

# Cover Page

## Signed Declaration

**Waste License  
Registration Number:** W0201-03

**Licensee:** Bord na Mona Resource Recovery Ltd

**Reporting year:** 2014

I Declare that;

“All the data and information presented in this report has been checked and certified as being accurate. The quality of the information is assured to meet licence requirements”

Signature



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Landfill Manager

# 2014 ANNUAL ENVIRONMENTAL REPORT

Bord na Móna Resource Recovery  
Drehid Waste Management Facility



**Drehid Waste Management Facility**

<b>License Registration Number:</b>	W0201-03
<b>Licensee:</b>	Bord Na Móna Plc Drehid Waste Management Facility
<b>Location of Activity:</b>	Killinagh Upper, Carbury, Co. Kildare
<b>Attention:</b>	Office of Environmental Enforcement, EPA Headquarters, PO Box 3000, Johnstown Castle Estate, Co. Wexford
<b>Prepared by:</b>	Bord Na Móna Plc Drehid Waste Management Facility

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## **1. INTRODUCTION**

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The following document is the 2014 Annual Environmental Report (AER) for Bord Na Móna Waste Management Facility at Drehid, County Kildare. It covers the period from 1st January 2014 to 31st December 2014. The Integrated Waste Management Facility comprises of a non-hazardous, fully engineered landfill, a composting plant and a landfill gas utilisation plant.

The Environmental Protection Agency (Agency) granted the Waste Licence (W0201-01) in August 2005 and construction works began in August 2006. Phase 1 was completed in 2007 and the facility began accepting waste in February 2008. In April 2009, the Agency issued a revised Waste Licence (W0201-02), which increased the annual waste acceptance limit to 360,000 tonnes for a seven year period or until the end of 2015, whichever is sooner. In March 2010, the Agency issued a revised Waste Licence (W0201-03), which was primarily aimed at ensuring that landfill operations are undertaken in compliance with all relevant requirements of the Landfill Directive (1999/31/EC) including the need to divert biodegradable municipal waste from landfill. In December of 2013, the Agency issued a notice of amendment of the license, to bring it into conformity with the European Union (Industrial Emissions) Regulations 2013. The content of this AER is based on Schedule F of the licence.

## **2. SITE DESCRIPTION**

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### **2.1 Site Location and Layout**

The facility is located approximately 9km south of Enfield in County Kildare and is within the confines of the Bord Na Móna owned Timahoe bog. The site encompasses a total area of approximately 179 hectares (ha), which includes the site access road, clay borrow area, landfill footprint, sand and gravel borrow area and associated infrastructure.

The landfill, when complete, will encompass approximately 39 ha. It will be developed in eight distinct phases, each having duration of between 2 to 3 years. Waste deposition will only take place in the active phase and each phase will occupy between 2.2ha and 2.6 ha in area. The initial construction phase was completed in January 2008 and waste acceptance began in February of that year.

Subsequent phases will involve the construction of additional engineered cells, the provision of additional leachate storage capacity required, landfill gas management infrastructure including an utilisation plant that will generate electricity, and the development of a composting facility.

### **2.2 Waste Types & Volumes**

Only non-hazardous, solid, residual waste is accepted for disposal. Hazardous and liquid wastes are not accepted. All wastes deliveries are subject to Waste Acceptance Procedures that have been approved by the Agency, as specified in Condition 8.1.10 of the Licence.

A maximum of 360,000 tonnes of non hazardous municipal, commercial and industrial waste can be accepted annually for disposal until the 1<sup>st</sup> December 2015, after which the annual intake reduces to a maximum of 120,000 tonnes per annum. A maximum of 25,000 tonnes of compostable wastes can be accepted in the composting facility. An unlimited amount of suitable inert waste can be accepted for use in on-site engineering.

### 2.3 Waste Activities

The facility is a full containment landfill, which is designed to accept treated waste for final disposal. The waste activities carried out during the reporting period were: -

- Disposal (landfilling) of wastes,
- Recovery of wastes for removal off-site for recycling,
- Recovery of certain inert wastes on-site for use in engineering works and as daily cover, and
- Capture and utilisation of the landfill gas for the generation of electricity for supply to the national grid.

The Compost Plant comprises a waste reception area, 12 composting tunnels and 1 hygenisation unit, a screening area and product storage bay.

### 2.4 Waste Received, Recovered & Consigned

The types and quantities of wastes received, disposed, recovered and consigned from the facility in 2014 are shown in Tables 2.1 and 2.2. The consigned wastes are those generated by daily operations and which were not suitable for recovery or disposal on-site.

**Table 2.1 Waste Received 2014**

<b>Waste Type to Landfill Facility</b>	<b>Description</b>	<b>Tonnes</b>
Municipal	Mixed Commercial and Domestic	176,770.20
	Street Cleansing and Local Authority Clean ups	50,524.70
Industrial	Non Hazardous Industrial Solid Waste	5,003.72
	Bottom Ash	1,304.04
	Medical waste	110.96
	Biostabilised Waste	46,195.61
Sludges & Filter cake	Non Hazardous Municipal & Industrial	3,423.31
C & D C & D	Non-Recoverable/Oversize processed C&D	1,087.28
	Non Hazardous Soil and Stone (containing Japanese Knotweed)	510.04
<b>Total Disposed to Landfill Facility</b>		<b>284,929.86</b>
C & D C & D C & D	Inert Soil and Fines Material	151,295.03
	Shredded Timber	19,454.04
	Engineering Material (Clean construction rubble)	93,352.75
Municipal and Industrial	Screenings (sand like material)	867.26
Municipal & Agricultural	Biostabilised Waste	29,007.10
<b>Total Recovered on-site from Landfill Facility</b>		<b>293,976.17</b>
<b>Total Accepted to Landfill Facility including Inert Waste</b>		<b>578,906.03</b>

Waste Type to Composting Facility	Description	Tonnes
Organic Fines	Screenings (<70mm) from trommelling of municipal Waste	27,632.28
Waste from mechanical treatment of waste & woodchip amendment material.	Oversize Amendment Material	1,339.58
<b>Total Accepted to Composting Facility</b>		<b>28,971.86</b>

Table 2.2 Waste Consigned 2014

Waste Description	Tonnes
Fuel Oil and Diesel	8.29
Landfill Leachate & Foul Water	42,798
Recyclables	34.62
Metals	188.4
<b>Total Consigned:</b>	<b>42,927</b>

## 2.5 Landfill Capacity

The most recent topographic survey of landfill cell footprint is included in Appendix 1. The projected closure date of the facility is 2028.

- The total capacity of the entire landfill facility is estimated to be **5,040,000m<sup>3</sup>**.
- The current constructed unused void space at the end of 2014 is approximately **237,512m<sup>3</sup>**
- **2,523,327m<sup>3</sup>** of void space has been used up to the end of 2014.

## 2.6 Method of Deposition of Wastes

### 2.6.1 Waste Acceptance

Waste accepted for disposal is residual waste from household, commercial and industrial sources. All of the waste collectors that deliver the waste have systems in place whereby the recyclable fraction is either collected separately, or else separation is carried out at their recovery/transfer facilities.

Wastes are delivered in Heavy Goods Vehicles (HGV) provided with the appropriate covers to prevent loss of load. Each vehicle first proceeds to the incoming weighbridge where it is weighed. The weighbridge operator and/or the Facility Manager may, at their own discretion, request the load to be tipped in the Waste Inspection Area to ensure it is suitable for acceptance.

The vehicles then proceed to the active fill area, where it is deposited under the direction of a banksman. Each landfill cell is divided into a number of 'grids', which are used to identify the areas where waste is deposited. Each load is assigned the relevant grid number. The vehicles weigh out at the outgoing weighbridge and receive an individual weighbridge docket before exiting the site.

2.6.2 *Working Face*

Waste is deposited close to and above the advancing tipping face. Site operatives inspect the deposited waste for items that are not acceptable under the Licence, such as tyres, gas bottles, batteries etc. These are removed and stored in appropriate areas for later removal from the site.

The deposited waste is then spread in shallow layers on the inclined surface and compacted. Steel-wheeled compactors operate on the gradient of the more shallow face, pushing and compacting thin layers of waste. Each day's waste input forms a 'block', which is compacted and covered. The following day a new 'block' of waste is deposited adjacent to this block. This allows areas that have been filled and are to be left for a period, to be progressively restored over the site life, minimising the areas of active waste deposition.

### **3. ENVIRONMENTAL MONITORING**

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Bord na Móna implements a comprehensive environmental monitoring programme to assess the significance of emissions from site activities. The programme, which is specified in Schedule C of the Licence, includes groundwater, surface water, leachate, landfill gas, noise, dust and particulate monitoring and a biological assessment of the Cushaling River. The monitoring locations are shown in Appendix 2.

The monitoring results, including the full laboratory reports, were submitted to the Agency at quarterly intervals in the reporting period. This section presents a summary of the monitoring, data included in Appendix 3.

#### **3.1 Groundwater Monitoring**

##### *3.1.1 Baseline Groundwater Conditions*

The site is underlain by the Carboniferous Kildare Shelf, which comprises the Waulsortian, Boston Hill and Allenwood limestone Formations. The majority of the site is underlain by Waulsortian limestone, which comprises pale grey, fine grained limestone. The subsoil comprises basin peat deposits, which are underlain by thick (10 to 35m) undifferentiated till.

The groundwater monitoring carried out before the start of the construction works established naturally occurring elevated ammonia, iron, manganese and electrical conductivity levels. The hydrochemistry in the upgradient and downgradient wells is similar and characteristic of the limestone rocks in confined conditions.

##### *3.1.2 Groundwater Quality*

Groundwater quality was monitored at monthly intervals at existing groundwater monitoring wells during 2014. Additional groundwater monitoring wells (GW-11S, GW-11D, GW-12S, GW-12D, GW-13S and GW-13D) were installed during March 2014 as requested by the EPA to provide additional down gradient monitoring locations. The sampling was carried out in accordance with internationally accepted techniques and control procedures and the analyses were completed by a laboratory using standard and internationally accepted procedures. Samples obtained were analysed for the monthly and annual parameters specified in Schedule C.3 of the Licence.

The results were generally consistent with those obtained during previous years, with naturally elevated levels of ammonia detected at all monitoring wells. The monitoring programme confirmed that the site activities are not impacting on groundwater quality.

#### **3.2 Surface Water Monitoring**

The site is located in the catchment of the River Barrow and a divide between the Barrow and the River Boyne catchments is more than 500m to the north. There is an extensive man made drainage network across the Bord na Móna landholding and the site is divided into a number of discrete areas, referred to as 'peat fields' formed by the surface water drains.

The drains connect to a central culvert, which flows towards the south, where it passes through settlement ponds, before discharging to the Cushaling River. Rainfall on roof and paved areas of the landfill discharge to the underground culvert and are directed to the settlement ponds prior to discharge to the Cushaling. The Cushaling supports salmonid and cyprinid fish, the latter being dominant in the slower flowing upper reaches.

The Cushaling is a tributary of River Figile, which is a sub-catchment of the River Barrow. Biological monitoring in the Figile downstream of the site before site development works began established that the surface water quality had been impacted by the peat extraction activities. The Barrow is a candidate Special Area of Conservation (cSAC), and a nationally important river for fisheries.

### *3.2.1 Visual Assessment*

Bord na Móna carries out weekly inspections of the surface water drainage system. The inspections completed in the reporting period did not identify the presence of any impact on the drainage system associated with site activities.

### *3.2.2 Chemical Assessment*

The surface water monitoring was conducted weekly at the three locations specified in the Licence. The sampling was carried out in accordance with internationally accepted techniques and control procedures, the analyses were completed by a laboratory using standard and internationally accepted procedures.

BOD, Ammonia and Total Suspended Solids (TSS) levels were compared to their relevant emission limit values (ELV's). The ELV for ammonia was exceeded on a total of 10 occasions at SW6 which is located at the outlet for the Integrated Constructed Wetland (ICW). The ICW was constructed in 2013 to actively manage naturally occurring elevated ammonia in groundwater which has elevated emissions at SW-6 from the pumping of groundwater.

The ELV for ammonia was exceeded on a total 3 occasions at SW-5 during 2014 which is located downstream of the settlement lagoons before surface waters discharge into the Cushaling River.

### **3.3 Leachate**

Leachate samples are analysed quarterly for BOD and COD at one monitoring location (LT1). The samples are also analysed annually for the range of parameters specified in the Licence. The results are typical of those of a leachate from a relatively young municipal solid waste landfill and are detailed in Appendix 2.

### **3.4 Landfill Gas (LFG)**

The gas monitoring programme includes monthly measurements of methane, carbon dioxide, oxygen and atmospheric pressure in wells located both outside and inside the waste body. The wells are at 50m intervals around the landfill footprint and two per hectare within the cells. The locations of the 29 external wells (LG-01 – LG-29), which were agreed in advance with the Agency, are shown on the monitoring location map included in Appendix 2.

#### *3.4.1 Outside the Waste Body*

The concentration limit for methane (1% v/v) was Exceeded at monitoring location LG-21 (4.4% v/v) in quarter two of 2014.

#### *3.4.2 Inside the Waste Body*

Methane levels varied from 6.0 to 65.9 %v/v, carbon dioxide levels varied from 1.4 to 58.0 %v/v, while oxygen levels varied from 0 to 20.2 %v/v. These levels are typical of those in an operational non-hazardous waste landfill.

### **3.5 Noise Survey**

Noise monitoring is carried out annually at five monitoring locations (N2, N3, N4, N5 and noise sensitive location N1) in accordance with International Standards Organisation 1996: Acoustics-description and Measurement of Environmental Noise (Parts 1, 2 and 3).

Noise monitoring undertaken in 2014 included both daytime and night time monitoring. The noise sensitive location (NSL) recorded daytime LAeq levels of 41-48 dB(A) and night-time LAeq levels of 29-30 dB(A), all of which are within their respective licence limits.

Tonal noise was not detected at any of the boundary locations or at the NSL during any of the daytime or night-time monitoring events.

The daytime site boundary LAeq levels ranged from 37-39 dB(A) at N3 to 52dB(A) at N4. The elevated noise level at N4 was attributed to event noise such as waste trucks/cars entering and exiting the waste management facility in close proximity to the noise meter.

The monitoring results confirmed that the noise emissions from the Drehid facility are in compliance with conditions of licence W0201-03. See monitoring location map in Appendix 2.

### 3.6 Dust Monitoring

Dust deposition is monitored monthly at five monitoring locations (D1, D2, D5, D6 and D8) as shown on the monitoring location map in Appendix 2. All of the monitoring results (with the exception of three results at D6) were less than the deposition limit set in the licence (350 mg/m<sup>2</sup>/day). Elevated readings were recorded at D6, an internal site monitoring location in February/March (762) these readings were attributed to the associated traffic movement past the dust gauge location.

### 3.7 Meteorological Monitoring

Average rainfall, temperature, humidity and wind speed and direction for the monitoring period were obtained from the Meteorological Station at Casement Aerodrome, which is located approximately 40 km from the facility, is presented in Table 3.1.

**Table 3.1 Meteorological Data: Casement Aerodrome – 2014**

<b>Rainfall</b>	
Total Annual (2014)	948.5mm
Maximum monthly (November)	138.9mm
Minimum monthly (September)	12.8mm
<b>Temperature</b>	
Mean (2014)	10.1°C
Mean Maximum (July)	16.3°C
Mean Minimum (December)	5.3°C
<b>Wind</b>	
Prevailing direction	South West
Prevailing sector	South West

Total rainfall in millimetres for Casement

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2014	110.7	122.0	56.7	39.3	98.4	31.7	42.6	142.2	12.8	89.1	138.9	64.1	948.5
2013	69.5	45.2	63.3	47.5	52.8	43.2	42.7	62.9	35.1	100.4	21.2	104.7	688.5
2012	63.2	19.8	27.5	94.7	64	178.5	102.7	74.9	89.6	84.2	79.8	46.8	925.7
mean	63.8	48.5	50.7	51.9	59.1	62.5	54.2	72.3	60.3	81.6	73.7	75.7	754.3

Mean temperature in degrees Celsius for Casement

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2014	5.5	5.6	6.8	9.5	11.6	13.9	16.3	13.9	13.7	11.1	7.5	5.3	10.1
2013	5.1	4.3	3.1	6.9	10	13.5	17.8	15.9	13.2	11.8	6.2	6.8	9.6
2012	6	6.6	8.5	6.6	10.2	13.1	14.3	15.6	11.9	8.5	6.1	5.2	9.4
mean	5.1	5.1	6.8	8.2	10.9	13.6	15.7	15.4	13.3	10.3	7.2	5.4	9.8

### 3.8 Biological Monitoring

The annual biological assessment of the Cushaling River was carried out by ANUA Environmental in accordance with Condition 8.11 of the License on 8<sup>th</sup> December 2014.

