Killurin Landfill Site
Newtown Lower
Killurin
County Wexford
Tel: 053 9120922
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Our Ref: 801_K06_10

Administration,
Office of Environmental Enforcement,
EPA Headquarters,
PO Box 3000,
Johnstown Castle Estate,
Wexford.

F.A.O. Ms. Deirdre French, Waste License Inspector

17 May 2011

Re: Killurin Landfill Site, Waste License W0016-02
Annual Environmental Report 2010.

Dear Ms. French,

Please find attached our Annual Environmental Report 2010 for Killurin Landfill for your attention.

We have enclosed one original and three copies of this document in accordance with clause 11.1.

Yours Sincerely,

Fran Hobbs
Facility Technician.

Wexford County Council

Killurin Landfill
W0016-02

Annual Environmental Report 2010

Quality Control Sheet

Publication title	Annual Environmental Report for Killurin Landfill
Date	May 2011
Address:	Wexford County Council County Hall, Wexford. Daniel McCartan, Facility Manager Tel 053-9120922 Mob 087-1236027 Email daniel.mccartan@wexfordcoco.ie

Doc No.	Issue No.	Reason for Issue	Author	Approved
Kill16-02_EPA_2010 AER	1	Compliance with Waste Licence W0016-02	Fintan Ryan Facility Engineer Fran Hobbs Facility Technician	Daniel McCartan, Senior Executive Engineer, Facility Manager

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EXECUTIVE SUMMARY

This *Annual Environmental Report* has been prepared for Killurin Landfill, Waste Licence 16-2, for the reporting period from **1 January 2010 to 31 December 2010 inclusive**. The report includes the information specified in Schedule G of the Waste Licence, Content of the Annual Environmental Report, in accordance with Waste Licensing - *Draft Guidance on Environmental Management Systems (EMS) and Reporting to the Agency, 1999'.* The main topics discussed with this report are as follows:

- General Site Information
- Management and Staffing
- Reported Incidents and Complaints
- Development Works
- Waste Acceptance and Handling
- Emissions Management
- Environmental Nuisances
- Resource and Energy Consumption
- Environmental Monitoring and Emissions

Killurin Landfill was closed to accepting waste on the 07 June 2008. No waste was accepted to landfill in 2010.

Wexford County Council continued to carry out a comprehensive environmental monitoring programme during 2010, in compliance with the waste licence conditions (Schedule D), to assess the significance of emissions. The monitoring programme included Landfill Gas, Leachate Level & Quality, Surface Water Quality, Groundwater Level & Quality, Construction Noise monitoring, Odour monitoring and Meteorological monitoring as well as Topographical.

1 INTRODUCTION

1.1 General Information

The Annual Environmental Report (AER) for Killurin Landfill includes the information specified in Schedule G of the Waste Licence 16-2, *Content of Annual Environmental Report* and has been prepared in accordance with the Environmental Protection Agency (EPA) publication *'Waste Licensing – Draft Guidance on Environmental Management Systems (EMS) and Reporting to the Agency, 1999'.*

The reporting period for this AER is **1 January 2010 to 31 December 2010 inclusive**.

