# Wexford County Council

## Holmestown Waste Management Facility
## W0191-02

**Annual Environmental Report 2014**

# Quality Control Sheet

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# EXECUTIVE SUMMARY

This *Annual Environmental Report* has been prepared for Holmestown Waste Management Facility, Waste Licence W0191-02, for the reporting period from **1 January 2014 to 31 December 2014 inclusive**. The report includes the information specified in Schedule H of the Waste Licence, Content of the Annual Environmental Report, in accordance with Waste Licensing - *Draft Guidance on Environmental Management Systems (EMS) and Reporting to the Agency, 1999'.* The main topics discussed within this report are as follows: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

The waste management facility commenced accepting waste on 29 April 2008 in the northern end of the landfill, namely Cells 3 + 4 in Phase 1, being used first. The waste management facility temporarily ceased accepting waste on 21st May 2012. No waste has been accepted for landfilling at the facility since then. Therefore, the total quantity of waste accepted for landfill at the facility for the reporting period 1st January to 31st December 2014 was 0 tonnes.

An environmental management system was prepared for Holmestown Waste Management Facility in October 2008 consisting of the following elements:

- Schedule of Environmental Objectives and Targets
- Environmental Management Plan
- Corrective Action Procedures
- Awareness and Training Programme

A number of objectives and targets were developed for the facility which are reviewed and updated where appropriate on an annual basis.

The majority of engineering works associated with the general development of the site including the preparation of Phase 1, Cells 1-4, were completed from 2006-2008. The installation of the twin gas lines from phase 1 to the enclosed gas flare and other minor operational works were completed in 2009.

The enclosed flare was commissioned in August 2009 and put into permanent operation in September 2009. Horizontal and vertical gas management infrastructure has been installed in cells 1, 2, 3, and 4. The volumes of landfill gas extracted varied from 165 $m^3$/hr to 86 $m^3$/hr during the reporting period. Gas extraction rates were optimised in 2014 to minimise odours. The gas quality remained varied during the reporting period with $CH_4$ values of approx. 22.2% up to 35.6%.

The construction of the Phase 2 landfill cells commenced in June 2010 and was completed in December 2010.

The Phase 2 landfill footprint encompasses approximately 17,500 $m^2$. Lining of the cells involved the placing of approximately 16,600 $m^3$ of engineered clay and the laying and welding of approximately 17,500 $m^2$ of HDPE liner. A 500 mm stone drainage blanket was laid on the cell floors with a protective geotextile placed on the cell side slopes.

Wexford County Council carried out a comprehensive environmental monitoring programme during 2014 in compliance with the waste licence conditions. The monitoring programme incorporated Landfill Gas, Leachate Level & Quality, Surface Water Quality, Groundwater Level & Quality, Noise, Dust, Odour, Meteorological and topographical surveys. Results to date suggest that there is no notable pollution from operational activities.

There were a number of recurring category 3 incidents in 2014. These were related to:

- peripheral gas wells;
- groundwater monitoring;
- noise.

The elevated gas and groundwater results were detected pre-landfilling and are not related to site operations. Reports to date have summarised that the elevated results recorded are due to naturally occurring elements in the site soils.

The elevated noise readings were also not attributed to site operations. Noise reports commented that all the elevated readings were caused by either the N25 or local noises in close proximity to the sampling device (e.g. tractor passing, dog barking etc.).

Reports have been submitted to the EPA that review peripheral gas, groundwater and surface water pond results and provide proposals for control and trigger levels where applicable.

No complaints were received by WCC or the EPA during this reporting period.

There were two incidents related to escape of leachate during 2014 as follows:

- February 12th – overspill of leachate from tanks at leachate treatment plant.
- November 14th – overspill of leachate from Cell 1

Both incidents were reported by WCC to the EPA. Both were of short duration (<2 hours) and volumes of leachate released were small (<20$m^3$).

# Contents Page


Annual Environmental Report 2014 1

**EXECUTIVE SUMMARY 3**

**1 INTRODUCTION 3**

1.1 General Information 3

1.2 Site information 3

**2 MANAGEMENT & STAFFING STRUCTURE 4**

2.1 Management and staffing structure for Holmestown Waste Management Facility 4

2.2 Financial provisions 5

2.3 Review of Environmental Liabilities 5

2.4 Environmental Management System 6

**3 REPORTED INCIDENTS & COMPLAINTS SUMMARIES 14**

3.1 Incidents 14

3.2 Complaints 15

**4 DEVELOPMENT WORKS UNDERTAKEN DURING THE REPORTING PERIOD & THOSE PROPOSED FOR THE COMING YEAR 16**

4.1 Landfill Engineering Works 16

4.2 Restoration and Aftercare 17

**5 WASTE ACCEPTANCE & HANDLING 19**

5.1 Waste Activities carried out at the Facility 19

5.2 Waste Acceptance and Handling Procedures 19

5.3 Waste Deposition 19

5.4 Total quantity of wastes accepted on site 19

5.5 Total Quantity of Waste Consigned Off Site 19

5.6 Remaining capacity of the site 21

5.7 Area occupied by waste 21

**6 EMISSIONS MANAGEMENT 22**

6.1 Landfill Gas Management 22

6.2 Leachate, Groundwater and Surface Water Management 22

**7 ENVIRONMENTAL NUISANCES 27**

7.1 Review of environmental nuisance control at the facility for the reporting period 27

**8 RESOURCE & ENERGY CONSUMPTION 29**

8.1 Electricity and Energy Usage 29

8.2 Water 29

8.3 Diesel 29

**9 EMISSIONS & ENVIRONMENTAL MONITORING SUMMARY 30**

9.1 Emissions and environmental monitoring 30

9.2 Monitoring 31

9.3 Emissions Monitoring: 31

9.4 Environmental Monitoring 34

## APPENDICES

A. PRTR 2014

B. Staff Training

C. Monitoring Results and Graphs

D. Meteorological Data Graphs

E. Summary of waste accepted and consigned off-site

F. Water Balance Calculation Spreadsheet

G. Drawings

H. Bund Integrity Testing Reports

# 1 INTRODUCTION

## 1.1 General Information

The Annual Environmental Report (AER) for Holmestown Waste Management Facility includes as a minimum the information specified in Schedule H of the Waste Licence W0191-2, *Content of Annual Environmental Report.*

The AER 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'* and further guidance provided on the EPA website. This document is the sixth AER prepared for the site.

The reporting period for this AER is **1 January 2014 to 31 December 2014 inclusive**.

## 1.2 Site information

**Table 1 Site information on Holmestown Waste Management Facility**

| HOLMESTOWN WASTE MANAGEMENT FACILITY | |
|---|---|
| Waste licence register no: | W0191-02 (revised date 24/03/2010) |
| Name and address of operator: | Wexford County Council<br>County Hall<br>Carricklawn,<br>Wexford. |
| Name and address of facility: | Holmestown Waste Management Facility<br>Barntown<br>Wexford |
| Site Description: | Holmestown Waste Management Facility is located within the town lands of Holmestown Great, Glenduff, Bolgerstown, Muchwood and Ballyeaton, approximately 8 kilometres west from Wexford Town (National Grid Reference 2973, 1230). The site which lies to the north of the N25, Wexford to New Ross road comprises an area of approximately 63 hectares of which 15 hectares will be used for landfilling and is situated within a mixed forested plantation of mainly coniferous trees known as Holmestown Wood.<br>The property is bounded by agricultural lands to the North, South, East and West. The land use in the surrounding area is good quality grazing and is intensely farmed to the west, north and east by dairy and livestock farmers. There are a number of dwellings surrounding the site including farmhouses, residences and a nursing home. The site is within the catchment of the Slaney River, and a number of small streams drain the site to the Slaney, less than 2km away. A site location map is provided as **Appendix G.** |

# 2 MANAGEMENT & STAFFING STRUCTURE

## 2.1 Management and staffing structure for Holmestown Waste Management Facility

**Management Structure for Holmestown Waste Management Facility on 31st December 2014**

The Holmestown waste management facility was operated by Wexford County Council during 2014 with consultancy support provided by sub consultants including Fehily Timoney & Company, Irish Biotech Services and Odour monitoring Ireland. Details of the management structure during the reporting period for the facility are provided above.

## 2.2 Financial provisions

In accordance with Condition 12.1 Wexford County Council paid a sum of €13,095.60 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 Holmestown Waste Management Facility. WCC has assigned a full time permanent engineer for the management of 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 Holmestown Landfill for the duration of the Waste Licence, and has made financial provision as presented in the Environmental Liabilities Risk Assessment (see 2.3 below).

### 2.2.2 Community Support and Development

An environmental monitoring committee (EMC) was established in July 2005 and includes two members of the Barntown Environmental Alliance, two elected members of Wexford County Council and two Wexford County Council officials. The Committee meets periodically – less frequently than when the landfill was fully operational. A community support and development fund has been set up by Wexford County Council.

## 2.3 Review of Environmental Liabilities

Condition 12.2.2 states the licensee shall arrange for the completion of a Environmental Liabilities Risk Assessment (ELRA) to address the liabilities from past and present activities. WCC engaged the services of Fehily Timoney and Company, consulting engineers, to undertake this assessment. The ELRA was completed in July 2013 and issued to the EPA via the Eden system.

In September 2014, the EPA responded to seek submission of an updated ELRA and CRAMP to take account of their newly published guidelines ‘’*Guidance on Assessing and Costing Environmental Liabilities 2014’’*. WCC submitted the revised ELRA in December 2014 and the revised CRAMP in January 2015. WCC submitted a further revision of the ELRA in March 2015 to correct some earlier minor discrepancies.

The ELRA approach is a standard risk assessment that involves the assessment of the likelihood of occurrence of an event in combination with the consequences of that event. This is followed by the costing of the plausible worst case scenario for the purposes of informing the level of financial provision (cover) necessary. The projected worst-case scenario for Holmestown is landfill fire. Cosst associated with such an event are estimated at **€671,440 (excluding VAT).**

## 2.4 Environmental Management System

Condition 2.3 requires the licensee to establish and maintain an Environmental Management System (EMS) at the facility. The site environmental management system was prepared in October 2008 and revised in 2010. The EMS consists of the following elements:

- Schedule of Environmental Objectives and Targets
- Environmental Management Plan
- Corrective Action procedures
- Awareness and training Programme

### 2.4.1 *Environmental Objectives & Targets – Progress*

The Environmental Objectives and Targets for the period January 2014 to December 2014 and details of progress made regarding each objective are detailed in Table 2 and 3 hereafter. In summary the objectives and targets established include the following;

- Objective No 1: Operate facility in accordance with the conditions of the waste licence and promote continual environmental improvement
- Objective No 2: Improve Environmental Performance of the facility by maintaining a comprehensive monitoring regime
- Objective No 3: Progress implementation of polluter-pays principle at the civic amenity
- Objective No 4: Enhance protections to groundwater

### 2.4.2 *Environmental Management Plan*

An environmental management plan (EMP) was prepared and as part of the EMS in October 2008 and reviewed in January 2010. The EMP comprises information on the following topics:

- Site description
- Site infrastructure
- Types of waste accepted on site
- Civic amenity 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 and litter control
- Fires
- Restoration and Aftercare

### 2.4.3 *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 and included in the overall EMS report.

### 2.4.4 *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 Holmestown waste management facility. 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. A training schedule summarizing staff training proposals for 2014 is included in Appendix B.

**Table 2 Achievement of Objectives and Targets for 2014**

| Achievement of Objectives and Targets for 2014 | | | |
|---|---|---|---|
| | **Comments** | **Target** | **Progress** |
| **Objective No 1: Operate facility in accordance with the conditions of the waste licence and promote continual environmental improvement** | | | |
| 1.1 To re-commence landfill activity without any undue increase in nuisance or environmental impact | This will require strict compliance with the conditions of the waste licence | December 2014 | None. Landfilling did not recommence in 2014. |
| **Objective No 2: Improve environmental performance of the facility by maintaining a comprehensive monitoring regime** | | | |
| 2.1 Regularly review environmental monitoring data and monitor changes in trends | Conduct monitoring, as a minimum in accordance with the waste licence<br>Maintain trend analysis graphs for 2014, interrogate and interpet this data.<br>Make improvements where the need is identified | December 2014 | Ongoing. No required improvements identified. |
| **Objective No 3: Increase the scope of service at the civic amenity** | | | |
| 3.1 Commence acceptance of source segregated food waste in accordance with the Household Food Waste Regulations | 140L wheelie bins to be provided for patron disposal of food waste to minimise odour nuisance. Food waste taken off site to compost facility for recovery. Advertise on website, local press, local radio | January 2014 | Complete |

| Achievement of Objectives and Targets for 2014 | | | |
|---|---|---|---|
| | **Comments** | **Target** | **Progress** |
| 3.2 Commence acceptance of garden waste | Obtain prices from contractors. Agree schedule of charges.<br>Advertise on website, local press, local radio | April 2014 | Complete |
| 3.3 Commence acceptance of waste paint | Obtain prices from contractors. Agree schedule of charges.<br>Advertise on website, local press, local radio | June 2014 | Complete |
| **Objective No 4: Reduce leachate generation in phase 1** | | | |
| 4.1 Enhance run-off of clean surface water from Cells 1 and 2 | To reduce leachate generation, run-off needs to be shed to outside the Cell 1 containment berm. This will be done using proprietary artificial lining materials. | June 2014 | None. |
| **Objective No 5: To commence discharge of pre-treated leachate to sewer** | | | |
| 5.1 This will displace current tankering of leachate to Wexford WWTP, which is environmentally costly from a CO2 perspective | The pipeline will be re-tested to ensure integrity prior to commissioning. | Q1 2014 | Complete (as of January 2015) |

**Table 3 Objectives and Targets for 2015**

| Objectives and Targets for 2015 | | | |
|---|---|---|---|
| | **Comments** | **Target** | **Responsibility** |
| **Objective No 1: Operate facility in accordance with the conditions of the waste licence and promote continual environmental improvement** | | | |
| 1.1 To prevent recurrence of leachate-related incidents that occurred during 2014 | • Ensure strict controls are in place if pumps are operated in manual mode<br>• New off-site pumping arrangement increases our capacity to manage leachate volumes. We can use auxiliary tinkering if necessary.<br>• We will install larger capacity pumps in cel lrisers | Continuous | Facility Manager |
| **Objective No 2: Improve environmental performance of the facility by maintaining a comprehensive monitoring regime** | | | |
| 2.1 Regularly review environmental monitoring data and monitor changes in trends | Conduct monitoring, as a minimum in accordance with the waste licence<br>Maintain trend analysis graphs for 2014, interrogate and interpet this data.<br>Make improvements where the need is identified | December 2015 | Facility Technician & Manager |
| **Objective No 3: Progress implementation of polluter-pays principle at the civic amenity** | | | |

| Objectives and Targets for 2015 | | | |
|---|---|---|---|
| | **Comments** | **Target** | **Responsibility** |
| 3.1 Start planning for introduction of payu-by-weight for residual waste in 2016 | Need to devise new entry control, weighing system, payment system and data management system | December 2015 | Facility Supervisor & Manager |
| **Objective No 4: Enhance Protections to Groundwater** | | | |
| 4.1 Complete Groundwater Technical Assessment and Implement any Recommendations Therein | Recommendations to be advised under separate cover to this AER | December 2015 | Facility Manager & technician |

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

During the reporting period January – December 2014 no new site procedures were developed at the facility. All procedures are kept on file at the site office and all staff are made fully aware of new/revised procedures as they are developed. The procedures developed for the site are as follows:

- HWMF001 Waste Acceptance Procedure rev.2
- HWMF002 Waste Handling Procedure
- HWMF003 Communications Procedure
- HWMF004 Environmental Records Procedure
- HWMF005 Corrective Action Procedure
- HWMF006 Leachate Handling Procedure
- HWMF007 Emergency Response Procedures
- HWMF008 Firewater Risk Retention assessment
- HWMF009 Entering onto private property procedure
- HWMF010 Civic Amenity procedures
- HWMF011 Weighbridge procedures
- HWMF012 Fire Evacuation - Emergency Procedure
- HWMF013 Accident and reporting procedure

### 2.4.6 *Report on communication programme*

In accordance with Condition 2.4.1 of the waste licence a communications programme has been developed at the facility. An environmental monitoring committee convenes periodically to discuss a range of matters relating to the management and operation of the waste management facility. In addition Wexford County Council provides the following documentation for public access at the site office and at Wexford County Hall:

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

| List of records available for public access |
|---|
| Waste Licence W00191-2 |
| Waste Licence application |
| Correspondence with the EPA |
| Incident / complaints records |
| Audit records |
| Waste acceptance records |
| Rejected waste records |
| All monitoring records |

| |
|---|
| Surface water inspection forms |
| Leachate removal records |
| Bird / vermin control reports |

# 3 REPORTED INCIDENTS & COMPLAINTS SUMMARIES

## 3.1 Incidents

A recurring category 3 incident which was initially reported to the EPA on 11 January 2008 relating to the detection of carbon dioxide and methane gas at a number of gas monitoring boreholes continued to be in exceedence of its trigger level during the period January to December 2014.

Monitoring of gas wells was carried out between September 2007 and March 2008. Naturally occurring methane and carbon dioxide were regularly detected in a number of boreholes located outside the perimeter of the constructed lined cells during routine monitoring on site prior to waste acceptance. As a means of investigating these recurring gas levels the EPA requested that an investigation be carried out on site, this was undertaken between March and April 2008.

The investigation found existing levels of naturally occurring methane and carbon dioxide in the area as a result of the breakdown of organic material in the soil. An assessment was carried out and the risk associated with naturally occurring methane and carbon dioxide on the site was deemed not to be significant due to the underlying geology of the area. The presence of clay which has a low permeability acts as a natural containment material preventing gas from travelling through the ground for any considerable distance. The cells are also fully lined with a double liner system consisting of a geocomposite liner on top of an engineered clay liner. A number of recommendations were made to monitor and manage the landfill in the absence of perimeter gas wells through maintaining a negative pressure within the waste body. Two reports were submitted to the EPA during April and December 2008 entitled:

- Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill – Risk Assessment and Recommendations. (Revision 1)

- Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill – Risk Assessment and Recommendations – Trace Gas Analysis. (Revision 2)

A review of the peripheral gas borehole results as recommended in previous reports has been completed. The review incorporates all results to the end of 2009. This report will form the basis for future works/monitoring

Another recurring category 3 incident was the exceedence of trigger levels for groundwater boreholes. Results were outside Interim Guideline Values in a number of the on-site groundwater boreholes tested. The elevated values date back to pre-landfilling and have been recorded both upstream and downstream of the landfill footprint. Similar to gas readings the elevated results are prevalent downstream in the north east corner where the bulk of the on site excavation works were carried out and appear to be due to a non-landfill source in the soil. The main soil mass is low permeability clay with sand and gravel lenses. Groundwater movement in the soil zone is relatively slow resulting in low flows. This enables emissions to build up locally around a source as appears to be indicated from the results.

Subsequent to ongoing interim trigger level exceedences, a report reviewing all groundwater data to the end of 2009 was completed and submitted to the EPA.

Exceedences of noise trigger levels were also noted during the reporting period. The excessive noise was attributed to traffic on the N25 roadway or local noise sources (dogs barking etc.) during monitoring for all the monitoring locations that tested above the licence limit.

On 13/2/14 a Category 2 incident was notified to the agency because of a release of leachate to ground. Due to a computer fault on the day caused apparently by severe weather, our leachate treatment plant was out of operation. Leachate cell pumps were switched to manual operation, pumping to tanks at the leachate treatment plant. Leachate was being drawn from these tanks by tanker to Drinagh WWTP. These tanks overflowed resulting in a release to ground of leachate. The incident was first noted at 14:50. The incident ended at c.16:00. The estimated volume of leachate released is estimated at between 10 – 20$m^3$.

On 14/11/14 a Category 2 incident was notified to the agency because Cell 1 leachate levels rose following severe rainfall event resulting in a minor overspill to surface water. The overspill was first noticed at 1230. The event ceased at 1320.

It is unlikely that the release commenced very long before 1230. The landfill manager came on the scene c. 1245 and observed weir flow of barely perceptible depth over a weir width of approximately 0.5m. This flow increased marginally to a weir width of c. 600mm over a flow depth of perhaps 10mm during 35mm of observation, prior to the incident ending. So, the volume of release was clearly increasing with time - working backwards, it would seem that the release can only have commenced relatively shortly before it was actually noticed.

We have run a calculation based on weir depth 100m and width 600mm for 1 hour and calculate a release volume of 7.2$m^3$.

## 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

Condition 3.1 of the licence states that the licensee shall establish all infrastructure referred to in the licence prior to the commencement of the licensed activities or as required by the waste licence. In accordance with Condition 3.2 proposals for all Specified Engineering Works reports (SEW's) have been submitted to the Agency for approval. A list of these reports to date is as follows. Due to a numbering error SEW No. 7 was omitted i.e. next report after SEW No. 6 is in fact SEW No. 8.

- SEW Report No. 1: Development of the facility including preparatory works and lining – October 2005
- SEW Report No. 2: Installation of the Civic Amenity Facility – October 2005
- SEW Report No. 3: Installation of the Landfill Gas System – October 2005
- SEW Report No. 3A: Installation of the Landfill Gas System (Revised) – September 2007
- SEW Report No. 4: Installation of the Leachate Management System – October 2005
- SEW Report No. 5: Installation of the Groundwater Control Infrastructure – October 2005
- SEW Report No. 6 Installation of the Surface Water Management Infrastructure – October 2005
- SEW Report No. 8: Installation of Clay Liner – February 2007
- SEW Report No. 9: Access to Additional Cells – July 2008
- SEW Report No. 10: Landfill Cell Development Phase 2 – April 2009

### 4.1.1 *Completed Engineering Works to end of 2014*

The majority of engineering works associated with the general development of the site including the preparation of Phase 1, Cells 1-4, were completed during 2006 and 2007. During the latter part of 2008 engineering works associated with the completion of contract 3 and snagging works were completed. During 2009 the installation of the twin gas lines from phase 1 to the enclosed gas flare and other minor operational works was completed. Landfill Cell Development Phase 2 commenced in June 2010 and was completed in December 2010.