Sampling was undertaken at one monitoring location downstream of the facility. As the river rises on-site there is no upstream sampling location. The assessment used the EPA Q-rating system for the evaluation of rivers and streams. Benthic macro-invertebrates were sampled qualitatively using kick-sampling and the results indicated that the Q value to be Q3-4, which is slightly polluted.

The results reflect the findings of the previous assessment undertaken on 5<sup>th</sup> September 2013 and that of the 2008 assessment, which was carried out prior to waste acceptance. The assessment indicates that the facility is not impacting upon the Cushaling River.

## 4. SITE DEVELOPMENT WORKS

### 4.1 Tank, Pipeline and Bund Testing

An inspection and integrity testing of the bunds at the facility was carried out by Fehily Timoney and Co in 2011; consequently, testing was not required for the reporting period.

### 4.2 Summary of Resource & Energy Consumption

Table 4.1 presents an estimate of the resources used on-site in 2014. Bord Na Móna completed an Energy Efficiency Audit of the facility in compliance with Conditions 7.1 and 7.2 of the Licence in January 2009. The audit was carried out in accordance with the Agency's "Guidance Note on Energy Efficiency Auditing" (2003). The Audit report recommended the development of a documented energy policy statement, as this is considered fundamental to the successful implementation of any management system as it provides the framework for the introduction and maintenance of energy efficiency and conservation measures in the day to day operation of the facility.

During 2013, Bord Na Móna commissioned the installation of a 5MW landfill gas utilisation plant at the facility. This plant was commissioned in November 2013 and converts landfill gas into electricity for export to the national grid. Not only does the plant produce electricity, but it also serves to reduce the facility's carbon footprint whilst ensuring the safe capture and destruction of landfill gas. Typically, the flaring of landfill gas contributes to greenhouse gas emissions; however, the landfill gas prevents this occurrence.

**Table 4.1 Resources Used On-Site**

Resources	Quantities
Diesel (green)	412,667litres
Kerosene	3,900litres
Electricity (Landfill and Composting activity)	2,210,301kWhr
Electricity (Gas Plant)	5,658.85kWhr

### 4.3 Site Developments

Phase 7 construction began in 2013 with the completion of both Phase 7 and Phase 8 by the end of 2014. The construction of Phases 9 & 10 to the east of the existing footprint of the landfill began in 2014 with the completion of Phases 9-15 scheduled to be completed by 2017.

The final capping of Phases 1 & 3 commenced during 2014 with Phase 1 been completed by the end of the reporting period. The final capping of Phase 3 is on-going and due to be completed during 2015. The capping works have comprised the installation of the geo-membrane landfill cap overlain by inert soils. Every effort was made to source reclaimed inert soils for the final capping works to avoid the unnecessary exploitation of virgin soils.

During 2014 a trial odour abatement system was constructed and commissioned at the Compost Plant at the Drehid Facility. The odour abatement system utilises Sulphuric Acid to regulate the ammonia levels to the air stream inlet for the biofilters. The plant comprises a double walled Sulphuric Acid storage tank with a 10 cubic meter capacity with a bunded filling cabinet as the interface between the storage tank and delivery trucks. The infrastructure is located adjacent to the Compost Plant on a purpose built concrete base.

As requested by the EPA additional groundwater monitoring wells were installed down gradient of the landfill. Three sets of wells GW-11, GW-12 & GW-13 (one deep and one shallow) were installed

during March 2014. As well as the installation of the new wells replacement wells GW-5a and GW-3s were installed to replace the originals which had been decommissioned during site development.

#### **4.4 Stability Assessment**

The Drehid Facility is currently within Phase 9 & 10 of construction works, which as per other phases are subject to a stringent Construction Quality Assurance (CQA) programme. This programme ensures the side slopes of the retaining bunds are stable. The method of waste placement, where the active waste face is confined to a height of 2.5 metres after compaction, a width of 25 metres and a slope no greater than 1 in 3 ensures that the risk of slope failure is negligible.

## **5. EMISSIONS**

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### **5.1 Landfill Gas**

The volume of landfill gas generated at the facility during the reporting period was estimated using predictive gas generation model GasSim Version 1.54. The model input data were site specific values, i.e. size of the site, operational period, quantity and type of waste.

The model estimates that approximately 3401 M3/ hour of landfill gas is produced, which equates to a 2014 total for methane production of 9,938,135 kgs . The total landfill gas flared from the site was calculated to be 3,814,464 kg.

In addition, as this is our first full year of LFG utilisation 5,638,881kg of methane was utilised to generate green electricity onsite.

Gas Sim	9,938,134.81
Flared	3,814,463.50
Utilised	5,638,881.00
Fugitive Loss	484,790.32

### **5.2 Surface Water**

Rainfall from the landfill cap and hard stand areas of the landfill discharges firstly into a regulated settlement lagoon before entering the Integrated Constructed Wetland (ICW) the outlet of which (SW-6) is continuously monitored. The discharge then flows to the extensive manmade drainage network across the Bord na Móna landholding formed by the surface water drains between areas referred to as "Peat fields". The drain connects to a central culvert, which flows towards the south, where it passes through settlement ponds, before discharging to the Cushaling River.

### **5.3 Leachate**

The tonnage of leachate and foul water taken offsite in 2014 was 42,798 tonnes. The leachate was directed off site for treatment at Kildare County Council's Waste Water Treatment Plant in Leixslip, County Kildare or to licensed/permitted facilities operated by Rilta Environmental Limited and Enva.

## **6. NUISANCE CONTROL**

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Bord na Móna is committed to operating in the best possible manner, using the best available techniques to minimise impacts to the environment and local residential neighbours. The potential sources of nuisance at the facility are odour, vermin, birds, flies, mud, dust and litter.

### **6.1 Odour**

In addition to the gas extraction and flaring system, good operational practices on-site are the main controls to avoid odour nuisances. The handling, depositing and covering of waste at the facility is carried out in accordance with the Agency's Landfill Manual "Landfill Operational Practices". In addition, Bord na Móna have developed a site specific "Odour Management Plan".

The waste delivery trucks are unloaded at the working face and the waste is compacted within 3 to 4 minutes. The level areas of the working face are covered on a continuous basis during the day. The slope of the working face is covered completely with artificial cover sheets at the end of each working day, which can easily be removed again the following day prior to commencement of operations.

### **6.2 Pest Control**

The methods used for vermin control are as detailed in the EMS, which is ISO 14001 accredited. These control measures have found to be successful.

Bord na Móna employs bird control specialists. The aim is to create an association of danger, so that birds choose not to fly around the area where bird control is active. To date, these measures have proven to be successful.

### **6.3 Dust & Litter**

Bord na Móna has prepared a Dust and Litter Control Plan, a copy of which is included in Appendix 4.

Dust and mud control measures were implemented at the start of the construction phase of the site and continued into the operational phase. These measures include the use of a wheelwash, road sweeper and a water bowser to dampen access roads and stockpiles during periods of dry weather. To date these measures have proven to be successful.

Litter is controlled by fencing which was installed around the landfill footprint as specified in the Licence. Portable litter fencing is also used at the working face, which can be moved to various points around the working face depending on the wind direction. As part of operational controls all litter is collected at the end of the working day and litter has not been an issue at the facility.

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## **7. ENVIRONMENTAL INCIDENTS AND COMPLAINTS**

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### **7.1 Incidents**

There were 20 incidents on-site during the reporting period. The majority (10) related to exceedance of the ammonia limit of 0.5mg/l NH<sub>4</sub> set in the Licence at SW-6. Three (3) related to exceedances of suspended solids and ammonia limits at SW6.

There were 4 No. Incidents related to the exceedences of the trigger value (1.5%v/v) for carbon dioxide (CO<sub>2</sub>) and 1 No. related to the exceedence of the trigger value (1.5%v/v) for methane (CH<sub>4</sub>) in the perimeter landfill gas monitoring wells during Quarterly monitoring events . One (1) incident related to a marginal exceedance in the level of leachate within an active cell (i.e. 1.1 metres versus 1.0 metres specified in the licence).

Naturally occurring ammonia in groundwaters is perhaps the most challenging aspect of managing surface waters at Drehid. The ammonia levels recorded at SW6 are not a result of waste activities, but are caused by the influence of elevated ammonia concentrations within the shallow groundwater due to the reducing properties of the peat environment.

Nonetheless, Bord na Móna are actively seeking to reduce ammonia levels in surface waters as in evidence from the measures outlines above, and, more importantly from the monitoring results provided. In 2012, Drehid reported 40 no. ELV exceedances for ammonia, in 2013 this number was reduced to 36 and finally in 2014 to 10 no. ELV exceedances. In order to further build on the successes in 2015 therefore we propose constructing an second wetland pond adjacent to the first and to integrate the two wetlands by phasing the flow from the first primary pond to the second pond and out to the SW6 discharge point.

During 2014, Bord na Móna continued to maintain the following control measures to reduce the level of naturally occurring ammonia in surface waters leaving the site:

1. Bord na Mona have allowed and encouraged the growth of suitable plant species to the rear of the attenuation lagoons which behaves as a polishing filter for the discharge from the lagoons. The ICW has demonstrated very positive results, with significant ammonia reduction in evidence between the inlet and the outlet of the ICW
2. Bord na Mona planted the swale with appropriate emergent wetland vegetation (e.g. *Typha latifolia* - Bullrush; *Iris pseudacorus* - Flag Iris) to the west and south side of the landfill. Furthermore, stone weirs were installed that involved the placement of stone in the swale at a slope, thus facilitating the riffing of water across the swale. The riffle process breaks up the water surface to enhance the oxygen content. It is recognised (for rivers and streams particularly) that an effective pool and riffle system can be quite effective in aerating the water and in driving-off ammonia in the process.

### **7.2 Register of Complaints**

Bord na Móna maintains a register of complaints in compliance with Condition 11.4. Details of all complaints received during the reporting period and the action taken by Bord na Móna are available at the facility. A total of 10 complaints were received in the reporting period relating to odour (9no.) and litter (1no.). All of the complaints were addressed by facility staff.

**8. ENVIRONMENTAL MANAGEMENT SYSTEM**

**8.1 Management Structure**

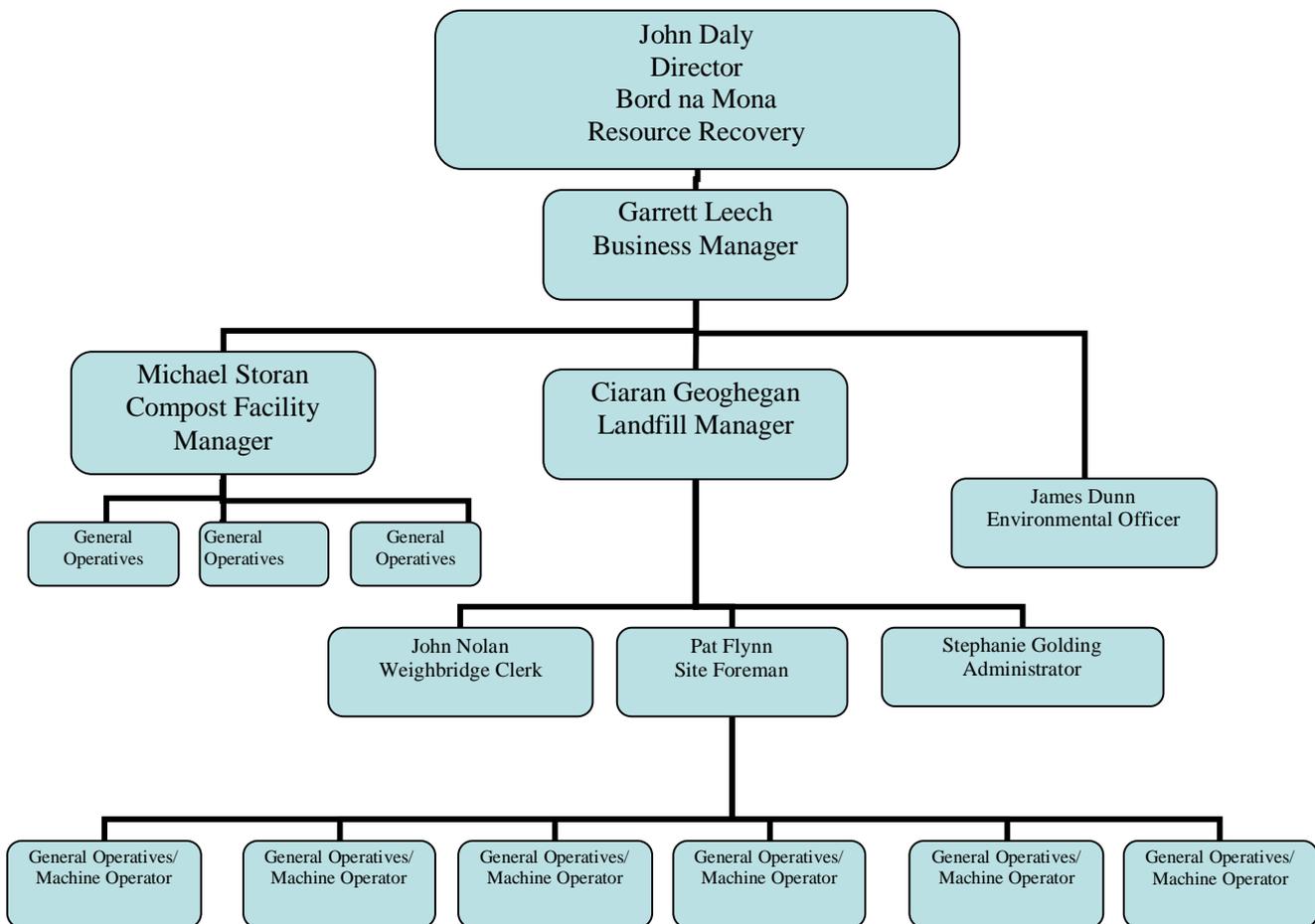
The Management Structure as required by Condition 2.2.2.1 of the licence was submitted to the Agency on 26<sup>th</sup> May 2006, as part of the EMS. An amended version is included below.

*8.1.1 Site Management Structure*

The day to day management of the facility and supervision of waste activities are the responsibility of the Environmental Manager, Landfill Manager, Facility Supervisor/Foreman and the General Operatives. The site organisational chart for 2014 is shown below.

*8.1.2 Staff Training*

Staff training is carried out in accordance with the Environmental Management System (EMS) training procedures for the facility which is included in Appendix 5.



## **8.2 EMP**

In compliance with Condition 2.2.1 an Environmental Management System (EMS) has been documented and implemented at the Facility. As part of the EMS an Environmental Management Programme (EMP) was developed.

### *8.2.1 Schedule of Objectives 2014*

Table 8.1 describes the implementation of the objectives and targets in the reporting period.

### *8.2.2 Schedule of Objectives 2015*

Bord Na Móna has set a schedule of targets and objectives for 2015. These are presented in Table 8.2.

## **8.3 Communications Programme**

The Communications Programme required by Condition 2.4.1 Licence, was established three months before the start of waste activities and has been submitted to the Agency.