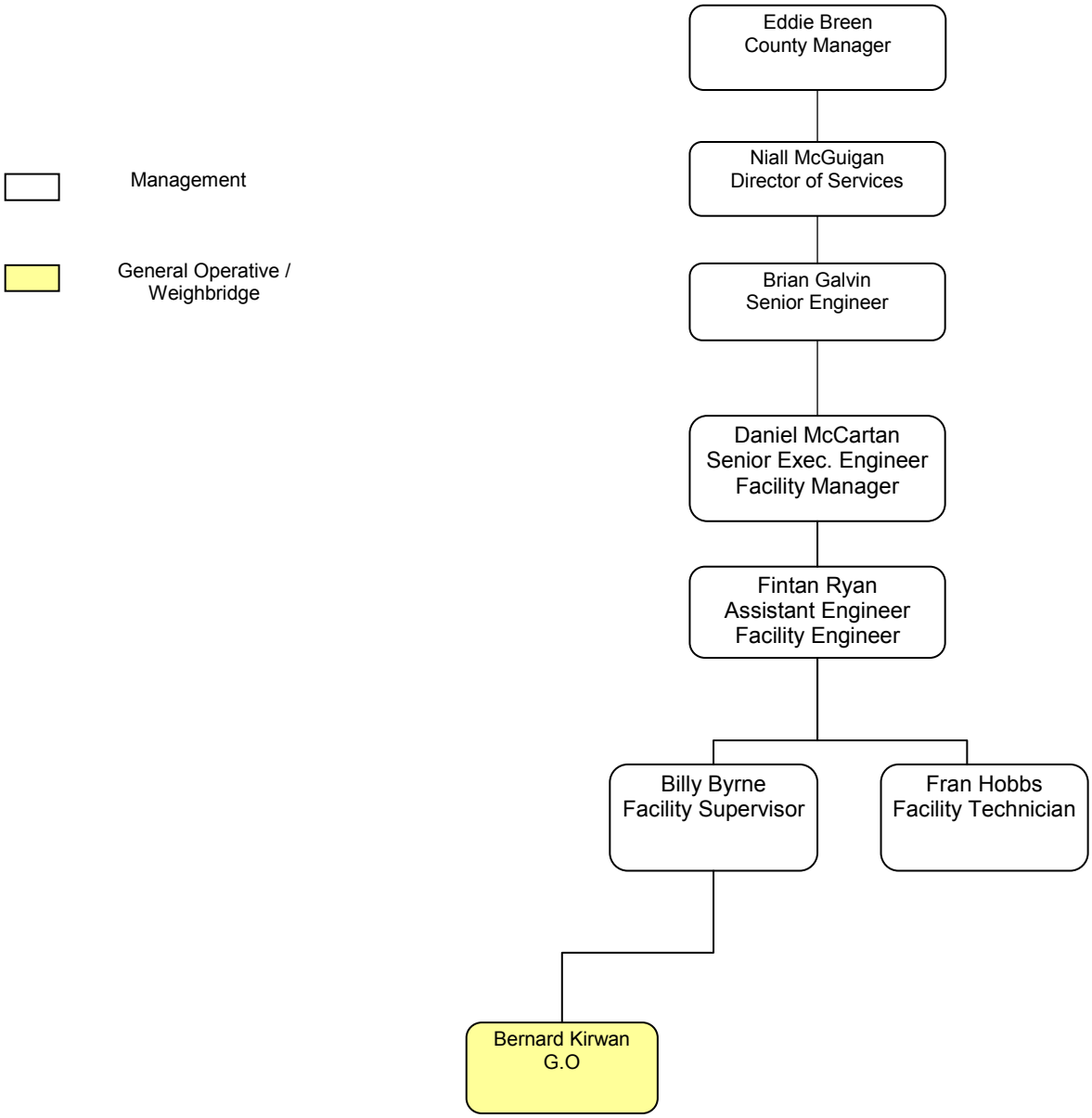
1.2 Site information

Table 1 Site information for Killurin Landfill

KILLURIN LANDFILL	
Waste licence register no:	16-2
Name and address of operator:	Wexford County Council County Hall Spawell Road County Wexford
Name and address of facility:	Killurin Landfill Killurin County Wexford
Site Description:	Killurin Landfill site is located in the town land of Newtown lower, Killurin, close to Deeps Bridge on a meander of the eastern bank of the River Slaney. The site is approximately 11km from Wexford town and covers an area of 10.7 hectares, of which 4.9 hectares are landfill and the remainder is CA site, buildings, car parking and buffer zones/screening. The facility is located in what once was a sand and gravel quarry. The area surrounding the site is rural with a mixed pattern of highly productive pasture and arable land use, with the River Slaney being the prominent landscape feature. Landfilling and CA site operations ceased in June 2008.

2 MANAGEMENT & STAFFING STRUCTURE

2.1 Management and staffing structure for Killurin Landfill 2010



The Killurin Landfill was operated by Wexford County Council during 2010 with consultancy support provided by sub consultants including Fehily Timoney & Company, Irish Biotech Services and Enviros Consulting.

2.2 Financial provisions

In accordance with Condition 12.1 Wexford County Council paid a sum of €21,434 to the Environmental Protection Agency for the management and monitoring of the waste licence.

2.2.1 *Provision for the Closure, Restoration and Aftercare*

Wexford County Council (WCC), as a Local Authority, has made the necessary provisions, for the development, management, restoration and aftercare of Killurin Landfill. WCC has assigned engineering and technical staff to manage the facility. Wexford County Council is committed to the ongoing provision of funding for all site development works, environmental monitoring costs and restoration and aftercare works at Killurin Landfill for the duration of the Waste Licence.

2.3 Environmental Management System

2.3.1 *Environmental Management Programme*

The site has an operational environmental management system (EMS) in accordance with the Waste Licence condition 2.3.2.1. Implementation of the EMS continued during this reporting period (January 2010 - December 2010). The Objectives and Targets of the EMS were reviewed and revised for the reporting period 2010.

2.3.2 *Environmental objectives and targets.*

Table 2 below provides the Objectives and Targets for 2010 and details progress made regarding each objective. Table 3 provides the Objectives and Targets for 2011 and the methods by which they will be achieved.

An environmental management plan (EMP) was prepared as part of the EMS for the facility. The EMP comprises information on the following topics:

- Site description
- Site infrastructure
- Types of waste accepted on site
- Leachate Collection and treatment Leachate Management System
- Landfill Gas Abatement Methods
- Surface water Control Measures
- Environmental Monitoring
- Site Security and Site Offices
- Operational Matters
- Noise and dust abatement
- Vermin control

- Fires
- Restoration and Aftercare

2.3.3 *Corrective action Procedure*

Procedures are in place in accordance with Condition 2.3.2.3 of the licence to monitor, measure, audit and record the environmental performance of the environmental management system. These procedures establish how non-conformance within the system is dealt with and how any corrective and preventive action is carried out. A corrective action procedure was prepared in October 2008 (reviewed in 2010) and is included in the overall EMS report.

2.3.4 *Awareness and Training Programme*

In accordance with Condition 2.3.2.4 of the licence, an awareness and training programme has been developed to increase environmental awareness among staff and identify training needs of all personnel working at Killurin Landfill. The facility manager has overall responsibility for reviewing training needs on an annual basis to ensure that all staff have the necessary skills and level of awareness to carry out their duties to the highest environmental and safety standards. Training records are kept on file at Holmestown Waste Management Facility.

Table 2 **Achievements of Objectives and Targets for 2010**

Achievements of Objectives and Targets for 2010			
Objective	Comments	Target	Progress
Objective No 1: To maintain a documented EMS			
1.1 Review existing EMS annually	Ensure that annual modifications, omissions or deletions are incorporated into the EMS and agreed for inclusion into the AER no new procedures were developed in 2010	2010	Complete
Objective No 2: To maintain a system for the notification of incidents and improve record keeping methods used at the facility			
2.1 Improve current site record keeping and performance of site procedures including documentation of reviews.	Review existing filing system and record storage for the facility, in particular the retention of records for historical review of the facilities environmental performance. This will include for the archiving of files related to the sites' operations, communications and compliance of the waste licence at any time.	2010	Complete for 2010. Work is ongoing into 2011
Objective No 3: To maintain the current site infrastructure			
3.1 Ensure ongoing maintenance of the following site infrastructure: Site security; Roads; Weighbridge; Fuel storage; Surface water drains; Site offices and plant shed; Landfill gas extraction system; Leachate extraction system; Scrap metal area.	All of the items of existing infrastructure are being maintained as required and in accordance with suppliers/manufacturers instructions where applicable.	2010	Complete for 2010. Maintenance Ongoing into 2011
Objective No 4: To control emissions from the facility			
4.1 Assess current leachate extraction	Create a structured approach to the	2010	Incomplete 2010. Additional

Achievements of Objectives and Targets for 2010			
Objective	Comments	Target	Progress
system to determine a schedule of maintenance and improvement to optimise the amounts of leachate removed for treatment from the facility	monitoring and performance of the leachate extraction system to include a schedule for servicing of pumps, compressors, air and leachate lines. The assessment of the system should provide increased leachate removal, additional control of leachate migration and preventative measures against failure of the system and additional protection against potential pollution sources.		infrastructure required. Twelve new leachate and landfill gas extraction wells installed in 2010. Review is ongoing
Objective No 5: To provide for the restoration and aftercare of the facility			
5.1 Update the Restoration and Aftercare Plan for the facility in 2010	This will include a schedule of site inspections for routine maintenance of site infrastructure, monitoring of emissions, pollution control framework and slope stability.	2010	Incomplete 2010. Additional infrastructure required. Review is ongoing
Objective No 6: To develop a system for the monitoring and measurement of emissions			
6.1 Collate all environmental monitoring of the landfill site by private contractors	Wexford County Council will review all monitoring by site staff, EPA's regional laboratory and private monitoring contractors to ensure that all monitoring information gathered is in accordance with the licence. All monitoring has been completed but all monitoring contractors still operate on individual contracts, it is proposed to review this and implement a cover contract for any monitoring at the facility for one or two contractors.	2010	Complete