A description of minor engineering works completed at Holmestown Waste Management facility during 2014 is as follows:

**Table 5 Summary of Engineering Works 2014**

| Start Date | Development Works |
|---|---|
| October | ○ Maintenance works to site roads |

### 4.1.2 *Proposed Engineering Works 2015*

A description of engineering works proposed at Holmestown Waste Management Facility for 2015 is as follows:

**Table 6 Summary of Proposed Engineering Works 2015**

| Start Date | Development Works |
|---|---|
| August | ○ Maintenance works to site roads |
| September | ○ Maintenance works to drains/channels |

## 4.2 Restoration and Aftercare

No permanent capping works were carried out on site during 2014.

# 5 WASTE ACCEPTANCE & HANDLING

## 5.1 Waste Activities carried out at the Facility

In accordance with Schedule A of the Licence, Holmestown Waste Management facility is licensed to accept 80,000 Tonnes of waste per annum. This includes 55,000 Tonnes of non-hazardous household and commercial waste, 5,000 Tonnes of waste for composting, 8,000 Tonnes of construction and demolition waste for recovery and 12,000 Tonnes of household and commercial waste for recovery.

Both waste recovery and disposal operations took place on site at Holmestown Waste Management facility during 2014.

## 5.2 Waste Acceptance and Handling Procedures

Holmestown Waste Management facility opened in April of 2008, as a replacement landfill for Killurin which ceased accepting waste on site at the end of June 2008. The facility temporarily stopped accepting waste on 21st May 2012. Waste has been placed in cells 1, 2, 3 & 4 of Phase 1 which is at the northern end of the landfill footprint.

## 5.3 Waste Deposition

As the facility temporarily stopped accepting waste on 21st May 2012 no Waste was brought to the active tipping face during the reporting period.

All waste consigned off-site during 2014 was disposed of to facilities licensed or permitted to accept or treat that waste. Transport of waste was carried out in accordance with the *Waste Management (Collection Permit) Regulations, SI 820 of 2007, and Amendment Regulations, SI 87 of 2008* as appropriate.

## 5.4 Total quantity of wastes accepted on site

As the facility temporarily stopped accepting waste on 21st May 2012 no waste was accepted for landfill at the facility for the reporting period 1st January to 31st December 2014

## 5.5 Total Quantity of Waste Consigned Off Site

The total quantity of waste consigned off site at Holmestown Waste Management facility for the reporting period 1st January to 31st December 2014 was 1729Tonnes.

A summary of the total quantity of waste consigned off site for the reporting period is presented below in Appendix E

The total volume of leachate sent off site for treatment at Wexford Wastewater Treatment Works was 20,984 tonnes.

## 5.6 Remaining capacity of the site

The most recent void calculation indicates a remaining landfill capacity of approximately 1.1million tonnes remaining for waste, net of allowances for cover.

## 5.7 Area occupied by waste

A topographical survey completed in March 2011 showed the area of waste present within Cells 1, 2, 3 and 4 to be 18,132m$^2$. The overall area where waste will be land filled is approximately 15.2 ha (152,000 m$^2$).

# 6 Emissions Management

## 6.1 Landfill Gas Management

The installation of the landfill gas control system is an ongoing process and will develop further as each of the cells is filled with waste. Horizontal and vertical infrastructure is placed concurrent with waste. The pipe work systems are then connected to a 500$m^3$ enclosed gas flare. The enclosed flare was commissioned in August 2009 and put into permanent operation in September 2009 replacing the temporary open flare with carbon filter which operated from January to August 2009.

More detailed information on the landfill gas extraction system installed to date on site can be found in the following report which can also be viewed on file in the site office:

- *SEW Report No. 3A: Installation of the Landfill Gas System (Revised) which was submitted to the EPA in September 2007*

### 6.1.1 *Estimated annual and cumulative quantities of landfill gas emitted from the site.*

The volumes of landfill gas extracted varied from 165$M^3$/hr to 86$M^3$/hr during the reporting period. Gas extraction rates have been maximised to minimise odours. The gas quality varied during the reporting period from 22.2% $CH_4$ up to 35.6% $CH_4$. The total volume of CH4 flared off on site during 2014 was 178,587 $m^3$ recorded by SCADA system The cumulative volume from commencement of flaring to the end of 2014 was 2,873,678 $m^3$

We have installed infrastructure in accordance with best practice to ensure that gas capture is maximised. We are confident from the absence of odour in and around the site and by maintaining a negative pressure in the landfill that gas capture at HWMF is satisfactory.

## 6.2 Leachate, Groundwater and Surface Water Management

### 6.2.1 *Leachate*

Leachate is generated by incident rainfall seeping into the landfill and becoming contaminated by contact with the waste product, and by the decomposition of the waste itself. Other potential sources of leachate generation, such as groundwater and surface water ingress are prevented from entering the waste fill areas through a number of site specific engineering works.

Leachate from Cells 1, 2, 3 & 4 is pumped directly to the leachate treatment plant using the in-cell submersible pumps. A road tanker then removes the treated leachate from the leachate treatment plant balancing tank to Wexford Town Wastewater Treatment Plant for final treatment and disposal. It should be noted that occasionally, during periods of persistent heavy rainfall, it becomes necessary to remove untreated leachate from site by tanker.

The on-site leachate treatment plant was commissioned during 2009 and began to accept leachate directly from Phase 1 for treatment. The treatment plant provides a capacity of approximately 1200 $m^3$, equivalent to a process retention time of 15 days at the maximum flow (average estimate is 50$m^3$ per day, estimated peak flow is 80$m^3$ per day). The plant comprises of the following main elements, together with ancillary pipe work to convey the leachate between tanks:

- 2 x Sequencing batch reactor (SBR);
- Treated leachate balance tank (TLBT);
- Raw leachate feed pump;
- Venturi aerators;
- Decant pump;
- Final discharge pump;
- Alkali dosing facilities; and
- Nutrient dosing facilities.

Monthly volumes of leachate tankered off site are presented in Table 7 below.

**Table 7 Leachate volumes removed from site in 2014**

| Month | Volume ($m^3$) |
|---|---|
| January | 2,672 |
| February | 3,088 |
| March | 2,139 |
| April | 1,123 |
| May | 1,007 |
| June | 293 |
| July | 279 |
| August | 1,306 |
| September | 176 |
| October | 1,525 |
| November | 5,899 |
| December | 1,477 |
| **Total** | **20,984** |

Integrity testing of leachate storage tanks in the leachate treatment plant was carried out during July 2014. The tests were carried out in accordance with the procedure described in the *Civil Engineering specification for the Water Industry (CESWI).* All tanks assessed passed the integrity test. These tanks are due for retesting during 2017. The fuel and the waste recycling bunded storage areas were tested in October 2014 in accordance with section 9.2 of BS 8007:1987. Both bunded storage area tanks passed the integrity test and are due for retesting in 2017.

### 6.2.2 *Groundwater*

Condition 3.10 of the licence states that effective groundwater management infrastructure shall be provided and maintained at the facility during construction, operation, restoration and aftercare of the facility. As a minimum, the infrastructure is required to be capable of the following:

- Protection of groundwater resources from pollution by the waste activities
- Protection of other infrastructure, such as the liner; from any adverse effects caused by groundwater.

At Holmestown Waste Management facility the cell formation levels have been designed so that the formation levels will be a minimum of 2m above the expected winter water-table levels. The nature of the excavation elsewhere on site is shallow so groundwater is not expected to be encountered.

Groundwater resources are protected from waste related pollution by the construction of a quality-assured composite lining system, which comprise the following:

- 1,000 mm compacted engineered clay with hydraulic conductivity (k) ≤ 1 x $10^{-9}$ m/sec; overlain by
- 2 mm fully-welded HDPE liner.

Leachate arising from waste activities is contained within the landfill by the lined system and conveyed to the on-site leachate treatment plant via sealed pipe systems. Treated leachate is currently tankered off site to Wexford Town Wastewater Treatment Plant for final treatment and disposal Effluent will eventually be removed from site via a pumped rising main to Wexford Wastewater Treatment Plant as outlined in *Specified Engineering Works Report No. 4*. There is no discharge to groundwater from any aspect of the landfill development.

Foul water drains to a proprietary wastewater treatment plant on site. Effluent from the wastewater treatment plant discharges to the leachate treatment plant.

### 6.2.3 *Surface Water*

In accordance with the licence conditions (condition 3.10); surface water is collected on site via a network of drains, and is fed into the surface water collection pond to the north of the site at SWP1. The water settles in the pond and is then released to a petrol interceptor tank via SWP2. From there the surface water flows in an easterly direction to the stream on the east of the site, and enters the stream at SW4.

The following describes the various aspects of surface water collection systems:

- All clean surface water from paved roads and roofed areas on site drains into the constructed surface water drainage system and drains to the surface water pond via carrier pipes and open channels.

- Dirty surface run-off from the civic amenity area is collected in gullies, and drains and diverted to the leachate treatment plant via a splitter chamber and carrier pipe.

- Surface water run-off from the screening berm at the north end of the site is collected by a number of embankment swales and directed to the surface water pond.

- Surface water in constructed landfill cells in which the filling with waste has not yet commenced is pumped to the surface water pond.

The surface water pond located to the north east of the landfill is lined with a 1 m thick layer of clay, engineered to ensure a maximum permeability of 1 x $10^{-9}$ m/sec. The pond is designed to attenuate peak flows up to a 1 in 100 year return period, and to fully contain peak flows up to a 1 in 5 year return period. The pond is designed to cater for the worst case scenarios during the lifetime of the entire landfill. The allowable discharge from the pond has been reduced below baseline flow levels in order to enable water settlement and achieve suspended solids content less than 25 mg/l.

### 6.2.4 *Water Balance Calculations*

The objective of water balance calculations is to understand and predict and reconcile the liquid inputs and outputs of the facility. In order to predict the approximate leachate volumes which would be generated on-site, water balance calculations have been calculated for the period 1st January 2014 to 31st December 2014 to estimate the approximate volume of leachate that were generated during the reported period. This volume can then be compared to the volume of leachate leaving site, by tanker over the weighbridge.

The water balance addressed the volume of leachate generated at the site including the estimated annual infiltration of rainfall. The water balance methodology is described below and the calculation is shown in Appendix F.

The water balance calculations are based on the methodology specified in the EPA's Landfill Site Design Manual. The calculation used is as follows: -

Lo = [ER(A) + LW + IRCA +ER(I)] – [aw]

Lo = leachate produced (m3)

ER = effective rainfall (m) (Use actual rainfall (R) for active cells)

A = area of cell ($m^2$)

LW = liquid waste ($m^3$)

IRCA = infiltration through restored and capped areas (m)

I = surface area of lagoon ($m^2$)

a = absorptive capacity of new waste ($m^3$/t)

w = weight of waste deposited (t/a)

An absorptive capacity of 0.025 $m^3$ per tonne was assumed.

The meteorological data used was obtained from the nearby Met Eireann meteorological station at Johnstown Castle. The total rainfall from 1st January 2014 to the 31st December 2014 was approximately 1155 mm. Meteorological data is presented in Appendix D.

Phase 1 (18,700$m^2$) was the only part of the landfill contributing to leachate generation in 2014. The entire Phase 1 area is covered with a temporary cap. An 89% infiltration rate was used in the 2014 AER for temporary restored areas. Given that no fresh waste was emplaced during 2014, the absorptive capacity of waste was ignored.

In addition, the water balance takes account of other 'dirty' areas of the site that drain to the leachate treatment plant, namely the weighbridges, wheelwash, waste inspection/quarantine bays and the leachate treatment plant pavement. We have also made an adjustment to the leachate quantity tankered off-site to take account of wastewater generated on site by facility staff.

The estimated volume of leachate generated for the period 1$^{st}$ January 2014 to the 31$^{st}$ December 2014 is 20,927$m^3$ (a calculation summary is included in Appendix F). During the same period 21,108 $m^3$ of leachate (adjusted to 20,988$m^3$ when wastewater is deducted) was removed from the site for treatment in the waste water treatment plant at Wexford. A monthly breakdown of leachate volumes removed is presented in Table 7 above.

It should be noted that we have increased the infiltration rate through the temporary cap on Phase 1 from 72% to 89% for this calculation. This 'infiltration rate' is in fact an estimate of what water gets to the cell floor, whether by percolation through the waste, or by surface run-off from sidelopes and cell slopes to the cell floor. This infiltration rate is an average calculation over a full year and, for a temporary cap, will depend on rainfall distribution. Heavy storm events in winter time will yield proportionately higher volumes of leachate than the same events in summertime. However, given the artificial nature of a landfill layout, it is not appropriate to take account of this by strictly applying 'effective rainfall' to a temporary capped area, as it does not act precisely like an open water body or grassland. Total rainfall for 2014 was approximately 31% higher than for 2013 – yet leachate volumes were approximately 59% higher. We estimate that this occurred because the additional rainfall fell mostly in wintertime, when saturated surface conditions resulted in more surface water being shed directly to the cell floor, with no opportunity for evapotranspiration. Hence – the actual 'infiltration rate' of the temporary cap increased. In fact, when effective rainfall for the two full years is compared, effective rainfall for 2014 was 86% higher than for 2013.

# 7 ENVIRONMENTAL NUISANCES

## 7.1 Review of environmental nuisance control at the facility for the reporting period

Condition 8.15 of the Waste Licence states that the licensee will inspect the facility and its immediate surrounds for nuisances caused by litter, vermin, birds, flies, mud, dust and odours. Nuisances at Holmestown Waste Management facility are logged in a weekly tick-box report and action is taken immediately to address any identified issues. Table 8 below summarises the measures implemented on site to combat environmental nuisances during 2014.

Condition 7.3 of the Waste Licence states that litter fencing shall be installed and maintained around the perimeter of the active tipping area prior to the disposal of waste in any cells and that all litter control infrastructure shall be inspected on a daily basis. A litter fence was maintained around Cells 1, 2, 3 & 4 during the filling period. The litter control infrastructure was inspected on a daily basis and any defects remedied immediately. Any loose litter or other litter identified on site is removed and disposed of in an appropriate manner and all vehicles delivering waste to or removing waste from Holmestown Waste Management facility are appropriately covered.

**Table 8 Environmental Nuisance Control 2014**

| Nuisance | Mitigation Measures in Place |
|---|---|
| Vermin | *Pestguard.* 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 site office. |
| Litter | Daily litter picking and litter inspections are carried out as CA site. Inspection log kept at site office. Litter fencing has been erected around Cells 1, 2, 3 & 4. Permanent litter fencing was erected around Phase 2 |
| Flies | *Pestguard* employed to control flies. If flies present then treated through spraying. Reports kept in site office. |
| Odour | Fixed monitoring points established on site and monitored as required. Odour inspections adhere to recommendations from the Office of Environmental Enforcement's method of assessment of odours. |

Condition 11.5 of the licence states that prior to the commencement of waste disposal, the licensee shall submit to the Agency for its agreement a proposal for the control and eradication of vermin and fly infestations at the facility.
A number of proposals were produced by Wexford County Council during 2008 and submitted to the Agency for approval. These proposals have since been approved and implemented on site in order to address the issue of nuisance monitoring as follows:

- Control and eradication of vermin and fly infestation proposal.
- Odour monitoring proposal

Copies of both proposals and associated correspondence with the Agency are kept on file at the site office.

# 8 RESOURCE & ENERGY CONSUMPTION

## 8.1 Electricity and Energy Usage

Electricity usage for the reporting period was estimated at 241,188 kWh. The administration building at Holmestown has been designed with energy efficiency in mind. The following is a list of energy saving mechanisms that have been implemented:

- Control of internal lighting based on occupancy and the level of available natural light.
- Hot water heated by a combination of wood chip boiler and highly efficient vacuum tube solar panels
- Under floor heating system and wood chip boiler providing all heat for administration building
- Mechanical heat recovery unit which uses exhaust warm air to heat cold air coming into the building
- Rainwater harvester in operation to collect water from building roof for reuse in toilets
- Building management system monitors the temperature in each room and controls
- Integral mini wind turbine and solar panel power each light column in operation in the car park area.
- A wind turbine was constructed on site in October 2009. This is located south east of the Administration Building and provides power to the building.

## 8.2 Water

No water was used on the landfill site. As there was no water meter installed in the site office to date to monitor water intake, no domestic water usage data is available. A rainwater harvester is in operation to supply water for sanitary use.

## 8.3 Diesel

Total diesel fuel consumption is estimated to be 500 litres from 1st January to 31st December 2014.

# 9 EMISSIONS & ENVIRONMENTAL MONITORING SUMMARY

## 9.1 Emissions and environmental monitoring

A summary of licence requirements for environmental monitoring, as carried out at Holmestown Landfill during this reporting period (January 2014 – December 2014), is presented in Table 9 below. A plan showing the location of all monitoring points is included in Appendix G.

All industries have to annually report environmental emissions and waste transfer data through a web-based form as part of their AER. 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. The PRTR 2014 document is included in Appendix A.

**Table 9 A summary of emissions & environmental monitoring as specified in W0191-2**

| **Emissions Monitoring** | **Frequency** |
|---|---|
| **Landfill Gas**<br>Flare | Continuously/Annually |
| **Leachate**<br>Leachate Treatment Plant | Continuously/Quarterly/Annually |
| **Surface Water**<br>Pond | Continuously/Quarterly/Annually |
| **Environmental Monitoring** | **Frequency** |
| **Landfill Gas**<br>Site Office<br>Gas migration monitoring Boreholes<br>Gas field Balancing | Continuously<br>Monthly<br>Monthly/as required |
| **Leachate**<br>Leachate levels<br>Visual, odour and temperature<br>Leachate analysis | Continuous<br>Quarterly<br>Annual |
| **Surface water** | Quarterly / Annual |
| **Groundwater Levels** | Monthly |
| **Groundwater** | Quarterly / Annual |
| **Noise** | Quarterly |
| **Dust** | Tri-Annually and Annually |
| **Environmental Monitoring** | **Frequency** |
| **Odour** | Daily/Weekly/As required |

## 9.2 Monitoring

Wexford County Council carries out a comprehensive monitoring programme, in compliance with the waste licence conditions. The monitoring programme includes Landfill Gas, Leachate Level & Quality, Surface Water Quality, Groundwater Level & Quality, Noise, Dust, Odour, Meteorological and Topographical surveys.

Results are interpreted using either pre-defined emission limits or in the case of more variable systems such as water bodies by comparison with pre-operational (baseline) trends. Licence Monitoring at HWMF follows the principles set out in the following:

- 1999/31/EC. *Council Directive on the Landfill of Waste.* Official Journal of European Communities.
- Campbell, R. et al. (2003), *Landfill Manuals: Landfill Monitoring, 2nd Edition.* EPA.

There are emission limits in the license for gas, noise and dust parameters. Trigger Levels (based on monitoring data) have also been set for emissions from the storm water attenuation pond and selected groundwater parameters. Control Rule principles as referred to in the Landfill Directive have been established for groundwater monitoring and will be revised as more data is collected. In accordance with the Licence/best practice we measure a number of additional parameters to supplement emission limit/trigger level data. All the data measured is reviewed and utilised for interpretation where applicable.

Monitoring during this reporting period was carried out according to Schedule D of Waste Licence W191-02. Monitoring for 2014 is summarised in this section.

## 9.3 Emissions Monitoring:

### 9.3.1 *Landfill Gas Flare*

One enclosed type flare (in accordance with Section 3.14.1.of the licence) is in operation at HWMF. The flare was commissioned in August 2009. The flare is located at the eastern side of the facility adjacent to the Leachate Treatment Plant. The flare is connected to the active cells via a 355mm OD PE pipe that runs both over and underground. The flares maximum operating capacity is 500$m^3$/hr and it is set to burn at >1000 degrees C. The retention time for the flare is 0.5 sec. The main components of the flare include:

- Control valves;
- Knock out Pot with filter;
- Flame arresters;
- Gas booster (variable speed motor)
- Sampling equipment for both influent bulk gases and emissions;
- Temperature control by thermocouple and louvers;
- Human Machine Interface;
- Call out System.
- Connection to SCADA

Emission limit values for landfill gas plant are set out in Schedule C.6 of our License and are summarized in the Table 10 below.

**Table 10 Flare Emission Limits**

| Parameter | Flare Enclosed Emission Limit Value[Note 1] | Utilisation Plant Emission Limit Value[Note 1] |
|---|---|---|
| Nitrogen oxides ($NO_x$) | 150mg/$m^3$ | 500mg/$m^3$ |
| CO | 50mg/$m^3$ | 50mg/$m^3$ |
| Particulates | n/a | 130mg/$m^3$ |
| Total Organic carbon (TOC) | 10mg/$m^3$ | 10mg/$m^3$ |

**Note1:** Dry gas referenced to 5% oxygen by volume for utilisation plants and 3% oxygen by volume for flares.

The operation of the flare unit is continuously monitored and recorded by the SCADA system. A call out system is linked to the SCADA which notifies WCC staff via text message if the preset control limits are breached. The SCADA is linked to the Administration Building and the internet. Flare performance is monitored by staff on an ongoing basis.

## Flare emission results

A flare emission test was carried out in accordance with specified requirements on the flare unit in June 2014 AXIS environmental services Ltd. The report concluded that CO, NOx, as $NO_2$ and TOC in the landfill flare exhaust stack were within the emission limit values specified in Schedule C6 of Waste Licence W00191-02. The full report will be submitted to the EPA as part of the Annual Results Report under separate cover.

### 9.3.2 *Leachate Treatment Plant*

Emission limit values for leachate discharged to sewer are set out in Schedule C.7 of our License and are summarized in the Table 11 below.

**Table 11 Emission Limits for Leachate Being Discharged to Sewer**

*Emission Point Reference: LTP3*

*Volume to be emitted: Maximum in one day 80$m^3$*

| Parameter | Emission Limit Value |
|---|---|
| | Daily Mean Concentration (mg/l) |
| BOD | 200 |
| COD | 750 |
| Ammoniacal Nitrogen ($NH_{4+}N$) | 10 |
| Nitrate Nitrogen | 1500 |
| Alkalinity | 1000 |
| Dissolved Methane | 0.2 |

Monitoring frequency and analysis techniques for emissions to sewer are set out in Table D.8.1 of the licence.

## Leachate treatment plant results

The on site Leachate Treatment Plant was commissioned in 2009. All leachate following pre treatment (in accordance with section 5.12.4 of the Licence) was tankered off-site for final treatment at Wexford Wastewater Treatment Plant. It is noted that the Leachate Treatment Plant was fully compliant with the emission limits throughout 2014.

