

**ANNUAL ENVIRONMENTAL REPORT**  
**FOR**  
**GREENSTAR LTD. - BALLYNAGRAN LANDFILL**  
**LICENCE NO. W0165-02**  
**JANUARY – DECEMBER 2012**

**Prepared For: -**

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Project	Annual Environmental Report 2012			
Client	Greenstar Ltd – Ballynagran Landfill W0165-02			
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## 1. INTRODUCTION

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This is the 2012 Annual Environmental Report (AER) for Greenstar Ltd's (Greenstar) non-hazardous residual landfill at Coolbeg & Kilcandra, Ballynagran, County Wicklow. It covers the period from the 1<sup>st</sup> January 2012 to the 31<sup>st</sup> December 2012.

The content is based on Schedule B of the Waste Licence (Reg. No. W0165-02) and the report format follows guidelines set in the "Guidance Note for Annual Environmental Report" issued by the Environmental Protection Agency (Agency)<sup>1</sup>. Account is also taken of the AER Draft Guidance Document and AER Information Templates issued by the Agency in January 2013<sup>2</sup>.

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<sup>1</sup> EPA (Environmental Protection Agency) 1999 Waste Licensing – Draft Guidance on Environmental Management Systems and Reporting to the Agency

<sup>2</sup> EPA (Environmental Protection Agency) 2012 Draft AER Guidance Document

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## 2. SITE DESCRIPTION

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### 2.1 Site Location & Layout

The site, which encompasses approximately 128 ha, is located on the eastern side of the Wicklow Mountains in the townlands of Ballynagran, Coolbeg and Kilcandra. It is approximately 5 km to the south west of Wicklow Town and 3.5 km to the south east of Glenealy. It is on the southern side of an east-west ridge at an elevation between 52 and 147m Ordnance Datum (OD).

The site layout is shown on the topographical survey drawing included in Appendix 1 and includes: -

- Waste Reception Area;
- Weighbridges (2 No.);
- Wheel Wash;
- Waste Quarantine & Inspection Areas;
- Landfill Cells;
- Leachate Storage lagoon;
- Surface Water Pond;
- Administration Block (offices, stores, canteen, toilets and showers);
- Oil Storage Tank & Bund;
- Security Fencing.
- Landscaped Areas
- Landfill gas utilisation compound

### 2.2 Site History

The facility was granted a Waste Licence (W0165-01) by the Agency on 5<sup>th</sup> September 2003 which was reviewed with a revised licence (W0165-02) issued on the 23<sup>rd</sup> March 2010.

The facility will be developed in five phases. The initial phase involved the provision of five (5) landfill cells (1, 2, 3, 4 and 5A/B), and the entire supporting infrastructure. In 2007 the Agency approved the development of two additional cells (Cells 6 and 7), which were constructed in 2008 and became active in 2009. An active gas abstraction and flaring system was commissioned in April 2007. Cells 9 and 10 were constructed in 2009 and 2010

respectively and despite being EPA approved for waste placement; they did not receive any waste in 2011. Waste was deposited in Cell 9 in 2012. Cell 10 did not receive any waste in 2012. A landfill gas utilisation plant was commissioned and began operating in January 2011. Waste was placed to final profile heights in Cells 1, 2 and part of 5 before approximately 6,000 m<sup>2</sup> of permanent capping was undertaken in Cells 1, 3 and 6 in 2012 in addition to 16,000 m<sup>2</sup> permanently capped in 2011. Waste was continued to be placed in Cells 3, 4, 6 and 7 while Cell 9 was entered in April 2012. Subsequent phases will involve the provision of additional landfill cells and the associated expansion of leachate, landfill gas and surface water control measures. There were no new flares added in 2012.

### 2.3 Waste Activities Carried Out at the Facility

The facility is a full containment landfill, which is designed to accept treated waste for final disposal. The licensed waste activities are summarised in Tables 2.1 and 2.2.