Achievements of Objectives and Targets for 2010			
Objective	Comments	Target	Progress
Objective No 7: To develop a post operational plan for the site			
7.1 Review options under consideration at present and prepare proposals.	Landscaping plan for fully capped landfill.	2010	Incomplete. Final proposal to be completed in 2011.
7.2 Review Waste Licence,	Review of waste licence W0016/02, prepare submission for EPA on monitoring regime.	2010	Incomplete
7.3 Complete capping works	Complete capping of landfill during 2010	2010	Complete
7.4 Leachate extraction system	Full service and replacement (& where necessary installation) of wells for leachate extraction system	2010	Ongoing
7.5 Gas extraction system	Re-connect 3 wells in stage 5.	2010	Complete

Table 3 **Objectives and Targets for 2011**

Objectives and Targets for 2011			
	Comments	Target	Responsibility
Objective No 1: To maintain a documented EMS			
1.1 Review existing EMS annually	Ensure that annual modifications, omissions or deletions are incorporated into the EMS and agreed for inclusion into the AER	2011	Facility Manager
Objective No 2: To maintain a system for the notification of incidents and improve record keeping methods used at the facility			
2.1 Improve current site record keeping and performance of site procedures including documentation of procedure reviews due to the closure of the landfill	Review existing filing system and record storage for the facility, in particular the retention of records for historical review of the facilities environmental performance. This will include for the archiving of files related to the sites' operations, communications and compliance of the waste licence at any time.	2011	Facility Technician
Objective No 3: To maintain the current site infrastructure			
3.1 Ensure ongoing maintenance of the following site infrastructure: Site security; Roads; Surface Water drainage; Weighbridge; Fuel storage; Surface water drains; Site offices and plant shed; Landfill gas	All of the items of existing infrastructure are to be maintained as required and in accordance with suppliers/manufacturers instructions where applicable.	2011	Facility Technician

Objectives and Targets for 2011			
	Comments	Target	Responsibility
extraction system; Leachate extraction system; Scrap metal area.			
Objective No 4: To control emissions from the facility			
4.1 Assess current leachate extraction system to determine a schedule of maintenance and improvement to optimise the amounts of leachate removed for treatment from the facility	Create a structured approach to the monitoring and performance of the leachate extraction system to include a schedule for servicing of pumps, compressors, air and leachate lines. The assessment of the system should provide increased leachate removal, additional control of leachate migration and preventative measures against failure of the system and additional protection against potential pollution sources.	2011	Facility Technician
Objective No 5: To provide for the restoration and aftercare of the facility			
5.1 Update the Restoration and Aftercare Plan for the facility	This will include a schedule of site inspections for routine maintenance of site infrastructure, monitoring of emissions, pollution control framework and slope stability .	2011	Facility Manager
Objective No 6: To develop a post operational plan for the site			
6.1 Review options under consideration at present and prepare proposals.	Landscaping plan for fully capped landfill.	2011	Facility Manager
6.2 Review Waste Licence,	Review of waste licence W0016/02, prepare submission for EPA on monitoring regime.	2011	Facility Technician
6.Surface Site Roads	Re-grade tar and chip all site roads during 2011	2011	Facility Manager

Objectives and Targets for 2011			
	Comments	Target	Responsibility
6.4 Leachate extraction system	Full service and replacement (& where necessary installation) of wells for leachate extraction system	Ongoing	Facility Manager
6.5 Gas extraction system	Review gas extraction wells and install new wells if required.	Ongoing	Facility Manager

2.3.5 *Full title of any procedures developed by the licensee in the year which relates to the facility operation*

No additional procedures were developed or submitted during the reporting period.

2.3.6 *Report on communication programme*

The site's EMS includes a procedure for communication. In addition Wexford County Council provides the following documentation for public viewing at Holmestown Waste Management Facility:

Table 4 List of records available for public viewing in relation to the landfill

List of records available for public viewing
Waste Licence W0016-2
Waste Licence application
Correspondence with the EPA
Incident / complaints records
Audit records
Waste acceptance records
Recycled material removal log
Material acceptance dockets
All monitoring records
Leachate removal records
Vermin control reports

3 REPORTED INCIDENTS & COMPLAINTS SUMMARIES

3.1 Incidents

No incidents were recorded during this reporting period.

3.2 Complaints

No complaints were received during this reporting period.

4 DEVELOPMENT WORKS UNDERTAKEN DURING THE REPORTING PERIOD & THOSE PROPOSED FOR THE COMING YEAR

4.1 Landfill Engineering Works

4.1.1 *Completed Engineering Works 2010*

Proposed engineering works for 2010 are summarized as follows

- Stage C5/2, comprising the final stage of installation of the capping system was completed in 2010. The completed CQA report is available for viewing for that stage at Holmestown Waste Management Facility.

- Installation of 12 number multipurpose in-waste boreholes for gas/leachate extraction and monitoring were installed in 2010.

4.1.2 *Proposed Engineering Works 2011*

Proposed engineering works for 2011 are summarized as follows:

- Re-grade and tar and chip all site roads

- Connection of the 12 new multipurpose in-waste boreholes for gas/leachate extraction and monitoring.

4.2 Restoration and Aftercare

Several proposals for the end use of the site are currently being reviewed. It is envisaged that the review will be completed in 2011. A report will be submitted to the EPA for approval when the review is complete.

5 WASTE ACCEPTANCE & HANDLING

5.1 Waste Activities carried out at the Facility

No waste disposal operations took place on site at Killurin Landfill during the reporting period 1st January 2010 to 31st December 2010. Scrap metal was stored on site from Holmestown before it was transported off-site.

5.2 Total quantity of wastes accepted on site

A summary of the total quantity of waste accepted at the facility for the reporting period 1st January to 31st December 2010 is presented below in table 5.

5.3 Total Quantity of Waste Consigned Off Site

A summary of the total quantity of waste consigned off site at Killurin Landfill for the period 1st January to 31st December 2010 is presented below in table 6.

The total volume of leachate sent off site for treatment at Enniscorthy Wastewater Treatment Works was 3570 tonnes.

Table 5 **Waste accepted to Killurin Landfill from 1st January 2009 to 31st December 2010 (tonnes)**

Waste In	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly totals
SCRAP METAL	6.76	17.7	21.71	40.59	11.64	14.16	37.78	20.58	17.7	14.14	11.92	4.2	218.88
DEAD DOGS	1.80	1.44		1.60	1.04	0.56	0.92	0.78	1.06	0.88	0.94	0.76	11.78
Total													230.66

Table 6 **Waste consigned off-site from Killurin Landfill from 1st January to 31st December 2010 (tonnes)**

Waste Out	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yearly totals
SCRAP METAL			46.17			66.39			76.06			30.26	218.88
DEAD DOGS	1.80	1.44		1.60	1.04	0.56	0.92	0.78	1.06	0.88	0.94	0.76	11.78
LEACHATE	202	190	624	637	85	105	72	100	427	266	628	234	3570
Total													3800.66

5.4 Remaining capacity of the site

Killurin Landfill closed in the end of June 2008. There is no space remaining in the landfill for deposition of waste.

