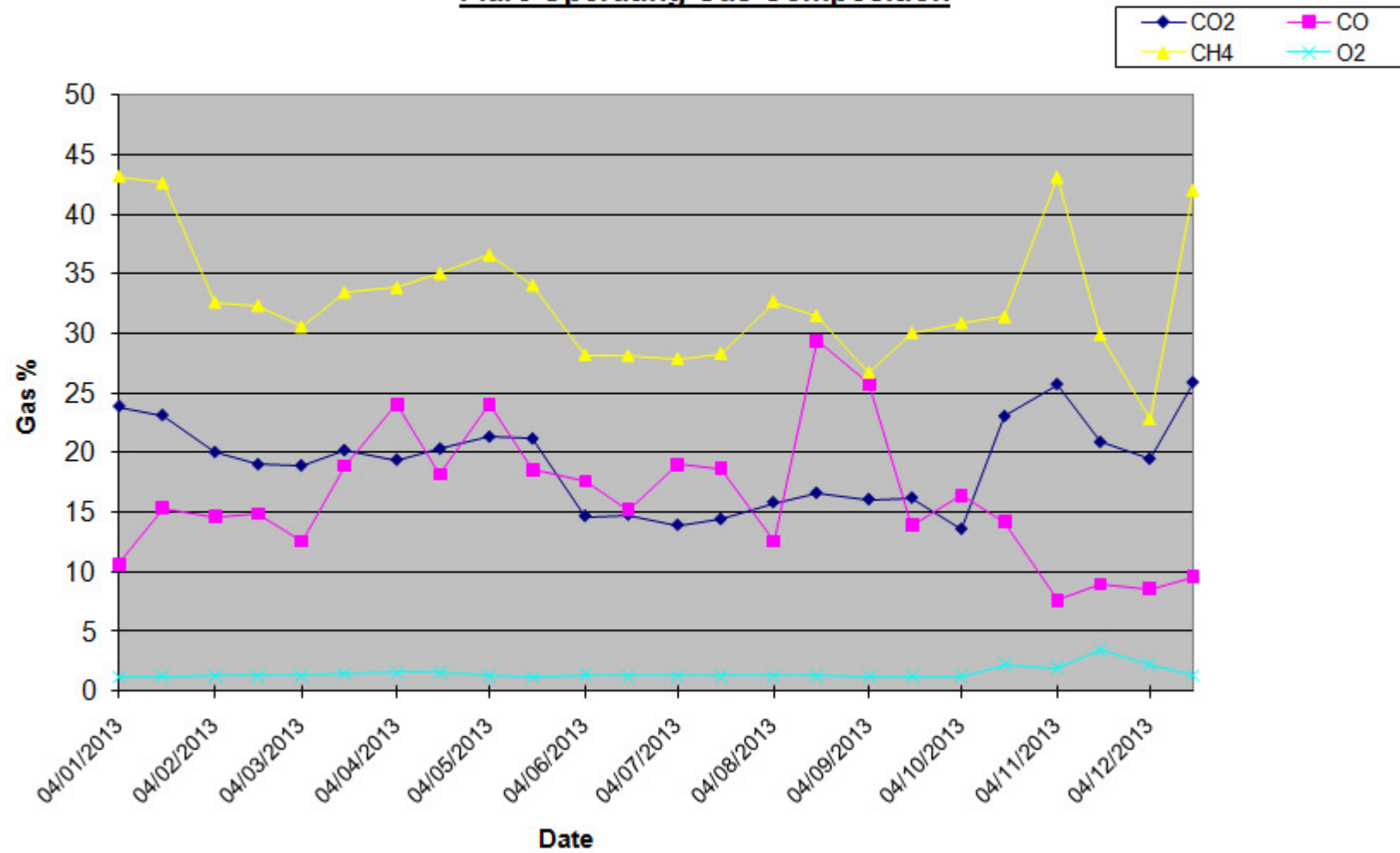
Flare Operating Pressure



Flare Operating Flow



Flare Operating Gas Composition



APPENDIX 3

2013 PRTR EMISSIONS DATA

AER Returns Workbook

Version 1.1.17

REFERENCE YEAR	2013
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1. FACILITY IDENTIFICATION

Parent Company Name	Cork County Council
Facility Name	Derryconnell Landfill
PRTR Identification Number	W0089
Licence Number	W0089-02