It should be noted that, occasionally, during periods of persistent heavy rainfall, it is necessary to tanker untreated leachate off site to Wexford WWTP for treatment. As this leachate is not being discharged to sewer, this leachate has not been assessed for compliance with the licence limits, although by its nature, this tends to be relatively weak leachate due to dilution.

### 9.3.3 *Surface Water Pond*

Two sampling points SWP1 and SWP2 are located on the inlet and outlet of the attenuation pond respectfully. Schedule C4 of the Licence sets discharge limits for the level of suspended solids from the outlet (SWP2) of the attenuation pond. The discharge limit is detailed in Table 12 below.

**Table 12 Surface Water Discharge Limit.**

*Measured at the outlet of the surface water pond (SWP2).*

| Level (Suspended Solids mg/l) |
|---|
| 25 |

In accordance with sections 3.22.1(c) and 6.5.3 of the Licence monitoring of surface water entering and discharging from the attenuation pond is ongoing. Proposals have been submitted to the Agency detailing criteria/trigger levels that determine when the outlet from the pond shall be closed. The pond outlet will close automatically if the trigger levels at the inlet (SWP1) are breached. The parameters monitored include conductivity, pH and TOC. Trigger levels have been set and are summarised in Table 13 below.

**Table 13 Trigger Levels for the Attenuation Pond.**

| Monitoring Point | pH | | Electrical Conductivity | TOC |
|---|---|---|---|---|
| | Upper | Lower | | |
| | pH | | uS/cm | mg/l |
| SWP1 | 9.5 | 6.5 | 875 | 25 |

The trigger level review recommends that TOC trigger levels are set at 25mg/l. For full details of attenuation pond trigger levels see report as follows:

- Fehily Timoney and Company (September 2010). Trigger Levels for Surface Water Retention Pond.

In addition Section 3.22.1 of the Licence requires levels in the surface water retention pond, flows to perimeter streams and quality of the surface water at the inlet to the surface water lagoons and being discharged to the perimeter streams to be recorded on telemetry. Similar to the pond inlet (and in addition to quarterly environmental monitoring) pH, electrical conductivity and TOC are being recorded continuously at the outlet (SWP2). A SCADA monitoring / control system is operational and can be accessed in the Administration Building on site. Discharges from the pond to the surface water stream were manually controlled, grab samples, SCADA data and visual inspection are used to ascertain optimum release conditions.

In 2014 flows to the pond were limited to:

- main access road drainage from the entrance gate to the head of the western track;
- Water pumped from waste free cells in Phase 2
- Clean run-off from the civic amenity and maintenance areas

All dirty run-off (including dirty run off from the civic amenity site and waste acceptance/quarantine areas) is directed to the LTP for pre-treatment in accordance with the Licence and then removed by tanker off-site to Wexford Waste Water Treatment Plant.

### Surface water pond emission results

Surface water results for the watercourses in and around the site were satisfactory. An elevated ammonia level was recorded in Quarter 3 at the outlet from the surface water pond, field notes record that the sample was taken from stagnant water and not from the actual outlet pipe.

## 9.4 Environmental Monitoring

### 9.4.1 *Landfill Gas*

Gas sampling was carried out on site prior to construction. Initially groundwater wells were sampled until gas wells were installed around the proposed landfill footprint. Pre-construction results showed elevated levels of carbon dioxide at a number of locations. One elevated methane reading was recorded. The majority of the pre-construction gas wells were in filled during the construction phase. Peripheral landfill monitoring boreholes GS11-GS17 (as detailed in Schedule D, Table D1.1, of our Licence) were installed in conjunction with Phase 1 of the landfill cells. Prior to landfilling high naturally occurring Methane and Carbon Dioxide levels were measured in these boreholes and an investigation was carried out at the request of the Agency. The high readings are all concentrated in the north east corner of the facility where the bulk of the excavation work was carried out. As part of the investigation nine additional boreholes (GW2-GW10) were installed. Subsequent reports noted the elevated levels of carbon dioxide and methane pre-construction and summarized that *'It is likely therefore that when fill material was placed on top of this virgin ground, it acted like a semi-impermeable blanket, inhibiting venting of gases and causing a build up of gas in the ground.'*

The reports recommended that for a two year period monitoring is carried out at all boreholes at intervals not exceeding one month. Additionally, vertical and horizontal gas extraction pipes are monitored (at weekly intervals approx.) to assess pressures

within the waste body to ensure that negative pressures are maintained. For full details of the investigation into the naturally occurring gases see reports as follows:

- Fehily Timoney and Company (April 2008). Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill. Risk Assessment and Recommendations, Rev 1;
- Fehily Timoney and Company (December 2008). Investigation of Naturally Occurring Background Gas Levels at Holmestown Landfill. Trace Gas Analysis, Rev 2;

In accordance with Section 3.24.1 (b) of the Licence, landfill gas is monitored continuously in all site buildings. WCC have also installed Gas monitoring equipment in two local dwellings at the owner's request.

To allow for settlement gas sampling points within the waste will be installed when the landfill cap is completed. As noted above monitoring of the in-cell gas infrastructure is ongoing.

Landfill gas concentration limits measured in any service duct or manhole on, at or immediately adjacent to the facility and/or at any other point located outside the body of the waste are set out in Schedule C.2 of our License and are summarized in the Table 14 below.

**Table 14 Landfill Gas Concentration Limits**

| Methane | Carbon Dioxide |
|---|---|
| 20% LEL (1% v/v) | 1.5% v/v |

A summary of gas monitoring points is included in Table 15 below.

**Table 15 Gas Environmental Monitoring Points**

| List of landfill gas monitoring points for 2014 | |
|---|---|
| **Points** | **Description** |
| (GS6 to GS10 baseline pre land filling monitoring)GS11, GS12, GS13, GS14, GS15, GS16, GS17 | Perimeter gas migration monitoring wells |
| GB1, GB2, GB3, GB4 | Gas monitoring points in buildings |
| GW2 East west, GW3 East west, GW4 North south, GW5, GW6, GW7, GW8, GW9 East west, GW10 | Gas investigation wells (Installed March/April 2008) |
| Waste cells | All vertical extraction wells in Phase 1. |

## Landfill gas results

Methane and Carbon Dioxide levels remain elevated in a number of the perimeter

monitoring wells. Elevated readings were initially recorded before landfilling operations commenced with Borehole GS13 consistently recording the highest readings with methane levels as high as 54% (Jun.2014). The elevated readings are concentrated along the north east periphery of the phase 1 landfill footprint where the bulk of the excavation work was carried out.

Methane and carbon dioxide results for the peripheral gas boreholes have tended to fluctuate dramatically. The results on average, however, indicate that the level and location of gas release has not varied significantly since the pre-landfilling stage (Q1, 2008) and contamination from the landfill cell is not suspected.

Three boreholes GS17, GW5 and GW10 have not exceeded trigger levels to date. GW5 and GW10 are located in virgin ground and GS17 is the most southerly borehole on the eastern perimeter of Phase 1.

Elevated results were also recorded pre and post landfilling operations for groundwater in the north east corner.

Plots detailing trends for Methane and Carbon Dioxide (licenced emission limit parameters) for the peripheral boreholes GS11-GS17 are included in Appendix C.

Gas has not been detected in any of the site buildings.

A report to review of the peripheral gas borehole results were submitted to the EPA in 2010.The review incorporates all results to the end of 2009.

### 9.4.2 *Flare.*

See section 9.3.1 for general information on the flare. Landfill gas utilisation plant/enclosed flare parameters and monitoring frequency are set out in Table D.7.1 of our License. The enclosed flare parameters, monitoring frequency and analysis method are summarized in Table 16 below.

**Table 16 Flare Parameters and Monitoring Frequency**

| Parameter | Flare (enclosed) | Analysis |
|---|---|---|
| | **Monitoring Frequency** | **Method / Technique** |
| **Inlet** | | |
| Methane ($CH_4$)%v/v | Continuous | Infrared analyser |
| Carbon dioxide ($CO_2$)%v/v | Continuous | Infrared analyser |
| Oxygen ($O_2$)%v/v | Continuous | Electrochemical |
| Total Sulphur | Annually | Ion chromatography |
| **Process Parameters** | | |
| Combustion Temperature | Continuous | Temperature Probe / Data logger |

The results of parameters which are monitored continuously are transferred and stored on the SCADA system.

In addition, regular monitoring of inlet gas is carried out as part of the gas field balancing procedure. The equipment used for the detection and quantification of landfill gas is a GA2000 – ATEX Certified Gas Analyser.

The operation of the flare unit is continuously monitored and recorded by the SCADA system. A call out system is linked to the SCADA which notifies WCC staff via text message if preset control limits are breached.

## Flare results

The reporting element of the SCADA system was commissioned in 2010. Daily on site inspections were also carried out the results have shown that the flare has operated satisfactorily since it was commissioned.

A backup data logging system was commissioned at the flare in February 2010. Data is downloaded from the backup data logger quarterly and maybe utilised for future reports if required.

### 9.4.3 *Leachate*

See section 6.2.1 for general information on the Leachate Treatment Plant. Seven leachate sampling locations have been established and maintained as detailed in Schedule D, Table D1.1, of the license. Three points LTP-1, LTP-2 and LTP-3 are located within the leachate treatment compound. The remainder of the monitoring points (L1, L2, L3 & L4) are located in the corresponding waste cells. In accordance with our licence, leachate levels are continuously monitored and are recorded on the SCADA system. Leachate levels for the landfill cells are maintained at 1.0m over the top of the liner at the base of the landfill in accordance with section 5.12.2 of our licence.

Leachate parameters and monitoring frequency are set out in Tables D.5.1 of the License. Continuous and quarterly monitored leachate parameters, monitoring frequency and analysis method are summarized in Table 17 below.

**Table 17 Leachate Parameters and Monitoring Frequency**

| Parameter | Flare (enclosed) | Analysis |
|---|---|---|
| | **Monitoring Frequency** | **Method / Technique** |
| **On-site Leachate** | | |
| Visual | Quarterly | Visual |
| Odour | Quarterly | Olfactory |
| Leachate Level | Continuous | Pressure transducer |
| Temperature. | Quarterly | Thermometer |

Visual, odour and temperature inspections are carried out by site staff. Visual and odour assessment are based on visual and olfactory scales respectively. In cell leachate level is controlled and monitored by a combination of pumps, pressure probes and the SCADA system.

## Leachate results

No significant visual, odour or temperature change was noted in 2014. Leachate levels in the landfill cells is maintained at <1.0m above the liner at the base of the landfill.

Annual leachate quality was sampled in July 2014 in accordance with Table D5.1 of the Licence. The annual leachate quality report is submitted under separate cover in accordance with schedule F of the licence.

### 9.4.4 *Surface Water*

Eleven surface water sampling locations have been established and maintained as detailed in Schedule 4, Table D1.1, of the license. Two points SW4 and SW5 are located downstream of Phase 1 of the landfill. Nine are located on watercourses upstream: SW1; SW2, SW2A; SW3; SW3A; SW6; SW7; SW8; SW9 of current operations. There are two principal surface water streams one flowing from SW9 to SW5 and another from SW2 to SW5. Each is made up from a number of smaller streams and drainage ditches. These combine to the north east of the site and flow east, north east towards the river Slaney. Monitoring point SW5 is located downstream of the main junction of these streams. The northern edge of the landfill is 1.8km approx. from the River Slaney. The first surface water samples were collected in 2002. Pre-construction and pre-landfilling results are utilised as baseline data for comparison as required.

The objective of environmental monitoring is to screen for environmental pollution due to facility operations. Surface water bodies within and downstream of the facility are at risk. The relevant monitoring points are SW4 & SW5 (both downstream of the main operational areas), SWP1 & SWP2 (the attenuation pond monitoring points) and to a lesser extent SW1, SW2, SW2A, SW3, SW3A, and SW6 which are also on the Holmestown site but are upstream of all major activities. The other monitoring locations (SW7, SW8 & SW9) are upstream and offsite and their results are only interpreted if an influence in onsite streams is suspected. Surface water monitoring locations are summarized in Table 18 below.

**Table 18 Surface Water monitoring locations**

| Surface water monitoring locations | |
|---|---|
| Surface water monitoring point | SW1, SW2, SW2a, SW3, SW4, SW5, SW6, SW7, SW8, SW9 |

The parameters tested in this report (in accordance with Table D.5.1 of the license) are as follows: Ammoniacal Nitrogen; Electrical Conductivity; Chloride; Dissolved Oxygen; Temperature; Ph; BOD; COD; Total Suspended Solids (TSS); Visual Inspection/Odour (weekly)

## Surface water results

A visual inspection of each of the surface water monitoring locations was carried out on a weekly basis during 2014 as per licence requirements. The visual inspection and surface water quality results for 2014 did not indicate pollution from facility activities.

A number of elevated COD and BOD readings were recorded in Q1 2014 and were consistent at both upstream and downstream sampling locations, the monitoring campaign was carried out following prolonged rainfall. The elevated readings do not appear to be linked to HWMF activities.

The annual suite of surface water monitoring which includes a more comprehensive list of chemical parameters compared to the quarterly groundwater monitoring suite was carried out in July 2014 at all surface water monitoring locations as per Schedule D. The test results suggest that no pollution is entering the surface water from the landfill. The annual surface water analysis report is submitted under a separate cover in accordance with Schedule F of the licence.

### 9.4.5 *Surface water Biological Survey*

A biological survey of the surface water streams surrounding Holmestown Waste Management Facility was carried out on 26th June 2014. A total of 4 locations were selected for monitoring as follows:

- KS01 Upstream SE of facility within the site boundary – Un-named stream
- KS02 Downstream NE of the facility within the site boundary – Un-named stream
- KS03 Downstream of the facility within the site boundary – Polehore stream
- KS04 Upstream of the facility within the site boundary – Polehore stream

The overall quality of the un-named stream upstream of the facility was determined to be slightly polluted and rated as Q3-Q4 at KS01, the overall quality of the un-named stream downstream of the facility was determined to be slightly polluted and rated as Q3-4 at KS02 using the EPA Q-value rating system. The overall quality of the Polehore stream upstream and downstream of the facility was determined to be slightly polluted and rated as Q3-4 using the EPA Q-value rating system. There were no signs of animal access to the streams at any of the monitoring locations. There was no noticeable difference in water quality between upstream and downstream locations. All surface water biological monitoring locations are shown in Appendix G. A copy of the biological monitoring report is kept on file at the site office and can be viewed upon request.

### 9.4.6 *Surface water pond quality: SWP1 – SWP2*

For general details on the pond see section 9.3.3 above. SWP1 and SWP2 are also monitored as part of the quarterly monitoring suite (see section 9.3.3 above). Elevated ammonia level 43.81mg/l was recorded in Q3, 2014 at SWP2 field notes record that the sample was taken from stagnant water and not from the actual pond outlet pipe.Slightly elevated ammonia readings were recorded in the past at SWP1 & SWP2.The elevated levels are kept under review and the suspected source is from neighbouring agricultural lands. Surface water results for the watercourses in and around the site were satisfactory..

### 9.4.7 *Groundwater*

Groundwater monitoring was carried out at a total of 7 on-site and 11 off-site private well locations on a quarterly basis as detailed in Schedule D of the waste licence.

Appendix G shows the location of all groundwater monitoring locations on site. Groundwater monitoring locations are summarized in Table 19 below.

**Table 19 Groundwater Monitoring Locations**

| Groundwater Monitoring Locations | |
|---|---|
| Existing Groundwater Monitoring Wells | BH1, BH2, BH3, BH6, BH7, BH8, BH9. |
| Private well monitoring points | PW1, PW2, PW2A, PW2B, PW5, PW7, PW8, PW9, PW10, PW11, PW11A. |

In accordance with section 6.4.2 of the Licence a report was previously submitted to the Agency detailing proposals for trigger levels for Groundwater results. Three parameters were selected based on suitability: Ammoniacal Nitrogen; Conductivity and Chloride. The trigger levels are summarised in Table 20 below.

**Table 20 Trigger Levels for Groundwater.**

| Trigger level | | | |
|---|---|---|---|
| **Units** | **Ammoniacal nitrogen mg/l** | **Electrical Conductivity µS/cm** | **Chloride Mg/l** |
| BH 1 | 0.2 | 1,890 | 126 |
| BH 2 Note 1 | 66.0 | 2,633 | 163 |
| BH 3 | 0.2 | 613 | 59 |
| BH 6 | 0.1 | 917 | 211 |
| BH 7 Note 2 | Note 2 | Note 2 | Note 2 |
| BH 8 | 1.6 | 835 | 59 |
| BH 9 Note 1 | 1.3 | 1,629 | 46 |

Note 1 = Down gradient groundwater borehole
Note 2 = BH7 has been dry during post waste monitoring

The trigger level report (in accordance with the Landfill Directive) proposes Control Rule principles for groundwater management at HWMF. The Control Rule principal involves the establishment of Control Levels and Trigger Levels. A Control Level is set as an indicator of possible environmental pollution. A Trigger Level is defined as the level at which significant adverse environmental effects have occurred. Control Levels are used to instigate review/remediation works prior to significant environmental pollution taking place. For full details on the Control Levels and the Trigger Levels for groundwater see report as follows:

- Fehily Timoney and Company (September 2010). Groundwater Monitoring Trigger Levels.

## Groundwater results

Elevated levels were recorded in a number of the on-site groundwater boreholes tested. The elevated levels date back to pre-landfilling and have been recorded both upstream and downstream of the landfill footprint. Similar to gas readings the

elevated results are prevalent downstream in the north east corner where the bulk of the on site excavation works were carried out and appear to be due to a non-landfill source in the soil. Elevated ammonia and chloride levels were recorded in 2014, based on borehole locations and trends the elevated ammonia and chloride do not appear to be related to HWMF activities. The main soil mass is low permeability clay with sand and gravel lenses. Groundwater movement in the soil zone is relatively slow resulting in low flows. This enables emissions to build up locally around a source as appears to be indicated from the results.

Monitoring of groundwater levels was carried out at each of the on-site locations on a quarterly basis with the use of a dip meter. Groundwater levels remained relatively consistent throughout the monitoring period, with only minor variations in groundwater levels recorded in accordance with prevailing weather conditions.

Monitoring results were not available for BH7 or BH8 during 2014 as the wells were found to be dry at time of sampling.
Historical trend graphs of groundwater trigger levels (ammoniacal nitrogen, conductivity and chloride) are included in Appendix C

A total of eleven private wells are monitored around the facility. A review of private well results is considered outside the scope of standard reporting. The results will be utilised for more rigorous reviews if required. See quarterly reports for results.

The annual suite of groundwater monitoring which includes a more comprehensive list of chemical parameters compared to the quarterly groundwater monitoring suite was carried out in July 2014 at all borehole and private well monitoring locations as per Schedule D. The test results suggest that no pollution is entering the groundwater from the landfill. The annual groundwater analysis report is submitted under separate cover in accordance with Schedule F of the licence.

### 9.4.8 *Noise*

Ten potentially noise sensitive locations are sampled at HWMF on a quarterly basis in accordance with Table D.1.1 of the Licence and amendments thereof. Emission limit values for noise are set out in Schedule C.1 of our License and are summarized in the Table 21 below.

**Table 21 Noise Emission Limits**

| Day Db(A)$L_{Aeq}$(*30*[1] minutes) | Night Db(A)$L_{Aeq}$(*30*[1] minutes) |
|---|---|
| 55 | 45 |

1. *Duration amended to 30mins in accordance with Table D.4.1 of the licence and current standard practice.*

Noise monitoring frequency and technique are summarized Table 22 below.

**Table 22 Noise Monitoring: Frequency and Technique**

| Parameter | Monitoring Frequency | Analysis Method/Technique |
|---|---|---|
| **$L(A)E_Q$ [30 minutes]** | Quarterly | Standard[Note1] |

| Parameter | Monitoring Frequency | Analysis Method/Technique |
|---|---|---|
| **$L(A)_{10}$ [30 minutes]** | Quarterly | Standard[Note1] |
| **$L(A)_{90}$ [30 minutes]** | Quarterly | Standard[Note1] |
| **Frequency Analysis *(U3* Octave band analysis)** | Quarterly | Standard[Note1] |

***Note 1:*** *"International Standards Organisation. ISO 1996. Acoustics- description and Measurement of Environmental noise. Parts 1, 2 and 3."*

Leq(t): is the continuous equivalent sound level over a specified time (t), where t represents a 30-minute period during this survey. This measure is used to give an indication of the average noise level over the specified time period.

L10 and L90: are both statistical noise levels. L10 Indicates that for 10% of the monitoring period, the sound levels were greater than the quoted value. L90 Indicates that for 90% of the monitoring period, the sound levels were greater than the quoted value. L10 is used to express event noise. L90 is used to express background noise, usually filtering out loud, intermittent interferences such as traffic noise.

## Noise results

A number of elevated noise monitoring results were noted for both day and night monitoring in 2014. The elevated noise levels have been attributed to external factors (e.g. N25, vehicles passing, dogs barking etc.) for the majority of the results recorded. No significant tonal noises were recorded. Historical trend graphs of noise results are included in Appendix C.

### 9.4.9 *Dust*

AXIS environmental services carried out dust monitoring at ten representative locations using Bergerhoff dust gauges on three separate occasions during 2014. Sampling results are provided in Appendix C. The location of all dust monitoring locations can be found in Appendix G.

- The dust deposition limit of 350 mg/$m^2$/day was not exceeded during 2014.
- For a number of samples (indicated NR in the tables in Appendix C), dust jars were contaminated with either bird droppings or excessive algal growth.

### 9.4.10 *$PM_{10}$ Monitoring*

$PM_{10}$ monitoring was carried out as per Licence condition D.3.1 over a 24 hour period from 24 to 25 July 2014. The $PM_{10}$ monitoring locations were the same locations used for the ambient dust monitoring. All results were noted to be below the trigger value of 50ug/m3 as specified in the waste licence. $PM_{10}$ monitoring results are included in Appendix C.