**Table 8.1** Progress Report on Schedule of Objectives and Targets for 2014

Ref No	Objective	Target	Timescale	Responsible Person	Status
1	Completion of Construction Strategy	Construction of further engineered landfill cells along with associated infrastructure in line with the phased construction management plan (Phase 7).	Dec-14	CG	Complete
2	Final Capping	Progress installation of final capping (Phases 1&3).	Ongoing	CG	Phase 1 Complete
3	Leachate	Bord na Mona to continue to investigate and to trial proven technologies to treat landfill leachate onsite.	Dec-14	CG/JE	Complete
4	Surface Water	Continue to evaluate the effectiveness of ICW (integrated constructed wetland) and other proven treatment solutions to reduce naturally occurring ammonia levels in surface waters.	Dec-14	CG/JE	Complete
5	Waste Minimisation	Re-use where possible materials used on site.	Ongoing	CG	On-going
6	Upkeep of Environmental Management System	Maintain EMS to ISO 14001 standard/certification.	Ongoing	Team	On-going
		Implement Energy standard at the Facility.	Dec-14	Team	On-going
		Integrated Management System (IMS) to be rolled-out in 2014.	Dec-14	SG/JE/MS	On-going
		Maintain Policy for control of waste generated onsite.	Ongoing	SG/JE/PF	On-going
7	Environmental Training and Awareness	Continue internal training programme and assessment of training needs for all operational staff during 2013	Ongoing	CG	On-going
8	BMW conversion rate (in line with EU Landfill Directive)	<i>Condition 8.1.2 of Licence W0201-03</i> 'From 1st July 2010 to 30th June 2013 inclusive, a maximum of 47% by weight of municipal solid waste (MSW) accepted for disposal to the body of the landfill shall comprise biodegradable municipal waste (BMW), measured on a calendar year basis or, in 2010 and 2013, part thereof'	Ongoing	CG/JE	On-going
9	Reduction in energy consumption and use of fossil fuels	Assess recommendations and introduce where possible. Establish monitoring matrices for the consumption of diesel, kerosene etc.	Ongoing	CG/JE	Complete
10	Odour Management Plan	Maintain Odour Management Plan, including installation of intermediate liner and gas infrastructure as required.	Ongoing	CG/PF	On-going
11	Environmental Compliance	Review licence conditions outlined within W0201-03	Jul-14	CG/JE	On-going
12	Landfill Gas Cleaning	Continue to trial solutions and refine design to cleanse LFG.	Dec-14	CG/GL	Complete – full scale plant in design process
13	Environmental Auditing	Carrying out audits of customers to establish environmental compliance	Ongoing	CG/JE/SG	On-going

**Table 8.2** Schedule of Objectives and Targets for 2015

Ref No	Objective	Target	Timescale	Responsible Person	Status
1	Final Capping	Continue installation of final capping across Phase 3	June 2015	CG/PF	
2	Leachate Management	Commissioning of full scale Reverse Osmosis Leachate treatment plant in 2015	March 2015	CG/PF	
3	Waste Minimisation	Re-use where possible materials used on site.	Ongoing	Team	
4	Environmental Training and Awareness	Continue internal training programme and assessment of training needs for all operational staff during 2013	Ongoing	Environmental Team	
5	Environmental Compliance	Review license conditions outlined within W0201-03 to ensure continued compliance with the license conditions.	Ongoing	Environmental team	
6	Reduction in energy consumption and use of fossil fuels within the Compost Facility	Assess recommendations and introduce where possible. Establish monitoring matrices for the consumption of diesel, kerosene etc.	Dec-2015	MS	
7	Odour Management Plan	Maintain Odour Management Plan, including installation of intermediate liner and gas infrastructure as required. Commission full scale Landfill Gas Cleaning plant to cleanse landfill gas utilised by the on-site Landfill Gas Engines.	Ongoing	CG/PF	
8	Environmental Auditing	Maintaining waste inspections during 2015 of waste coming on to site to ensure compliance with W0201-03 for waste acceptance.	Ongoing	Team	

## **9. OTHER REPORTS**

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### **9.1 Financial Provision**

An Environmental Liability Risk Assessment (ELRA) was submitted as part of 2007 AER. A revised ELRA and a Closure, Restoration and Aftercare Management Plan (CRAMP) submitted to the Agency. The ELRA outlines:

- Estimated costs that may arise from accidents and unplanned events;
- Estimated costs associated with the closure, restoration and aftercare measures, including unexpected closure.

Condition 12.2.2 of W0201-03 requires the preparation of a fully costed Environmental Liabilities Risk Assessment (ELRA), together with a proposal for Financial Provision arising from the carrying out the activities to which the licence relates. The assessment shall include those liabilities and costs identified in Condition 10 for the execution of the Closure Restoration and Aftercare Management Plan (CRAMP).

Condition 10 of W0201-03 requires the provision of a closure, restoration and aftercare management plan (CRAMP) by the licensee *“to make provision for the proper closure of the activity ensuring protection of the environment”*.

### **9.2 Contributions to Community fund**

A contribution of €361860.92 is to be made to the community fund for 2014 in compliance with planning condition 17 of PL09.212059.

### **9.3 Statement on Costs of Landfill**

The costs in the setting up, operation of, and provision of financial security and closure and after-care for a period of at least 30 years, are covered by the price charged for the disposal of waste at the facility.

### **9.4 European Pollutant Release and Transfer Register**

Under the European Pollutant Release and Transfer Register Regulation (EC) No. 166/2006 Bord na Móna are required to submit information annually to the Agency. A copy of the information submitted to the Agency via the web-based data reporting system is included in Appendix 6.

### **9.5 Waste Recovery Report**

National and regional policy on waste management is based on the Department of the Environment and Local Government's policy statement of September 1998, "Changing Our Ways", in which the Government affirmed its commitment to the EU hierarchy of waste management. In order of preference this is: -

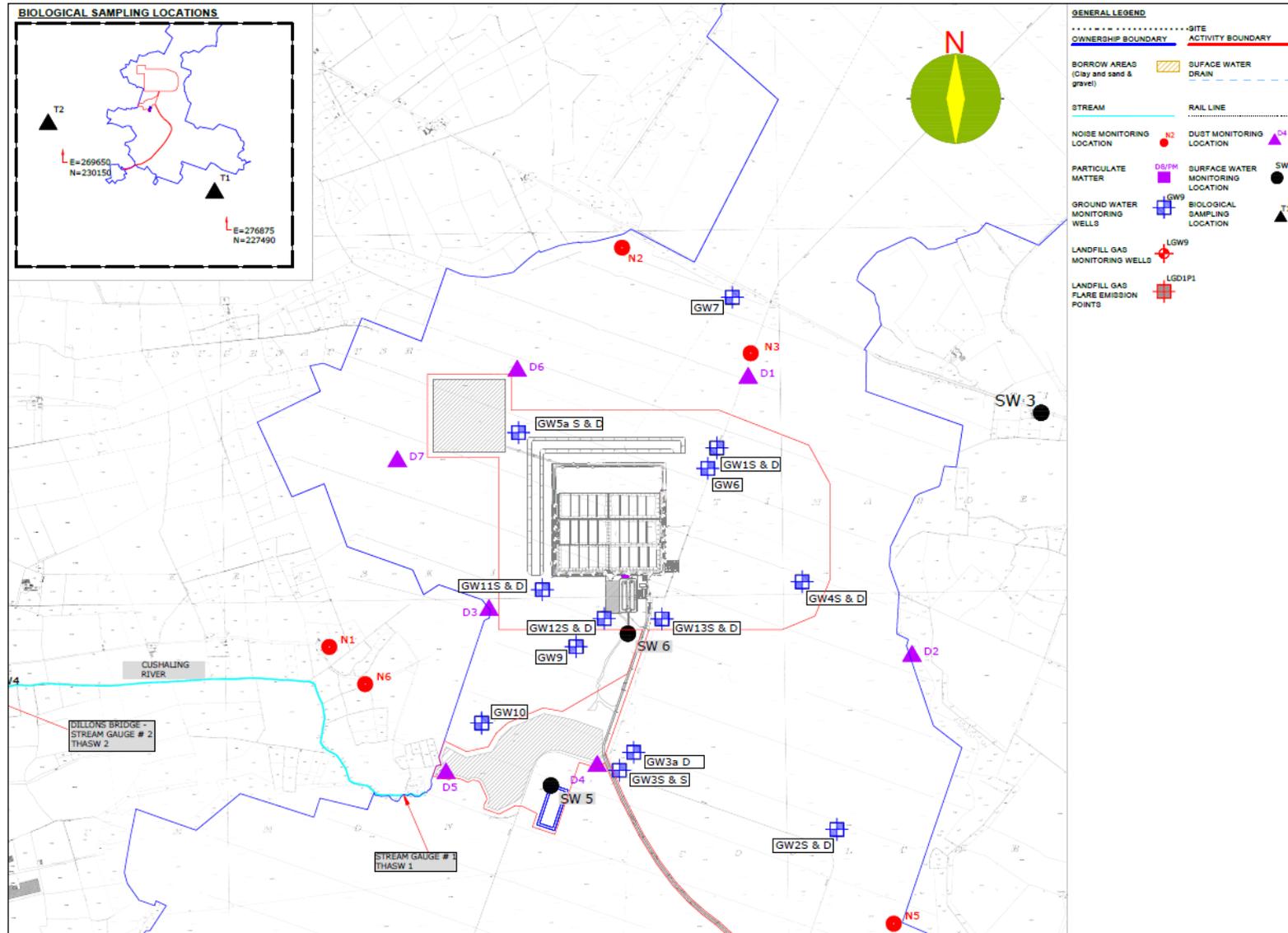
- Prevention,
- Minimisation,
- Reuse,
- Recycling,
- Energy Recovery,
- Disposal.

The policy statement was based on, and is supported by, EU legislation (Landfill Directive 99/339/EC) that requires the diversion of organic wastes, including green waste, from landfill to alternative waste treatment facilities.

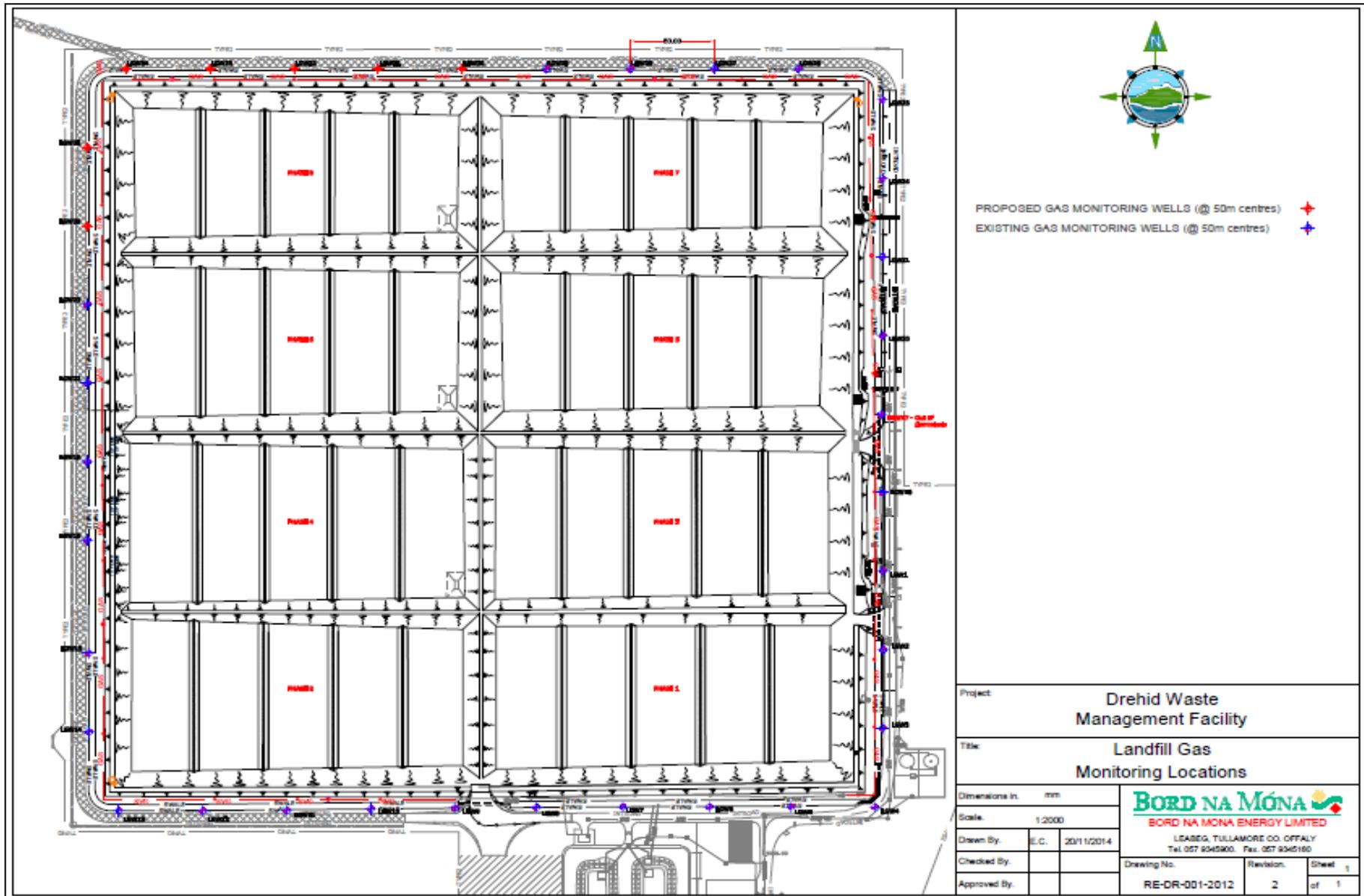
# **APPENDIX 1**

## **Site Plans & Monitoring Locations**

### Surface Water & Groundwater Monitoring Locations



Landfill Gas Monitoring Wells



Topographic Survey

## **APPENDIX 2**

### **Monitoring Results**



## Surface Water Monitoring

Location reference	Location relative to site activities	PRTR Parameter	Licensed Parameter	Monitoring date	ELV or trigger level in licence or any revision thereof*	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence	Comments
SW6	onsite		BOD	quarterly	25	All values < ELV	<2	mg/L	yes	
SW6	onsite		COD	quarterly		N/A	16	mg/L	yes	
SW6	onsite		Ammonia (as N)	weekly	0.5	All values < ELV	0.36	mg/L	no	An Ammonia level greater than 0.5 mg/l was recorded at SW5 during Weeks 2, 3, 4, 5, 6, 8, 9, 10, 11, 46 and 47 of 2014
SW6	onsite		Suspended Solids	weekly	35	All values < ELV	15	mg/L	yes	
SW6	onsite		pH	weekly		N/A	7.6	pH units	yes	
SW6	onsite		Conductivity	weekly		N/A	516	µS/cm@25oC	yes	
SW6	onsite	Chlorides (as Cl)		weekly		N/A	15	mg/L		
SW6	onsite		Ortho-phosphate (as PO4)	Annual		N/A	0.04	mg/L		
SW6	onsite	Total phosphorus		Annual		N/A	<0.05	mg/L		
SW6	onsite		Nitrate (as N)	Annual		N/A	<0.2	µg/L		
SW6	onsite		Sulphate	Annual		N/A	30	mg/L		
SW6	onsite		Beryllium	Annual		N/A	<1	µg/L		
SW6	onsite		Aluminium	Annual		N/A	<50	µg/L		
SW6	onsite	Chromium and compounds (as Cr)		Annual		N/A	<3	µg/L		
SW6	onsite		Manganese (as Mn)	Annual		N/A	59.1	µg/L		
SW6	onsite		Cobalt	Annual		N/A	<0.5	µg/L		
SW6	onsite	Nickel and compounds (as Ni)		Annual		N/A	6.36	µg/L		
SW6	onsite	Copper and compounds (as Cu)		Annual		N/A	<4	µg/L		
SW6	onsite	Zinc and compounds (as Zn)		Annual		N/A	14.3	µg/L		
SW6	onsite	Arsenic and compounds (as As)		Annual		N/A	3.15	µg/L		
SW6	onsite		Selenium	Annual		N/A	<1	µg/L		
SW6	onsite		Silver	Annual		N/A	<2	µg/L		
SW6	onsite	Cadmium and compounds (as Cd)		Annual		N/A	<0.5	µg/L		
SW6	onsite		Tin	Annual		N/A	<3	µg/L		
SW6	onsite		Antimony (as Sb)	Annual		N/A	<4	µg/L		
SW6	onsite		Barium	Annual		N/A	244	µg/L		
SW6	onsite	Lead and compounds (as Pb)		Annual		N/A	<0.5	µg/L		
SW6	onsite		Iron	Annual		N/A	0.0558	mg/L		
SW6	onsite	Mercury and compounds (as Hg)		Annual		N/A	<0.02	µg/L		
SW6	onsite		Pesticides	Annual		N/A	<0.01	µg/L		
SW6	onsite		Semi-volatiles	Annual		N/A	<1	µg/L		
SW6	onsite		Volatile organic compounds (as T)	Annual		N/A	<1	µg/L		
SW5	downstream		Ammonia (as N)	weekly		N/A	0.18	mg/L	see enter details in co	An Ammonia level greater than 0.5 mg/l was recorded at SW5 during Week 44 and Week 45 of 2014.
SW5	downstream		BOD	quarterly	25	All values < ELV	5.0	mg/L	yes	
SW5	downstream		COD	quarterly		N/A	65	mg/L	yes	
SW5	downstream		Suspended Solids	weekly	35	All values < ELV	13	mg/L	see enter details in co	The Suspended Solids ELV limit of 35 mg/l was exceeded at SW5 on one occasion during 2014. WK44
SW5	downstream	Chlorides (as Cl)		weekly		N/A	14	mg/L	yes	
SW5	downstream		Conductivity	weekly		N/A	380	µS/cm@25oC	yes	
SW5	downstream		pH	weekly		N/A	7.5	pH units	yes	
SW5	downstream		Ortho-phosphate (as PO4)	Annual		N/A	<0.01	mg/L		
SW5	downstream	Total phosphorus		Annual		N/A	<0.05	mg/L		
SW5	downstream		Nitrate (as N)	Annual		N/A	<0.2	µg/L		
SW5	downstream		Sulphate	Annual		N/A	9.1	mg/L		
SW5	downstream		Beryllium	Annual		N/A	<1	µg/L		
SW5	downstream		Aluminium	Annual		N/A	<50	µg/L		
SW5	downstream	Chromium and compounds (as Cr)		Annual		N/A	<3	µg/L		
SW5	downstream		Manganese (as Mn)	Annual		N/A	67.7	µg/L		
SW5	downstream		Cobalt	Annual		N/A	<0.5	µg/L		
SW5	downstream	Nickel and compounds (as Ni)		Annual		N/A	4.5	µg/L		
SW5	downstream	Copper and compounds (as Cu)		Annual		N/A	<4	µg/L		
SW5	downstream	Zinc and compounds (as Zn)		Annual		N/A	5.83	µg/L		
SW5	downstream	Arsenic and compounds (as As)		Annual		N/A	3.49	µg/L		
SW5	downstream		Selenium	Annual		N/A	<1	µg/L		
SW5	downstream		Silver	Annual		N/A	<2	µg/L		
SW5	downstream	Cadmium and compounds (as Cd)		Annual		N/A	<0.5	µg/L		
SW5	downstream		Tin	Annual		N/A	<3	µg/L		
SW5	downstream		Antimony (as Sb)	Annual		N/A	<4	µg/L		
SW5	downstream		Barium	Annual		N/A	92.1	µg/L		
SW5	downstream	Lead and compounds (as Pb)		Annual		N/A	<0.5	µg/L		
SW5	downstream		Iron	Annual		N/A	0.313	mg/L		
SW5	downstream	Mercury and compounds (as Hg)		Annual		N/A	<0.02	µg/L		
SW5	downstream		Pesticides	Annual		N/A	<0.01	µg/L		
SW5	downstream		Semi-volatiles	Annual		N/A	<1	µg/L		
SW5	downstream		Volatile organic compounds (as T)	Annual		N/A	<1	µg/L		
SW4	downstream		Ammonia (as N)	weekly		N/A	0.09	mg/L	yes	
SW4	downstream		BOD	quarterly		N/A	3.0	mg/L	yes	