Waste or IPPC Classes of Activity	
class name	
3.12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.1	Deposit on, in or under land (including landfill).
	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.13	Surface impoundment, including placement of liquid or sludge
3.4	discards into pits, ponds or lagoons.
	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.5	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.13	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.2	Recycling or reclamation of metals and metal compounds.
4.3	Recycling or reclamation of other inorganic materials.
4.4	
Address 1	Derryconnell
Address 2	Schull
Address 3	County Cork
Address 4	
Country	Ireland
Coordinates of Location	-7.46596 53.2762
River Basin District	IESW
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Mairead Hales
AER Returns Contact Email Address	mairead.hales@corkcoco.ie
AER Returns Contact Position	Executive Engineer
AER Returns Contact Telephone Number	028 37742
AER Returns Contact Mobile Phone Number	086 6018493
AER Returns Contact Fax Number	028 37742
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	3
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

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

Is it applicable?	No
Have you been granted an exemption?	
If applicable which activity class applies (as per Schedule 2 of the regulations)?	
Is the reduction scheme compliance route being used?	

4. WASTE IMPORTED/ACCEPTED ONTO SITE

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

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities)?	
-----------------------------------------------------------------------------------------------------------	--

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

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR							Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
01	Methane (CH4)	C	OTH	LandGEM Modelling	0.0	303331.0	0.0	303331.0	

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR							Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
					0.0	0.0	0.0	0.0	

ADD NEW ROW | DELETE ROW * * 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)

RELEASES TO AIR							Please enter all quantities in this section in KGs		
POLLUTANT		METHOD			ADD EMISSION POINT	QUANTITY			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year	
					0.0	0.0	0.0	0.0	

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

Additional Data Requested from Landfill operators

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

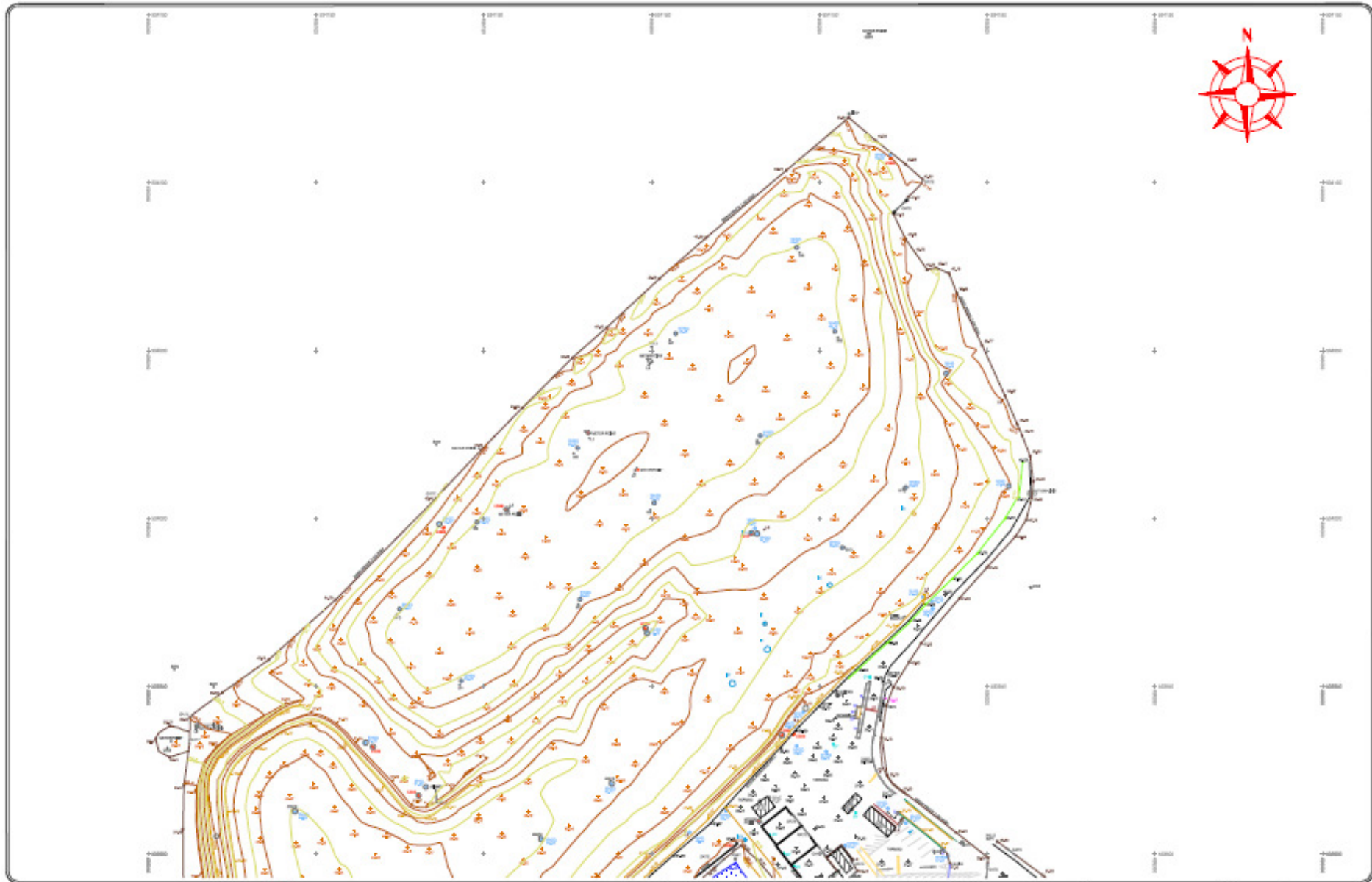
Landfill: Please enter summary data on the quantities of methane flared and / or utilised	Derryconnell Landfill				
	T (Total) kg/Year	M/C/E	Method Code	Method Used Designation or Description	Facility Total Capacity m3 per hour
Total estimated methane generation (as per site model)	357408.0	C	OTH	LandGEM Modelling	N/A
Methane flared	54077.0	C	OTH	Landfill Gas Survey	500.0 (Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0 (Total Utilising Capacity)
Net methane emission (as reported in Section A above)	303331.0	C	OTH	LandGEM Modelling	N/A