### 9.4.11 *Odour*

Odour monitoring was carried out at Holmestown waste facility during 2014 as per EPA Guidance. Five odour monitoring points previously agreed with the Agency were monitored and labelled OD1, OD2, OD3, OD4 and OD5. OD1 is located to the northeast of the landfill on a bordering farm property. OD2 is located on the landfill between the active tipping area and Holmestown Little Farm on the western boundary of the site. OD3 is located between the landfill and Bolgerstown Farm on the eastern boundary of the site OD4 is upwind of the landfill and OD5 is downwind of the landfill. Odour monitoring is based on a combination of odour persistence which is rated on a scale of 0 to 2 (0 = none, 1 = intermittent, 2 = persistent), and odour intensity which is rated on a scale of 0 to 4 (0 = none, 1 = faint, 2 = moderate, 3 = strong, 4 = very strong).

No odour persistence or intensity was recorded above 0 at anytime during 2014. No odour complaints were received during 2014. On a daily basis site personnel carry out a brief walkover of the site, to assess potential odour issues. If any odours are identified during the walkover measures are implemented to reduce or remove the source of the odour as soon as possible. Monthly odour monitoring is carried out at the five agreed points copies of all odour logs are kept on file at the site office and can be viewed upon request. Odour monitoring results for the reporting period are included in Appendix C.

### 9.4.12 *Bioaerosols*

Bioaerosols monitoring was not carried out on site at Holmestown during 2014. As per licence conditions bioaerosols monitoring is only required to be carried out upon commencement of composting operations on site. To date no composting of materials has taken place at Holmestown Waste Management facility.

### 9.4.13 *Meteorological monitoring*

All monitoring information was obtained from the weather station located at Johnstown Castle in Wexford; this station is within 10km of Holmestown Landfill site. A copy of the reports are available for review at the facility office. Meteorological graphs showing trends over time are available for review in Appendix D.

### 9.4.14 *Topographical Survey*

A topographical survey of the landfill cells was carried out in March 2014 and is included in Appendix G. Given that there was no landfilling carried out during the reporting period, a simple level survey was conducted for record purposes to monitor settlement and to check slope gradients.

It is difficult to make any predictions in relation to settlement by comparison to the 2012 AER survey; given that some landfilling (c. 3,000t) was carried out after that survey was conducted, prior to the landfill ceasing to accept waste. Some temporary capping works were also carried out post landfill cessation. However the 2014 survey will serve as a useful benchmark for future monitoring of landfill settlement.

# APPENDICES

# A. PRTR 2014

Guidance to completing the PRTR workbook

# AER Returns Workbook

Version 1.1.18

| | |
|---|---|
| **REFERENCE YEAR** | 2014 |

**1. FACILITY IDENTIFICATION**

| | |
|---|---|
| Parent Company Name | Wexford County Council |
| Facility Name | Holmestown Waste Management Facility |
| PRTR Identification Number | W0191 |
| Licence Number | W0191-02 |

Classes of Activity

| No. | class_name |
|---|---|
| - | Refer to PRTR class activities below |

| | |
|---|---|
| Address 1 | Barntown |
| Address 2 | Wexford |
| Address 3 | |
| Address 4 | |
| | |
| | Wexford |
| Country | Ireland |
| Coordinates of Location | -6.57278 52.35079 |
| River Basin District | IESE |
| NACE Code | 3821 |
| Main Economic Activity | Treatment and disposal of non-hazardous waste |
| **AER Returns Contact Name** | Sean Meyler |
| **AER Returns Contact Email Address** | sean.meyler@wexfordcoco.ie |
| **AER Returns Contact Position** | Facility Manager |
| **AER Returns Contact Telephone Number** | 053 9120922 |
| **AER Returns Contact Mobile Phone Number** | 087 6846089 |
| **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** | Holmestown landfill was temporarily closed throughout 2014, a recycling center attached to the facility was operational throughout 2014. The volumn of landfill gas generated and extracted reduced from 2013 levels. |
| **Web Address** | |

**2. PRTR CLASS ACTIVITIES**

| Activity Number | Activity Name |
|---|---|
| 5(d) | Landfills |
| 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? | |
| 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

## 4.1 RELEASES TO AIR

Link to previous years emissions data

### 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 |
| **01** | **Methane (CH4)** | C | ALT | Landgem | 235069.31 | 235069.31 | 0.0 | 0.0 |
| 08 | Nitrogen oxides (NOx/NO2) | M | EN 14792:2005 | | 144.576792 | 144.576792 | 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) | | | | 3.342816 | 3.342816 | 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:** Holmestown Waste Management Facility

| **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 pe site model) | 413656.0 | | | Landgem | N/A | |
| Methane flared | 178586.69 | | | Flare SCADA records | 500.0 | (Total Flaring Capacity) |
| Methane utilised in engine/s | 0.0 | | | | 0.0 | (Total Utilising Capacity) |
| Net methane emission (as reported in Sectio A above) | 235069.31 | | | | 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 | 13 02 08 | Yes | 4.2 | other engine, gear and lubricating oils | R9 | M | Weighed | Offsite in Ireland | Enva Environmental,084/1 | Clonman,Portlaoise,Co.Laoise ,.',Ireland | Enva Environmental,084/1,Clonman ,Poartlaoise,Co. Laoise,.',Ireland | Clonman,Poartlaoise,Co. Laoise,.',Ireland |
| Within the Country | 13 02 08 | Yes | 0.0 | other engine, gear and lubricating oils | R9 | M | Weighed | Offsite in Ireland | Greenstar,WCP/KK/054(A)10 8 | Ramstown Business Park,Gorey,Co.Wexford,.',Ireland | .',.',.',.',.',.',Ireland | .',.',.',.',Ireland |
| Within the Country | 15 01 02 | No | 67.58 | plastic packaging | R3 | M | Weighed | Offsite in Ireland | Greenstar,WCP/KK/054(A)10 8 | Ramstown Business Park,Gorey,Co.Wexford,.',Ireland | | |
| Within the Country | 15 01 04 | No | 2.15 | metallic packaging | R4 | M | Weighed | Offsite in Ireland | Rhab Glassco Ltd.,WP247/2006 | Unit 4 Osberstown Industrial Park,Caragh Road,Nass,Co.Kildare,Ireland | | |
| Within the Country | 15 01 05 | No | | composite packaging | R3 | M | Weighed | Offsite in Ireland | AES/GOFF Ltd.,W00229-01 | Kilrane,Rosslare,Co. Wexford,.',Ireland | | |
| Within the Country | 15 01 05 | No | 2.62 | composite packaging | R3 | M | Weighed | Offsite in Ireland | Greenstar,WCP/KK/054(A)10 8 | Ramstown Business Park,Gorey,Co.Wexford,.',Ireland | | |
| Within the Country | 15 01 07 | No | 56.88 | glass packaging | R3 | M | Weighed | Offsite in Ireland | Rhab Glassco Ltd.,WP247/2006 | Unit 4 Osberstown Industrial Park,Caragh Road,Nass,Co.Kildare,Ireland | | |
| Within the Country | 16 01 07 | Yes | 0.86 | oil filters | R9 | M | Weighed | Offsite in Ireland | Enva Environmental,084/1 | Clonman,Portlaoise,Co.Laoise ,.',Ireland | Enva Environmental,084/1,Clonman ,Poartlaoise,Co. Laoise,.',Ireland | Clonman,Poartlaoise,Co. Laoise,.',Ireland |
| Within the Country | 16 06 01 | Yes | | lead batteries | R4 | M | Weighed | Offsite in Ireland | Enva Environmental,084/1 | Clonman,Portlaoise,Co.Laoise ,.',Ireland | Enva Environmental,084/1,Clonman ,Poartlaoise,Co. Laoise,.',Ireland | Clonman,Poartlaoise,Co. Laoise,.',Ireland |
| Within the Country | 16 06 01 | Yes | 2.78 | lead batteries | R4 | M | Weighed | Offsite in Ireland | KMK,WCP-OW-08-0607-01 | Bettystown Cross,Bettystown ,Co.Meath,.',Ireland | KMK,WCP-OW-08-0607-01,Bettystown Cross,Bettystown ,Co. Meath,.',Ireland | Bettystown Cross,Bettystown ,Co. Meath,.',Ireland |
| Within the Country | 16 06 04 | No | 1.72 | alkaline batteries (except 16 06 03) | R4 | M | Weighed | Offsite in Ireland | The Recycling Village,WFP-LH-10-0010-01 | Unit 4 Tenure Business Park,Monasterboice,Drogheda ,Co.Louth,Ireland | | |
| Within the Country | 19 07 03 | No | 20984.03 | landfill leachate other than those mentioned in 19 07 02 | D9 | M | Weighed | Offsite in Ireland | Wexford Waste Water Treatment Plant,.' | Trinity Street,Wexford .',.',Ireland | | |
| Within the Country | 20 01 01 | No | | paper and cardboard | R3 | M | Weighed | Offsite in Ireland | AES/GOFF Ltd.,W00229-01 | Kilrane,Rosslare,Co. Wexford,.',Ireland | | |
| Within the Country | 20 01 01 | No | 131.4 | paper and cardboard | R3 | M | Weighed | Offsite in Ireland | Greenstar,WCP/KK/054(A)10 8 | Ramstown Business Park,Gorey,Co.Wexford,.',Ireland | | |
| Within the Country | 20 01 01 | No | 32.92 | paper and cardboard | R3 | M | Weighed | Offsite in Ireland | Recycling 2000,WP/06/06 | Drinagh Business Park,Rosslare Road,Wexford,Co.Wexford,Ireland | | |
| Within the Country | 20 01 01 | No | | paper and cardboard | R3 | M | Weighed | Offsite in Ireland | Greenstar,WCP/KK/054(A)10 8 | Ramstown Business Park,Gorey,Co.Wexford,.',Ireland | | |
| Within the Country | 20 01 11 | No | 11.41 | textiles | R3 | M | Weighed | Offsite in Ireland | Textiles Recycling Limited,WCP-DC-08-1225-01 | Glen Abby Complex,Belgard Road,Tallagh,Dublin 24,Ireland | | |
| Within the Country | 20 01 21 | Yes | 0.47 | fluorescent tubes and other mercury-containing waste | R5 | M | Weighed | Offsite in Ireland | KMK,WCP-OW-08-0607-01 | Bettystown Cross,Bettystown ,Co.Meath,.',Ireland | KMK,WCP-OW-08-0607-01,Bettystown Cross,Bettystown ,Co. Meath,.',Ireland | Bettystown Cross,Bettystown ,Co. Meath,.',Ireland |
| Within the Country | 20 01 25 | No | 0.2 | edible oil and fat | R9 | M | Weighed | Offsite in Ireland | Pure Oil,WCP-KK-10-557-01 | Ballyweather,Barntown,Co.Wexford,.',Ireland | | |
| Within the Country | 20 01 35 | Yes | 185.2 | discarded electrical and electronic equipment other than those mentioned in 20 01 21 and and 20 01 23 containing hazardous components | R5 | M | Weighed | Offsite in Ireland | The Recycling Village,WFP-LH-10-0010-01 | Unit 4 Tenure Business Park,Monasterboice,Drogheda ,Co.Louth,Ireland | The Recycling Village,WFP-LH-10-0010-01,Unit 4 Ternure Business Park,Monasterboice,Drogheda ,Co.Louth,Ireland | Unit 4 Ternure Business Park,Monasterboice,Drogheda ,Co.Louth,Ireland |
| Within the Country | 20 01 40 | No | | metals | R4 | M | Weighed | Offsite in Ireland | Wexford County Council,.' | Killurin Landfill,The Deeps,Killurin Landfill,Co.Wexford,Ireland | | |
| Within the Country | 20 01 40 | No | 123.46 | metals | R4 | M | Weighed | Offsite in Ireland | Greenstar,WCP/KK/054(A)10 8 | Ramstown Business Park,Gorey,Co.Wexford,.',Ireland | | |
| Within the Country | 20 03 01 | No | | mixed municipal waste | R3 | M | Weighed | Offsite in Ireland | AES/GOFF Ltd.,W00229-01 | Kilrane,Rosslare,Co. Wexford,.',Ireland | | |
| Within the Country | 20 03 01 | No | | mixed municipal waste | R3 | M | Weighed | Offsite in Ireland | Wexford County Council (kerb side recycling section),.' | Machinery Yard,Enniscorthy,Co.Wexford, .',Ireland | | |
| Within the Country | 20 03 01 | No | 1099.13 | mixed municipal waste | R3 | M | Weighed | Offsite in Ireland | Greenstar,WCP/KK/054(A)10 8 | Ramstown Business Park,Gorey,Co.Wexford,.',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
Link to Waste Guidance

# B. Staff Training

**Training Record 2013**
**HWMF W0191-2**
**Outdoor Staff**

| DESCRIPTION | Browne Barry | Browne Joseph | Byrne Billy | Byrne Noel | Byrne Peter | Courtney Billy | Dempsey Michael | Fenlon Myles | Hudson John | Kelly Eamonn | Nolan Larry | Walsh Nigel | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abrasive Wheels | 25/07/2014 | | 22/10/2014 | | | | | | 25/07/2014 | | | | Refresher required every 3 years. |
| | 25/07/2017 | | 22/10/2017 | | | | | | 25/07/2017 | | | | |
| Asbestos Awareness | 13/10/2012 | | 13/03/2012 | 13/03/2012 | 14/03/2012 | | | | 14/03/2012 | | | | |
| | | | | | | | 2015 | | | 2015 | | | |
| ATEX: Safety Awareness | 25/04/2014 | 25/04/2014 | 25/04/2014 | 25/04/2014 | 25/04/2014 | | | | 25/04/2014 | 25/04/2014 | 20/03/2011 | | Refresher required every 2 years. |
| | 25/04/2016 | 25/04/2016 | 25/04/2016 | 25/04/2016 | 25/04/2016 | | | | 25/04/2016 | 25/04/2016 | | | |
| Basic Road Strengthening | | | | | | | | | | | | 22/03/2007 | |
| Basic Surface Dressing | | | | | | | | | | | | 19/02/2007 | |
| Bin Lift | | 06/05/2010 | | 04/05/2010 | | | | | 29/04/2010 | | 28/04/2010 | | Refresher recommended every 2 years Refuse trucks no longer operated by WCC |
| | | 06/05/2012 | | 04/05/2012 | | | | | 29/04/2012 | | 28/04/2012 | | |
| Business (Honours)) | 01/09/2012 | | | | | | | | | | | | |
| Business (Bachelor of)) | 01/09/2011 | | | | | | | | | | | | |
| Business (Higher Cert) | 01/09/2009 | | | | | | | | | | | | |
| Certificate in Local Government Studies | | | 06/07/1905 | | | | | 01/11/2008 | | | | | |
| Childcare Safeguarding Awareness | 02/12/2014 | | | | | | | | | | | | |
| Chemical Safety (spraying) | | 12/09/2007 | | 12/09/2007 | | Mar. & May '12 | | Mar. & May '12 | | | | | |
| Chlorine Hazard Awareness | | | | | | 25/05/2009 | | | | | | | Check Refresher |
| Compactors & Balers (safe use) | | | | | | | | 01/10/2008 | | | | 01/10/2008 | Refresher recommended every 3 years |
| | | | | | | | | 01/10/2011 | | | | 01/10/2011 | |
| Computers (Introductory Level) | 01/09/2007 | | | | | | | | | | 20/10/2010 | | |
| Counter-Balance Fork Lift Training | Sep-13 | | | 23/10/2014 | | 13/11/2014 | 19/5/2014 | 30/09/2014 | | | | 16/07/2014 | Refresher required every 3 years. |
| | Sep-16 | | | 23/10/2017 | | 13/11/2017 | 19/05/2017 | 30/09/2017 | | | | 16/07/2017 | |
| CSCS Tickets -360 Excavator | | | | | | | | | | | | | |
| CSCS Tickets -Dumper (provisional) | 09/10/2012 | | | 09/10/2012 | | | | | 09/10/2012 | 26/07/2010 | 05/07/2010 | | Valid for 2 years |
| | 23/10/2014 | | | 23/10/2014 | | | | | 23/10/2014 | 26/07/2012 | 05/07/2012 | | |
| CSCS Tickets -HEALTH AND SAFETY AT ROADWORKS) | 06/11/2012 | | 06/11/2012 | 06/11/2012 | 06/11/2012 | | | | 06/11/2012 | 06/11/2012 | | | Refresher required every 5 years. |
| | 06/11/2017 | | 06/11/2017 | 06/11/2017 | 06/11/2017 | | | | 06/11/2017 | 06/11/2017 | | | |
| CSCS SLG at Roadworks Info update | | | | | | | | | 21/05/2014 | | | | Check Refresher |
| Customer Care inc Managing difficult and Aggressive Behavour | 17/10/2013 | 20/04/2012 | 16/10/2012 | 13/11/2012 | 17/05/2012 | 17/05/2012 | | 24/05/2012 | 17/10/2012 | 17/10/2012 | | 20/04/2012 | |
| | | | | | | | 2015 | | | | | | |
| Disability Awareness Training | | | | | | 23/05/2007 | | | | | | | |
| Driver CPC (module 1) | | | | | | 29/03/2011 | | | | | | | Module to be completed every 5 years. |
| Driver CPC (module 2) | | | | | | 09/09/2010 | | | | | | | Module to be completed every 5 years. |
| Driver CPC (module 3) | | | | | | 28/03/2012 | | | | | | | Module to be completed every 5 years. |
| | | | | | | 2017 | | | | | | | |
| Driver CPC (module 4) | | | | | | 11/02/2013 | | | | | | | Module to be completed every 5 years. |
| | | | | | | 2018 | | | | | | | |
| Driver CPC (module 5) | | | | | | 11/02/2014 | | | | | | | Module to be completed every 5 years. |
| | | | | | | 2019 | | | | | | | |
| E.C.D.L. Computer Course | | | 19/03/2003 | | | | | 20/09/2007 | | | | | |
| Energy Mapping | | | 13/10/2010 | | | | | | | | | | |
| Fas Waste Management Certificate | | | 07/06/2007 | | | | | | | | | | |
| Fas Waste Operatives Training Course | | | | | | | | | | 10/07/2007 | | | |
| Fas: Safe Pass | 14/10/2014 | 14/10/2014 | 14/10/2014 | 16/10/2012 | 04/02/2015 | 08/12/2014 | | 29/09/2011 | 19/02/2013 | 24/05/2012 | 27/05/2011 | 08/05/2013 | Refresher required every 4 years. |
| | 14/10/2018 | 14/10/2018 | 14/10/2018 | 16/10/2016 | 05/02/2019 | 08/12/2018 | | 29/09/2015 | 19/02/2017 | 24/05/2016 | 27/05/2015 | 08/05/2017 | |
| Safe Pass Alliance-Quarry & Mining | | | | | 30/08/2011 | | | | | | | | |
| Fire Extinguisher (certificate) | 12/05/2014 | 12/05/2014 | 12/05/2014 | 12/05/2014 | 12/05/2014 | 15/05/2012 | 12/05/2014 | 13/12/2011 | 05/07/2012 | 12/05/2014 | | 13/12/2011 | Refresher recommended every 3 years |
| | 12/05/2017 | 12/05/2017 | 12/05/2017 | 12/05/2017 | 12/05/2017 | 15/05/2015 | 12/05/2017 | 12/12/2014 | 05/07/2015 | 12/05/2017 | 20/07/2011 | 12/12/2014 | |
| Fire Warden | | | 06/12/2012 | 06/12/2012 | 04/12/2012 | | | 04/12/2012 | | | | 06/12/2012 | |
| | | | | | | 2015 | 2015 | | | | | | |
| First Aid Basic | | | 04/04/2007 | 04/04/2007 | | | | | | | | | |
| First Aid: Cardiac First Responder | 11/03/2011 | | | | | | | | | | | 23/03/2011 | Refresher required every 2 years. |
| First Aid: Heartsaver AED | | | 22/01/2010 | 22/01/2010 | | | | 17/09/2010 | | | | 23/03/2011 | Refresher required every 2 years. |
| | | | 22/01/2012 | 23/01/2012 | | | | 16/09/2012 | | | | | |
| First Aid: Occupational | 12/03/2013 | | 12/03/2013 | 25/05/2011 | 12/11/2013 | 12/11/2013 | 28/01/2015 | 12/11/2013 | 20/03/2013 | 20/03/2013 | | 29/01/2014 | Refresher required every 2 years. |
| | 12/03/2015 | | 12/03/2015 | 25/05/2013 | 12/11/2015 | 12/11/2015 | 28/01/2017 | 12/11/2015 | 20/03/2015 | 20/03/2015 | | 29/01/2016 | |
| Health & Safety for Road Workers | | | | | | | | | | | | 23/10/2007 | |
| Walk behind Lawnmower training | | | | | | | | Feb. 2013 | | | | Feb. 2013 | |
| I Map Training | | | 04/04/2013 | | 04/04/2013 | | | | | | | | |
| Ladder Awareness | 07/03/2013 | 07/03/2013 | 07/03/2013 | 13/03/2013 | 13/03/2013 | 06/03/2013 | 13/03/2013 | 24/02/2011 | 13/03/2013 | 07/03/2013 | | 22/02/2011 | |
| Landfill Gas Management | | | 15/05/2012 | | | | | | | | | | |
| Landfill Compactor (maintenance & safe use) | 04/04/2008 | | | | | | | | | 04/04/2008 | 15/12/2008 | | Refresher recommended every 3 years,Landfill Temp Closed Training not required |
| | 04/04/2011 | | | | | | | | | 04/04/2011 | 15/12/2011 | | |
| Life Jacket (Care & Use) | 11/11/2010 | 11/11/2010 | 11/11/2010 | 11/11/2010 | | | | | 11/11/2010 | 11/11/2010 | 31/03/2011 | | |
| Loading Shovel (maintenance & safe use) | 08/09/2014 | 08/09/2014 | 08/09/2014 | 08/09/2014 | 08/09/2014 | | | | 08/09/2014 | 08/09/2014 | 08/08/2011 | | Refresher recommended every 3 years |
| | 08/09/2017 | 08/09/2017 | 08/09/2017 | 08/09/2017 | 08/09/2017 | | | | 08/09/2017 | 08/09/2017 | 08/08/2014 | | |
| Manual Handling | 11/09/2014 | 16/07/2014 | 30/07/2014 | 23/07/2014 | 30/07/2014 | 16/11/2009 | 28/07/2014 | 31/07/2014 | 23/07/2014 | 11/09/2014 | 19/05/2010 | 31/07/2014 | Refresher recommended every 3 years |
| | 11/09/2017 | 16/07/2017 | 30/07/2017 | 23/07/2017 | 30/07/2017 | 16/11/2012 | 28/07/2017 | 31/07/2017 | 23/07/2017 | 11/09/2017 | 19/05/2013 | 31/07/2017 | |
| Operating Horticulture Equipment | 25/04/2013 | 25/04/2013 | 25/04/2013 | 25/04/2013 | 25/04/2013 | | | 25/04/2013 | | 25/04/2013 | | 25/04/2013 | |
| OHSAS 18001 Internal Auditor Training | | | | | 04/11/2013 | | | | | | | | |
| PE Pipe Welding | | | | | | | | | | | | | |
| PSDS & PSDP Training | | | 12/03/2009 | | | | | | | | | | |
| Quad Bike Training (safe use and operation) | 20/08/2012 | | 20/08/2012 | 20/08/2012 | 20/08/2012 | | | | | | | | |