6 ENVIRONMENTAL NUISANCES

6.1 Review of environmental nuisance control at the facility for the reporting period

Nuisances at Killurin Landfill are logged in a weekly tick-box report and action is taken immediately to address any identified issues. Table 7 below summarises the measures implemented on site to combat environmental nuisances during 2010.

Table 7 Environmental Nuisance Control during 2010

Nuisance	Mitigation Measures in Place
Vermin	Permanent bait points set up on site (internal and external). Inspections carried out on a monthly basis. If infection found then weekly inspections until rodent free. Monthly reports produced and kept at Holmestown site office.
Litter	Killurin landfill is litter free.
Flies	No flies present.
Odour	No odour emissions

7 RESOURCE & ENERGY CONSUMPTION

7.1 Electricity and Energy Usage

The cost of electricity on site for 2010 was €25,530.26.

7.2 Water

Domestic water usage data was not recorded.

7.3 Diesel

Total diesel fuel consumption is estimated to be 500 litres from 01 January to 31 December 2010.

8 ENVIRONMENTAL MONITORING & EMISSIONS SUMMARY

8.1 Summary report on emissions

A summary of emissions monitoring at Killurin Landfill carried out during this reporting period (January 2010 – December 2010) is contained in Table 8 below. The E-PRTR Regulation (EC) No. 166/2006 concerning the establishment of a European Pollutant Release and Transfer Register came into force in February 2006 and was brought into Irish law through SI No 123 of 2007. As a result all industries have to annually report environmental emissions and waste transfer data through a web-based form as part of their AER. The PRTR 2010 document is included in Appendix A1.

Table 8 **A summary of Emissions monitoring as specified in Waste Licence W0016-2**

Note 1: When specific engineering works are being carried out

Emission Monitoring	Frequency
Landfill Gas	Continuously (Dwellings adjacent to Landfill, Flare) Weekly (Site Accommodation) Monthly (Boreholes) Annual (Flare)
Leachate	Monthly (Borehole Level) Quarterly (Analysis) Annually (Analysis)
Surface water	Weekly (Visual) Quarterly (Analysis) Annually (Analysis)
Groundwater Levels	Monthly (Borehole Level)
Groundwater	Quarterly (Analysis) Annually (Analysis)
Noise	As required (Note 1)
Dust	As required (Note 1)
River Water	Quarterly (Analysis)

8.2 Environmental Monitoring

Wexford County Council carries out a comprehensive environmental monitoring programme, in compliance with the waste licence conditions, to assess the significance of emissions. The monitoring programme includes Landfill Gas, Leachate Level & Quality, Surface Water Quality, Groundwater Level & Quality, Noise and Dust monitoring (as required), Odour monitoring and Meteorological monitoring, as well as Flare emission and Topographical.

Monitoring during this reporting period was carried out according to Schedule D of Waste Licence W0016-2. Quarters 1, 2, 3 and 4 of 2010 are summarised in this chapter. A monitoring point location plan is provided see figure 2.

8.2.1 *Landfill gas*

In accordance with Schedule D.1 of the Waste Licence W0016-2, the following monitoring has been carried out and reported to the Agency.

- Monitoring boreholes LB2, LB3, LB4, LB5, LB6, LB7, LB8, LB12, LB13, LB15, LB16 as specified in the licence.
- Perimeter boreholes T1, T2, T3, T5, T6, T7, T9, T10, T11, T12, T13, T14, T15, T16, T17, T18 and T19 were monitored on a monthly basis by Wexford County Council site staff.

The majority of boreholes have varying levels of gas quality over the reporting period and no particular trend could be identified. Gas monitoring details are provided in Table 9 below.

Table 9 Gas Monitoring Points

Off site and on site gas boreholes		
CO2 and CH4 levels (monthly)	40 points	In waste gas monitoring wells LB 2 - LB8, LB 12 - LB 16
		Boundary gas monitoring wells T1 –T3, T5- T7, T9- T20 GW1, GW9- GW11, GW17-GW19.
		Resident gas boreholes: GB1 and GB2
Site offices & Residential Dwelling gas alarms		
CO2 and CH4 levels (continuously)	2 points	Two closest residences
CO2 and CH4 levels (weekly)	10 points	All site buildings

Methane (CH_4)

Perimeter boreholes

CH4 readings at GW17, GW18 and GW 19 were noted to range from 0% to 71.7% v/v. CH4 levels were recorded below the limit value of 1.0% v/v at groundwater monitoring boreholes GW1, GW9, GW10 and GW11 in 2010. Perimeter boreholes T14, T15 and T16 were recorded as above the trigger level of 1.5% v/v and similar to results recorded in the previous reporting period, no exceedences were recorded at T17 – T19 which are located outside the landfill boundary.

Resident's boreholes

The following was recorded at resident's boreholes during this reporting period:

- **GB1 at Carley's:** Methane levels at this monitoring location were seen to be below the 1.0% volume per volume (v/v) trigger-level throughout the reporting period.
- **GB2 at Foxes:** Methane levels at this monitoring location were seen to be below the 1.0% volume per volume (v/v) trigger-level throughout the reporting period.

The CH_4 trigger level at the gas monitoring wells is 1.0% volume by volume (v/v)

Carbon Dioxide (CO_2)

Perimeter boreholes

CO2 concentrations at GW17 and GW19 were noted to be above the trigger level of 1.5% v/v and similar to results recorded in the previous reporting period. CO2 concentrations ranging from 0% to 30.1% v/v were recorded during the year. The elevated results at GW17, GW18 and GW19 are consistent with the migration of landfill gas away from the fill areas. These boreholes are located on the landfill side of the gas vent trench. Extraction of landfill gas is likely to gradually reduce the concentration of landfill gas detected at these particular monitoring locations. The CO2 levels were recorded below the limit value of 1.5% v/v at groundwater monitoring boreholes GW1, GW9, GW10 and GW11 during 2010. Perimeter boreholes T1 to T16 were recorded as above the trigger level of 1.5% v/v and similar to results recorded in the previous reporting period, no exceedences were recorded at T17 – T19 which are located outside the landfill boundary.

Resident's boreholes

The following was recorded at resident's boreholes during this reporting period:

- **GB1 at Carley's:** All results were below the 1.5% volume per volume (v/v) trigger-level.
- **GB2 at Foxe's:** All results were below the 1.5% volume per volume (v/v) trigger-level.