Please enter all quantities on this sheet in Tonnes

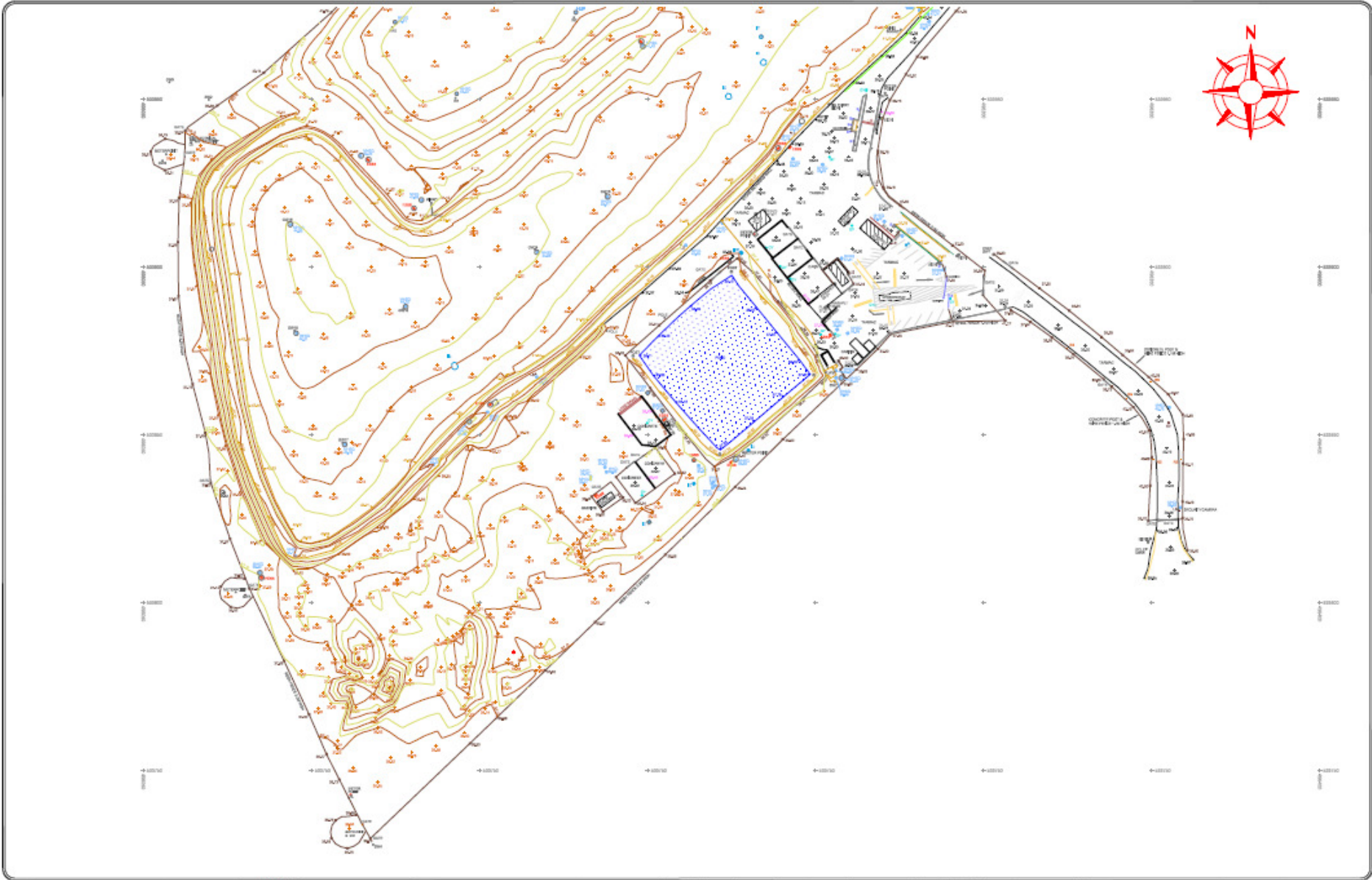
Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility	Haz Waste : Address of Next Destination Facility	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used		Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Non Haz Waste: Address of Recover/Disposer		
Within the Country	13 02 08	Yes	3.0	other engine, gear and lubricating oils	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01 Green Dragon Recycling,WFP-CK-10-0060-02	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland
Within the Country	15 01 04	No	4.8	metallic packaging	R13	M	Weighed	Offsite in Ireland	Mr. Binman Ltd.,W0061-02	Corbally,Glanmire,Co. Cork,.,Ireland		
Within the Country	15 01 04	No	1.22	metallic packaging	R13	M	Weighed	Offsite in Ireland	Mr. Binman Ltd.,W0061-02	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	15 01 06	No	127.52	mixed packaging	R13	M	Weighed	Offsite in Ireland	Bantry Skip Hire,W0136-02	Dunbittern East ,Bantry ,Co. Cork ,.,Ireland		
Within the Country	15 01 07	No	52.22	glass packaging	R13	M	Weighed	Offsite in Ireland	Mr. Binman Ltd.,W0061-02	Luddenmore,Grange,Kilmallock,Co. Limerick,Ireland		
Within the Country	16 01 07	Yes	0.1	oil filters	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland
Within the Country	16 02 14	No	42.49	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	R13	M	Weighed	Offsite in Ireland	KMK Metals Recycling,W0113-03	Cappincur Industrial Estate,Duingean Road,Tullamore,Co. Offaly,Ireland		
Within the Country	16 05 04	Yes	1.09	gases in pressure containers (including halons) containing dangerous substances	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland
Within the Country	16 06 01	Yes	1.882	lead batteries	R13	M	Weighed	Offsite in Ireland	KMK Metals Recycling,W0113-03	Cappincur Industrial Estate,Duingean Road,Tullamore,Co. Offaly,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland
Within the Country	16 06 05	No	1.338	other batteries and accumulators	R13	M	Weighed	Offsite in Ireland	KMK Metals Recycling,W0113-03	Offaly,Ireland		
Within the Country	19 07 03	No	8235.0	landfill leachate other than those mentioned in 19 07 02	D9	M	Weighed	Offsite in Ireland	Cork County Council - Bandon WWTP,.	Glaslin Road,Bandon,Co. Cork,.,Ireland		
To Other Countries	20 01 11	No	5.6	textiles	R13	M	Weighed	Abroad	All-Tex Recyclers Ltd.,WMEX05/24	Road,Cloughmills,Co. Antrim,.,Ireland		
Within the Country	20 01 25	No	0.96	edible oil and fat	R13	M	Weighed	Offsite in Ireland	Cork Oil Collectors,WFP-CK-08-0002-01	5 St. Lappans Place,Little Island,Cork,.,Ireland		
Within the Country	20 01 27	Yes	6.35	paint, inks, adhesives and resins containing dangerous substances	R13	M	Weighed	Offsite in Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland	Enva Ireland Ltd.,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland
Within the Country	20 01 38	No	60.86	wood other than that mentioned in 20 01 37	R13	M	Weighed	Offsite in Ireland	Bantry Skip Hire,W0136-02	Dunbittern East ,Bantry ,Co. Cork ,.,Ireland		
Within the Country	20 01 40	No	47.5	metals	R13	M	Weighed	Offsite in Ireland	Pouladuff Dismantlers,CK-10-0070-02	Forge Hill,Airport Road,Cork,.,Ireland		
Within the Country	20 03 01	No	229.8	mixed municipal waste	D15	M	Weighed	Offsite in Ireland	Greenstar Recycling,W0136-02	Sarsfield Industrial Estate,Glanmire,Co. Cork,.,Ireland		
Within the Country	20 03 07	No	22.8	bulky waste	D15	M	Weighed	Offsite in Ireland	Greenstar Recycling,W0136-02	Sarsfield Industrial Estate,Glanmire,Co. Cork,.,Ireland		
Within the Country	20 03 07	No	85.44	bulky waste	D15	M	Weighed	Offsite in Ireland	Ballineen Skip Hire,WFP-CK-10-0054-01-A2	Connagh,Ballineen,Co. Cork,.,Ireland		