**Training Record 2013**
**HWMF W0191-2**
**Outdoor Staff**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Refuse Trucks (Safe Use) Banksman** | 20/04/2010 | 20/04/2010 | 20/04/2010 | 20/04/2010 | | | | 20/04/2010 | 20/04/2010 | | 20/04/2010 | 27/04/2010 | Refresher recommended every 2 years |
| | 20/04/2012 | 20/04/2012 | 20/04/2012 | 20/04/2012 | | | | 20/04/2012 | 20/04/2012 | | 20/04/2012 | 27/04/2012 | |
| **Safety Awareness** | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Safety in Excavations** | | | 21/09/2010 | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Signing, Lighting & Guarding at Roadworks** | | | | | | | | | 06/10/2009 | | 06/10/2009 | 22/02/2007 | Refresher recommended every 5 years |
| | | | | | | | | | | | | | |
| | | | | | | | | | 06/10/2014 | | 06/10/2014 | 22/02/2012 | |
| **Statutory Inspections (Lifting Equipment)** | | | 15/05/2013 | | 15/05/2013 | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Supervising Safety** | | | 27/06/2011 | | | 04/11/2013 | | 04/11/2013 | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Telecopic Material Handling** | | | | | | 24/11/2005 | | | | | | | Refresher recommended every 5 years |
| | | | | | | | | | | | | | |
| | | | | | | 24/11/2010 | | | | | | | |
| **VDU Workstation Assessor** | | | | | 17/06/2014 | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **Safety Representative Training** | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | **2015** | | **2015** | | | **2015** | | | | | |

**KEY**

| | |
|---|---|
| | Training completed (date) |
| | No record of training |
| | Training proposed this year |
| | Training required |
| 31/12/2011 | Recommended refresher |
| **31/12/2011** | Required refresher |

Training Record 2013
HWMF W0191-2
Indoor Staff

| DESCRIPTION | Hobbs Fran | Meyler Sean | Ryan Fintan | Comments |
|---|---|---|---|---|
| Cryptosporidium: Risk Assessment | | | | |
| Abrasive Wheels | | | 23/10/2010 | Refresher required every 3 years. |
| | | | 23/10/2013 | |
| Asbestos Awareness | | | 14/03/2012 | |
| ATEX: Safety Awareness | 25/04/2014 | 25/04/2014 | 20/03/2011 | |
| CSCS Tickets -HEALTH AND SAFETY AT ROADWORKS) | 06/12/2012 | | 27/05/2013 | Refresher required every 5 years. |
| | 06/12/2017 | | 27/05/2018 | |
| Customer Care inc Managing difficult and Aggressive Behavour | 30/05/2012 | | | |
| Disability Awareness | | | | |
| EPA: Biodegradable Municipal Waste | | | 2406/2010 | |
| EPA: Odour Assessment | | | | |
| FAS: Waste Management | 18/01/2005 | 2013-2014 | 05/05/2010 | |
| FAS: Safe Pass | 18/08/2011 | 17/09/2014 | 08/07/2011 | Refresher required every 4 years. |
| | 18/08/2015 | 17/09/2018 | 08/07/2015 | |
| Filters Eval., Op & Main. | | | | |
| Fire Extinguisher | 12/05/2014 | 12/05/2014 | 05/07/2012 | Refresher recommended every 3 years. |
| | | | 05/07/2015 | |
| Fire Safety Manager | 08/04/2009 | | 09/04/2009 | |
| Fire Warden | 06/12/2012 | | 06/12/2012 | |
| First Aid Basic | | | | |
| First Aid: Cardiac First Responder | | | 11/03/2011 | |
| First Aid: Heartsaver AED | 22/01/2010 | | | |
| First Aid: Occupational | 02/05/2013 | | 05/03/2013 | Refresher required every 2 years. |
| | 02/05/2015 | | 05/03/2015 | |
| GPS Training | 16/06/2006 | | | |
| Health & Safety Management System Awareness | | | 29/11/2012 | |
| IEI Construction Contacts Bill | | 10/09/2013 | 29/11/2012 | |
| Landfill Gas Management | | | 15/05/2012 | |
| Life Jacket: Care and Use. | 11/11/2010 | | 11/11/2010 | |
| Manual Handling | 22/09/2011 | 16/07/2014 | | Refresher recommended every 3 years. |
| | 22/09/2014 | 16/07/2017 | | |
| PSDS & PSCS | 11/03/2009 | | 09/03/2009 | |
| | | | 21/09/2010 | |

Training Record 2013
HWMF W0191-2
Indoor Staff

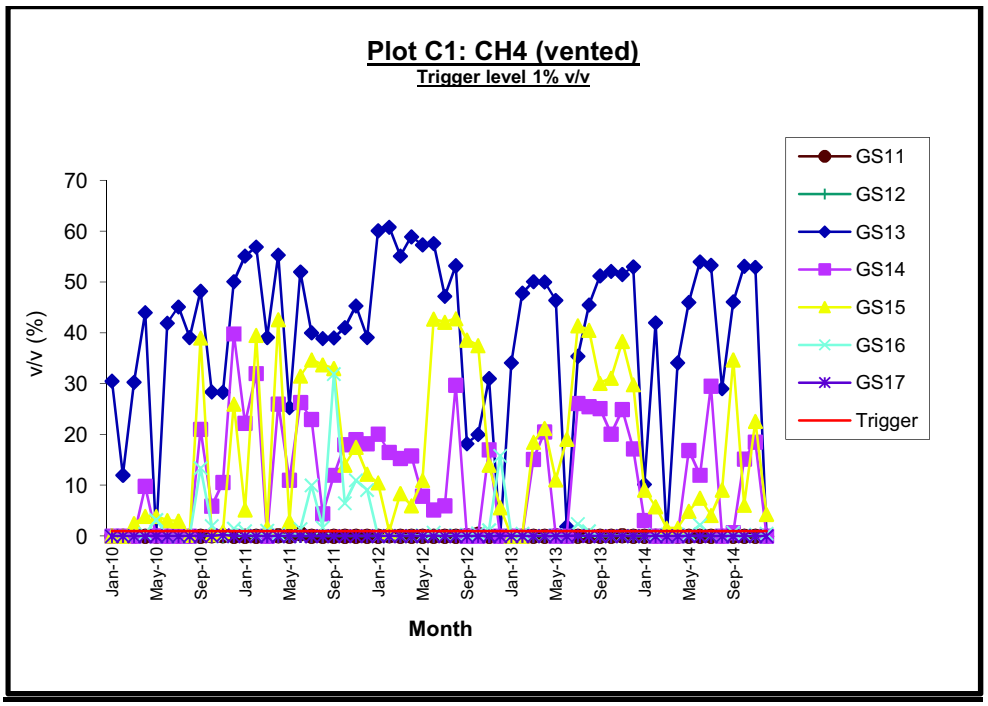
| | | | | |
|---|---|---|---|---|
| **Safety in Excavations** | | | | |
| | | | | |
| **Statutory Inspections (Lifting Equipment)** | | | 15/05/2013 | |
| | | | | |
| | | | | |
| **Supervising Safety** | | 04/11/2013 | 06/11/2012 | |
| | | | | |
| | | | | |
| **Water: Validation and Interpretation** | | | | |
| | | | | |
| | | | | |

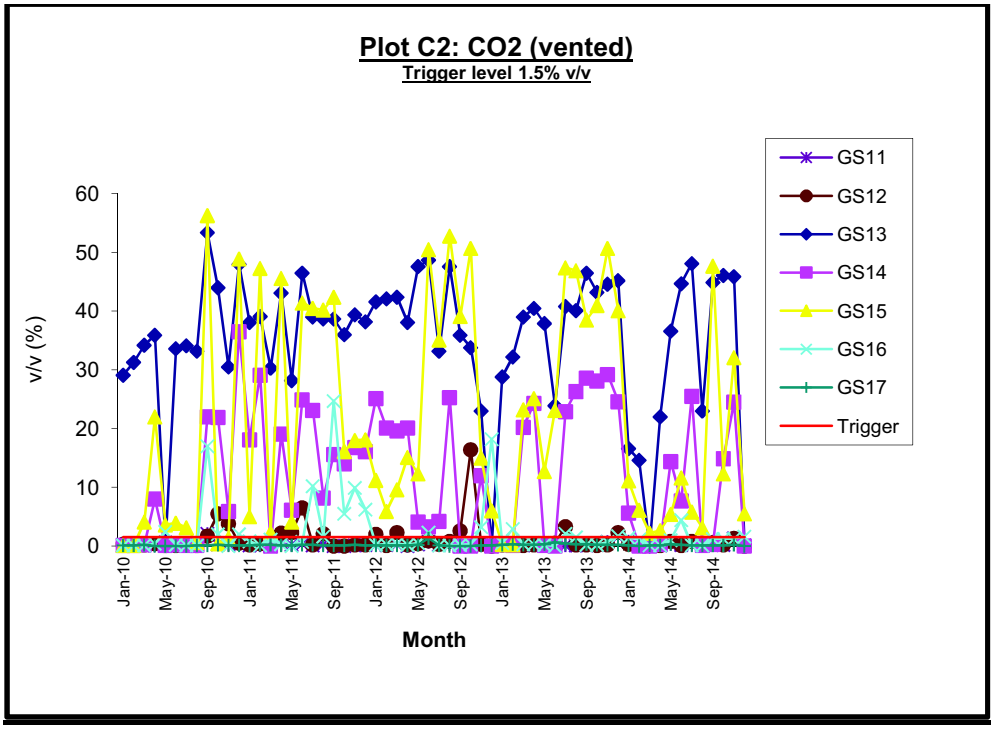
**Key**

| | |
|---|---|
| | Training completed |
| | No record of training |
| | Training proposed this year |
| | Training required |
| 31/12/2011 | Recommended refresher |
| **31/12/2011** | Required refresher |