The CO_2 trigger level at the gas monitoring wells is 1.5% volume by volume (v/v)

Monitoring boreholes GB1 and GB2 are located on the resident's side of the gas migration cut off trench. The cut off trench consists of a excavated trench along the landfill boundary adjacent to Carley's and Fox's residents. Installed in this trench is an impermeable geotextile membrane with a series of gas extraction wells installed on the landfill side. The results indicate that the gas migration cut off trench combined with the gas abstraction system is operating as designed.

8.2.2 *Flare Emissions*

An air emission test of the landfill flare was carried out on the 9th November 2010. NO_x, SO_2, CO, O_2, HCL, HF and TOC were found to be in compliance with the emission limit values contained in Waste Licence W0016-2 – Schedule C4. The report is available to view at WCC, Holmestown Waste Management Facility, Administration Building.

8.2.3 *Leachate levels and monitoring*

Leachate monitoring points

Leachate Monitoring			
Level	10 points	LB2-LB8, LB12-LB16	Weekly
Analysis	3 points	Leachate storage tanks, LB2, LB12,	Annual

Leachate levels

Leachate levels were taken at 10 leachate boreholes during 2010 in compliance with Schedule D.5 of the waste licence. Samples were obtained for analysis from LB2, LB12 and the leachate storage tank on 12th May 2010. The levels were recorded using a dip meter on a weekly basis by Wexford County Council staff at the landfill. Wexford County Council has adopted a Leachate Management Plan designed to maintain leachate at acceptable levels by routine removal from the holding tank. The volumes of leachate removed from the tank in 2010 are detailed in Table 10. The quantity exported off-site in 2010 was 3,570 cubic metres compared to 4,890 cubic metres in 2009.

Leachate is collected from 34 extraction wells located around the site within the waste boundary. This leachate is directed to the three holding tanks located in the northwest of the landfill. It is then removed by road tanker on a routine basis and transported to Enniscorthy Wastewater Treatment Plant for treatment in accordance with the leachate management plan.

Leachate monitoring

Annual monitoring was undertaken on 12th May 2010. Leachate samples were collected from three locations, LB2, LB12 and the leachate storage tanks. The samples were analysed for a range of organic and inorganic parameters as defined in Table D.5.1 of the Waste Licence 16-2.

The levels recorded did not reveal any significant change to those recorded in the previous reporting period.

The typical characteristics of leachate generated on site are presented in Table 11. The results are similar to those obtained for the last reporting period and are in general indicative of a landfill in the methanogenic stage of decomposition of organic compounds i.e. conversion of organic compounds to landfill gas.

Table 10 Leachate analysis results 2010

Sampling Points		LB2	LB12	Tanks
Parameters	**Units**	**Annual**	**Annual**	**Annual**
Depth of Borehole	m	6.5	4	
Leachate level	m	1.2	0.8	
Temperature	°C	10.8	17	12.4
pH	pH	6.6	nm	7.5
Conductivity	µS/cm	968	6930	6410
Ammonia	mg/l N	30	590	390
Chloride	mg/l Cl	36	487	585
Nitrite	mg/l N	<0.002	0.096	1.96
Ortho-Phosphate	mg/l P	<0.01	0.05	1.8
Total Oxidised Nitrogen	mg/l N	<0.5	<0.5	3.8
Chemical Oxygen Demand	mg/l 02	20	521	904
Biochemical Oxygen Demand	mg/l 02	0.8	52.5	42.5
Fluoride	mg/l F	0.16	4.7	2.1
Sulphate	mg/l SO4	41	<25	30
Aluminium	µg/l	88	870	500
Antimony	µg/l	0.7	1	7.1
Arsenic	µg/l	21	17	18
Barium	µg/l	200	<3	170
Beryllium	µg/l	<0.5	<0.5	<0.5
Boron	µg/l	290	1700	1700
Cadmium	µg/l	<0.5	<0.5	<0.5
Calcium	mg/l	36	110	96
Chromium	µg/l	2.2	32	60
Cobalt	µg/l	2.8	8.4	7.7
Copper	µg/l	2.1	<0.5	46
Iron	µg/l	4800	4000	20000
Lead	µg/l	<0.5	<0.5	52
Magnesium	mg/l	26	79	55
Manganese	µg/l	4000	790	780
Mercury	µg/l	<0.5	<0.5	<0.5
Molybdenum	µg/l	0.5	1.3	1.4

Nickel	µg/l	2.5	37	32
Potassium	mg/l	28	290	270
Selenium	µg/l	1.2	12	17
Sodium	mg/l	32	410	420
Thallium	µg/l	<0.5	<0.5	<0.5
Tin	µg/l	<1	2	14
Uranium	µg/l	<0.5	<0.5	<0.5
Vanadium	µg/l	<0.5	11	52
Zinc	µg/l	15	<3	110

Inspection and testing of leachate storage tanks

In December 2008 Enviros Consulting carried out analysis of the leachate storage tanks at Killurin Landfill. The tanks passed the integrity test and are deemed fit for storing leachate. The tanks are due to be re- tested in December 2011.

8.2.4 *Surface Water*

Under Schedule D.5 of the Waste Licence 16-2, surface water monitoring was required in the locations listed below. SW1 is located upstream of the site, SW2 is situated downstream of the site and SW4 is located at the southern tip of the facility. The site streams sometimes run dry during the drier months of the year and consequently surface water samples cannot be obtained. These are discussed in subsequent sections.

Table 11 Surface water monitoring locations and frequency

Surface water monitoring locations and frequency			
Parameter	**Location**	**Name**	**Frequency**
Visual Inspection/ Odour	Off site (River Slaney)	S1, S2, S4	Quarterly
Chemical analysis	Off site (River Slaney)	S1, S2, S4	Quarterly and Annual
Visual inspection	On site	SW1, SW2, SW4	Weekly
Chemical analysis	On site	SW1, SW2 and SW4,	Quarterly and Annual

Visual inspection of surface water

Weekly visual inspections of surface water were conducted for monitoring points SW1, SW2 and SW4, and quarterly at off-site locations S1, S2 and S3. All surface water details are included in previously submitted monitoring reports for the landfill.

No visual abnormalities were recorded for any of the surface water inspection points during the reporting period.

Surface water quality analysis

Results for all surface water monitoring carried out in 2010 have been submitted to the Agency in quarterly monitoring reports. Due to dry periods it was not always possible to retrieve samples from all of the monitoring points. Only 5 samples were collected for SW1, SW2 and SW4.