SW4	downstream		COD	quarterly	N/A	98	mg/L	yes	
SW4	downstream		Suspended Solids	weekly	N/A	8.0	mg/L	yes	
SW4	downstream	Chlorides (as Cl)		weekly	N/A	15	mg/L	yes	
SW4	downstream		Conductivity	weekly	N/A	498	µS/cm@25oC	yes	
SW4	downstream		pH	weekly	N/A	7.5	pH units	yes	
SW4	downstream		Ortho-phosphate (as PO4)	Annual	N/A	0.08	mg/L		
SW4	downstream	Total phosphorus		Annual	N/A	0.12	mg/L		
SW4	downstream		Nitrate (as N)	Annual	N/A	<0.2	µg/L		
SW4	downstream		Sulphate	Annual	N/A	8.2	mg/L		
SW4	downstream		Beryllium	Annual	N/A	<1	µg/L		
SW4	downstream		Aluminium	Annual	N/A	<50	µg/L		
SW4	downstream	Chromium and compounds (as Cr)		Annual	N/A	<3	µg/L		
SW4	downstream		Manganese (as Mn)	Annual	N/A	64.4	µg/L		
SW4	downstream		Cobalt	Annual	N/A	<0.5	µg/L		
SW4	downstream	Nickel and compounds (as Ni)		Annual	N/A	5.6	µg/L		
SW4	downstream	Copper and compounds (as Cu)		Annual	N/A	<4	µg/L		
SW4	downstream	Zinc and compounds (as Zn)		Annual	N/A	9.13	µg/L		
SW4	downstream	Arsenic and compounds (as As)		Annual	N/A	<2	µg/L		
SW4	downstream		Selenium	Annual	N/A	<1	µg/L		
SW4	downstream		Silver	Annual	N/A	<2	µg/L		
SW4	downstream	Cadmium and compounds (as Cd)		Annual	N/A	<0.5	µg/L		
SW4	downstream		Tin	Annual	N/A	<3	µg/L		
SW4	downstream		Antimony (as Sb)	Annual	N/A	<4	µg/L		
SW4	downstream		Barium	Annual	N/A	99.1	µg/L		
SW4	downstream	Lead and compounds (as Pb)		Annual	N/A	<0.5	µg/L		
SW4	downstream		Iron	Annual	N/A	0.23	mg/L		
SW4	downstream	Mercury and compounds (as Hg)		Annual	N/A	<0.02	µg/L		
SW4	downstream		Pesticides	Annual	N/A	<0.01	µg/L		
SW4	downstream		Semi-volatiles	Annual	N/A	<1	µg/L		
SW4	downstream		Volatile organic compounds (as T	Annual	N/A	<1	µg/L		
SW4	downstream	SELECT	SELECT		SELECT		SELECT	SELECT	

<b>Groundwater/Soil monitoring template</b>	Lic No: P0xxx-01	Year 2013
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		Comments
1	Are you required to carry out groundwater monitoring as part of your licence requirements?	SELECT
2	Are you required to carry out soil monitoring as part of your licence requirements?	SELECT
3	Do you extract groundwater for use on site? If yes please specify use in comment section	SELECT
4	Do monitoring results show that groundwater generic assessment criteria such as GTVs or IGVs are exceeded or is there an upward trend in results for a substance? If yes, please complete the Groundwater Monitoring Guideline Template Report (link in cell G8) and submit separately through ALDER as a licensee return AND answer questions 5-12 below.	<a href="#">Groundwater monitoring template</a> SELECT

Please provide an interpretation of groundwater monitoring data in the interpretation box below or if you require additional space please include a groundwater/contaminated land monitoring results interpretation as an additional section in this AER

Please enter interpretation of data here

### Upgradient Groundwater monitoring results

Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration++	Average Concentration+	unit	GTV's*	IGV	Upward trend in pollutant concentration over last 5 years of monitoring data
Monthly	GW1s	pH	APHA 2012 4500 H&B	Monthly	7.1	6.9	pH Units	-	≥6.5 and ≤9.5	no
Monthly	GW1s	Conductivity	APHA 2012 2510B	Monthly	1212	956	µS/cm	800 – 1875	1000	yes
Monthly	GW1s	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Monthly	7.6	6.9	mg/l	0.065-0.175	0.15	no
Monthly	GW1s	Ammonium	via inhouse calculation	Monthly	9.8	8.8	mg/l		0.2	no
Monthly	GW1s	Chloride	APHA 2012 4500-CL-E	Monthly	16	14	mg/l	187.5	30	yes
05/09/2014	GW1s	Sulphate	APHA 2012 4110B	Annually	0.8		mg/l	187.5	200	no
05/09/2014	GW1s	Nitrate as NO3	APHA 2012 4500-NO <sub>3</sub> B. Colorimetric Method	Annually	<0.2		mg/l	37.5	25	no
05/09/2014	GW1s	Orthophosphate	APHA 2012 4500-P.E	Annually	0.0		mg/l	-	0.03	no
05/09/2014	GW1s	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	0.1		mg/l	-	-	no
05/09/2014	GW1s	Calcium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	200.0		mg/l	-	200	no
05/09/2014	GW1s	Magnesium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	15.0		mg/l	-	50	yes
05/09/2014	GW1s	Potassium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	1.6		mg/l	-	5	yes
05/09/2014	GW1s	Sodium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	15.0		mg/l	150	150	yes
05/09/2014	GW1s	Iron - dissolved	ICP-MS Based on EPA Method 200.8	Annually	3.0		mg/l	-	0.2	no
05/09/2014	GW1s	Boron - dissolved	ICP-MS	Annually	10.0		ug/l	0.75	1	no
05/09/2014	GW1s	Arsenic - dissolved	ICP-MS Based on EPA Method 200.8	Annually	36.0		ug/l	7.5	0.01	no
05/09/2014	GW1s	Barium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	372.0		ug/l	-	0.1	no
05/09/2014	GW1s	Cadmium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.005	no
05/09/2014	GW1s	Cobalt - dissolved	ICP-MS Based on EPA Method 200.8	Annually	3.0		ug/l	-	-	no
05/09/2014	GW1s	Chromium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.03	no
05/09/2014	GW1s	Copper - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	1.5	0.03	no
05/09/2014	GW1s	Mercury - dissolved	ICP-MS	Annually	<1		ug/l	7.5	0.001	no
05/09/2014	GW1s	Manganese - dissolved	ICP-MS Based on EPA Method 200.8	Annually	359.0		ug/l	-	0.05	yes
05/09/2014	GW1s	Beryllium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1s	Nickel - dissolved	ICP-MS Based on EPA Method 200.8	Annually	25.0		ug/l	15	0.02	no
05/09/2014	GW1s	Lead - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	18.75	0.01	no
05/09/2014	GW1s	Antimony - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1s	Selenium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1s	Silver - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1s	Aluminium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	3.0		ug/l	-	200	no
05/09/2014	GW1s	Tin - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1s	Zinc - dissolved	ICP-MS Based on EPA Method 200.8	Annually	5.0		ug/l	-	0.1	no

Groundwater/Soil monitoring template				Lic No:	P0xxx-01	Year	2013			
05/09/2014	GW1s	VOC's USEPA 524.2 list	GC-FID, GC-MS Based on USEPA 524.2 method	Annually	<1	ug/l	-	-	no	
05/09/2014	GW1s	Faecal Coliforms	MTM025	Annually	0.0	cfu / 100 ml	0	0	no	
05/09/2014	GW1s	Total Coliforms	MTM025	Annually	0.0	cfu / 100 ml	0	0	yes	
Monthly	GW1d	pH	APHA 2012 4500 H&B	Monthly	7.3	7.2	pH Units	-	≥6.5 and ≤9.5	no
Monthly	GW1d	Conductivity	APHA 2012 2510B	Monthly	694	676	µS/cm	800 – 1875	1000	yes
Monthly	GW1d	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Monthly	5.3	5.0	mg/l	0.065-0.175	0.15	no
Monthly	GW1d	Ammonium	via inhouse calculation	Monthly	6.8	6.5	mg/l		0.2	no
Monthly	GW1d	Chloride	APHA 2012 4500-CL-E	Monthly	12	11	mg/l	187.5	30	no
05/09/2014	GW1d	Sulphate	APHA 2012 4110B	Annually	0.6		mg/l	187.5	200	no
05/09/2014	GW1d	Nitrate as NO3	APHA 2012 4500-NO3B, Colorimetric Method	Annually	<0.2		mg/l	37.5	25	no
05/09/2014	GW1d	Orthophosphate	APHA 2012 4500-P.E	Annually	0.0		mg/l	-	0.03	no
05/09/2014	GW1d	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	0.2		mg/l	-	-	no
05/09/2014	GW1d	Calcium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	165.0		mg/l	-	200	no
05/09/2014	GW1d	Magnesium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	4.4		mg/l	-	50	no
05/09/2014	GW1d	Potassium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	1.2		mg/l	-	5	no
05/09/2014	GW1d	Sodium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	9.1		mg/l	150	150	no
05/09/2014	GW1d	Iron - dissolved	ICP-MS Based on EPA Method 200.8	Annually	1.6		mg/l	-	0.2	no
05/09/2014	GW1d	Boron - dissolved	ICP-MS	Annually	5.0		ug/l	0.75	1	no
05/09/2014	GW1d	Arsenic - dissolved	ICP-MS Based on EPA Method 200.8	Annually	39.0		ug/l	7.5	0.01	no
05/09/2014	GW1d	Barium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	348.0		ug/l	-	0.1	no
05/09/2014	GW1d	Cadmium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.005	no
05/09/2014	GW1d	Cobalt - dissolved	ICP-MS Based on EPA Method 200.8	Annually	7.0		ug/l	-	-	no
05/09/2014	GW1d	Chromium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.03	yes
05/09/2014	GW1d	Copper - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	1.5	0.03	no
05/09/2014	GW1d	Mercury - dissolved	ICP-MS	Annually	<1		ug/l	7.5	0.001	no
05/09/2014	GW1d	Manganese - dissolved	ICP-MS Based on EPA Method 200.8	Annually	202.0		ug/l	-	0.05	yes
05/09/2014	GW1d	Beryllium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1d	Nickel - dissolved	ICP-MS Based on EPA Method 200.8	Annually	29.0		ug/l	15	0.02	no
05/09/2014	GW1d	Lead - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	18.75	0.01	no
05/09/2014	GW1d	Antimony - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1d	Selenium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1d	Silver - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1d	Aluminium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	200	no
05/09/2014	GW1d	Tin - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW1d	Zinc - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	0.1	no
05/09/2014	GW1d	VOC's USEPA 524.2 list	GC-FID, GC-MS Based on USEPA 524.2 method	Annually	<1		ug/l	-	-	no
05/09/2014	GW1d	Faecal Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	no
05/09/2014	GW1d	Total Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	yes
Monthly	GW2s	pH	APHA 2012 4500 H&B	Bi-Monthly	7.5	7.0	pH Units			no
Monthly	GW2s	Conductivity	APHA 2012 2510B	Bi-Monthly	862	824	µS/cm			yes
Monthly	GW2s	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Bi-Monthly	6.0	2.2	mg/l			yes
Monthly	GW2s	Ammonium	via inhouse calculation	Bi-Monthly	7.7	2.8	mg/l			yes
Monthly	GW2s	Chloride	APHA 2012 4500-CL-E	Bi-Monthly	12	12	mg/l			no
Monthly	GW2d	pH	APHA 2012 4500 H&B	Bi-Monthly	7.4	7.3	pH Units			data not available
Monthly	GW2d	Conductivity	APHA 2012 2510B	Bi-Monthly	763	749	µS/cm			data not available
Monthly	GW2d	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Bi-Monthly	2.4	2.0	mg/l			data not available