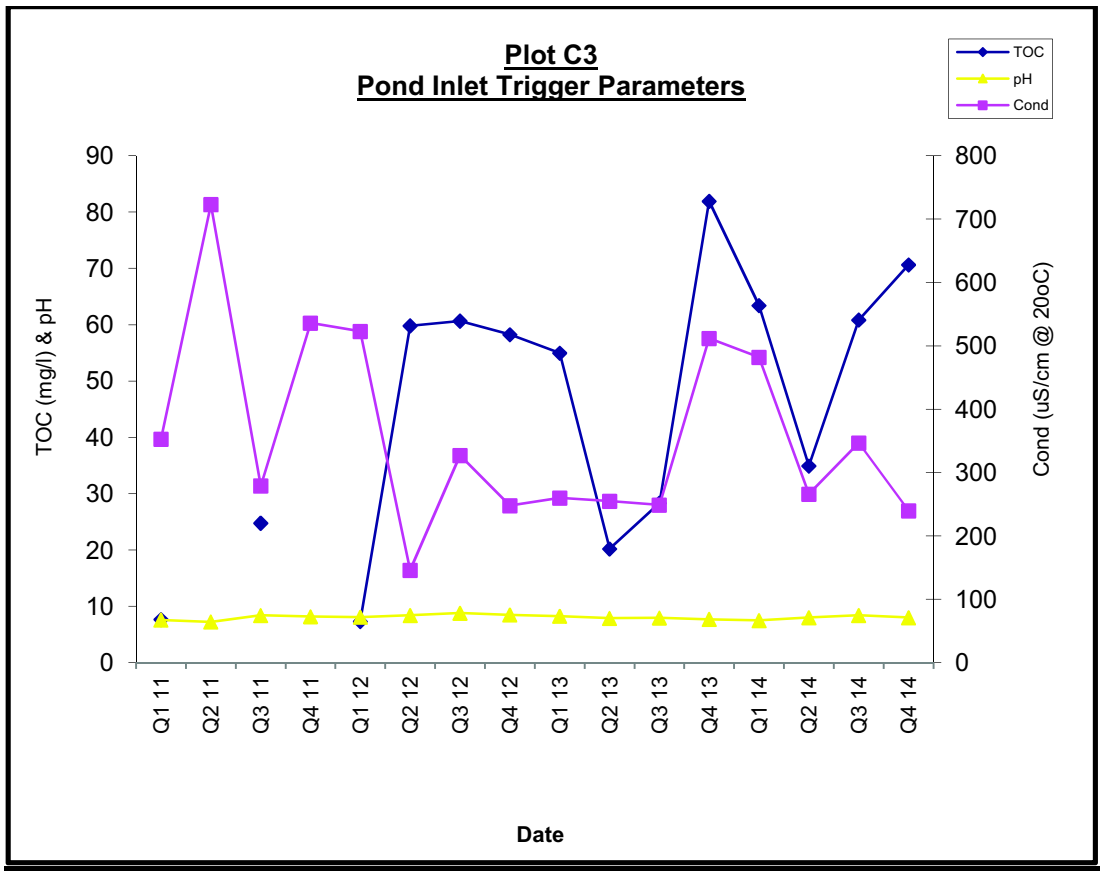
# C. Monitoring Results and Graphs

# Gas Monitoring Results 2014

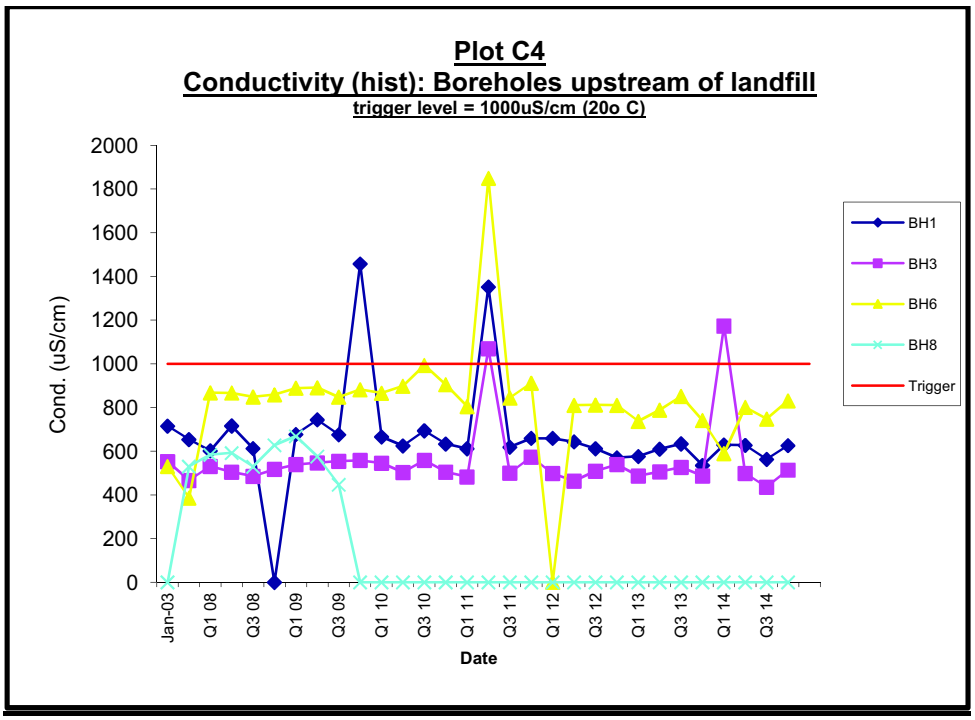


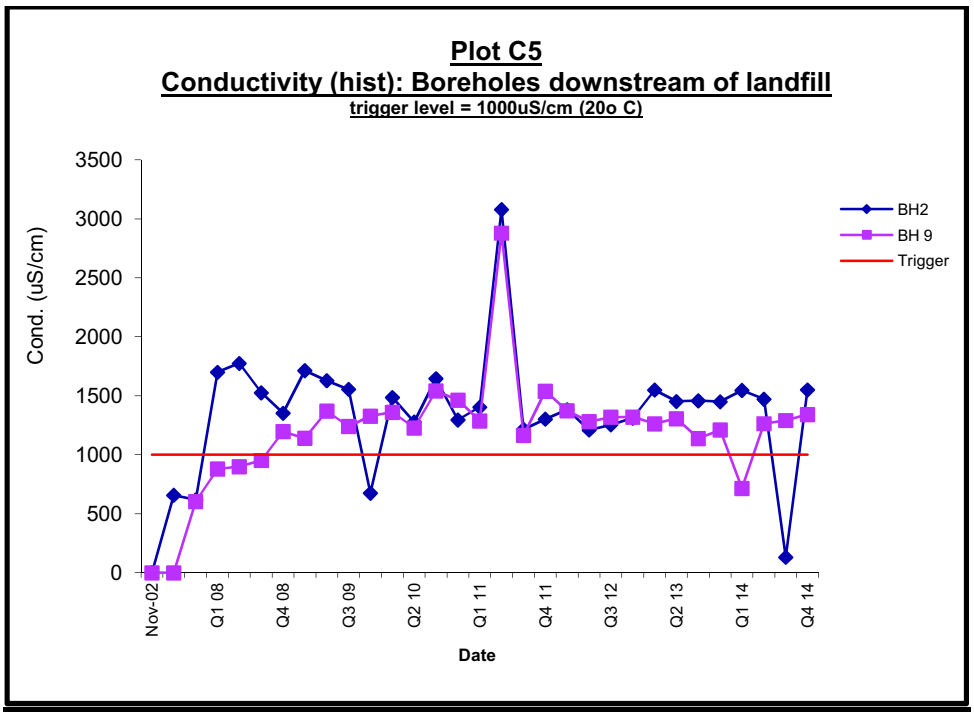



# Surface Water Monitoring Results 2014

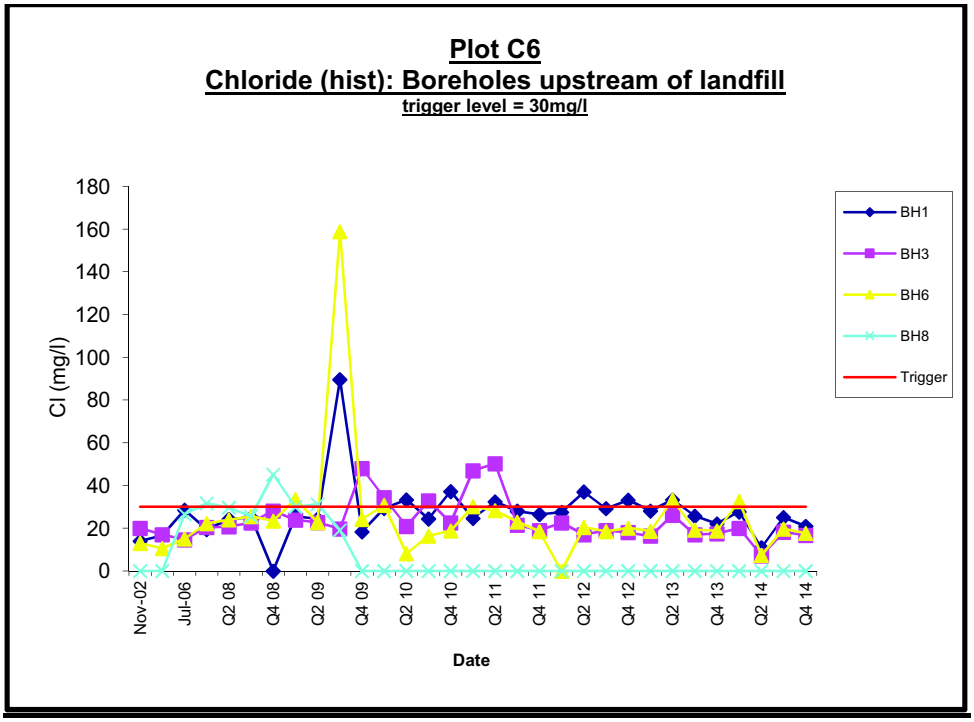


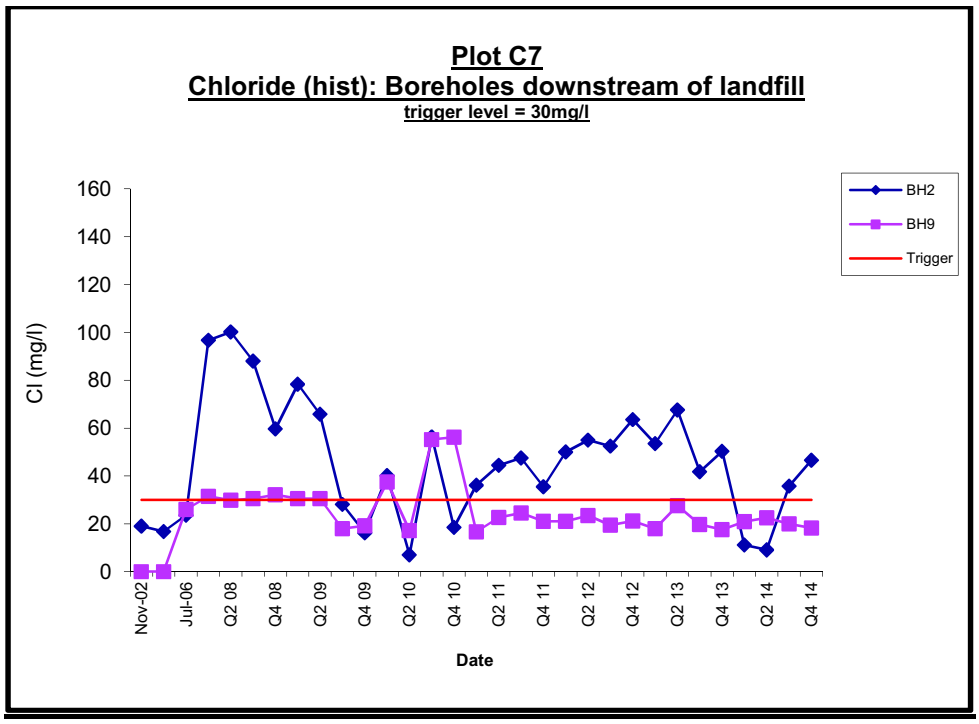
# Groundwater Monitoring Results 2014



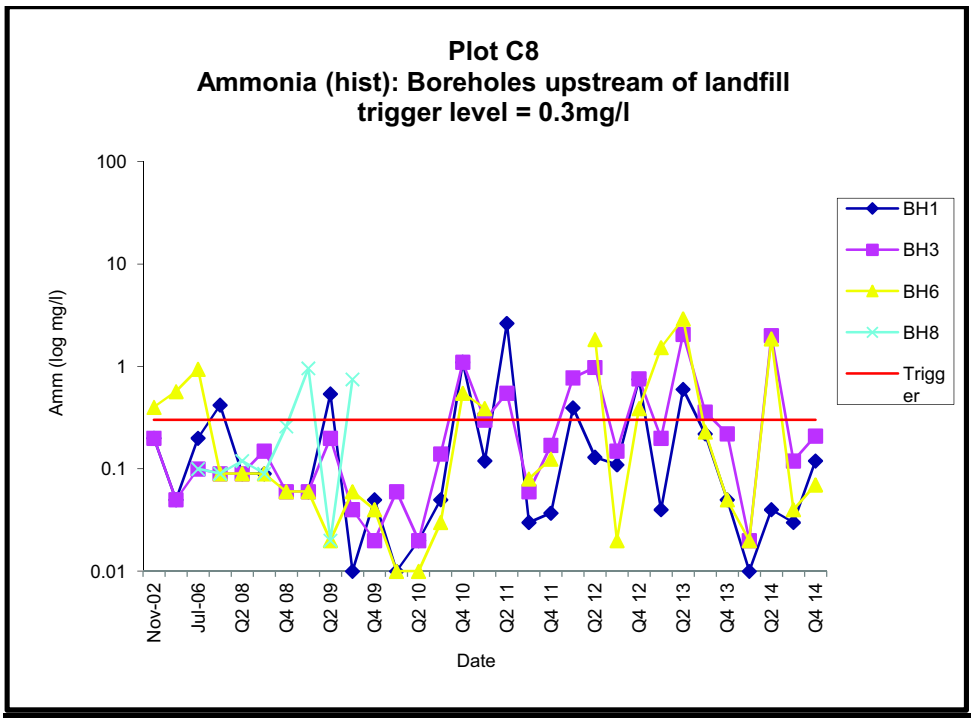



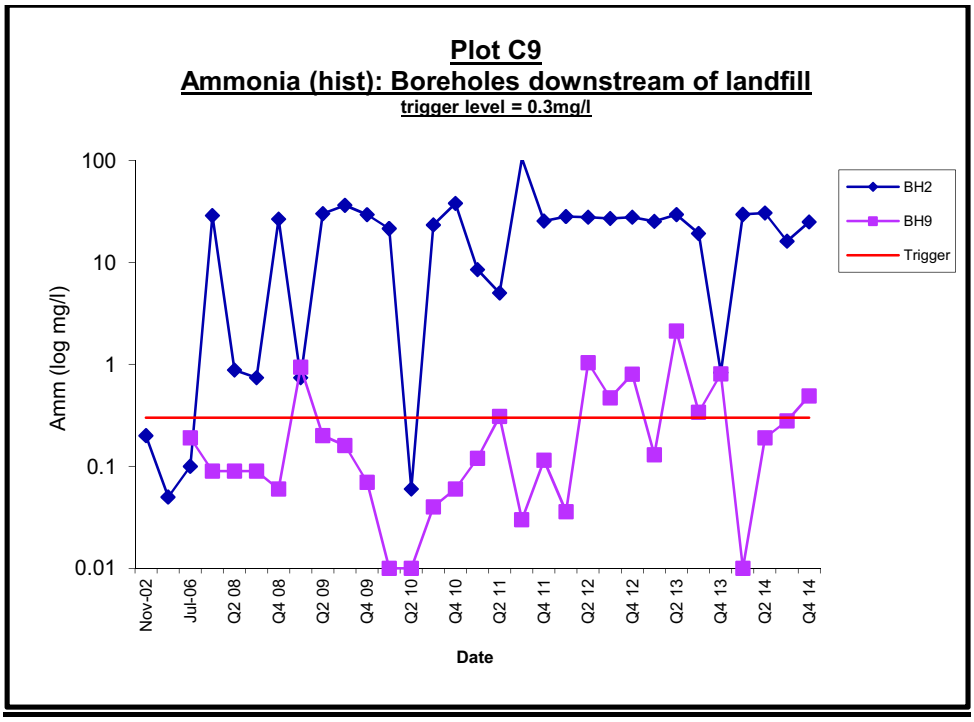
# Groundwater Monitoring Results 2014



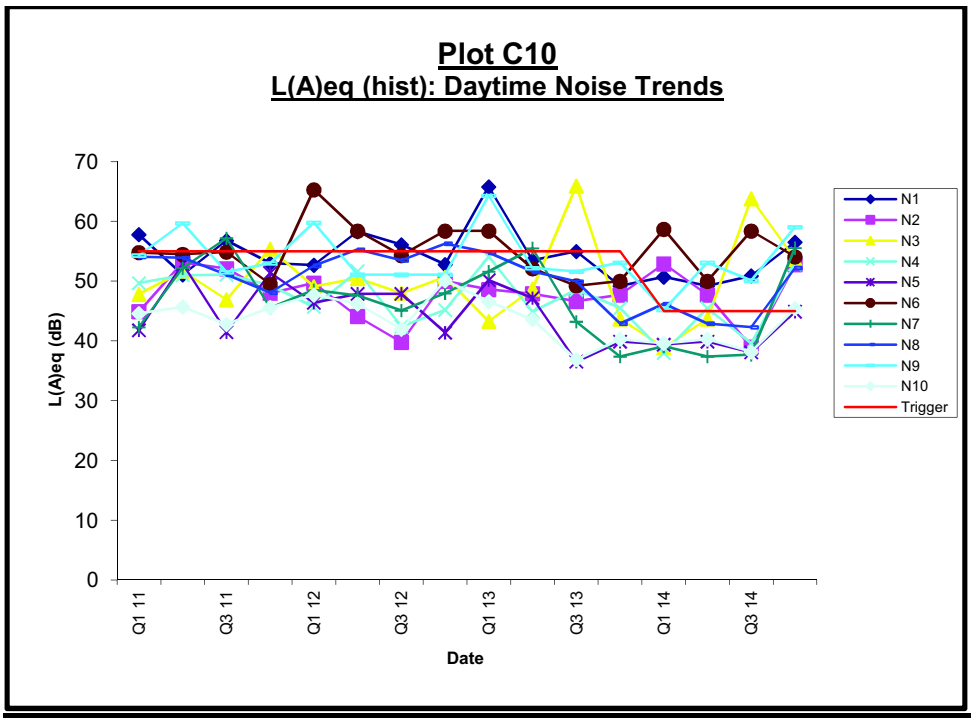



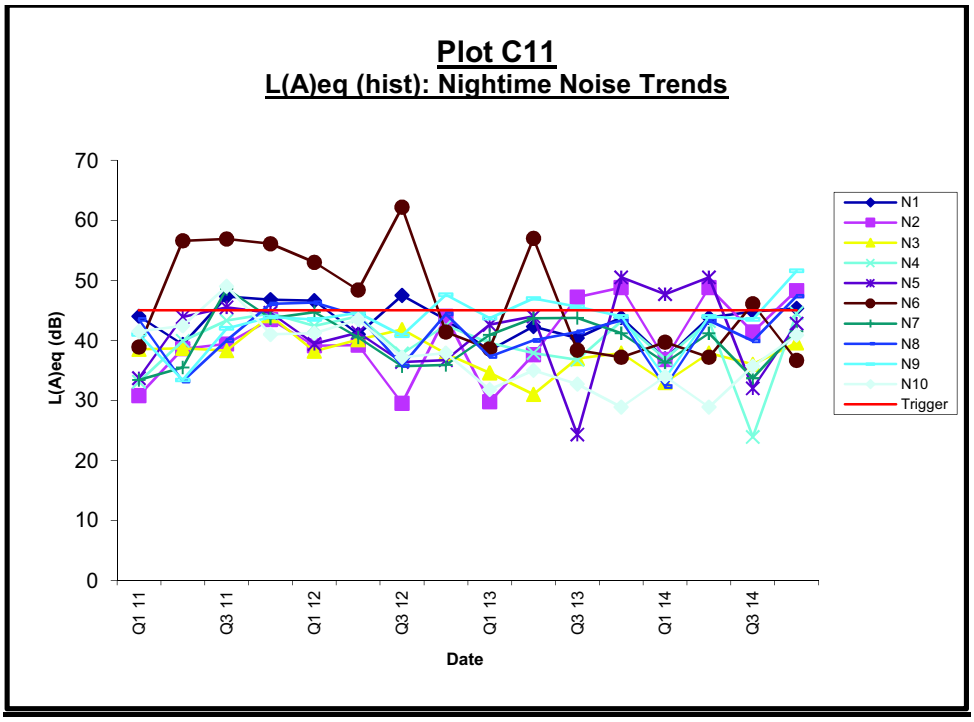
# Groundwater Monitoring Results 2014



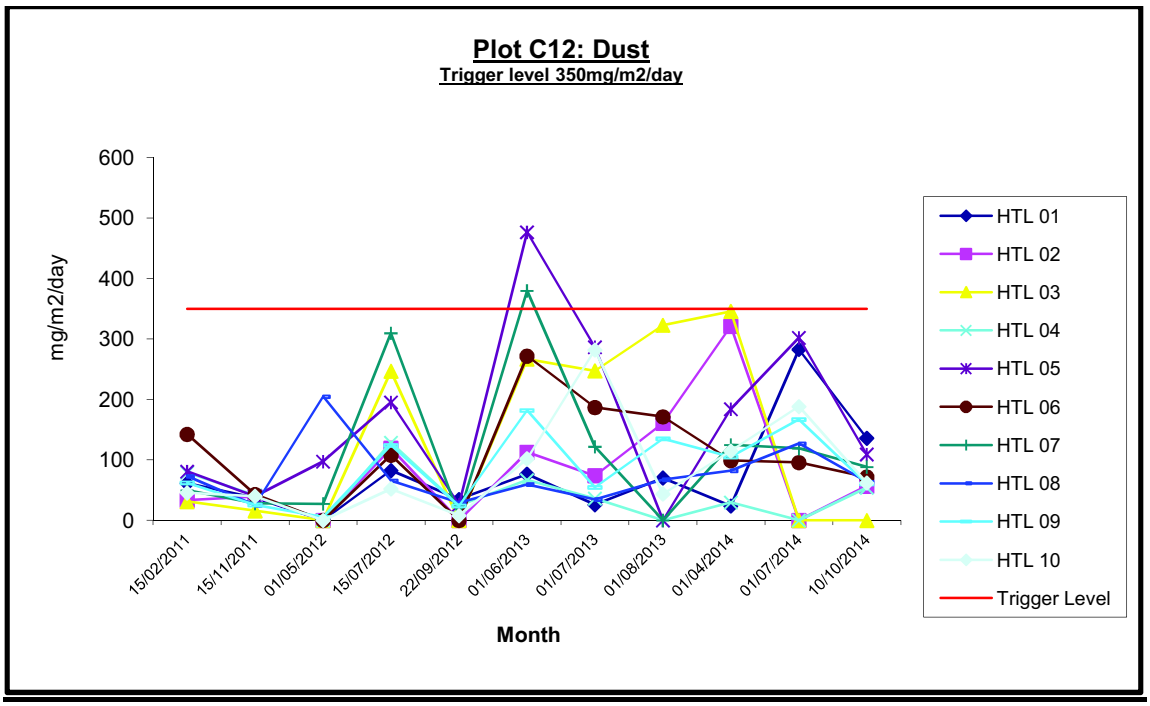



# Noise Monitoring Results 2014



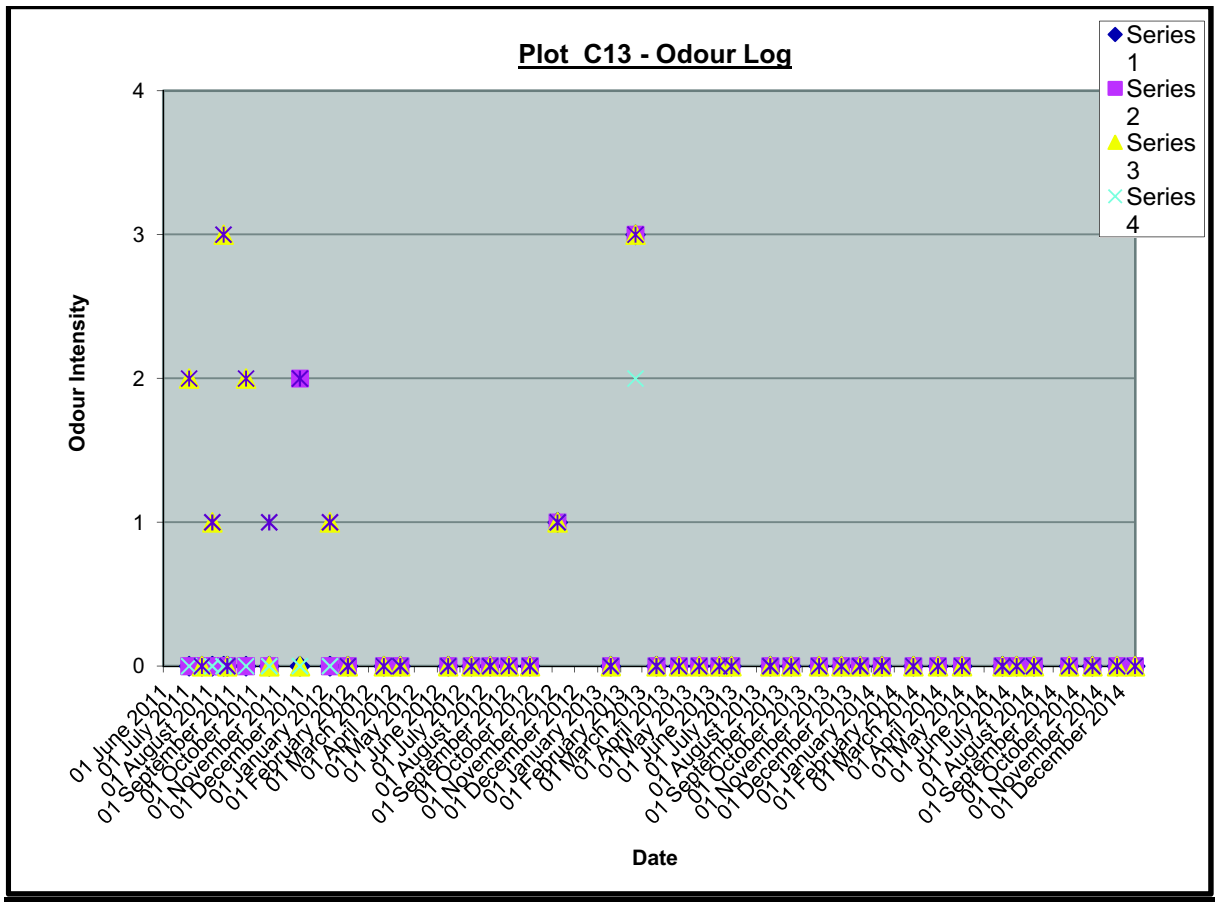
# Dust Monitoring Results 2014



# Dust Monitoring Results 2014

| Dust Monitoring Locations and Frequency | | | |
|---|---|---|---|
| **Dust analysis** | D1 - D10 | D1 - D10 | D1 - D10 |
| **Dust Monitoring Results ($mg/m^2/day$)** | | | |
| **Date Range** | **Apr-14** | **Jul-14** | **Oct-14** |
| **D1** | 24 | 283 | 136 |
| **D2** | 321 | NR | 57 |
| **D3** | 346 | NR | NR |
| **D4** | 30 | NR | 54 |
| **D5** | 184 | 302 | 109 |
| **D6** | 99 | 96 | 72 |
| **D7** | 125 | 119 | 88 |
| **D8** | 82 | 127 | 63 |
| **D9** | 105 | 167 | 60 |
| **D10** | 115 | 188 | 62 |

# Odour Monitoring Results 2014

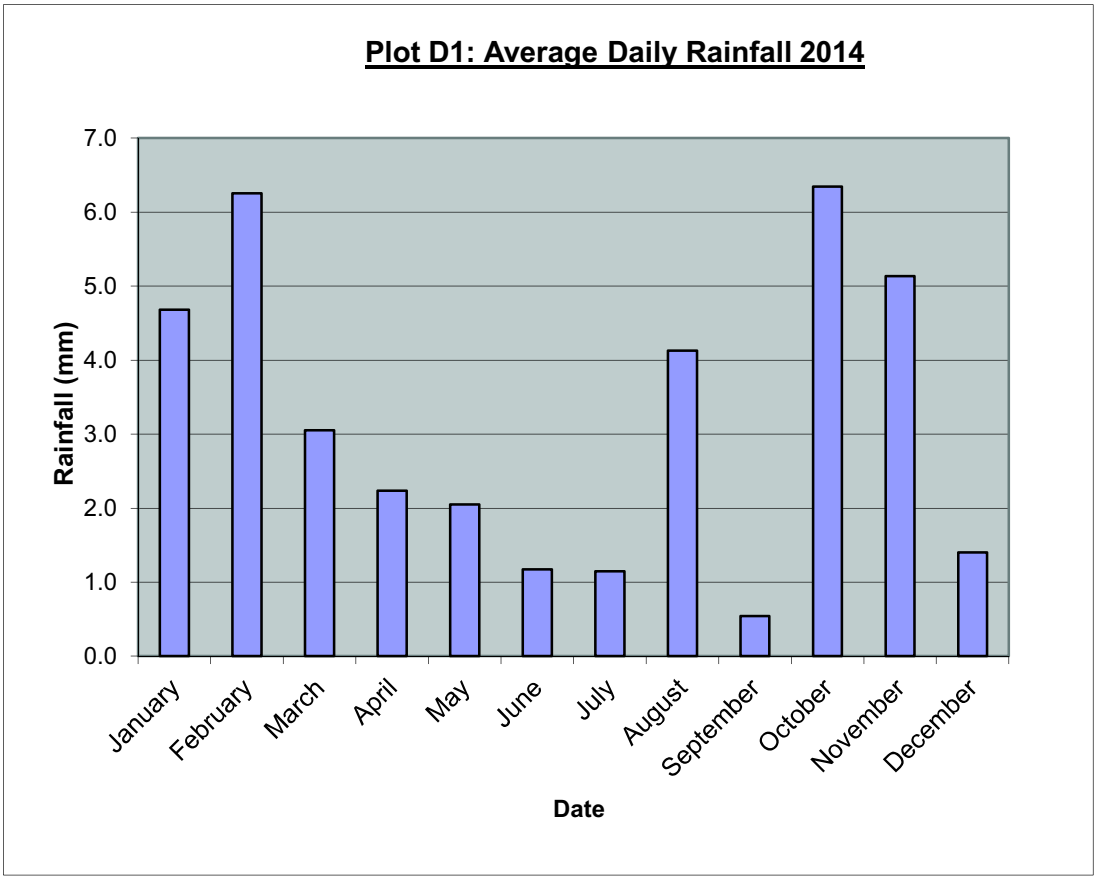


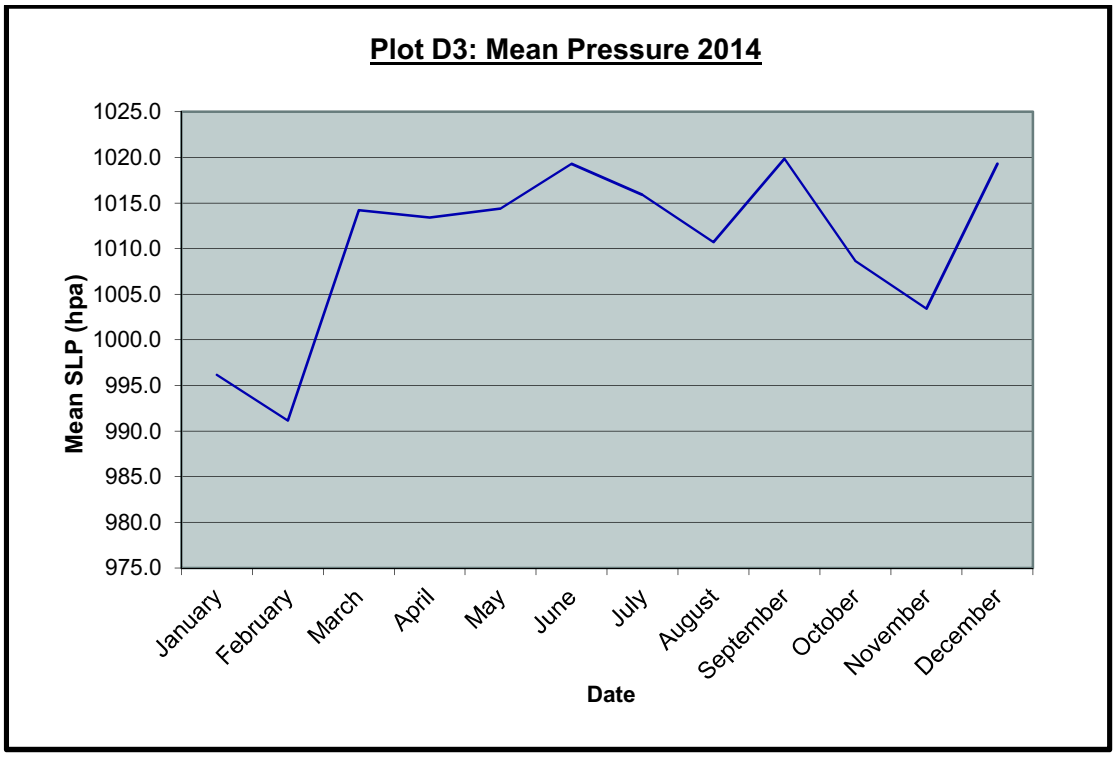

**Legend**

| | |
|---|---|
| 0 | No detectable odour |
| 1 | Faint odour |
| 2 | Moderate odour |
| 3 | Strong odour |
| 4 | Very strong odour |