All sampling and analysis was carried out in accordance with recognised quality assurance and control procedures. The detailed monitoring results are presented in the quarterly monitoring reports submitted to the Agency in the reporting period. The range of analysis is as specified in Schedule D.5 of the Waste Licence 16-2 and includes parameters such as ammoniacal nitrogen, BOD, COD, dissolved oxygen, pH, electrical conductivity and organic and inorganic parameters.

No exceedences were recorded during the quarterly monitoring in 2010.

8.2.5 *Groundwater*

Table 12 Groundwater monitoring locations

Groundwater Monitoring Locations		
Upgradient	1 point	GW1
Downgradient (border of reed beds)	1 point	GW9
Downgradient (border of reed beds)	1 point	GW10
Upgradient	1 point	GW11
Upgradient	1 point	GW17
Upgradient	1 point	GW18
Upgradient	1 point	GW19
Upgradient	1 point	GBH1
Upgradient	1 point	GBH2

Groundwater levels

Groundwater levels were measured on a monthly basis using a dip meter. The groundwater dip levels have been submitted to the Agency in the quarterly monitoring reports. Details of groundwater levels are also available for inspection at the Holmestown site office. Groundwater levels remained relatively constant throughout the monitoring period, with only minor variations in groundwater levels in accordance with prevailing weather conditions. During the drier months the groundwater levels were seen to gradually decrease while during wetter periods where prolonged rain was evident, levels of groundwater were noted to rise slightly over a number of months.

Groundwater quality boreholes

Upgradient groundwater boreholes

Wexford County Council monitors groundwater quality in upgradient boreholes located around the landfill in accordance with Condition 8 and Schedules D1 and D.5.1 of the waste licence. Elevated levels of ammonia were consistently detected at GW1, throughout each of the quarterly monitoring rounds. Levels were found to be as high as 89 mg/l N during July 2010. This monitoring point is located upgradient of the landfill site and so pollution from agricultural sources or road run-off is most likely the reason for these elevated levels. The landfill may be having an effect on the boreholes but it is difficult to isolate a source. Elevated levels of iron and manganese are typical of the groundwater chemistry of the area although they are elevated above the levels of the other groundwater boreholes. In relation to List I/II substances no exceedences were recorded. All other parameters were noted to be within acceptable limits.

Downgradient groundwater boreholes

Elevated levels of ammonia were detected at GW9 during each round of quarterly sampling. Levels were consistently high during 2010 with 29mg/l N detected in Q2. These levels indicate slight contamination which is most likely to have been from leachate as a result of landfill operations on site. List I/II organic substances were not found to be above detection limits which is consistent with the previous reporting period.

Private Well water analysis

Table 13 Private well monitoring locations

Drinking water		
Pearson's residence	UV treated	Pearson's tap

Quarterly monitoring was carried out on drinking water samples from the Pearson's residence. Total coliforms were detected in October 2010 the Pearson's were informed at the time.

8.2.6 *Noise*

A noise survey was carried out during September 2010 while capping works were ongoing, the construction works were found to have had a low influence on the noise levels around neighbouring properties.

8.2.7 *River water*

The river water monitoring results for the river Slaney are reported in the Table 14 below. Monitoring location S1 is located upstream of the landfill, monitoring location S2 is in the river adjacent to the landfill and monitoring location S3 is located downstream of the landfill and all are located within the tidal zone of the river estuary (salt water). High levels of chloride and electrical conductivity were recorded at all three monitoring locations during 2010.

Table 14 **River water monitoring results for River Slaney 2010**

River water monitoring results for River Slaney 2009										
		Monitoring Locations								
		S1			S2			S3		
Parameter	Limit/ Units									
Date		08-Apr	29-Sep	17-Nov	08-Apr	29-Sep	17-Nov	08-Apr	29-Sep	17-Nov
BOD	5	1.5	<0.5	1.7	1.3	0.7	1.5	1.7	<0.5	1.5
COD	40	12	15	18	14	15	8	21	22	12
Chloride as Cl	250	14	680	22	14	777	24	19	2428	26
Dissolved oxygen		9.87	9.01	8.91	9.98	8.88	9.62	9.93	8.51	9.6
Conductivity	1500	172	2330	230	181	2180	225	193	7220	246
pH	6<pH>9	7.48	7.85	7.65	7.48	7.87	7.62	7.49	8	7.68
Suspended Solids	30	6	16	5	10	20	6	40	12	6
Ammonia as NH3-N	0.3	0.08	<0.02	<0.02	0.06	<0.02	<0.02	0.08	<0.02	0.02

8.2.8 *Dust*

Table 15 **Dust Deposition Results 2010**

Dust Deposition 2010				
Stations	**Date**	**Units**	**Standard Reference**	**Results**
D1	18-08-10 to 27-09-10	mg/m^2/day	VDI-2119	46.7
D2	18-08-10 to 27-09-10	mg/m^2/day	VDI-2119	122.9
D3	18-08-10 to 27-09-10	mg/m^2/day	VDI-2119	26.3

Dust monitoring was carried out during the construction work to complete Stage 5/A of the landfill cap, no exceedences were recorded

8.2.9 *Meteorological monitoring*

All monitoring information was obtained from the weather station located at Johnstown Castle in Wexford; this station is within 10km of Killurin Landfill site. A full set of data has been previously sent to the Agency in the four quarterly monitoring reports.

8.2.10 *Topographical Survey*

A topographical survey of the site was carried out by Wexford County Council staff in November 2010. The site survey drawing is contained in Appendix A2.

Figures

Figure 1 Monitoring Locations

APPENDICES

A1 PRTR 2010

A2 Topographical Survey

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.12

REFERENCE YEAR	2010

1. FACILITY IDENTIFICATION

Parent Company Name	Wexford County Council
Facility Name	Killurin Landfill Site
PRTR Identification Number	W0016
Licence Number	W0016-02

Waste or IPPC Classes of Activity

No.	class_name
3.1	Deposit on, in or under land (including landfill
3.10	Release of waste into a water body (including a seabed insertion).
3.12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
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.
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
4.10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
4.3	Recycling or reclamation of metals and metal compounds

Address 1	Newtown Lower
Address 2	Killurin
Address 3	Co. Wexford
Address 4	
Country	Ireland
Coordinates of Location	-6.56116 52.3816
River Basin District	IESE
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Fran Hobbs
AER Returns Contact Email Address	fran.hobbs@wexfordcoco.ie
AER Returns Contact Position	Technician
AER Returns Contact Telephone Number	053 9120922
AER Returns Contact Mobile Phone Number	087 9141105
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(d)	Landfills
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 ?	