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Monthly	GW2d	Ammonium	via inhouse calculation	Bi-Monthly	3.1	2.6	mg/l			data not available
Monthly	GW2d	Chloride	APHA 2012 4500-CL-E	Bi-Monthly	17	16	mg/l			data not available
Monthly	GW3s	pH	APHA 2012 4500 H&B	Monthly	7.1	7.0	pH Units	-	≥6.5 and ≤9.5	no
Monthly	GW3s	Conductivity	APHA 2012 2510B	Monthly	879	844	µS/cm	800 – 1875	1000	yes
Monthly	GW3s	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Monthly	5.3	4.0	mg/l	0.065-0.175	0.15	yes
Monthly	GW3s	Ammonium	via inhouse calculation	Monthly	6.8	5.1	mg/l		0.2	yes
Monthly	GW3s	Chloride	APHA 2012 4500-CL-E	Monthly	20	15	mg/l	187.5	30	no
05/09/2014	GW3s	Sulphate	APHA 2012 4110B	Annually	1.1		mg/l	187.5	200	no
05/09/2014	GW3s	Nitrate as NO3	APHA 2012 4500-NO2B. Colorimetric Method	Annually	<0.2		mg/l	37.5	25	no
05/09/2014	GW3s	Orthophosphate	APHA 2012 4500-P.E	Annually	0.0		mg/l	-	0.03	no
05/09/2014	GW3s	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	0.2		mg/l	-	-	no
05/09/2014	GW3s	Calcium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	184.0		mg/l	-	200	no
05/09/2014	GW3s	Magnesium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	13.0		mg/l	-	50	no
05/09/2014	GW3s	Potassium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	2.1		mg/l	-	5	yes
05/09/2014	GW3s	Sodium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	13.0		mg/l	150	150	no
05/09/2014	GW3s	Iron - dissolved	ICP-MS Based on EPA Method 200.8	Annually	0.6		mg/l	-	0.2	no
05/09/2014	GW3s	Boron - dissolved	ICP-MS	Annually	17.0		ug/l	0.75	1	no
05/09/2014	GW3s	Arsenic - dissolved	ICP-MS Based on EPA Method 200.8	Annually	5.0		ug/l	7.5	0.01	yes
05/09/2014	GW3s	Barium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	412.0		ug/l	-	0.1	no
05/09/2014	GW3s	Cadmium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.005	no
05/09/2014	GW3s	Cobalt - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW3s	Chromium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.03	no
05/09/2014	GW3s	Copper - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	1.5	0.03	no
05/09/2014	GW3s	Mercury - dissolved	ICP-MS	Annually	<1		ug/l	7.5	0.001	no
05/09/2014	GW3s	Manganese - dissolved	ICP-MS Based on EPA Method 200.8	Annually	236.0		ug/l	-	0.05	no
05/09/2014	GW3s	Beryllium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW3s	Nickel - dissolved	ICP-MS Based on EPA Method 200.8	Annually	4.0		ug/l	15	0.02	no
05/09/2014	GW3s	Lead - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	18.75	0.01	no
05/09/2014	GW3s	Antimony - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW3s	Selenium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW3s	Silver - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW3s	Aluminium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	5.0		ug/l	-	200	no
05/09/2014	GW3s	Tin - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW3s	Zinc - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	0.1	no
05/09/2014	GW3s	VOC's USEPA 524.2 list	GC-FID, GC-MS Based on USEPA 524.2 method	Annually	<1		ug/l	-	-	no
05/09/2014	GW3s	Faecal Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	no
05/09/2014	GW3s	Total Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	no
Monthly	GW4s	pH	APHA 2012 4500 H&B	Bi-Monthly	7.5	7.4	pH Units	-	≥6.5 and ≤9.5	data not available
Monthly	GW4s	Conductivity	APHA 2012 2510B	Bi-Monthly	786	767	µS/cm	800 – 1875	1000	data not available
Monthly	GW4s	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Bi-Monthly	7.6	7.2	mg/l	0.065-0.175	0.15	data not available
Monthly	GW4s	Ammonium	via inhouse calculation	Bi-Monthly	9.8	9.3	mg/l		0.2	data not available
Monthly	GW4s	Chloride	APHA 2012 4500-CL-E	Bi-Monthly	16	14	mg/l	187.5	30	data not available
05/09/2014	GW4s	Sulphate	APHA 2012 4110B	Annually	<0.5		mg/l	187.5	200	data not available
05/09/2014	GW4s	Nitrate as NO3	APHA 2012 4500-NO2B. Colorimetric Method	Annually	<0.2		mg/l	37.5	25	data not available
05/09/2014	GW4s	Orthophosphate	APHA 2012 4500-P.E	Annually	0.0		mg/l	-	0.03	data not available
05/09/2014	GW4s	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	0.1		mg/l	-	-	data not available
05/09/2014	GW4s	Calcium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	175.0		mg/l	-	200	data not available
05/09/2014	GW4s	Magnesium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	19.0		mg/l	-	50	data not available
05/09/2014	GW4s	Potassium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	2.6		mg/l	-	5	data not available

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05/09/2014	GW4s	Sodium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	15.0		mg/l	150	150	data not available
05/09/2014	GW4s	Iron - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<0.1		mg/l	-	0.2	data not available
05/09/2014	GW4s	Boron - dissolved	ICP-MS	Annually	15.0		ug/l	0.75	1	data not available
05/09/2014	GW4s	Arsenic - dissolved	ICP-MS Based on EPA Method 200.8	Annually	8.0		ug/l	7.5	0.01	data not available
05/09/2014	GW4s	Barium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	197.0		ug/l	-	0.1	data not available
05/09/2014	GW4s	Cadmium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.005	data not available
05/09/2014	GW4s	Cobalt - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4s	Chromium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.03	data not available
05/09/2014	GW4s	Copper - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	1.5	0.03	data not available
05/09/2014	GW4s	Mercury - dissolved	ICP-MS	Annually	<1		ug/l	7.5	0.001	data not available
05/09/2014	GW4s	Manganese - dissolved	ICP-MS Based on EPA Method 200.8	Annually	454.0		ug/l	-	0.05	data not available
05/09/2014	GW4s	Beryllium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4s	Nickel - dissolved	ICP-MS Based on EPA Method 200.8	Annually	4.0		ug/l	15	0.02	data not available
05/09/2014	GW4s	Lead - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	18.75	0.01	data not available
05/09/2014	GW4s	Antimony - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4s	Selenium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4s	Silver - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4s	Aluminium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	3.0		ug/l	-	200	data not available
05/09/2014	GW4s	Tin - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4s	Zinc - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	0.1	data not available
05/09/2014	GW4s	VOC's USEPA 524.2 list	GC-FID, GC-MS Based on USEPA 524.2 method	Annually	<1		ug/l	-	-	data not available
05/09/2014	GW4s	Faecal Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	data not available
05/09/2014	GW4s	Total Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	data not available
Monthly	GW4d	pH	APHA 2012 4500 H&B	Bi-Monthly	7.7	7.6	pH Units	-	≥6.5 and ≤9.5	data not available
Monthly	GW4d	Conductivity	APHA 2012 2510B	Bi-Monthly	481	477	µS/cm	800 – 1875	1000	data not available
Monthly	GW4d	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Bi-Monthly	0.7	0.6	mg/l	0.065-0.175	0.15	data not available
Monthly	GW4d	Ammonium	via inhouse calculation	Bi-Monthly	0.9	0.8	mg/l		0.2	data not available
Monthly	GW4d	Chloride	APHA 2012 4500-CL-E	Bi-Monthly	14	12	mg/l	187.5	30	data not available
05/09/2014	GW4d	Sulphate	APHA 2012 4110B	Annually	1.0		mg/l	187.5	200	data not available
05/09/2014	GW4d	Nitrate as NO3	APHA 2012 4500-NO3.B. Colorimetric Method	Annually	<0.2		mg/l	37.5	25	data not available
05/09/2014	GW4d	Orthophosphate	APHA 2012 4500-P.E	Annually	0.0		mg/l	-	0.03	data not available
05/09/2014	GW4d	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	<0.05		mg/l	-	-	data not available
05/09/2014	GW4d	Calcium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	82.0		mg/l	-	200	data not available
05/09/2014	GW4d	Magnesium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	18.0		mg/l	-	50	data not available
05/09/2014	GW4d	Potassium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	1.4		mg/l	-	5	data not available
05/09/2014	GW4d	Sodium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	16.0		mg/l	150	150	data not available
05/09/2014	GW4d	Iron - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<0.1		mg/l	-	0.2	data not available
05/09/2014	GW4d	Boron - dissolved	ICP-MS	Annually	12.0		ug/l	0.75	1	data not available
05/09/2014	GW4d	Arsenic - dissolved	ICP-MS Based on EPA Method 200.8	Annually	21.0		ug/l	7.5	0.01	data not available
05/09/2014	GW4d	Barium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	86.0		ug/l	-	0.1	data not available
05/09/2014	GW4d	Cadmium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.005	data not available
05/09/2014	GW4d	Cobalt - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4d	Chromium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.03	data not available
05/09/2014	GW4d	Copper - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	1.5	0.03	data not available
05/09/2014	GW4d	Mercury - dissolved	ICP-MS	Annually	<1		ug/l	7.5	0.001	data not available
05/09/2014	GW4d	Manganese - dissolved	ICP-MS Based on EPA Method 200.8	Annually	106.0		ug/l	-	0.05	data not available
05/09/2014	GW4d	Beryllium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4d	Nickel - dissolved	ICP-MS Based on EPA Method 200.8	Annually	4.0		ug/l	15	0.02	data not available
05/09/2014	GW4d	Lead - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	18.75	0.01	data not available
05/09/2014	GW4d	Antimony - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available
05/09/2014	GW4d	Selenium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	data not available

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05/09/2014	GW4d	Silver - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	-	data not available
05/09/2014	GW4d	Aluminium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	200	data not available
05/09/2014	GW4d	Tin - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	-	data not available
05/09/2014	GW4d	Zinc - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	0.1	data not available
05/09/2014	GW4d	VOC's USEPA 524.2 list	GC-FID, GC-MS Based on USEPA 524.2 method	Annually	<1		ug/l	-	-	-	data not available
05/09/2014	GW4d	Faecal Coliforms	MTM025	Annually	0.0		cfu / 100 ml		0	0	data not available
05/09/2014	GW4d	Total Coliforms	MTM025	Annually	0.0		cfu / 100 ml		0	0	data not available
Monthly	GW6	pH	APHA 2012 4500 H&B	Monthly	7.6	7.5	pH Units	-		≥6.5 and ≤9.5	no
Monthly	GW6	Conductivity	APHA 2012 2510B	Monthly	513	503	µS/cm	800 – 1875		1000	no
Monthly	GW6	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Monthly	6.0	5.9	mg/l	0.065-0.175		0.15	no
Monthly	GW6	Ammonium	via inhouse calculation	Monthly	7.7	7.5	mg/l			0.2	no
Monthly	GW6	Chloride	APHA 2012 4500-CL-E	Monthly	13	12	mg/l	187.5		30	no
05/09/2014	GW6	Sulphate	APHA 2012 4110B	Annually	<0.5		mg/l	187.5		200	no
05/09/2014	GW6	Nitrate as NO3	APHA 2012 4500-NO3.B. Colorimetric Method	Annually	<0.2		mg/l	37.5		25	no
05/09/2014	GW6	Orthophosphate	APHA 2012 4500-P.E	Annually	0.0		mg/l	-		0.03	no
05/09/2014	GW6	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	<0.05		mg/l	-		-	no
05/09/2014	GW6	Calcium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	89.0		mg/l	-		200	no
05/09/2014	GW6	Magnesium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	11.0		mg/l	-		50	yes
05/09/2014	GW6	Potassium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	1.9		mg/l	-		5	yes
05/09/2014	GW6	Sodium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	13.0		mg/l	150		150	yes
05/09/2014	GW6	Iron - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<0.1		mg/l	-		0.2	no
05/09/2014	GW6	Boron - dissolved	ICP-MS	Annually	12.0		ug/l	0.75		1	no
05/09/2014	GW6	Arsenic - dissolved	ICP-MS Based on EPA Method 200.8	Annually	87.0		ug/l	7.5		0.01	no
05/09/2014	GW6	Barium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	128.0		ug/l	-		0.1	no
05/09/2014	GW6	Cadmium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5		0.005	no
05/09/2014	GW6	Cobalt - dissolved	ICP-MS Based on EPA Method 200.8	Annually	9.0		ug/l	-		-	yes
05/09/2014	GW6	Chromium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5		0.03	no
05/09/2014	GW6	Copper - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	1.5		0.03	no
05/09/2014	GW6	Mercury - dissolved	ICP-MS	Annually	<1		ug/l	7.5		0.001	no
05/09/2014	GW6	Manganese - dissolved	ICP-MS Based on EPA Method 200.8	Annually	37.0		ug/l	-		0.05	no
05/09/2014	GW6	Beryllium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-		-	no
05/09/2014	GW6	Nickel - dissolved	ICP-MS Based on EPA Method 200.8	Annually	23.0		ug/l	15		0.02	yes
05/09/2014	GW6	Lead - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	18.75		0.01	no
05/09/2014	GW6	Antimony - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-		-	no
05/09/2014	GW6	Selenium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-		-	no
05/09/2014	GW6	Silver - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-		-	no
05/09/2014	GW6	Aluminium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	3.0		ug/l	-		200	yes
05/09/2014	GW6	Tin - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-		-	no
05/09/2014	GW6	Zinc - dissolved	ICP-MS Based on EPA Method 200.8	Annually	3.0		ug/l	-		0.1	no
05/09/2014	GW6	VOC's USEPA 524.2 list	GC-FID, GC-MS Based on USEPA 524.2 method	Annually	<1		ug/l	-		-	no
05/09/2014	GW6	Faecal Coliforms	MTM025	Annually	0.0		cfu / 100 ml		0	0	no
05/09/2014	GW6	Total Coliforms	MTM025	Annually	0.0		cfu / 100 ml		0	0	yes
											SELECT
											SELECT
											SELECT

.+ where average indicates arithmetic mean

++ maximum concentration indicates the maximum measured concentration from all monitoring results produced during the reporting year

#### Downgradient Groundwater monitoring results

Groundwater/Soil monitoring template				Lic No:	P0xxx-01	Year	2013			
Date of sampling	Sample location reference	Parameter/ Substance	Methodology	Monitoring frequency	Maximum Concentration	Average Concentration	unit	GTV's*	IGV	Upward trend in yearly average pollutant concentration over last 5 years of monitoring data
Monthly	GW9	pH	APHA 2012 4500 H&B	Monthly	7.4	7.3	pH Units	-	≥6.5 and ≤9.5	no
Monthly	GW9	Conductivity	APHA 2012 2510B	Monthly	673	603	µS/cm	800 – 1875	1000	yes
Monthly	GW9	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Monthly	4.2	2.4	mg/l	0.065-0.175	0.15	yes
Monthly	GW9	Ammonium	via inhouse calculation	Monthly	5.4	3.1	mg/l		0.2	yes
Monthly	GW9	Chloride	APHA 2012 4500-CL-E	Monthly	17	14	mg/l	187.5	30	yes
05/09/2014	GW9	Sulphate	APHA 2012 4110B	Annually	5.5		mg/l	187.5	200	yes
05/09/2014	GW9	Nitrate as NO3	APHA 2012 4500-NO <sub>3</sub> B. Colorimetric Method	Annually	<0.2		mg/l	37.5	25	no
05/09/2014	GW9	Orthophosphate	APHA 2012 4500-P.E	Annually	0.1		mg/l	-	0.03	yes
05/09/2014	GW9	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	0.1		mg/l	-	-	no
05/09/2014	GW9	Calcium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	137.0		mg/l	-	200	no
05/09/2014	GW9	Magnesium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	8.1		mg/l	-	50	no
05/09/2014	GW9	Potassium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	1.5		mg/l	-	5	yes
05/09/2014	GW9	Sodium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	14.0		mg/l	150	150	no
05/09/2014	GW9	Iron - dissolved	ICP-MS Based on EPA Method 200.8	Annually	2.9		mg/l	-	0.2	no
05/09/2014	GW9	Boron - dissolved	ICP-MS	Annually	11.0		ug/l	0.75	1	yes
05/09/2014	GW9	Arsenic - dissolved	ICP-MS Based on EPA Method 200.8	Annually	12.0		ug/l	7.5	0.01	no
05/09/2014	GW9	Barium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	142.0		ug/l	-	0.1	no
05/09/2014	GW9	Cadmium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.005	no
05/09/2014	GW9	Cobalt - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW9	Chromium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	37.5	0.03	no
05/09/2014	GW9	Copper - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	1.5	0.03	no
05/09/2014	GW9	Mercury - dissolved	ICP-MS	Annually	<1		ug/l	7.5	0.001	no
05/09/2014	GW9	Manganese - dissolved	ICP-MS Based on EPA Method 200.8	Annually	284.0		ug/l	-	0.05	no
05/09/2014	GW9	Beryllium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW9	Nickel - dissolved	ICP-MS Based on EPA Method 200.8	Annually	5.0		ug/l	15	0.02	no
05/09/2014	GW9	Lead - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	18.75	0.01	no
05/09/2014	GW9	Antimony - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW9	Selenium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW9	Silver - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW9	Aluminium - dissolved	ICP-MS Based on EPA Method 200.8	Annually	33.0		ug/l	-	200	no
05/09/2014	GW9	Tin - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	-	no
05/09/2014	GW9	Zinc - dissolved	ICP-MS Based on EPA Method 200.8	Annually	<2		ug/l	-	0.1	no
05/09/2014	GW9	VOC's USEPA 524.2 list	GC-FID, GC-MS Based on USEPA 524.2 method	Annually	<1		ug/l	-	-	no
05/09/2014	GW9	Faecal Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	no
05/09/2014	GW9	Total Coliforms	MTM025	Annually	0.0		cfu / 100 ml	0	0	yes
Monthly	GW10	pH	APHA 2012 4500 H&B	Monthly	7.3	7.2	pH Units	-	≥6.5 and ≤9.5	no
Monthly	GW10	Conductivity	APHA 2012 2510B	Monthly	685	666	µS/cm	800 – 1875	1000	yes
Monthly	GW10	Ammonia as NH3	APHA 2012 4500-NH3 and bluebook Ammonia in waters 1981	Monthly	4.3	4.1	mg/l	0.065-0.175	0.15	no
Monthly	GW10	Ammonium	via inhouse calculation	Monthly	5.5	5.2	mg/l		0.2	no
Monthly	GW10	Chloride	APHA 2012 4500-CL-E	Monthly	12	11	mg/l	187.5	30	yes
05/09/2014	GW10	Sulphate	APHA 2012 4110B	Annually	1.1		mg/l	187.5	200	no
05/09/2014	GW10	Nitrate as NO3	APHA 2012 4500-NO <sub>3</sub> B. Colorimetric Method	Annually	<0.2		mg/l	37.5	25	no
05/09/2014	GW10	Orthophosphate	APHA 2012 4500-P.E	Annually	0.1		mg/l	-	0.03	no
05/09/2014	GW10	Total Phosphours	APHA 2012 4500-PB & Hach Method 8190	Annually	0.1		mg/l	-	-	no