**Table 2.1** Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Act 1996 as amended

Class 1	Deposit on, in or under land (including landfill).
Class 4	Surface impoundment, including placement of liquids or sludge discards into pits, ponds or lagoons: This activity is limited to the storage and management of leachate and surface water at the facility.
Class 5	Specially engineered landfill, including placement into lines discrete cells which are capped and isolated from one another and the environment: This is the principal activity. This activity is limited to the construction of the landfill in distinct phases consisting of specially engineered lined cells, the deposit of non-hazardous waste into these lined cells and the collection of leachate and landfill gas.
Class 6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule: This activity is limited to the treatment of leachate at the facility.
Class 13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced. This activity is limited to the storage of unacceptable waste prior to its transport off-



	site to another facility.
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**Table 2.2** Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Act 1996 as amended

Class 4	Recycling or reclamation of other inorganic materials. This activity is limited to the use of recycled construction and demolition waste as cover and/or construction material at the facility.
Class 9	Use of any waste principally as a fuel or other means to generate energy: This activity is limited to the utilisation of landfill gas at the facility.
Class 11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule: This activity is limited to the use of recycled construction and demolition waste at the facility.
Class 13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced: This activity is limited to the storage of recycled construction and demolition waste prior to reuse.

## 2.4 Waste Types & Volumes

Only non-hazardous, solid, residual waste is accepted for disposal. Hazardous and liquid wastes are not accepted. All wastes delivered to the facility are subject to Waste Acceptance Procedures that have been approved by the Agency, as specified in Condition 5.3 of the Waste Licence.

The facility is licensed to accept 175,000 tonnes of waste per annum for disposal. The following waste types and volumes, as specified in Schedule A of the Waste Licence, can be accepted: -

- Household (62,500 tonnes),
- Commercial (67,500 tonnes),
- Industrial (45,000 tonnes),

## 2.5 Waste Received & Consigned

A breakdown of the different types and quantities of wastes received, consigned & recovered from the facility in 2012 are shown in Tables 2.3, 2.4 and 2.5.

**Table 2.3** Waste Received 2012

European Waste Code Categories	Description	Tonnes
06 13 99	Carbon granules	21.9
07 05 14	Filter Cake	87.78
08 03 15	Solid Sludge	21
17 05 04	Soil and Stones	7204.12
17 09 04	Soil and Stones	38.74
18 01 04	Health care non-infectious	7.9
19 05 99	Biostabilised waste	6026.75
19 08 01	Screening from Waste water treatment	1364.98
19 08 02	Waste from desanding	94.78
19 09 02	Filter cake from water treatment	5151.59
19 09 05	Ion exchange resin	4.98
19 10 06	Frag from ELV's (non-metallic ELV residues i.e. shredded seats, dashboards etc)	8648.01
19 12 07	Woodchip	6906.32
19 12 09	C&D fines	55695.45
19 12 12	C&I Dry Mixed	17698.77
20 03 01	MSW	120,575.57
20 03 03	Street cleanings	635.6
<b>Total</b>		<b>230,184.24</b>

**Table 2.4** Waste Consigned 2012

EWC	Description	Tonnes	Destination
19 07 03	Leachate	471.54	Enniskerry WWTP
19 07 03	Leachate	954.6	ENVA U/GROUND SER DIV DUBLIN
19 07 03	Leachate	2,643.21	EPS Ltd/
19 07 03	Leachate	3,341.5	Leixlip WWTP
19 07 03	Leachate	3,028.561	RILTA ENVIRONMENTAL LTD
19 07 03	Leachate	738.36	KTK LANDFILL
19 07 03	Leachate	6,860.85	Ringsend WWTP
19 07 03	Leachate	11,853.05	Veolia WWTP
<b>Total waste consigned</b>			<b>29,898</b>

**Table 2.5** Waste Recovered 2012

<b>European Waste Code Categories</b>	<b>Description</b>	<b>Tonnes</b>
<i>Waste for recovery</i>		
17 05 04	Soil and Stones	3,474.82
17 09 04	Soil and stones	38.74
19 05 99	Biostabilised Waste	4,893.61
19 09 02	Filtercake	5,151.59
19 12 07	Shredded wood used on site for engineering	6,906.32
19 12 09	Stones and fines used for engineering	55,695.45
<b><i>Total waste for recovery</i></b>		<b>76,160.53</b>

## **2.6 Landfill Capacity**

The most recent topographic survey for the landfill cell footprint is included in Appendix 1. The facility has a design capacity of approximately 2,770,000 m<sup>3</sup>. It is estimated that the void space consumed since the site opened up until 31<sup>st</sup> December 2012 is approximately 1,091,820m<sup>3</sup>.