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
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
03	Carbon dioxide (CO2)	M	ISO 12039:2001		2155194.0	2345379.0	0.0	190185.0
01	Methane (CH4)	M	ALT	EN12619:1999	46.81	33523.81	0.0	33477.0
08	Nitrogen oxides (NOx/NO2)	M	EN 14792:2005		693.0	693.0	0.0	0.0
11	Sulphur oxides (SOx/SO2)	M	EN 14791:2005		42.0	42.0	0.0	0.0
02	Carbon monoxide (CO)	M	EN 15058:2004		18.4	18.4	0.0	0.0

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
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

* 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				QUANTITY		
			Method Used					
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
351	Total Organic Carbon (as C)	M	ALT	EN12619:1999	46.81	46.81	0.0	0.0
319	**Inorganic acids**	M	EN 1911-1 to 3:2003	and EN15713:2010	13.14	13.14	0.0	0.0

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

Additional Data Requested from Landfill operators

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

Landfill: Killurin Landfill Site

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
Total estimated methane generation (as per site model)	1018612.0	E	PER	GasSim model Ver. 2	N/A	
Methane flared	752344.0	M	ALT	Inline CEMs analyser	1250.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	33523.81	M	ALT	EN12619:1999	N/A	

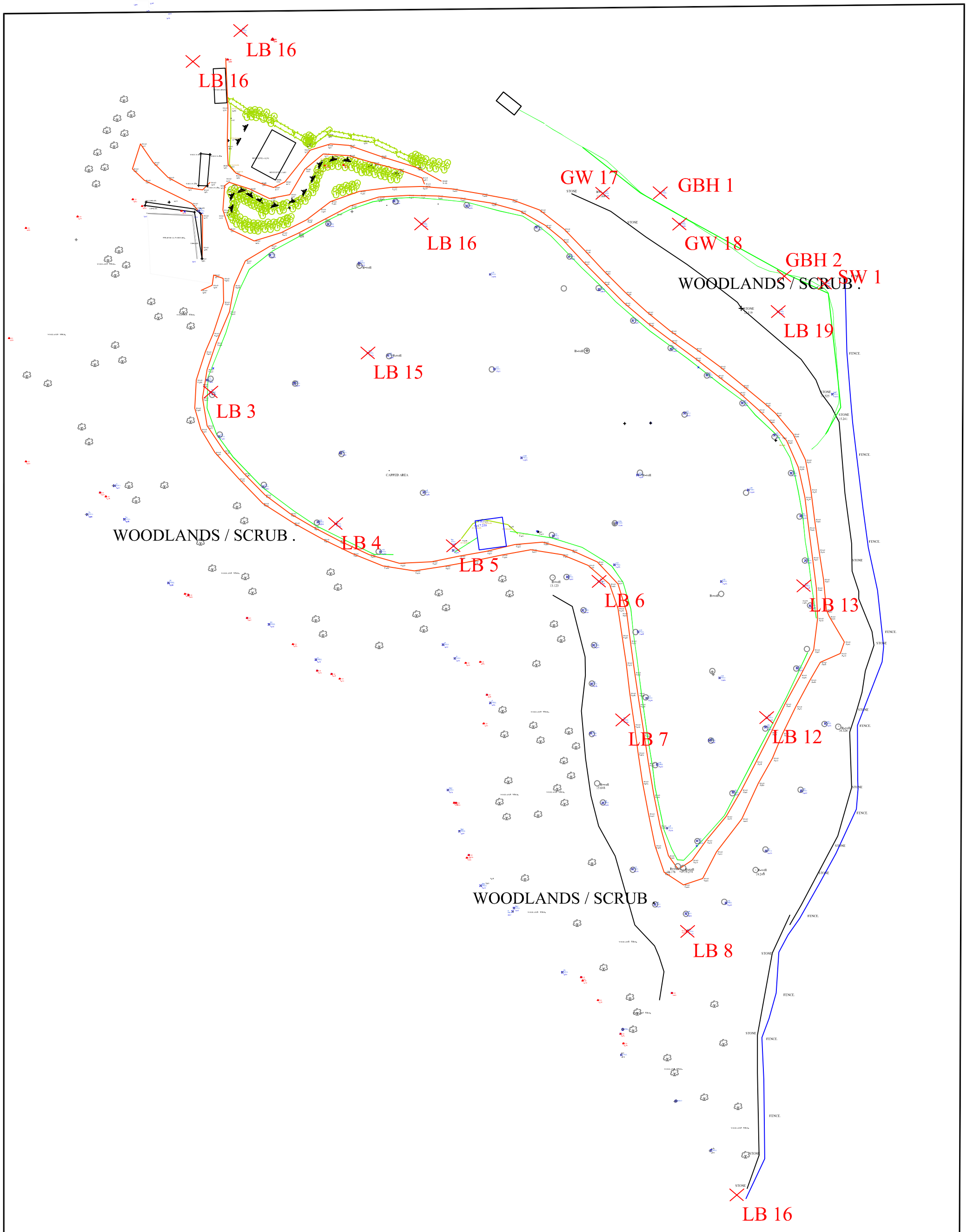
5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

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 Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	02 01 02	No	11.78	animal-tissue waste	R6	M	Weighed	Onsite in Ireland	Waterford Proteins,Dept. of Agriculture Permit - R919	Ferrybank ,Waterford ,".",".",Ireland		
Within the Country	20 01 40	No	218.88	metals	R4	M	Weighed	Onsite in Ireland	Mulligan Recyclers ,WP/05/20	Mulligan Dismantling & Salvage ,Scaranagh Lower ,Inch ,Gorey ,Ireland		
Within the Country	**19 07 03**	**No**	3570.0	landfill leachate other than those mentioned in 19 07 02	D9	M	Weighed	Onsite in Ireland	Enniscorthy Waste water treatment plant,Wexford County Council	Saint Johns ,Enniscorthy ,".",".",Ireland		

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

Link to previous years waste data
Link to previous years waste summary data & percentage change