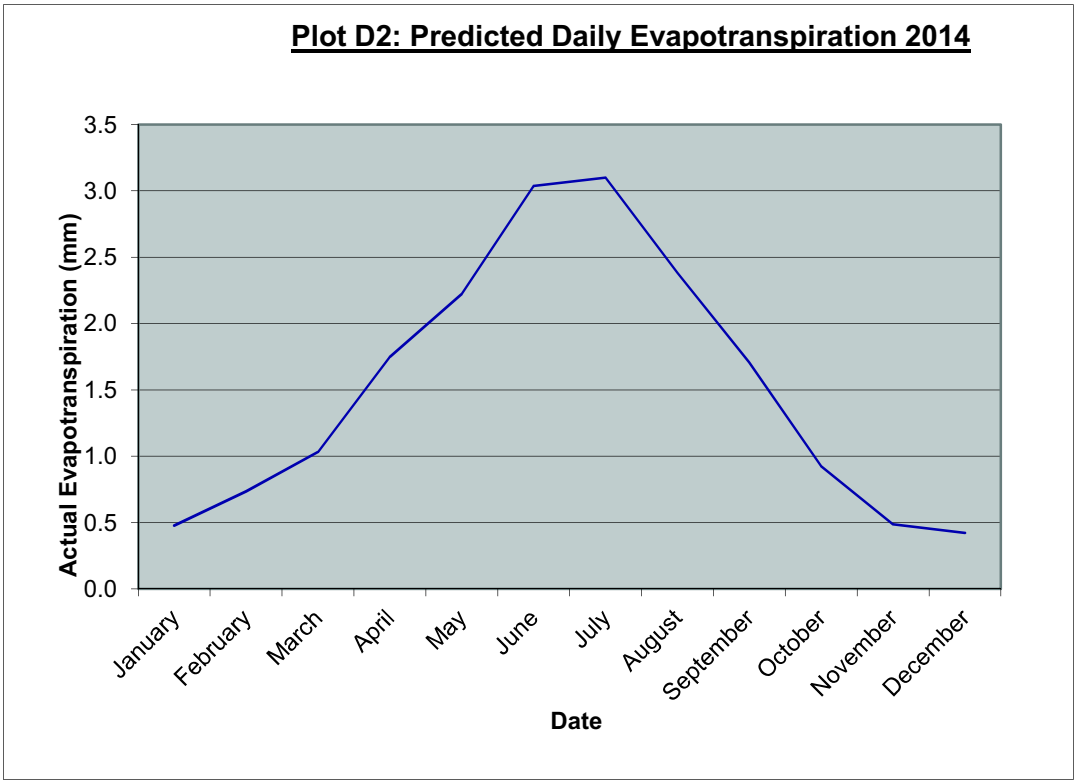
# D. Meteorological Data Graphs

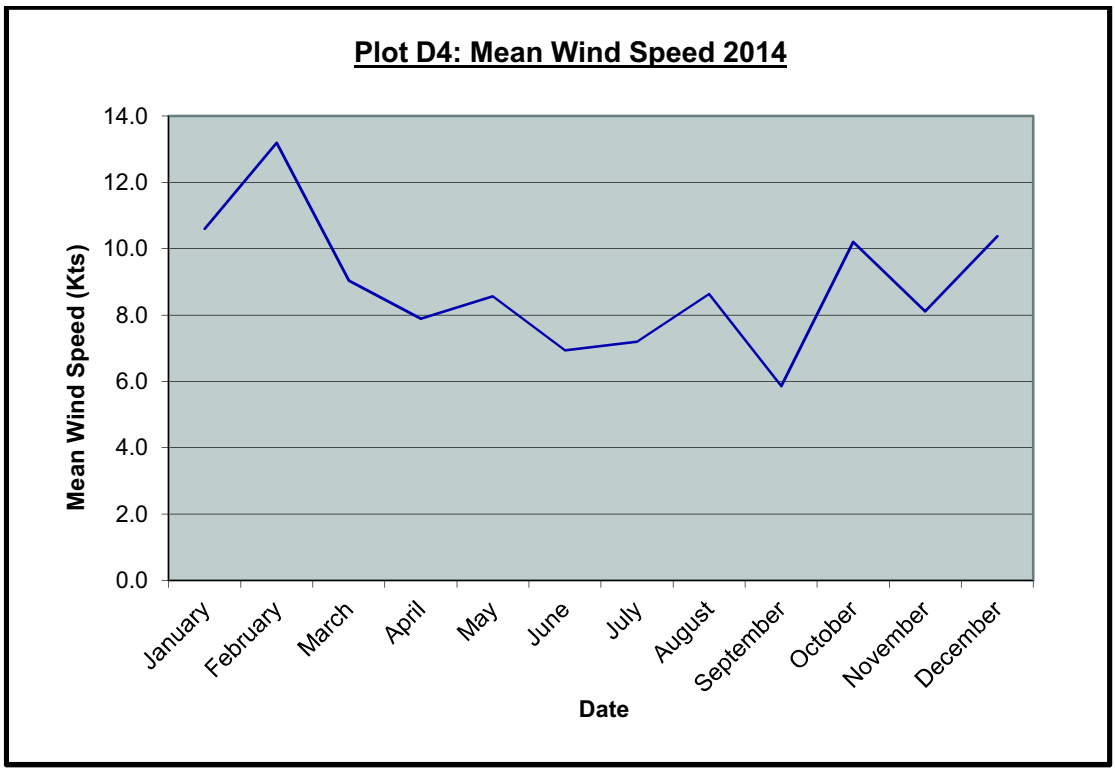
# Appendix D – Meteorological Graphs



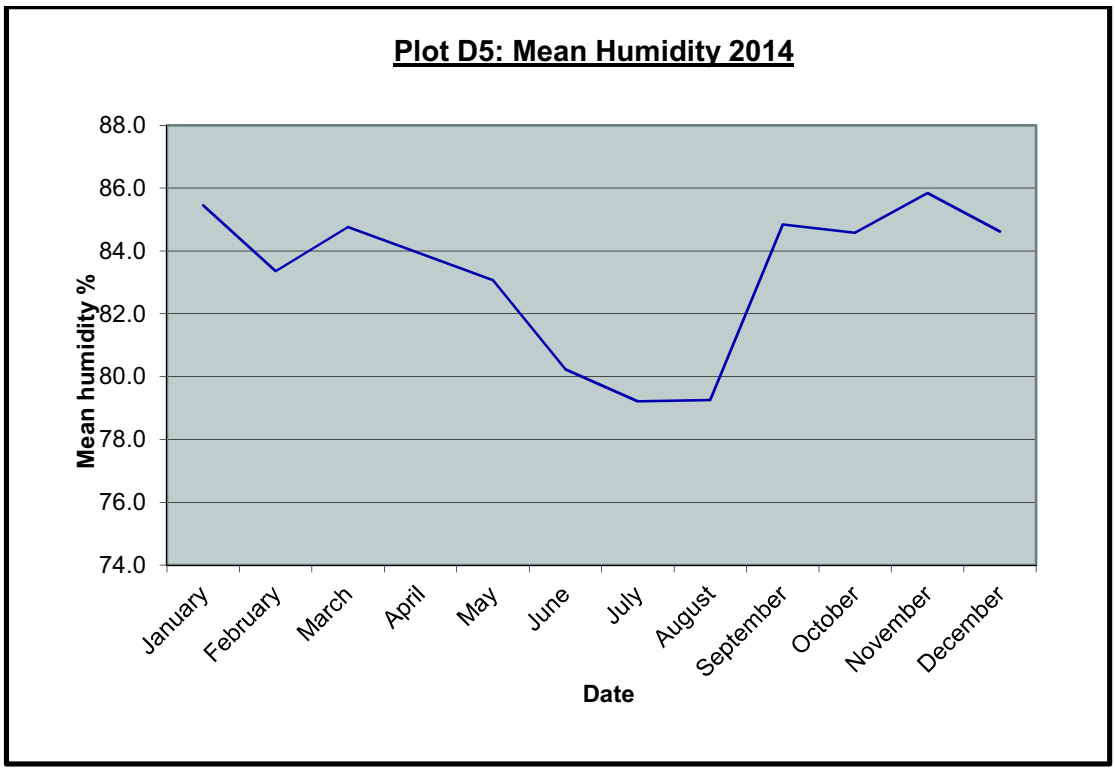



# Appendix D – Meteorological Graphs



# Appendix D – Meteorological Graphs



# E. Summary of waste accepted and consigned off-site

**Waste consigned off-site from Holmestown Landfill from 1st January 2014 to 31st December 2014 (tonnes)**

| Waste Out | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Yearly totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BULKY WASTE: | 36.1 | 4.58 | 40.2 | 52.6 | 58.14 | 34.76 | 55.47 | 46.42 | 53.5 | 52.7 | 41.36 | 36.12 | **511.95** |
| BLACK BAGS: | 34.84 | 24.48 | 29.58 | 32.96 | 36.08 | 29.3 | 28.82 | 34.56 | 34.96 | 23.38 | 5.5 | 25.06 | **339.52** |
| FLY TIPPING: | 10.78 | 10.6 | 15.36 | 9.52 | 13.6 | 10.08 | 10.84 | 24.78 | 5.18 | 10.32 | 8.84 | 0 | **129.9** |
| TIMBER: | 0 | 11.18 | 7.74 | 14.56 | 11.58 | 14.62 | 10.2 | 14.94 | 14.08 | 5.34 | 7.68 | 1.96 | **113.88** |
| FOOD WASTE: | 0 | 0 | 0 | 0 | 0 | 0.5 | 0.42 | 0.58 | 0.64 | 0.76 | 0.54 | 0.44 | **3.88** |
| BATTERIES : | 0 | 1.8 | 0.57 | 0.7 | 0 | 0.72 | 0.56 | 0 | 0.74 | 0 | 0.74 | 0 | **5.83** |
| FLUORESCENT LIGHTS : | 0 | 0.16 | 0 | 0.04 | 0 | 0.067 | 0.046 | 0.088 | 0.046 | 0.027 | 0 | 0 | **0.47** |
| GLASS BOTTLES : | 6.84 | 5.88 | 5.42 | 4.84 | 2.3 | 5.61 | 7.19 | 4.28 | 3.13 | 3.07 | 5.39 | 2.93 | **56.88** |
| LEACHATE | 2,672.00 | 3,088.10 | 2,138.58 | 1,122.92 | 1,006.88 | 293.38 | 279.06 | 1,305.61 | 175.96 | 1,525.48 | 5,899.05 | 1,477.01 | **20,984.03** |
| PLASTIC BOTTLES : | 6.48 | 3.7 | 4.56 | 4.84 | 6.46 | 4.96 | 8.1 | 6.1 | 5.2 | 6.88 | 4.44 | 5.86 | **67.58** |
| TEXTILES : | 0.75 | 0.8 | 0.92 | 1.1 | 1.12 | 0.8 | 1.66 | 1.08 | 1.62 | 0.68 | 0.7 | 0.18 | **11.41** |
| SCRAP METAL | 11.44 | 7.08 | 10 | 12.02 | 13.76 | 13.08 | 13.92 | 12.1 | 11.64 | 10.12 | 0 | 8.3 | **123.46** |
| ALLUMINIUM CANS | 0.2 | 0.2 | 0.3 | 0.18 | 0.06 | 0.2 | 0.25 | 0.16 | 0.11 | 0.12 | 0.25 | 0.12 | **2.15** |
| CARDBOARD | 8.5 | 4.36 | 5.32 | 6.04 | 6.28 | 7.3 | 6.64 | 6.32 | 7.68 | 6.08 | 5.12 | 7.1 | **76.74** |
| NEWSPAPER | 2.8 | 1.54 | 1.74 | 1.9 | 2.48 | 4.4 | 3.96 | 2.97 | 2.42 | 3.41 | 3.4 | 1.9 | **32.92** |
| TETRAPACK | 0.46 | 0.42 | 0 | 0.36 | 0 | 0.46 | 0.56 | 0 | 0.36 | 0 | 0 | 0 | **2.62** |
| WASTE ELECTRONICS | 18.76 | 13.06 | 13.44 | 14 | 21.56 | 15.98 | 21 | 16.2 | 14.33 | 16.34 | 11.07 | 9.52 | **185.14** |
| WASTE ENGINE OIL | 0.82 | 0 | 0 | 0.96 | 0.42 | 0 | 1.08 | 0 | 0 | 0.92 | 0 | 0 | **4.20** |
| OIL FILTERS | 0 | 0.34 | 0 | 0 | 0 | 0 | 0 | 0.36 | 0 | 0 | 5.16 | 0 | **5.86** |
| PRINT CARTRIDGES | 0 | 0.06 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0.06** |
| COOKING OIL | 0 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **0.20** |
| MAGAZINES | 5.44 | 4.82 | 2.18 | 6.14 | 2 | 4.64 | 4.98 | 5.24 | 4.88 | 4.74 | 3.9 | 5.7 | **54.66** |
| Monthly Totals: | **2,816.21** | **3,183.16** | **2,276.11** | **1,285.56** | **1,182.72** | **440.86** | **454.76** | **1,481.79** | **336.48** | **1,670.37** | **6,003.14** | **1,582.20** | **22,713.35** |

# F.Water Balance Calculation Spreadsheet

**TABLE 1**

## Leachate Generation

| | | | | |
|---|---|---|---|---|
| Actual rainfall | | 1154.7 | mm/yr | actual data from met eireann (1st Jan to 31st dec) |
| | | | | |
| Infiltration | | **1027.683** | mm/yr (temporary restored areas) | 89% |
| | | | | |
| | | **1154.7** | mm (waste - active and unrestored areas) - assumes all rainfall infiltrates into the waste | |
| Density | | 0.90 | t/m3 | |
| Waste input 2014 | | 0.00 | t | |
| Liquid waste input | | 0 | m3/yr | |
| Absorptive Capacity | | **0.025** | m3 per m3 | |
| Site life | | 20 | years | |

| Year | Months | Phase | Active Area Temp Cap | Full Cap | | Waste Input 2013 | Active Infiltration (m³) | Temp Infiltn. m3 | Restored Area Infiltration (m³) | Total Water (m³) | Cumulative Water (m³) | Absorbtive Capacity (m³) | Cumulative abs. capacit (m³) | Cumulative leachate generation (m³) | leachate produced (Lo) (m³) | Monthly leachate generation (m³/mnt) | Leachate per day (m/day) | 50% allowance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2014 (1st Jan to 31st Dec) | 12 | Dirty paved areas | 740 | 0 | | 0 | 854 | 0 | 0 | 854 | 854 | 0 | 0 | 854 | 854 | 71 | 2 | 4 |
| 2014 (1st Jan to 31st Dec) | 12 | 1 (Cell 1,2,3,4, 1b) | 0 | 18700 | | 0 | 0 | 19,218 | 0 | 19,218 | 20,072 | 0 | 0 | 20,072 | 20,072 | 1,673 | 56 | 84 |

**Dirty' paved areas draining to LTP**

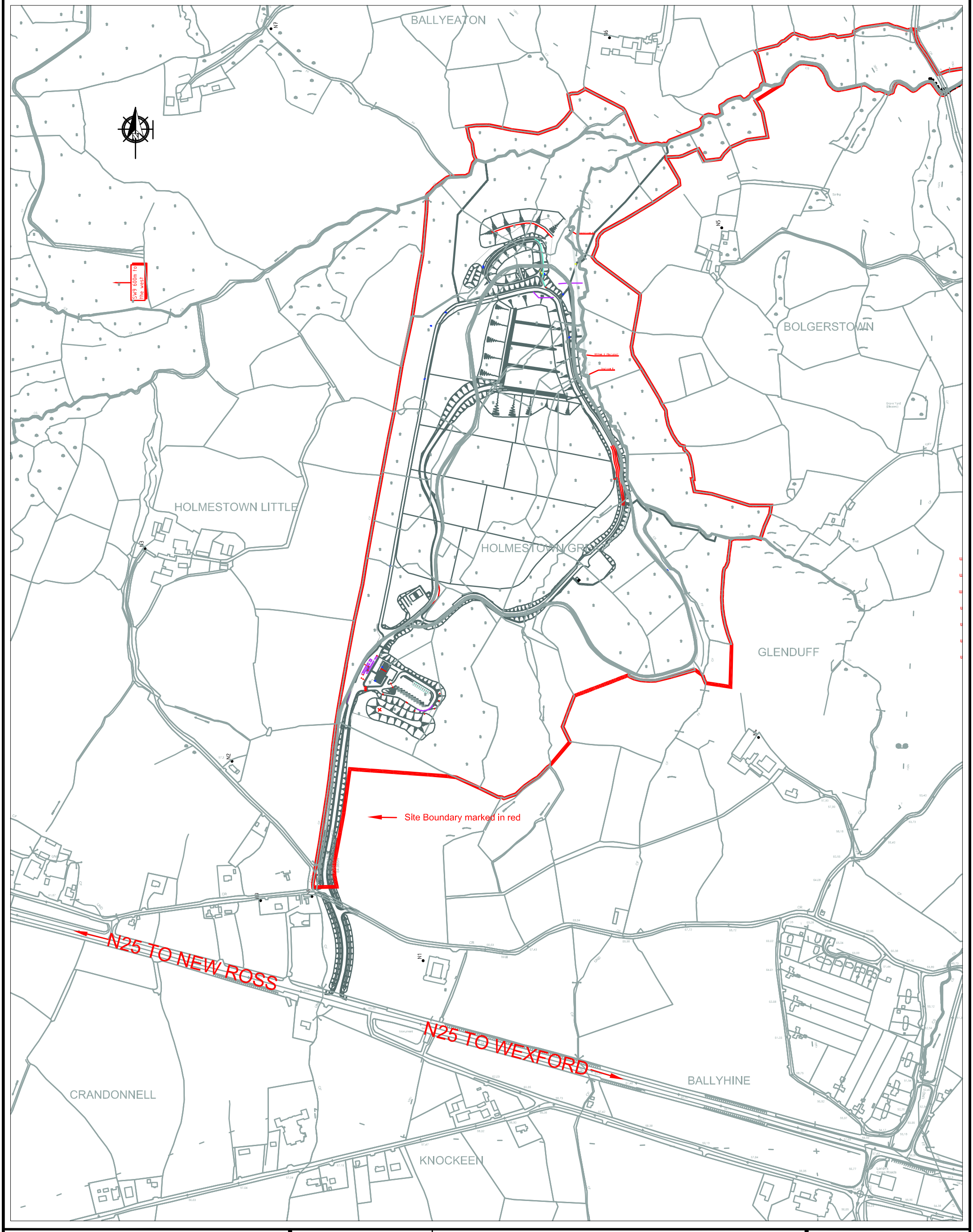
| | Area (m2) |
|---|---|
| Weighbridges | 100 |
| Waste Inspection/Quarantine | 250 |
| Wheelwash | 90 |
| LTP Yard | 300 |
| Total | 740 |

**Wastewater from Admin Building**

| | |
|---|---|
| Ave Nr of Staff | 8 |
| Per capita daily flowrate (from EPA manu | 60 l |
| Total Daily flowrate | 480 l |
| Nr working days | 250 d |
| total Annual Flow | 120000 l |
| | **120 m3** |

| | |
|---|---|
| **Total 2014** | 20,927 |
| **Weighbridge Quantity** | **21108** |
| Less Admin Bldg WW | 120 |
| **Nett WB Quantity** | **20988** |
| Variance | 0.292414237 % |

# G. Drawings




Wexford County Council

**Holmestown Waste Management Facility**

Wexford County Council,
Wexford
Tel: 053-9120922

**PROJECT TITLE:** Holmestown Waste Management Facility

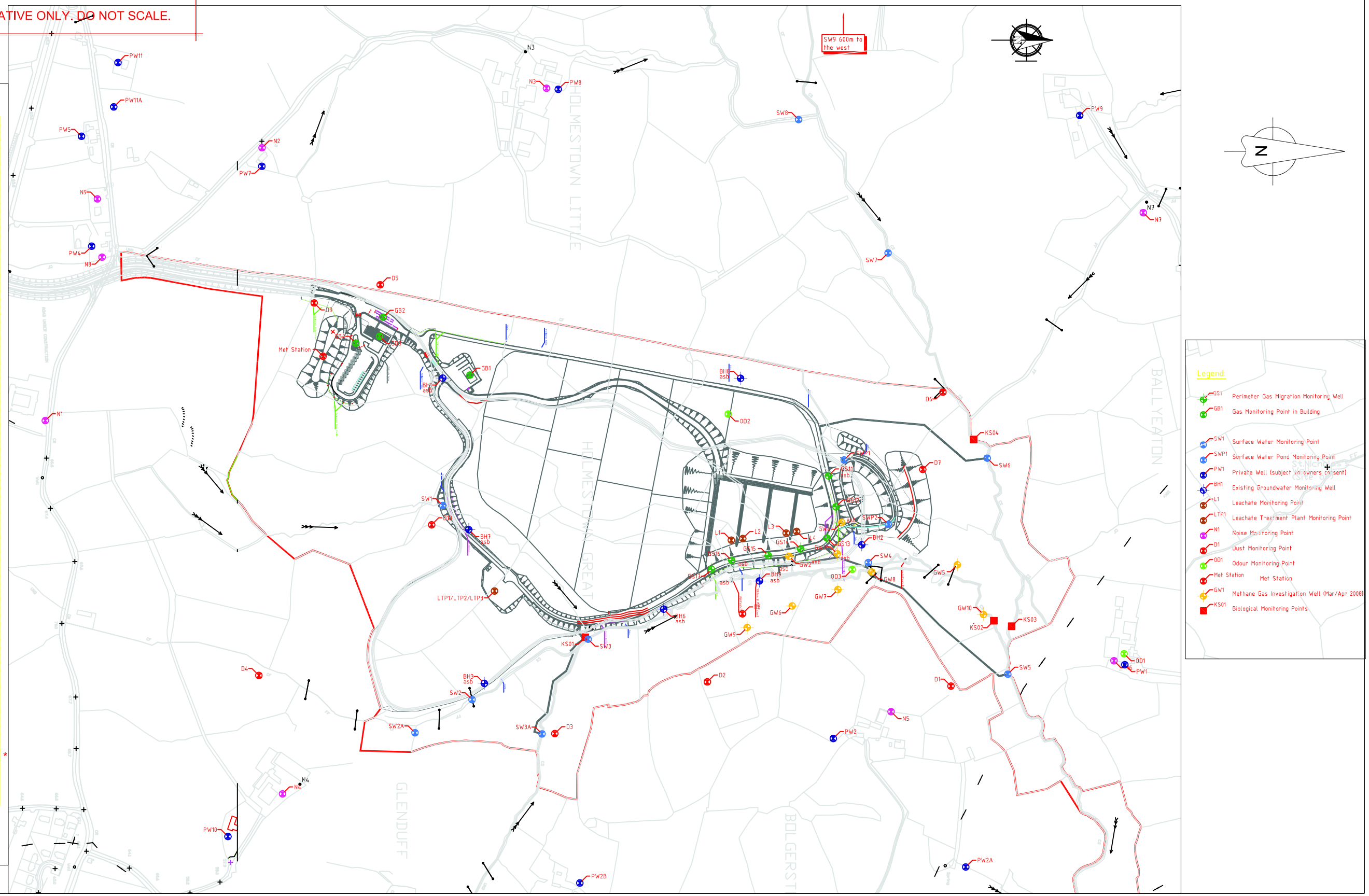
**DRAWING TITLE:** Appendix G1
Site Location Plan