## Dust Monitoring

Emission reference no:	Parameter/ Substance	Frequency of Monitoring	ELV in licence or any revision thereof	Licence Compliance criteria	Measured value	Unit of measurement	Compliant with licence limit	Method of analysis	Annual mass load (kg)	Comments -reason for change in % mass load from previous year if applicable
D1	Total Particulates	Monthly	350	Daily average < ELV	77	mg/m2/day	yes	OTH Based on VDI 2119 Blatt 2		
D2	Total Particulates	Monthly	350	Daily average < ELV	60	mg/m2/day	yes	OTH Based on VDI 2119 Blatt 2		
D5	Total Particulates	Monthly	350	Daily average < ELV	57	mg/m2/day	yes	OTH Based on VDI 2119 Blatt 2		
D6	Total Particulates	Monthly	350	Daily average < ELV	175	mg/m2/day	no (if no please enter details in comments box)	OTH Based on VDI 2119 Blatt 2		Exceedance of licence limit of 350mg/m2/day with a result of 762mg/m2/day,
D8	Total Particulates	Monthly	350	Daily average < ELV	113	mg/m2/day	yes	OTH Based on VDI 2119 Blatt 2		
	SELECT			SELECT		SELECT	SELECT	SELECT		

Note 1: Volumetric flow shall be included as a reportable parameter

<b>Noise monitoring summary report</b>	Lic No: P0xxx-01	Year	2013
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- 1 Was noise monitoring a licence requirement for the AER period? Yes  
If yes please fill in table N1 noise summary below
- 2 Was noise monitoring carried out using the EPA Guidance note, including completion of the "Checklist for noise measurement report" included in the guidance note as table 6? Yes  
[Noise Guidance note NG4](#)
- 3 Does your site have a noise reduction plan? SELECT
- 4 When was the noise reduction plan last updated? Enter date
- 5 Have there been changes relevant to site noise emissions (e.g. plant or operational changes) since the last noise survey? SELECT

**Table N1: Noise monitoring summary**

Date of monitoring	Time period	Noise location (on site)	Noise sensitive location -NSL (if applicable)	LA <sub>eq</sub>	LA <sub>90</sub>	LA <sub>10</sub>	LA <sub>max</sub>	Tonal or Impulsive noise* (Y/N)	If tonal /impulsive noise was identified was 5dB penalty applied?	Comments (ex. main noise sources on site, & extraneous noise ex. road traffic)	Is site compliant with noise limits (day/evening/night)?
28/05/2014	09:38 -10:08	N1 (NSL)	yes	41	32	44	57	No	SELECT	Site: Very faint reverse alarms. Engines of heavy plant machinery	Yes
28/05/2014	14:05 -14:35	N1 (NSL)	yes	42	33	43	61	No			Yes
29/05/2014	11:55 -12:25	N1 (NSL)	yes	48	39	49	70	No			Yes
28/05/2014	10:28 -10:58	N2	No	42	27	44	61	No			Yes
28/05/2014	14:50 -15:20	N2	No	42	28	45	60	No			Yes
29/05/2014	12:41 -13:11	N2	No	44	32	45	59	No		larms.Background: Birds	Yes
28/05/2014	11:02 -11:32	N3	No	37	29	40	56	No		Site: Reverse alarms in distance. Heavy plant machinery operating	Yes
28/05/2014	15:24 -15:54	N3	No	37	29	41	59	No			Yes
29/05/2014	14:11 -14:41	N3	No	39	32	41	58	No			Yes
28/05/2014	08:58 -09:28	N4	No	52	39	51	78	No		Site: Cars and trucks entering/exiting site on landfill entrance/exit	Yes
28/05/2014	12:37 -13:07	N4	No	52	37	52	83	No			Yes
29/05/2014	11:16 -11:46	N4	No	52	35	51	73	No			Yes
28/05/2014	12:12 -12:42	N5	No	40	30	44	58	No		Site: Heavy plant machinery faintly audible – including	Yes
28/05/2014	16:06 -16:36	N5	No	40	28	44	59	No			Yes
29/05/2014	10:31 -11:01	N5	No	42	35	45	62	No		Site: No site noise audible.	Yes
29/05/2014	00:49 -01:19	N1 (NSL)	yes	29	24	28	60	No			Yes
29/05/2014	03:47 -04:17	N1 (NSL)	yes	30	25	29	61	No			Yes
29/05/2014	01:24 -01:54	N2	No	37	27	38	56	No		Site: Very faint hum of operations from	Yes
29/05/2014	04:24 -04:54	N2	No	36	25	37	49	No			Yes
29/05/2014	01:55 -02:25	N3	No	33	26	34	55	No		Site: Very faint hum of operations from	Yes
29/05/2014	04:58 -05:28	N3	No	30	24	31	54	No			Yes
28/05/2014	00:08 -00:38	N4	No	30	21	31	62	No		Site: No audible site activity.	Yes
29/05/2014	03:05 -03:35	N4	No	33	21	36	58	No			Yes
28/05/2014	23:22 -23:52	N5	No	23	20	24	48	No		Site: No site noise audible.	Yes
29/05/2014	02:27 -02:57	N5	No	22	20	23	48	No			Yes

\*Please ensure that a tonal analysis has been carried out as per guidance note NG4. These records must be maintained onsite for future inspection

**Results of the Annual Chemical Analysis of Leachate Sample LT 1 taken  
on the 11<sup>th</sup> of February 2014**

Sample ID	Units	LT-1 11/02/14
Received Date & Time		12/02/14 14:47
Sample Type		Leachate
pH	pH units	7.2
NH3-N	mg/l	2.3
NH4-N	mg/l	3.0
BOD	mg/l O2	32
COD	mg/l O2	93
Chloride	mg/l	61
Boron (total)	µg/l	116
Beryllium (total)	µg/l	<2
Aluminium (total)	µg/l	184
Chromium (total)	µg/l	<2
Manganese (total)	µg/l	506
Cobalt (total)	µg/l	<2
Nickel (total)	µg/l	3
Copper (total)	µg/l	3
Zinc (total)	µg/l	20
Arsenic (total)	µg/l	<2
Selenium (total)	µg/l	<2
Silver (total)	µg/l	<2
Cadmium (total)	µg/l	<2
Tin (total)	µg/l	<2
Antimony (total)	µg/l	<2
Barium (total)	µg/l	24
Lead (total)	µg/l	6
Iron (total)	mg/l	1.5
Mercury (total)	µg/l	<1

**Notes**

< Less than Lab limit of Detection

<b>Drehid Facility W0201-03</b>				<b>January Q1 2014</b>	
<b>Operator: J. Egan</b>				<b>Date: 31/01/2014</b>	<b>Time: 14:00-16:00</b>
<b>Instrument ID: Geotech GA 2000</b>				<b>Date Next Calibration: December 2014</b>	
<b>Weather: Dry</b>				<b>Barometric pressure: 980</b>	
				<b>Ambient Temp: 4°C</b>	
<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
<b>LG - 01</b>	<b>0.1</b>	<b>0.8</b>	<b>19.8</b>	<b>980</b>	
<b>LG - 02</b>	<b>0.2</b>	<b>1.8</b>	<b>19.7</b>	<b>980</b>	
<b>LG - 03</b>	<b>0.2</b>	<b>1.7</b>	<b>18.4</b>	<b>980</b>	
<b>LG - 05</b>					<b>Note 1.</b>
<b>LG - 06</b>	<b>0.1</b>	<b>2.4</b>	<b>15.9</b>	<b>980</b>	
<b>LG - 07</b>	<b>0.6</b>	<b>1.0</b>	<b>20.1</b>	<b>980</b>	
<b>LG - 08</b>					<b>Note 1.</b>
<b>LG - 09</b>	<b>0.2</b>	<b>1.4</b>	<b>14.9</b>	<b>980</b>	
<b>LG - 10</b>	<b>0.3</b>	<b>1.2</b>	<b>19.8</b>	<b>980</b>	
<b>LG - 11</b>	<b>0.1</b>	<b>0.4</b>	<b>20.9</b>	<b>980</b>	
<b>LG - 12</b>	<b>0.1</b>	<b>0.3</b>	<b>20.8</b>	<b>980</b>	
<b>LG - 13</b>	<b>0.1</b>	<b>0.6</b>	<b>20.2</b>	<b>980</b>	
<b>LG - 14</b>	<b>0.1</b>	<b>0.8</b>	<b>20.6</b>	<b>980</b>	
<b>LG - 15</b>	<b>0.1</b>	<b>1.0</b>	<b>20.7</b>	<b>980</b>	
<b>LG - 16</b>	<b>0.2</b>	<b>3.2</b>	<b>18.6</b>	<b>980</b>	
<b>LG - 17</b>					<b>Note 1.</b>
<b>LG - 18</b>					<b>Note 1.</b>
<b>LG - 19</b>					<b>Note 1.</b>

<b>Drehid Facility W0201-03</b>				<b>February Q1 2014</b>	
<b>Operator: J. Egan</b>				<b>Date: 27<sup>th</sup> February 2014</b>	<b>Time: 15:00-17:30</b>
<b>Instrument ID: Geotech GA 2000</b>				<b>Date Next Calibration: December 2014</b>	
<b>Weather: Fine, calm conditions</b>				<b>Barometric pressure: 988</b>	
				<b>Ambient Temp: 7°C</b>	
<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
<i>LG - 01</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 02</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 03</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 05</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 06</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 07</i>	<i>0.1</i>	<i>2.2</i>	<i>17.3</i>	<b>988</b>	
<i>LG - 08</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 09</i>	<i>0.1</i>	<i>1.0</i>	<i>17.6</i>	<b>988</b>	
<i>LG - 10</i>	<i>0.3</i>	<i>1.0</i>	<i>19.3</i>	<b>988</b>	
<i>LG - 11</i>	<i>0.1</i>	<i>0.2</i>	<i>21.0</i>	<b>988</b>	
<i>LG -12</i>	<i>0.1</i>	<i>0.1</i>	<i>21.1</i>	<b>988</b>	
<i>LG - 13</i>	<i>0.1</i>	<i>0.5</i>	<i>20.6</i>	<b>988</b>	
<i>LG - 14</i>	<i>0.1</i>	<i>0.2</i>	<i>21.0</i>	<b>988</b>	
<i>LG - 15</i>	<i>0.1</i>	<i>1.8</i>	<i>20.4</i>	<b>988</b>	
<i>LG -16</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 17</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 18</i>				<b>988</b>	<i>Note 1.</i>
<i>LG - 19</i>				<b>988</b>	<i>Note 1.</i>

<b>Drehid Facility W0201-03</b>				<b>March Q1 2014</b>	
<b>Operator: J. Egan</b>				<b>Date: 19<sup>th</sup> March 2014</b>	<b>Time: 09:00-12:00</b>
<b>Instrument ID: Geotech GA 2000</b>				<b>Date Next Calibration: December 2014</b>	
<b>Weather: Fine, calm conditions</b>				<b>Barometric pressure: 1016</b>	
				<b>Ambient Temp: 7°C</b>	
<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
<i>LG - 01</i>				<i>1016</i>	<i>Note 1.</i>
<i>LG - 02</i>	<i>0</i>	<i>2.6</i>	<i>15.5</i>	<i>1016</i>	
<i>LG - 03</i>	<i>0</i>	<i>2.0</i>	<i>16.9</i>	<i>1016</i>	
<i>LG - 05</i>	<i>0</i>	<i>1.7</i>	<i>17.9</i>	<i>1016</i>	
<i>LG - 06</i>				<i>1016</i>	<i>Note 1.</i>
<i>LG - 07</i>				<i>1016</i>	<i>Note 1.</i>
<i>LG - 08</i>				<i>1016</i>	<i>Note 1.</i>
<i>LG - 09</i>	<i>0</i>	<i>1.6</i>	<i>14.8</i>	<i>1016</i>	
<i>LG - 10</i>	<i>0.2</i>	<i>0.6</i>	<i>18.8</i>	<i>1016</i>	
<i>LG - 11</i>	<i>0</i>	<i>0.2</i>	<i>20.3</i>	<i>1016</i>	
<i>LG - 12</i>	<i>0</i>	<i>0.3</i>	<i>20.1</i>	<i>1016</i>	
<i>LG - 13</i>	<i>0</i>	<i>0.8</i>	<i>19.9</i>	<i>1016</i>	
<i>LG - 14</i>	<i>0</i>	<i>0.3</i>	<i>20.4</i>	<i>1016</i>	
<i>LG - 15</i>	<i>0</i>	<i>1.4</i>	<i>20.1</i>	<i>1016</i>	
<i>LG - 16</i>	<i>0.1</i>	<i>1.1</i>	<i>18.8</i>	<i>1016</i>	
<i>LG - 17</i>	<i>0.1</i>	<i>4.7</i>	<i>11.5</i>	<i>1016</i>	
<i>LG - 18</i>				<i>1016</i>	<i>Note 1.</i>
<i>LG - 19</i>				<i>1016</i>	<i>Note 1.</i>

<b>Drehid Facility (W0201-03)</b>				<b>April Q2 2014</b>	
<b>Operator: J. Egan / C. Geoghegan</b>				<b>Date: 8<sup>th</sup> April 2014</b>	<b>Time: 14:00</b>
<b>Instrument ID: Geotech GA 2000</b>				<b>Date Next Calibration: December 2014</b>	
<b>Weather: Dry, gusty, cool</b>				<b>Barometric pressure: 1020mbar</b>	
				<b>Ambient Temp: 10°C</b>	
<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
<i>LG - 01</i>				1020	<i>Note 1</i>
<i>LG - 02</i>	0	2.4		1020	
<i>LG - 03</i>	0	2.0		1020	
<i>LG - 05</i>	0	1.2		1020	
<i>LG - 06</i>				1020	<i>Note 1.</i>
<i>LG - 07</i>				1020	<i>Note 1.</i>
<i>LG - 08</i>				1020	<i>Note 1.</i>
<i>LG - 09</i>	0	1.5		1020	
<i>LG - 10</i>	0.2	0.6		1020	
<i>LG - 11</i>	0	0.2		1020	
<i>LG - 12</i>	0	0.3		1020	
<i>LG - 13</i>	0	0.8		1020	
<i>LG - 14</i>	0	0.3		1020	
<i>LG - 15</i>	0	1.4		1020	
<i>LG - 16</i>	0.1	1.1		1020	
<i>LG - 17</i>	0.1	1.4		1020	
<i>LG - 18</i>				1020	<i>Note 1.</i>
<i>LG - 19</i>				1020	<i>Note 1.</i>

<b>Drehid Facility W0201-03</b>				<b>May Q2 2014</b>	
<b>Operator: J. Egan</b>				<b>Date: 30<sup>th</sup> May 2014</b>	<b>Time: 09:15</b>
<b>Instrument ID: Geotech GA 2000</b>				<b>Date Next Calibration: December 2014</b>	
<b>Weather: Dry, Overcast</b>				<b>Barometric pressure: 1013mbar</b>	
				<b>Ambient Temp: 12°C</b>	
<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
<i>LG-01</i>	0.2	1.0	19	1013	<i>Note 1</i>
<i>LG-02</i>	0.2	2.3	17.9	1013	
<i>LG-03</i>	0.1	0.1	19.9	1013	
<i>LG-05</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-06</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-07</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-08</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-09</i>	0.1	3.1	6.1	1013	
<i>LG-10</i>	0.1	1.7	8.1	1013	
<i>LG-11</i>	0.1	0.5	19.8	1013	
<i>LG-12</i>	0.1	0.5	18	1013	
<i>LG-13</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-14</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-15</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-16</i>	0.2	4.1	12.3	1013	
<i>LG-17</i>	-	-	-	1013	<i>Note 1</i>
<i>LG-18</i>	0.2	0.1	20.2	1013	
<i>LG-19</i>	-	-	-	1013	<i>Note 1</i>