DRAWINGS

DRAWING 02_2013
2013 TOPOGRAPHICAL SURVEY



<p>Scale 1:500</p> <p>Project Name: 2013 Topographical Survey Client: [Name] Date: 2013</p> <p>Drawn by: [Name] Checked by: [Name]</p> <p>www.murphy.ie</p>	<p>Legend</p> <table border="0"> <tr> <td></td> <td>Boundary</td> <td></td> <td>Spot Height</td> </tr> <tr> <td></td> <td>Contour Line</td> <td></td> <td>Building</td> </tr> <tr> <td></td> <td>Road</td> <td></td> <td>Fence</td> </tr> </table>		Boundary		Spot Height		Contour Line		Building		Road		Fence	<p>North Arrow</p>	<p>Index Map</p>	<p>Client Information</p> <table border="0"> <tr> <td>Client Name:</td> <td>[Name]</td> </tr> <tr> <td>Address:</td> <td>[Address]</td> </tr> <tr> <td>City:</td> <td>[City]</td> </tr> <tr> <td>County:</td> <td>[County]</td> </tr> <tr> <td>Postcode:</td> <td>[Postcode]</td> </tr> </table>	Client Name:	[Name]	Address:	[Address]	City:	[City]	County:	[County]	Postcode:	[Postcode]	<p>Survey Information</p> <table border="0"> <tr> <td>Survey Date:</td> <td>[Date]</td> </tr> <tr> <td>Survey Time:</td> <td>[Time]</td> </tr> <tr> <td>Survey Method:</td> <td>[Method]</td> </tr> <tr> <td>Survey Instrument:</td> <td>[Instrument]</td> </tr> </table>	Survey Date:	[Date]	Survey Time:	[Time]	Survey Method:	[Method]	Survey Instrument:	[Instrument]	<p>Company Information</p> <p>murphy GLOBAL CONSULTING SERVICES</p> <p>MPS Consulting Engineers 100, [Address] [City], [County] [Postcode]</p> <p>Topographical Survey 0145 665441</p>
	Boundary		Spot Height																																	
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Survey Method:	[Method]																																			
Survey Instrument:	[Instrument]																																			



Client: RPS
Location: London
Project: [illegible]
Date: [illegible]

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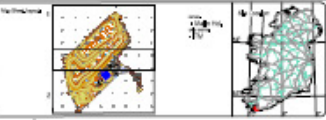
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LEGEND

	Spot Height		Building		Road		Boundary
	Contour Line		Fence		Path		Wall
	Water Feature		Gate		Driveway		Gate
	Tree		Gate		Driveway		Gate



Company Information

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Project: RPS Consulting Engineers
Client: [illegible]
Date: 01-03-2013
Project No.: 15000041
Project Name: Topographical Survey
Scale: 1:500
Sheet No.: NSL0005-01/13