Wexford County Council

Holmestown Waste Management Facility

Wexford County Council,
Wexford
Tel: 053-9120922

Drawing Notes

Killurin Landfill Monitoring Locations

F. Ryan	
FH	
21-08-10	
1:6000	
FR	
Drawing No.	

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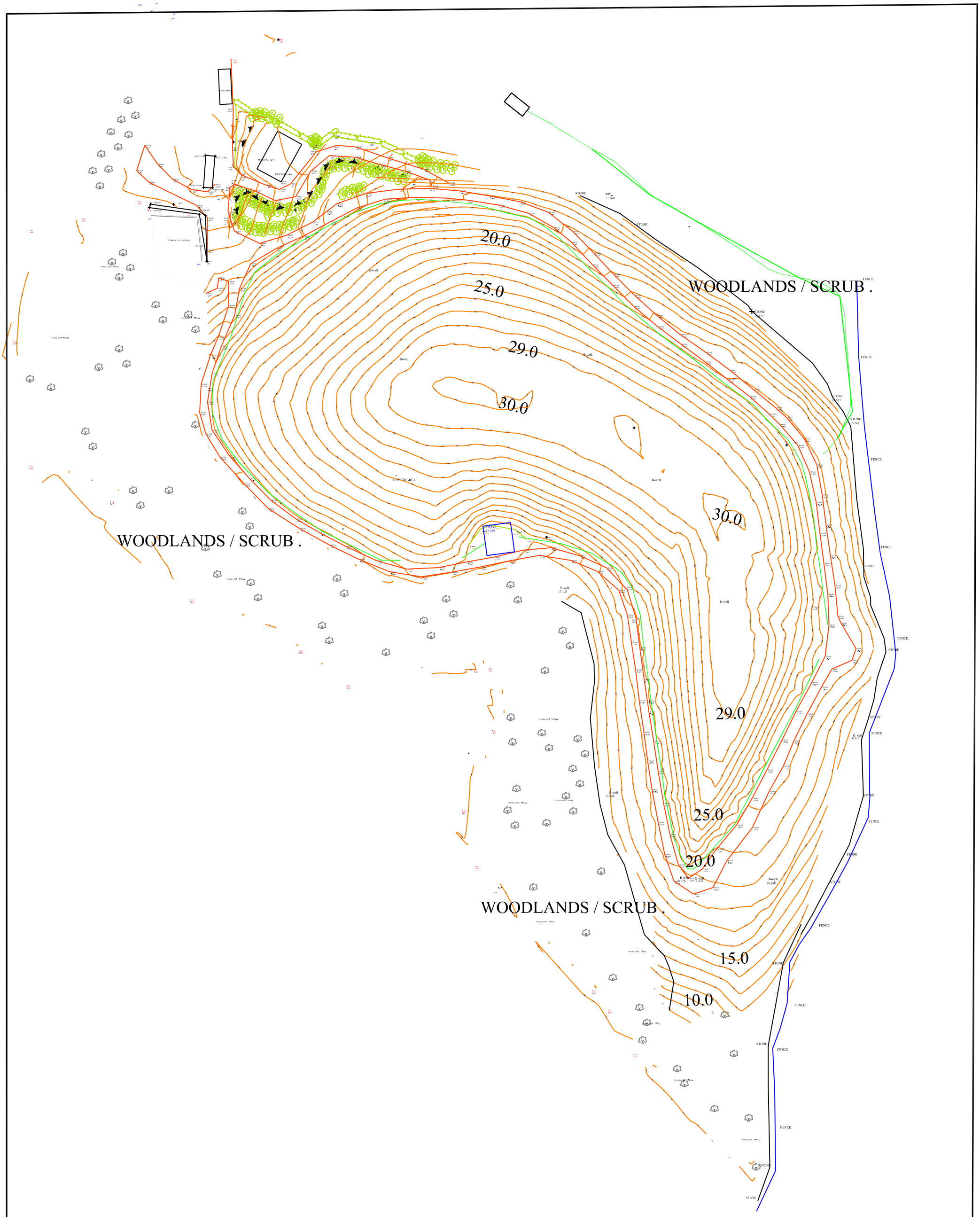

Wexford County Council

Holmestown Waste Management Facility

Wexford County Council,
Wexford
Tel: 053-9120922

Drawing Notes

Killurin Landfill Topographical Survey
September 2009

F. Ryan	
FH	
21-08-10	
1:6000	
FR	
Drawing No.	

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A survey of landfill sites to determine the quantity of methane flared and or recovered in utilisation plants for 2010

Please choose from the drop down menu the license number for your site	W0016
Please choose from the drop down menu the name of the landfill site	Killurin Landfill Site
Please enter the number of flares operational at your site in 2010	1
Please enter the number of engines operational at your site in 2010	Select
Total methane flared	752,344 kg/year
Total methane utilised in engines	0 kg/year

Please note that the closing date for reciept of completed surveys is 31/03/2011

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 uptodate 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:
LFGProject@epa.ie

If an operator wishes to enter more precise information than the data options in the drop down menus, please contact LFGProject@epa.ie for a version of the survey that will allow you to do so

Once completed please send the completed file as an attachment clearly stating the name and or license number of the landfill site (e.g. W000 Xanadu landfill_2010) to:
LFGProject@epa.ie

	to be filled in by licensee		calculated by spreadsheet	

Flare No. 1

Flare type ?	Biogas BG2468	**If "other" enter flare description here**	
Is the flare an open or enclosed flare ?	Enclosed	**Rated flare capacity ?**	1250 **m3/hr**
Month /year comissioned ?	March 2003		
Month decomissioned if decomissioned in 2010 ?	Select		
What is the function of the flare ?	Extraction from capped and uncapped areas	**If "other" enter flare function here**	

Monthly	Method M/C/E	Runtime days/month	Runtime hrs/day	Downtime hrs	Total runtime hrs/month	Average Inlet Pressure (mbg)	Average Flow Rate (m^3/hr)	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
January	M	31	24.0	0.0	744	-10	450	38.80	24.00	2.00	99.9	129,772	88,717
February	M	28	24.0	0.0	672	-10	500	27.70	23.00	2.00	99.9	92,979	63,564
March	E	31	24.0	0.0	744	-10	450	30.00	24.00	2.00	99.9	100,340	68,596
April	M	30	24.0	0.0	720	-10	400	30.60	20.00	6.00	99.9	88,040	60,187
May	M	31	24.0	0.0	744	-10	585	25.00	24.00	4.00	99.9	108,701	74,312
June	M	30	24.0	0.0	720	-10	460	28.00	22.40	2.90	99.9	92,643	63,334
July	E	31	24.0	0.0	744	-10	460	28.00	22.00	2.90	99.9	95,731	65,445
August	M	31	22.0	2.0	680	-10	450	20.00	18.70	6.80	99.9	61,139	41,797
September	M	30	24.0	0.0	720	-10	410	20.00	14.50	6.00	99.9	58,981	40,321
October	M	31	24.0	0.0	744	-10	420	29.00	20.00	6.90	99.9	90,529	61,889
November	M	30	24.0	0.0	720	-10	410	28.00	21.00	5.70	99.9	82,573	56,450
December	M	31	24.0	0.0	744	-10	430	31.00	21.00	7.00	99.9	99,076	67,732
Total					8,696							1,100,504	752,344

Please note: Only fill the "Yearly" table if data is not availabe or cannot be calculated nor estimated on a monthly basis

Yearly	Method M/C/E	Runtime days/year	Runtime hrs/day	Downtime hrs	Total runtime hrs/year	Average Inlet Pressure (mbg)	Average Flow Rate m^3/hr	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
2010	Select				0						99.9	0	0