<b>Drehid Facility W0201-03</b>				<b>June Q2 2014</b>	
<b>Operator: J. Egan</b>				<b>Date: 30<sup>th</sup> June 2014</b>	<b>Time: 16:00</b>
<b>Instrument ID: Geotech GA 2000</b>				<b>Date Next Calibration: December 2014</b>	
<b>Weather: Fine, sunny, calm conditions</b>				<b>Barometric pressure: 1005mbar</b>	
				<b>Ambient Temp: 20°C</b>	
<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
<i>LG - 01</i>	0	2.4	17.3	1005	
<i>LG - 02</i>	0	0.9	19.1	1005	
<i>LG - 03</i>	0	0.5	19.7	1005	
<i>LG - 05</i>	-	-	-	1005	<i>Note 1</i>
<i>LG - 06</i>	0	0.8	19.2	1005	
<i>LG - 07</i>	-	-	-	1005	<i>Note 1</i>
<i>LG - 08</i>	-	-	-	1005	<i>Note 1</i>
<i>LG - 09</i>	0	1.7	10.2	1005	
<i>LG - 10</i>	0	0.5	19.7	1005	
<i>LG - 11</i>	0	0.2	19.9	1005	
<i>LG - 12</i>	0.1	0.2	20.4	1005	
<i>LG - 13</i>	-	-	-	1005	
<i>LG - 14</i>	0	0.5	19.9	1005	
<i>LG - 15</i>	0	0.6	20.4	1005	
<i>LG - 16</i>	0	0.1	20	1005	
<i>LG - 17</i>	0	0.2	19.9	1005	
<i>LG - 18</i>	0	0	20.4	1005	
<i>LG - 19</i>	0	0	20.4	1005	
<i>LG - 20</i>	0.1	0.2	19.8	1005	
<i>LG - 21</i>	4.4	3.0	1.8	1005	
<i>LG - 22</i>	-	-	-	1005	<i>Note 1</i>
<i>LG - 23</i>	-	-	-	1005	<i>Note 1</i>

<b>Drehid Facility (W0201-03)</b>			
<b>Operator: J. Egan</b>		<b>Date: 30<sup>th</sup> July 2014</b>	<b>Time: 10:00hrs</b>
<b>Instrument ID: Geotech GA 2000</b>		<b>Date Next Calibration: December 2014</b>	
<b>Weather: Overcast, Mild, Dry, calm conditions</b>		<b>Barometric pressure: 997mbar</b>	
		<b>Ambient Temp: 20°C</b>	

<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
LG - 01	0.0	3.4	16.2	993	
LG - 02	0.1	0.8	19.4	993	
LG - 03	0.1	1.1	18.2	993	
LG - 04	-	-	-	-	Note 1
LG - 05	-	-	-	-	Note 1
LG - 06	0.0	0.0	19.3	997	
LG - 07	-	-	-	-	Note 1
LG - 08	-	-	-	-	Note 1
LG - 09	0.0	0.6	19.3	997	
LG - 10	0.0	0.2	17.9	997	
LG - 11	0.0	0.2	19.9	997	
LG - 12	0	0.1	19.8	997	
LG - 13	0.1	1.1	19.1	997	
LG - 14	0.0	0.1	20	997	
LG - 15	0.0	0.1	20	997	
LG - 16	0.0	4.6	14.3	993	
LG - 17	-	-	-	-	Note 1
LG - 18	-	-	-	-	Note 1
LG - 19	0.3	0.5	18.9	997	
LG - 20	0.0	0.0	20.1	993	
LG - 21	0.6	1.4	16.2	993	
LG - 22	-	-	-	-	Note 1
LG - 23	0.0	0.0	20.1	997	
LG - 24	-	-	-	-	Note 1
LG - 25	-	-	-	-	Note 1
LG - 26	0.1	1.3	19.4	993	
LG - 27	0.9	0.8	19	997	

<b>Drehid Facility (W0201-03)</b>			
<b>Operator: S.Trimble</b>		<b>Date: 28<sup>th</sup> August 2014</b>	<b>Time: 13:00hrs</b>
<b>Instrument ID: Geotech GA 2000</b>		<b>Date Next Calibration: December 2014</b>	
<b>Weather: Bright, dry Breezy</b>		<b>Barometric pressure: mbar</b>	
		<b>Ambient Temp:</b>	

<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
LG - 01	0.1	3.3	16.8		
LG - 02	0.1	0.0	19.9		
LG - 03	0.1	0.2	19.7		
LG - -4	-	-	-	-	Note 1
LG - 05	-	-	-	-	Note 1
LG - 06	0.1	0.5	19.1		
LG - 07	0.1	1.0	16.8	-	
LG - 08	-	-	-	-	Note 1
LG - 09	0.3	1.7	17.7		
LG - 10	0.1	1.8	16.7		
LG - 11	0.1	0.8	19.5		
LG - 12	0.1	0.2	19.6		
LG - 13	0.1	0.9	19.3		
LG - 14	0.1	0.2	19.7		
LG - 15	0.1	0.4	19.5		
LG - 16	0.2	1.8	17.3		
LG - 17	-	-	-	-	Note 1
LG - 18	-	-	-	-	Note 1
LG - 19	-	-	-	-	Note 1
LG - 20	0.1	0.0	20.2		
LG - 21	0.4	1.1	14.6		
LG - 22	-	-	-	-	Note 1
LG - 23	-	-	-	-	Note 1
LG - 24	0.7	3.5	16.4		
LG - 25	0.1	0.2	20.2		
LG - 26	0.1	1.5	19.9		
LG - 27	0.7	0.7	19.7		
LG - 28	0.1	0.2	20.2		
LG - 29	0.1	1.2	19.1		

<b>LG – 30</b>	<b>18.5</b>	<b>22.4</b>	<b>3.5</b>		
<b>LG – 31</b>	<b>0.1</b>	<b>1.7</b>	<b>18.8</b>		
<b>LG – 32</b>					<b>Note 1</b>
<b>LG – 33</b>	<b>0.1</b>	<b>6.1</b>	<b>11.2</b>		
<b>LG – 34</b>	<b>0.1</b>	<b>1.3</b>	<b>19.3</b>		
<b>LG - 35</b>	<b>0.2</b>	<b>2.5</b>	<b>17.6</b>		
<b>LG - 36</b>	<b>0.1</b>	<b>1.4</b>	<b>18.9</b>		

<b>Drehid Facility (W0201-03)</b>			
<b>Operator: J. Fagan</b>		<b>Date: 30<sup>th</sup> Sept 2014</b>	<b>Time: 10:00hrs</b>
<b>Instrument ID: Geotech GA 2000</b>		<b>Date Next Calibration: December 2014</b>	
<b>Weather:</b>		<b>Barometric pressure: 997mbar</b>	
		<b>Ambient Temp: 20°C</b>	

<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
LG - 01	0.1	2.5	16.8	1003	
LG - 02	0.1	0.0	19.8	1003	
LG - 03	0.1	2.1	17.3	1003	
LG - -4					<i>Note 1</i>
LG - 05					<i>Note 1</i>
LG - 06	0.1	1.6	17.8	1003	
LG - 07	0.1	2.1	18.3	1003	
LG - 08					<i>Note 1</i>
LG - 09	0.1	1.1	18.5	1003	
LG - 10	0.1	0.1	18.6	1003	
LG - 11	0.1	0.8	19.2	1003	
LG - 12	0.1	0.5	19.1	1003	
LG - 13	0.1	1.4	17.3	1003	
LG - 14	0.1	0.4	19.3	1003	
LG - 15	0.1	0.6	19.3	1003	
LG - 16	0.1	9.5	0.0	1003	
LG - 17					<i>Note 1</i>
LG - 18					
LG - 19	0.9	0.6	19.2	1003	
LG - 20	0.1	13.0	0.7	1003	
LG - 21	0.3	1.1	15.1	1003	
LG - 22					<i>Note 1</i>
LG - 23					<i>Note 1</i>

<b>LG - 24</b>	<b>0.1</b>	<b>0.1</b>	<b>19.8</b>	<b>1003</b>	
<b>LG - 25</b>	<b>0.1</b>	<b>0.2</b>	<b>19.8</b>	<b>1003</b>	
<b>LG - 26</b>	<b>0.1</b>	<b>2.1</b>	<b>19.1</b>	<b>1003</b>	
<b>LG - 27</b>	<b>0.9</b>	<b>0.9</b>	<b>18.8</b>	<b>1003</b>	
<b>LG-28</b>	<b>0.1</b>	<b>0.2</b>	<b>19.5</b>	<b>1003</b>	
<b>LG-29</b>					<b>Note 1</b>

<b>Drehid Facility (W0201-03)</b>			
<b>Operator: J. Dunn</b>		<b>Date: 29<sup>th</sup> Oct 2014</b>	<b>Time: 13:00hrs</b>
<b>Instrument ID: Geotech GA 2000</b>		<b>Date Next Calibration: December 2014</b>	
<b>Weather: Cloudy and damp</b>		<b>Barometric pressure: 1010mbar</b>	
		<b>Ambient Temp: 14°C</b>	

<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
LG - 01	0.1	1.2	18.6	1010	
LG - 02	0.1	0.0	17.2	1010	
LG - 03	0.1	0.2	18.1	1010	
LG - -4					<b>Note 1</b>
LG - 05	0.2	2.4	18.7		
LG - 06	0.1	1.6	17.9	1010	
LG - 07	0.1	2.1	18.3	1010	
LG - 08					<b>Note 1</b>
LG - 09	0.1	1.8	18.7	1010	
LG - 10	0.1	0.1	19.2	1010	
LG - 11	0.1	0.8	17.9	1010	
LG - 12	0.1	0.5	18.9	1010	
LG - 13	0.2	1.4	17.4	1010	
LG - 14	0.2	0.4	20.2	1010	
LG - 15	0.1	0.6	17.3	1010	
LG - 16	0.2	0.5	18.2	1010	
LG - 17					<b>Note 1</b>
LG - 18	0.1	0.1	20.0	1010	
LG - 19	0.3	0.4	20.1	1010	
LG - 20	0.1	0.3	0.7	1010	
LG - 21	0.3	0.5	19.9	1010	
LG - 22	0.2	0.0	17.9	1010	
LG - 23	0.1	0.0	20.2	1010	
LG - 24	0.1	0.1	19.8	1010	
LG - 25	0.1	0.2	19.8	1010	
LG - 26	0.1	2.1	19.1	1010	
LG - 27	0.9	0.9	18.8	1010	
LG-28	0.1	0.2	19.5	1010	
LG-29	0.1	0.1	19.9	1010	

<b>Drehid Facility (W0201-03)</b>		
<b>Operator: J. Dunn</b>	<b>Date: 28<sup>th</sup> Nov. 2014</b>	<b>Time: 12:00hrs</b>
<b>Instrument ID: Geotech GA 2000</b>	<b><i>Date Next Calibration: December 2014</i></b>	
<b>Weather: Clear &amp; sunny</b>	<b>Barometric pressure: 979mbar</b>	
	<b>Ambient Temp: 12°C</b>	

<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
LG - 01	0.1	1.4	18.6	979	
LG - 02	0.2	0.0	19.8	979	
LG - 03	0.2	0.1	19.8	979	
LG -04					<b>Note 1</b>
LG - 05	0.1	13	17.9	979	
LG - 06	0.1	2.8	16.4	979	
LG - 07	0.1	2.5	10.7	979	
LG - 08	0.1	0.3	19.8	979	
LG - 09	0.1	3.6	18.8	979	
LG - 10	0.5	3.5	16.4	979	
LG - 11	0.2	2.9	18.9	979	
LG - 12	0.2	1.8	19.2	979	
LG - 13	0.8	3.6	7.9	979	
LG - 14	0.1	3.1	18.7	979	
LG - 15	0.1	5.9	17.8	979	
LG - 16	0.1	3.5	19.0	979	
LG - 17					<b>Note 1</b>
LG - 18	0.1	0.1	20.0	979	
LG - 19	0.8	0.6	19.2	979	
LG - 20	0.3	0.9	8.3	979	
LG - 21	0.9	3.8	9.4	979	
LG - 22	0.3	0.0	20.0	979	
LG - 23	0.1	0.0	20.0	979	

<b>LG – 24</b>	<b>0.1</b>	<b>0.2</b>	<b>19.7</b>	<b>979</b>	
<b>LG - 25</b>	<b>0.1</b>	<b>0.4</b>	<b>17.8</b>	<b>979</b>	
<b>LG - 26</b>	<b>0.1</b>	<b>4.4</b>	<b>17.8</b>	<b>979</b>	
<b>LG - 27</b>	<b>0.3</b>	<b>2.1</b>	<b>17.6</b>	<b>979</b>	
<b>LG-28</b>	<b>0.1</b>	<b>0.5</b>	<b>19.5</b>	<b>979</b>	
<b>LG-29</b>	<b>0.1</b>	<b>0.1</b>	<b>19.9</b>	<b>979</b>	

<b>Drehid Facility (W0201-03)</b>			
<b>Operator: J. Dunn</b>		<b>Date: 31<sup>st</sup> December 2014</b>	<b>Time: 9:30hrs</b>
<b>Instrument ID: Geotech GA 2000</b>		<b><i>Date Next Calibration: December 2014</i></b>	
<b>Weather: Overcast</b>		<b>Barometric pressure: 1014 mbar</b>	
		<b>Ambient Temp: 8°C</b>	

<b>Results</b>					
<b>Sample Station Number</b>	<b>CH<sub>4</sub> (% v/v)</b>	<b>CO<sub>2</sub> (% v/v)</b>	<b>O<sub>2</sub> (% v/v)</b>	<b>Pressure (mbar)</b>	<b>Comments</b>
<b>LG - 01</b>	<b>0.1</b>	<b>1.7</b>	<b>17.8</b>	<b>1014</b>	
<b>LG - 02</b>	<b>0.4</b>	<b>3.0</b>	<b>17.6</b>	<b>1014</b>	
<b>LG - 03</b>	<b>0.1</b>	<b>0.4</b>	<b>18.2</b>	<b>1014</b>	
<b>LG - -4</b>	<b>0.3</b>	<b>0.7</b>	<b>17.8</b>	<b>1014</b>	
<b>LG - 05</b>					<b>Note 1</b>
<b>LG - 06</b>					<b>Note 1</b>
<b>LG - 07</b>					<b>Note 1</b>
<b>LG - 08</b>	<b>0.2</b>	<b>1.5</b>	<b>17.6</b>	<b>1014</b>	
<b>LG - 09</b>	<b>0.0</b>	<b>2.1</b>	<b>18.2</b>	<b>1014</b>	
<b>LG - 10</b>	<b>0.4</b>	<b>3.6</b>	<b>17.8</b>	<b>1014</b>	
<b>LG - 11</b>	<b>0.0</b>	<b>2.0</b>	<b>19.2</b>	<b>1014</b>	
<b>LG - 12</b>	<b>0.1</b>	<b>2.2</b>	<b>18.6</b>	<b>1014</b>	
<b>LG - 13</b>	<b>0.3</b>	<b>2.5</b>	<b>15.6</b>	<b>1014</b>	
<b>LG - 14</b>	<b>0.0</b>	<b>4.5</b>	<b>18.1</b>	<b>1014</b>	
<b>LG - 15</b>	<b>0.0</b>	<b>4.4</b>	<b>18.2</b>	<b>1014</b>	
<b>LG - 16</b>	<b>0.1</b>	<b>3.2</b>	<b>18.8</b>	<b>1014</b>	
<b>LG - 17</b>					
<b>LG - 18</b>	<b>1.0</b>	<b>0.5</b>	<b>19.6</b>	<b>1014</b>	
<b>LG - 19</b>	<b>0.2</b>	<b>2.6</b>	<b>18.1</b>	<b>1014</b>	
<b>LG - 20</b>	<b>0.1</b>	<b>0.4</b>	<b>17.9</b>	<b>1014</b>	
<b>LG - 21</b>	<b>0.1</b>	<b>0.2</b>	<b>18.1</b>	<b>1014</b>	
<b>LG - 22</b>	<b>0.0</b>	<b>0.1</b>	<b>19.8</b>	<b>1014</b>	
<b>LG - 23</b>	<b>0.2</b>	<b>2.2</b>	<b>18.9</b>	<b>1014</b>	
<b>LG - 24</b>	<b>0.0</b>	<b>0.1</b>	<b>20.1</b>	<b>1014</b>	
<b>LG - 25</b>	<b>0.0</b>	<b>0.3</b>	<b>20.0</b>	<b>1014</b>	
<b>LG - 26</b>	<b>0.1</b>	<b>2.2</b>	<b>18.8</b>	<b>1014</b>	

<b><i>LG - 27</i></b>	<b>0.9</b>	<b>4.9</b>	<b>14.6</b>	<b>1014</b>	
<b><i>LG-28</i></b>	<b>0.2</b>	<b>1.9</b>	<b>14.8</b>	<b>1014</b>	
<b><i>LG-29</i></b>	<b>0.0</b>	<b>0.1</b>	<b>20.2</b>	<b>1014</b>	

**Note 1: Well is inaccessible**

## **APPENDIX 3**

### **Dust & Litter Control Plan**

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document: <b>EP 25.0</b>
Document Approved by:		Revision: 0
_____	Issue Date: 15/6/09	
Landfill Manager	Page: Page 1 of 2	
<b>Title</b>		
<b>Litter and Dust Control</b>		
<i>1.1.1.1</i>		

**Purpose:** The facility licence requires that litter and dust is controlled, and, wherever possible, contained within the site boundary. However, under certain conditions it will be impossible to contain all litter. In such circumstances, litter that has left the site and contaminated other people's property must be collected as a priority.