DRAWN:
CHECKED:
DATE:
SCALE:
DRAWING No:

DRAWING IS INDICATIVE ONLY. DO NOT SCALE.

| | | | |
|---|---|---|---|
| BH1 | 297039.975 | 122814.478 | 42.730 |
| BH2 | 297295.299 | 123456.557 | 14.707 |
| BH3 | 297507.600 | 122878.303 | 24.256 |
| BH5 | 297119.292 | 123332.688 | 0.000 |
| BH6 | 297393.948 | 123153.195 | 17.184 |
| BH7 | 297272.112 | 122854.454 | 33.137 |
| BH8 | 297040.294 | 123270.883 | 33.260 |
| BH9 | 297350.708 | 123299.768 | 20.960 |
| BH10 | 297199.000 | 123330.000 | 0 |
| D1 | 297511.746 | 123593.241 | 0.000 |
| D10 | 297264.704 | 122797.575 | 0.000 |
| D2 | 297505.338 | 123219.998 | 0.000 |
| D3 | 297584.534 | 122986.308 | 0.000 |
| D4 | 297495.467 | 122532.866 | 0.000 |
| D5 | 296897.046 | 122718.769 | 0.000 |
| D6 | 297061.385 | 123580.954 | 0.000 |
| D7 | 297179.909 | 123550.036 | 0.000 |
| D8 | 297401.061 | 123273.780 | 0.000 |
| D9 | 296924.792 | 122617.597 | 0.000 |
| GB1 | 297035.277 | 122856.226 | 0.000 |
| GB2 | 296946.653 | 122723.357 | 0.000 |
| GB3 | 296975.975 | 122717.819 | 0.000 |
| GB4 | 296986.415 | 122681.418 | 0.000 |
| GS11 | 297189.710 | 123405.649 | 20.399 |
| GS12 | 297237.100 | 123416.951 | 0.000 |
| GS13 | 297284.965 | 123403.337 | 17.644 |
| GS14 | 297301.651 | 123362.923 | 17.230 |
| GS15 | 297311.668 | 123313.405 | 17.336 |
| GS16 | 297318.999 | 123269.027 | 0.000 |
| GS17 | 297332.800 | 123226.323 | 18.058 |
| GW1 | 297323.000 | 123287.000 | 0.000 |
| GW2 | 297313.000 | 123345.000 | 0.000 |
| GW3 | 297309.000 | 123419.000 | 0.000 |
| GW4 | 297261.000 | 123426.000 | 0.000 |
| GW5 | 297326.000 | 123603.000 | 0.000 |
| GW6 | 297389.000 | 123350.000 | 0.000 |
| GW7 | 297360.000 | 123420.000 | 0.000 |
| GW8 | 297337.000 | 123472.000 | 0.000 |
| GW9 | 297422.000 | 123281.000 | 0.000 |
| GW10 | 297402.000 | 123643.000 | 0.000 |
| KS01 | 297437.000 | 123033.000 | 0.000 |
| KS02 | 297411.663 | 123658.969 | 0.000 |
| KS03 | 297420.128 | 123686.356 | 0.000 |
| KS04 | 297134.000 | 123628.000 | 0.000 |
| L1 | 297288.236 | 123256.667 | 0.000 |
| L2 | 297285.790 | 123274.312 | 0.000 |
| L3 | 297277.324 | 123340.796 | 0.000 |
| L4 | 297274.776 | 123356.846 | 0.000 |
| LTP1/LTP2/LTP3 | 297366.093 | 122893.971 | 0.000 |
| N1 | 297033.882 | 122189.788 | 0.000 |
| N2 | 296696.386 | 122554.241 | 0.000 |
| N3 | 296595.962 | 122973.601 | 0.000 |
| N4 | 297676.851 | 122569.145 | 0.000 |
| N5 | 297617.057 | 123523.549 | 0.000 |
| N6 | 297368.822 | 123878.943 | 0.000 |
| N7 | 296786.508 | 123887.905 | 0.000 |
| N8 | 296854.739 | 122292.602 | 0.000 |
| N9 | 296765.477 | 122285.437 | 0.000 |
| PW1 | 297478.990 | 123859.662 | 18.339 |
| PW10 | 297742.159 | 122485.520 | 0.000 |
| PW11 | 296556.602 | 122317.026 | 0.000 |
| PW2 | 297546.337 | 123408.659 | 0.000 |
| PW2A | 297584.688 | 123553.368 | 0.000 |
| PW2B | 297827.481 | 123031.480 | 0.000 |
| PW4 | 296837.889 | 122276.677 | 0.000 |
| PW5 | 296669.494 | 122261.079 | 0.000 |
| PW6 | 296748.425 | 122427.439 | 0.000 |
| PW7 | 296715.488 | 122537.448 | 0.000 |
| PW8 | 296597.554 | 122991.603 | 0.000 |
| PW9 | 296637.600 | 123790.527 | 0.000 |
| SW1 | 297235.091 | 122814.649 | 0.000 |
| SW2 | 297532.459 | 122859.447 | 0.000 |
| SW2A | 297583.292 | 122772.100 | 0.000 |
| SW3 | 297439.978 | 123037.355 | 0.000 |
| SW3A | 297585.017 | 122966.756 | 0.000 |
| SW4 | 297322.540 | 123466.648 | 0.000 |
| SW5 | 297493.552 | 123680.361 | 0.000 |
| SW6 | 297162.636 | 123648.886 | 0.000 |
| SW7 | 296848.257 | 123496.913 | 0.000 |
| SW8 | 296643.949 | 123359.856 | 0.000 |
| * SW9 | 296027.225 | 123314.992 | 0.000 * |
| SWP1 | 297165.348 | 123429.626 | 0.000 |
| SWP2 | 297264.019 | 123497.170 | 0.000 |
| OD1 | 297355.000 | 123880.000 | |
| OD2 | 297095.000 | 123252.000 | |
| OD3 | 297333.000 | 123442.000 | |
| Met Station | 297006.600 | 122631.300 | 0.000 |

* = Approximate, to be checked on site




# Wexford County Council

Holmestown Waste Management Facility

Wexford County Council,
Wexford
Tel: 053-9120922

Drawing Notes

| No. | Revision Description | Date | Inl. | Ckd. |
|---|---|---|---|---|
| | | | | |

Project Title
Holmestown Waste Management Facility

Drawing Title
Appendix G2
Monitoring Locations

| | |
|---|---|
| Drawn | F. Ryan |
| Checked | FH |
| Date | 21-06-12 |
| Scale | 1:6000 |
| Surveyed | FR |
| Drawing No. | 001 |

# Holmestown Landfill Mar 2014 Elevation surevy



| Title: DESCRIPTION OF CONTENT | |
|---|---|
| Drawn by: EL | Checked by:SM |
| Date: 26 Mar 2014 | Map No: 1 |

# H. Bund Integrity Testing Reports

Capital Surveys Ltd

**Report on Inspection and testing of Bunded Storage tanks at Homestown Land Fill site.**

- **Tank B – Bunded tank under fuel storage area.**

**October 2014.**

**Client Address - Mr Fran Hobbs.**

**Wexford County Council, County Hall, Carriglawn, Wexford.**

**Prepared by - Justin Kelly BEng MIEI MCIOB. Capital Surveys Ltd**

**Castlehayestown, Taghmon, Co Wexford.**

**Tel 053 92 40825 - 087 6857464**

info@capitalsurveys.ie **www.capitalsurveys.ie**

**File ref no - 2014 – 147 SS/T1**

Content Page.

1. Introduction.

2. Summary of Inspection.

3. Summary of Integrity Tests.

   3.1 Test Protocol.

   3.2 Visual inspection

   3.3 Testing results.

4. Conclusion.

**Plates.**

**Appendices.**

1.Procedure for inspection and testing of bunded tanks for Homestown Landfill site.

2.Visual examination records of bunded storage tank interior ( Photo file).

**Introduction.**

This report covers the inspection and testing of bunded storage tanks at Homestown Landfill, Homestown, Barntown, Co Wexford.

The Bunded tanks were inspected and tested in compliance with Condition 3.12.2 of the licence , which states

*The licensee shall provide and maintain leachate storage tanks at the facility to facilitate the storage of leachate abstraction / collection from the waste. All leachate storage structures on the facility shall be inspected and certified fit for purpose every three years by an independent and appropriately qualified engineer.*

Tank B the Bunded tank is located under the fuel storage area.

The structures were constructed in approximately 2010 – 2011 and this is the first inspection and tests to be carried out, following the procedure for inspection and testing of bunded area and leachate storage tanks.

**2. Summary of Inspection.**

The Bunded tank B is located under the fuel storage area shed. The diesel oil for the landfill plant is stored here, and is cover with a steel portal framed shed. The bunded tank is a reinforced concrete tank with the diesel storage tank built in the centre of the tank / shed. The plant is driven down to the shed where the filling hose is put out through a little access hatch. Once the plant is fuelled then the hose in retracted and stored away.

The tank measures externally are 5.4 m long by 5.4 m wide and .420 deep. The walls are nominally 225mm thick. The tank was constructed in 2011.

The summary details of construction and capacity of the tanks is given in Table 2.

Table 1. Summary of Inspection of Bunded Storage Tanks.

| TANK NO | VOLUME OF TANKS LITRES | EFFECTIVE CAPACITY OF TANK LITRES | TANKS CONSTRUCTION LITRES |
|---|---|---|---|
| 1 | 24,000 | 24,000 | Reinforced Concrete |

1. This is the gross volume of the tank using the internal dimension.
2. This is the volume of the tank up the level of the plinth.

The bunded tank in this located in constructed above ground level. The tank wall forms the base of the steel portal frame shed. Access to the shed in via 5 number steps externally and 5 number steps internally. The tank external walls are 420mm high. The tank is surrounded with a concrete pathway. It is possible to inspect the external faces of the tank. The floor of the tank in my opinion is also reinforced.

The exposed concrete is in good condition and there are no cracks or corrosion in evidence.

There is evidence of minor leakage or staining about 250mm above the existing pathway.

The bunded tank was pumped out and visually inspected using a visual aid and photo survey. Some residual sediment and water remained on the floor of the tank precluding a visual inspection of the floor and the floor to wall joints of the tank.

The concrete is in good condition throughout the internal surfaces of the tank and no major defects to the concrete, joints, or reinforcement are in evidence. There is evidence that there is some staining around the external face of the tank walls. The levels of the stain on the exterior face are as the same level as the floor of the tank. There is evidence of staining on all four faces of the tanks exterior walls.

## 3. Summary of Integrity tests.

### 3.1 Test protocol.

The procedure for integrity testing of bunded areas and LSTs was designed to comply with the requirements of section 9.2 of B.S 8007:1987, the British standards code of practice for design of concrete structure for retaining aqueous liquids. The relevant section of the procedure are summarised in the form contained in appendix 1.

BS 8007calls for a minimum 7 day test for concrete structures designed and construed in accordance wit the requirements of the standards. While the standard sis not applicable to the structure to be tested on site, this testing period was used as a guide for the tests.

The bunded tank was tested over 7 days. The records of hydrostatic test form, also contained in Appendix 1, were completed for the bunded tank. Each structure would be deemed to have failed the test if the level of the water dropped more than 10mm over the duration of the test, as required by the standard.

As the bunded tank is covered it was not necessary to measure and record the daily rainfall and evaporation for the duration of the test.

3.2 Visual Inspection.

In addition to integrity testing the bunded tank was visually inspected and a photographic survey in included in appendix 2.

The results of the test are discussed in the following sections.

3.3 Testing results.

The bunded tank was constructed in two sections. The floor reinforcement was placed and the then the concrete was laid. I am making the assumption that a kicker was not placed. The remainder of the tank was completed with out the kicker being in place. The storage area has access by steps. As the bunded area is only used in cases of a spillage, the tank were filled with water which facilitated the test over the test period.

The bunded tank was filled with water on the 5th of October and was allowed to stabilise for 24 hours prior to the commencement of the test on the 7th October 2014. Measurements of the liquid were made each day for the 7days.

The results of the tests indicate that the water levels in the bunded tank dropped nearly 8mm respectively. Seepage from the tank was observed during the test. The tank is deemed to have passed the integrity test and are deemed fit for storing of liquids. The level of seepages was minimal. It is in my opinion that the cause of the kicker not being installed is the reason for the seepage / staining. The test was carried out on hot, dry sunny days and this would facilitate the seepage / staining.

Table 2 Test records.

| Tank 2. | | | | |
|---|---|---|---|---|
| Date | Date | Time | Liquid level mm | Signed |
| Tuesday | 7th Oct | 5.10 | 1mm | J Kelly. |
| Wednesday | 8th Oct | 5.12 | .2mm | J Kelly. |
| Thursday | 9th Oct | 5.10 | .2mm | J Kelly. |
| Friday | 10th Oct | 5.10 | 4mm | J Kelly |
| Saturday | 11th Oct | 5.15 | 5mm | J Kelly |
| Sunday | 12th Oct | 5.10 | 7mm | J Kelly |
| Monday | 13th Oct | 5.15 | 8mm | J Kelly |

**I confirm that as the engineer the above test was carried out to my satisfaction and the tank is certified fit for use.**

**Conclusion.**

The bunded tank was drained and inspected. There is evidence of minor seepage and on the border of a integrity tank failure. I would make the recommendation that the tank be lined internally. A heavy duty line could be placed over the entire floor area, and returned up the wall to the level of the plinth. Allowance will have to be made for block up stands that support the diesel tank itself.

The bunded tank was integrity tested in October 2014. The tank passed the integrity test and is deemed fit for storage of liquids.

Capital Surveys Ltd

Images of external face of tank with seepage / staining.

Images of the internal tank with diesel tank & fittings

Capital Surveys Ltd

Brickenstown, Taghmon,
Co Wexford.
(053) 924 0825
(087) 685 7464
info@capitalsurveys.ie www.capitalsurveys.ie



**Report on Inspection and testing of Bunded Storage tanks at Homestown Land Fill site.**

- **Tank A – Bunded tank under waste recycle area.**

**October 2014.**

**Client Address - Mr Fran Hobbs.**

**Wexford County Council, County Hall, Carriglawn, Wexford.**

**Prepared by - Justin Kelly BEng MIEI MCIOB. Capital Surveys Ltd**

**Castlehayestown, Taghmon, Co Wexford.**

**Tel 053 92 40825 - 087 6857464**

**info@capitalsurveys.ie www.capitalsurveys.ie**

**File ref no - 2014 – 146 SS/T1**

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1. Introduction.

2. Summary of Inspection.

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3.2 Visual inspection

3.3 Testing results.

4. Conclusion.

**Plates.**

**Appendices**.

1.Procedure for inspection and testing of bunded tanks for Homestown Landfill site.

2.Visual examination records of bunded storage tank interior ( Photo file).

**Introduction.**

This report covers the inspection and testing of bunded storage tanks at Homestown Landfill, Homestown, Barntown, Co Wexford.

The Bunded tanks were inspected and tested in compliance with Condition 3.12.2 of the licence , which states

*The licensee shall provide and maintain leachate storage tanks at the facility to facilitate the storage of leachate abstraction / collection from the waste. All leachate storage structures on the facility shall be inspected and certified fit for purpose every three years by an independent and appropriately qualified engineer.*

Tank A the Bunded tank is located under the waste recycle area..

The structures were constructed in approximately 2010 – 2011 and this is the first inspection and tests to be carried out, following the procedure for inspection and testing of bunded area and leachate storage tanks.

**2. Summary of Inspection.**

The Bunded tank A is located under the recycle area of the intake area of the landfill. In this area, the storage of various materials are placed here prior to collection. Materials such as waste oils, batteries, etc are stored here in plastic contained and then collected at various intervals. The bunded tank is a reinforced concrete tank with a steel mesh cover to allow any water or liquids to be collected in case of a accidental spill. The bunded area is covered by a steel portal frame shed with a sheeted roof. The sides are closed with a gate systems ( mesh) to allow materials to be removed easily. The side gate covers the entire side of the building in sections.

The tank measures internally 14.1 m long by 4.180 m wide and .530 deep. The walls are nominally 225mm thick. The tank consist of internal walls of 225 mm thickness with opes of between .700 and .610. There is 5 opes that run the entire length of the tank and each ope is interconnected by .2 x .2 m square section at the floor base at approximately 1.0 m intervals. The tank was constructed in 2011.

The summary details of construction and capacity of the tanks is given in Table 2.

Table 1. Summary of Inspection of Bunded Storage Tanks.

| TANK NO | VOLUME OF TANKS | EFFECTIVE CAPACITY OF TANK | TANKS CONSTRUCTION |
|---|---|---|---|
| | LITRES | LITRES | LITRES. |
| | | | |
| 1 | 45,100 | 45,100 | Reinforced Concrete |

1. This is the gross volume of the tank using the internal dimension.
2. This is the volume of the tank up the level ground level.

The bunded tank in this located in buried. The tank has a raised lip on the external walls, due to difference In

ground level. The tank is surrounded with a concrete pathway. It is not possible to inspect the external faces of the tank. The floor of the tank in my opinion is also reinforced.

The tank is covered with a steel mesh which facilitates the storage of material and allows a walk along. The mesh is laid in sections and secured at the edges with a tie. These ties can be opened and the mesh plates lifted and removed If required.

The exposed concrete is in good condition and there are no cracks or corrosion in evidence.

There is no evidence of leakage or staining.

The bunded tank were pumped out and visually inspected using a visual aid and photo survey. Some residual sediment and water remained on the floor of the tank precluding a visual inspection of the floor and the floor to wall joints of the tank.

The concrete is in good condition throughout the internal surfaces of the tank and no defects to the concrete, joints, water bar or reinforcement are in evidence.

## 3. Summary of Integrity tests.

### 3.1 Test protocol.

The procedure for integrity testing of bunded areas and LSTs was designed to comply with the requirements of section 9.2 of B.S 8007:1987, the British standards code of practice for design of concrete structure for retaining aqueous liquids. The relevant section of the procedure are summarised in the form contained in appendix 1.

BS 8007calls for a minimum 7 day test for concrete structures designed and construed in accordance wit the requirements of the standards. While the standard sis not applicable to the structure to be tested on site, this testing period was used as a guide for the tests.

The bunded tank was tested over 7 days. The records of hydrostatic test form, also contained in Appendix 1, were completed for the bunded tank. Each structure would be deemed to have failed the test if the level of the water dropped more than 10mm over the duration of the test, as required by the standard.

As the bunded tank is covered it was not necessary to measure and record the daily rainfall and evaporation for the duration of the test.

### 3.2 Visual Inspection.

In addition to integrity testing the bunded tank was visually inspected and a photographic survey in included in appendix 2.

The results of the test are discussed in the following sections.

### 3.3 Testing results.

The bunded tank was constructed in two sections. The floor reinforcement was placed and the then the concrete was laid. I am making the assumption that a kicker what placed and the remainder of the tank completed. The storage area above is accessed by large opening side access gate. Materials such as waste oil are stored here in plastic drums, and if any materials are spilled they are collected in the bunded area. As the bunded area is only used in cases of a spillage, the tank were filled with water which facilitated the test over the test period..

The bunded tank was filled with water on the 5$^{th}$ of October and were allowed to stabilise for 24 hours prior to the commencement of the test on the 7$^{th}$ October 2014. Measurements of the liquid were made each day for the 7days.

The results of the tests indicate that the water levels in the bunded tank remained constant and may have fallen by 1mm respectively. No seepage from the tank was observed during the test. The tank is deemed to have passed the integrity test and are deemed fit for storing of liquids.

Table 2 Test records.

| **Tank 2.** | | | | |
|---|---|---|---|---|
| | | | | |
| Date | Date | Time | Liquid level mm | Signed |
| | | | | |
| Tuesday | 7th Oct | 5.10 | .031 | J Kelly. |
| | | | | |
| Wednesday | 8th Oct | 5.12 | .031 | J Kelly. |
| | | | | |
| Thursday | 9th Oct | 5.10 | .031 | J Kelly. |
| | | | | |
| Friday | 10th Oct | 5.10 | .031 | J Kelly |
| | | | | |
| Saturday | 11th Oct | 5.15 | .031 | J Kelly |
| | | | | |
| Sunday | 12th Oct | 5.10 | .031 | J Kelly |
| | | | | |
| Monday | 13th Oct | 5.15 | .031 | J Kelly |

**I confirm that as the engineer the above test were carried out to my satisfaction and the tank is certified fit for use.**

**Conclusion.**

The bunded tank was drained and inspected.

The bunded tank was integrity tested in October 2014. The tank passed the integrity test and is deemed fit for storage of liquids.

Brackistown, Tuhamon,
Co Wexford.



Covered Bunded tank A, showing mesh floor & steel portal frame shed with side access gates.

Internal opes with mesh floor.

Interconnecting opes.

Images shows side access gates.