**Scope:** Every day the foreman ensures that an employee checks the environs of the site and to collect any loose litter by placing it into plastic bags or similar. These are disposed of at the tip face, before the end of the working day. All litter should be collected in accordance with Licence by 10 am the following morning..

**References:** [WIF 5.1 Daily Site Snspection](#)  
[Customer contact list](#)

### Procedure

1. Permanent litter nets are erected around the lined area with an entrance for access, they consist of 6m poles with UV treated netting.
2. Semi-permanent litter nets or cages should be erected close to the active face working cell, across the front of the cell while still allowing access for vehicles to the working face.

**Semi-Permanent Litter Netting** is the most common type of litter prevention on site. Typically these nets are 3-4 metres in height and are suspended on mobile litter poles it is important that on a 4 meter pole you use a 5m net ensuring that in a high wind event, the additional force on the net from the litter in the net does not cause windblown litter to escape underneath. Alternatively, poles mounted in a tripod fashion may also be used.

All nets should be cleared on a routine daily basis to prevent too much litter accumulating in the nets and causing them to split or overturn.

**Litter Cages** are also available on site. Cages must only be used on the direction of the FM or supervisor. The cages should be positioned next to each other in lines around the tipping area to minimise windblown litter. The cages should only be moved by on-site plant.

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document:	<b>EP 25.0</b>
Document Approved by:		Revision:	0
_____	Issue Date:	15/6/09	
Landfill Manager	Page:	Page 2 of 3	
<b>Title</b>		<b>Litter and Dust Control</b>	
<i>1.1.1.1</i>			

During high wind events the Landfill Manager and Site Foreman will agree if necessary to close the site.

Customers are contacted and given notice of closure from the Customer contact list.

Once working face is closed all staff will assist in litter picking and insure excessive pressure is not on the netting system.

3. **Dust minimisation** The site foreman must insure that there dust generation is minimised on the site.

With speed restrictions, wetting of haul roads, wetting of stockpiles prior to movement and grassing up exposed soil.

Adhering to site conditions, speed restrictions, and using only the designated access roads, will assist in limiting dust problems.

In dry weather, it may be necessary to damp down areas using water from bowsers, sprays or similar - this action is decided locally by the FM.

A wheelwash has been installed on site to prevent tracking of material onto the public road. All vehicles leaving the tip face must use this wheelwash.

Occasionally, due both to heavy traffic and works elsewhere on site, material may start to track past the wheelwash and along the site road. To remediate this, the metalled site roads and hard standing surfaces are swept using a road sweeper as conditions dictate. The road should be swept until the FM or his representative is satisfied that the required standard has been reached and maintained.

## **APPENDIX 4**

### **Training Procedures**

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <hr/> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document: <b>EP 19.0</b>
Document Approved by:  <hr/> <hr/> Landfill Manager		Revision: 2  Issue Date: 4/6/09  Page: Page 1 of 5
<b>Title Training</b>		

**Purpose:** To define how Bord na Móna ensures awareness of environmental issues and how environmental training is identified and conducted.

**Scope:** This procedure applies to employees at the Drehid Waste Management Facility

**References:** [EPF 19.1 Environmental Training Record](#)  
[EPF 19.2 Environmental Training Summary](#)  
[EPF 19.3 Training Needs Matrix](#)  
[EPF 19.4 Employee Induction Training Certificate](#)

**Procedure:**

1. The Landfill Manager is responsible for ensuring that his reports are fully trained for their specific tasks, and are aware of the implications of licence.
2. All employees shall be made familiar with their environmental responsibilities through a comprehensive environmental training programme
  - All employees will have an individual training file created which will detail all training received.
  - Training shall be updated as the environmental responsibilities of employees develop.
3. Environmental Training Records will be maintained on file for individual employees for 7 years.
4. External training programmes conducted on Drehid Waste Management Facility premises will be documented on Environmental Training Summary EPF 19.2, and the trainee's individual Environmental Training Records EPF 19.1 should be updated with same.
5. The Landfill Manager shall request that all relevant personnel undertake training in any new environmental procedure adopted by Drehid Waste Management Facility. (or any new amendments to existing environmental procedures). This Internal training should be recorded in the Environmental Training Records EPF 19.1.

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <hr/> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document: <b>EP 19.0</b>
Document Approved by:  <hr/> <hr/> Landfill Manager		Revision: 2  Issue Date: 4/6/09  Page: Page 2 of 6
<b>Title Training</b>		

6. As part of the Annual Review, the Management will review all training requirements. This environmental training review will identify the specific environmental training requirements for each operation within the company.
  
7. The Environmental Management Team will identify Environmental Training needs under the following headings:
  - Introduction of new materials
  - Introduction of new or altered work processes
  - Appointment of new personnel to plant
  - Transfer of personnel to new duties in plant
  - As part of Annual Review of Objectives and Targets and programmes
  - New environmental regulatory requirements
  - Updating of skills
  - Corrective and Preventive Action
  - Environmental Complaints
  
8. The planned environmental Training shall be documented on the Environmental Training need matrix EPF 19.3. This planned training shall be undertaken as scheduled.
  
9. The Landfill Manager shall ensure that all training tasks are completed by each employee identified as requiring environmental training.
  
10. Once an environmental training task has been completed by an employee, the Environmental Training record EPF 19.1 shall be updated.
  
11. All new employees will be required to undergo an environmental induction programme before commencing work at the facility. EPF 19.4 the Employee Induction Training Certificate shall be completed detailing the elements covered by the training. The induction will include the following:
  - Information with regards to the Company Structure and Environmental Responsibility
  - Environmental Policy Statement
  - Supplied with a description of the Licence
  - Awareness of the Emergency Response Procedures
  - Supplied with a description of activities on site
  - Reporting of environmental incidents to Environmental Team

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <hr/> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document: <b>EP 19.0</b>
Document Approved by:  <hr/> <hr/> Landfill Manager		Revision: 2  Issue Date: 4/6/09  Page: Page 3 of 7
<b>Title Training</b>		

When induction is completed an Environmental Training Record EPF 19.1 is created for each individual. All subsequent environmental training will also be retained on this record.

12. Employees, who have potential to have an effect on the environment, should undergo a more comprehensive training programme subsequent to Environmental Induction as follows:
- Training on all Environmental Procedures specific to their roles in the EMS
  - Fire Hazard Training
  - Spill Kit Training

When environmental training is complete Environmental Training Record EPF 19.1 will be updated.

## **APPENDIX 5**

### **Programme for Public Information**

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document: <b>EP 18.0</b>
Document Approved by:		Revision: 0
Landfill Operations Manager		Issue Date: 01/01/09
		Page: Page 1 of 9
<b>Title Programme for Public Information</b>		

**Purpose:** To define how Bord na Móna manages the communication of environmental information concerning the facility with external parties.

**Scope:** This procedure applies to Bord na Móna Drehid Waste Management Facility.

**References:** [Data Protection Act 1988 with 2003 amendment](#)

### **Procedure**

4. All external, out-going communication of environmental issues, unless specifically outlined below, must be approved by the Landfill Operations Manager. If the Facility Manager is unavailable, then the designated Environmental Officer may approve the communication.
5. Certain environmental information, as detailed below, will be available to external parties. Only 1 copy of each document is available for view at any time.
6. It is recommended that visitors should phone or write in advance, as this will facilitate the company to arrange for the necessary staff and documents to be available. However, a prior appointment by any member of the public is not necessary.
7. Viewing time is restricted to normal office hours (9.30 to 12.50, 14.00 to 16.30).  
No more than 1 hour of staff time is available for assistance or queries per day.
8. Visitors may ask for the Landfill Operations Manager. They are requested to sign in at reception, giving their name, address, and reason for their visit.
9. Access is restricted to the Meeting Room, and the information will be brought to this designated room for viewing. The original documents are not to be removed, altered or damaged in any way.
10. A copy of the following files will be kept in Document Control and are available to the public as outlined above:
  - Licence
  - Annual Environmental Reports

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document: <b>EP 18.0</b>
Document Approved by: _____  _____ Landfill Operations Manager		Revision: 0  Issue Date: 01/01/09  Page: Page 2 of 10
<b>Title Programme for Public Information</b>		

- Monthly monitoring reports
- Ground water monitoring results
- Surface water monitoring results
- Air monitoring results
- Environmental noise monitoring results

11. Every effort will be made to keep the files up-to-date. The information provided will comply with legal requirements and the requirements of the Licence, but confidential and commercially sensitive information will be restricted and Bord na Móna must comply with the [Data Protection Act 1988 with 2003 amendment](#).

Procedures Manual	 <p><b>BORD NA MÓNA</b></p> <hr/> <p><b>Drehid Waste Management Facility</b></p> <p>Environmental Procedures Manual</p>	Document: <b>EP 18.0</b>
Document Approved by:  <hr/> <hr/> Landfill Operations Manager		Revision: 0  Issue Date: 01/01/09  Page: Page 1 of 11
<b>Title Programme for Public Information</b>		

## **APPENDIX 6**

**EPRTR**  
**(European Pollutant Release and Transfer Register)**

Document Approved by:

Landfill Operations  
Manager



**Drehid Waste Management Facility**

**Environmental Procedures Manual**

Revision: 0

Issue Date: 01/01/09

Page: Page 2 of 12

**Title Programme for Public Information**



Environmental Protection Agency

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201\_2014\_draft.xls | Return Year : 2014 |

[Guidance to completing the PRTR workbook](#)

# AER Returns Workbook

Version 1.1.18

<b>REFERENCE YEAR</b>	2014
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## 1. FACILITY IDENTIFICATION

Parent Company Name	Bord na Mona Public Limited Company
Facility Name	Drehid Waste Management Facility
PRTR Identification Number	W0201
Licence Number	W0201-03

### Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	In the townlands of Parsonstown, Loughnacush, Kilkeaskin, Drumond
Address 2	Timahoe West, Coolcarrigan
Address 3	Killinagh Lower and Killinagh Upper, Carbury
Address 4	
	Kildare
Country	Ireland
Coordinates of Location	-9.77721 54.1523
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
<b>AER Returns Contact Name</b>	Charlotte Greene
<b>AER Returns Contact Email Address</b>	charlotte.greene@bnm.ie
<b>AER Returns Contact Position</b>	Environmental Officer
<b>AER Returns Contact Telephone Number</b>	045 439492
<b>AER Returns Contact Mobile Phone Number</b>	087 7697465
<b>AER Returns Contact Fax Number</b>	045 439489
<b>Production Volume</b>	0.0
<b>Production Volume Units</b>	
<b>Number of Installations</b>	0
<b>Number of Operating Hours in Year</b>	0
<b>Number of Employees</b>	30
<b>User Feedback/Comments</b>	
<b>Web Address</b>	

## 2. PRTR CLASS ACTIVITIES

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

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

Is it applicable?	No
Have you been granted an exemption ?	No
If applicable which activity class applies (as per Schedule 2 of the regulations) ?	Not Applicable
Is the reduction scheme compliance route being used ?	Not Applicable

**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) ?	No
--	----

4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201\_2014\_draft.xls | Return Year : 2014 |

03/06/2015 21:29

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

POLLUTANT		METHOD			Please enter all quantities in this section in KGs			
RELEASERS TO AIR		METHOD USED			QUANTITY			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	C	OTH	Gas Sim V2.5	0.0	0.0	0.0	0.0
					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 B : REMAINING PRTR POLLUTANTS

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

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

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

POLLUTANT		METHOD			Please enter all quantities in this section in KGs			
RELEASERS TO AIR		METHOD USED			QUANTITY			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	484790.8	0.0	484790.8

\* 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:	Drehid 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
	Total estimated methane generation (as per site model)	E	OTH	Gas Sim V1.54	N/A
	Methane flared	C	OTH	Monthly Records	0.0 (Total Flaring Capacity)
	Methane utilised in engine/s	M	OTH	SCADA	0.0 (Total Utilising Capacity)
	Net methane emission (as reported in Section A above)	E	OTH	Combination of the above	N/A

4.2 RELEASES TO WATERS

[Link to previous years emissions data](#)

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201\_2014\_draft.xls | Return Year : 2014 |

03/06/2015 21:30

**SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS**

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as t

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		M/C/E	Method Used		QUANTITY			
No. Annex II	Name		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 B : REMAINING PRTR POLLUTANTS**

RELEASES TO WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		M/C/E	Method Used		QUANTITY			
No. Annex II	Name		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 WATERS					Please enter all quantities in this section in KGs			
POLLUTANT		M/C/E	Method Used		QUANTITY			
Pollutant No.	Name		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

4.3 RELEASES TO WASTEWATER OR SEWER

[Link to previous years emissions data](#)

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201\_2014\_dr

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**SECTION A : PRTR POLLUTANTS**

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
No. Annex II	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
					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 B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)**

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
Pollutant No.	Name	M/C/E	Method Used		Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
			Method Code	Designation or Description				
					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

4.4 RELEASES TO LAND

[Link to previous years emissions data](#)

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201\_2014\_draft.xls | Return Year : 2014 |

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SECTION A : PRTR POLLUTANTS

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

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

SECTION B : REMAINING POLLUTANT EMISSIONS (as required in your Licence)

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

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

**5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE**

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201\_2014\_draft.xls | Return Year : 2014 |

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**Please enter all quantities on this sheet in Tonnes**

0

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility	Haz Waste : Address of Next Destination Facility	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used		Haz Waste : Name and Licence/Permit No of Recover/Disposer	Non Haz Waste: Address of Recover/Disposer		
Within the Country	13 07 01	Yes	8290.0	fuel oil and diesel aqueous liquid wastes other than those mentioned in 16 10 01	R9	M	Weighed	Offsite in Ireland	Enva,W0184-01	Clonminam Industrial Estate,,Portlaoise,Co. Laois,Ireland	Enva,W0184-01	Clonminam Industrial Estate,,Portlaoise,Co. Laois,Ireland
Within the Country	16 10 02	No	0.0	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Enva,W0196-1	JFK Road,Naas Road,Dublin 12,,Ireland		
Within the Country	19 07 03	No	19573.64	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	County Council,D0004-01	Aras Chil Dara,Devoy Park,Naas,Kildare ,Ireland		
Within the Country	19 07 03	No	9828.83	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Enva,W0196-1	JFK Road,Naas Road,Dublin 12,,Ireland		
Within the Country	19 07 03	No	17896.42	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Rilta Environmental,W0185-01	Park,Rathcoole,Dublin,Ireland		
Within the Country	20 01 01	No	0.14	paper and cardboard	R13	M	Weighed	Offsite in Ireland	AES Tullamore,W0104-02	Cappincur Industrial Estate,Cappincur,Tullamore, County Offaly,Ireland		
Within the Country	20 01 40	No	121.1	metals	R13	M	Weighed	Offsite in Ireland	AES Tullamore,W0104-02	Cappincur Industrial Estate,Cappincur,Tullamore, County Offaly,Ireland		
Within the Country	13 02 08	Yes	111.65	other engine, gear and lubricating oils	R9	M	Weighed	Offsite in Ireland	Enva,W0184-01	Clonminam Industrial Estate,,Portlaoise,Co. Laois,Ireland	Enva,W0184-01,Clonminam Industrial Estate,,Portlaoise,Co. Laoise,Ireland	Clonminam Industrial Estate,,Portlaoise,Co. Laoise,Ireland

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