## **2.7 Method of Deposition of Wastes**

### *2.7.1 Waste Acceptance*

The waste accepted for disposal is residual waste from County Wicklow and adjoining counties from household, commercial and industrial sources. At present the majority of waste is delivered to the facility by waste contractors based in County Wicklow. Waste contractors have systems in place whereby the recyclable fraction is either collected separately, or else separation is carried out mechanically at their facilities.

All waste is delivered to the site in Heavy Goods Vehicles (HGV) and small refuse trucks 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.

The vehicles then proceed to the active waste disposal area where waste is deposited under the direction of a banks man. The vehicles weigh out at the outgoing weighbridge and receive an individual weighbridge docket before exiting the site. 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.

### *2.7.2 Working Face*

Waste is deposited close to and above the advancing tipping face. In accordance with Condition 5.6.1 the active 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. Deposited waste is spread in shallow layers on the inclined surface and compacted. Steel-wheeled compactors operate on the gradient of the more shallow face, pushing thin layers of waste and applying compaction pressure to them. The site operatives inspect the deposited waste for items that are not acceptable under the Waste Licence, such as tyres, gas bottles, batteries etc. These are removed and stored in appropriate areas for later removal from the facility to appropriately licence facilities. Each day waste is deposited to form a block, which is compacted and covered as described above. The following day a new block of waste is deposited adjacent to the existing block. The waste is covered at the end of each day with a covering of fines and woodchip.

This ordered method of waste deposition enables areas, which 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.

## **2.8 Report on Development and Restoration at the Site**

Waste was placed to final profile heights in Cells 1, 2 and part of 5 before approximately 6,000 m<sup>2</sup> of permanent capping was undertaken in Cells 1, 3 and 6 in 2012. Waste was continued to be placed in Cells 3, 4, 6 and 7 in 2012 while Cell 9 was entered in April 2012. There were no new flares added in 2012.

## **2.9 Progress and Implementation of Landscaping Programme**

There was no additional tree planting at the facility during the reporting period. There was maintenance carried out on all existing trees planted, in terms of weeding and pruning.

## **2.10 Report on Meeting the Requirements of the Landfill Directive**

The site is fully compliant with the requirements of the Landfill Directive.

Greenstar, as a highly sophisticated integrated waste management company fully appreciates the requirement to comply with the landfill directive and the obligations with regards to the diversion of biodegradable waste from landfill. The company has invested heavily in state of the art material recycling systems in Greenstar Sarsfieldcourt and Greenstar Millennium Park with the aim of utilising a once landfill bound resource as solid refuse fuel which can be used as an alternative in fuelling cement kilns in Ireland or abroad. Black bin waste collected by the company is stabilised at innovative composting facilities. Greenstar has helped Ireland comply with its biodegradable waste diversion targets for 2010 and will assist in meeting future targets in 2013 and 2016.

## **2.11 Programme for Public Information**

During 2012 the site accommodated all requests for site visits and tours. Greenstar accommodated a number of tours including one for the Croatian EPA in November 2012.

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### **3. ENVIRONMENTAL MONITORING**

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Greenstar implements a comprehensive environmental monitoring programme to assess the significance of emissions from site activities. The programme includes groundwater, surface water, leachate, landfill gas, noise, dust and particulate monitoring and a biological assessment of the of the three streams (Ballynagran, Ford and Killandra) as well as the Three Mile Water River, Ballynagran Co. Wicklow. The monitoring locations are shown in Appendix 1.

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 with summary graphs showing trends. A summary of all monitoring data is included in Appendix 2.

#### **3.1 Groundwater Monitoring**

##### *3.1.1 Groundwater Levels*

Up until June 2011 groundwater levels were measured monthly in the sixteen (16 No.) groundwater wells on site. Following approval by the Agency on the 1<sup>st</sup> June 2011, the monitoring frequency was reduced from monthly to quarterly (Ref Agency Letter W0165-02/AP26DM). There are eight groundwater monitoring locations with one deep and one shallow well at each location. The monitoring confirms that the direction of groundwater flow in the bedrock aquifer is from the north west to the south east.

During 2012, fourteen (14 No.) private groundwater well samples were collected and analysed. These sampling events took place in Q-3 and Q-4 of 2012. The results of the analysis were reported in the Q-3 and Q-4 quarterly reports. All residents received copies of the results from their respective wells. Quality of private wells was consistent with previous monitoring.

##### *3.1.2 Groundwater Quality*

Groundwater quality was monitored in the on-site monitoring wells and reported to the Agency at quarterly intervals. 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.

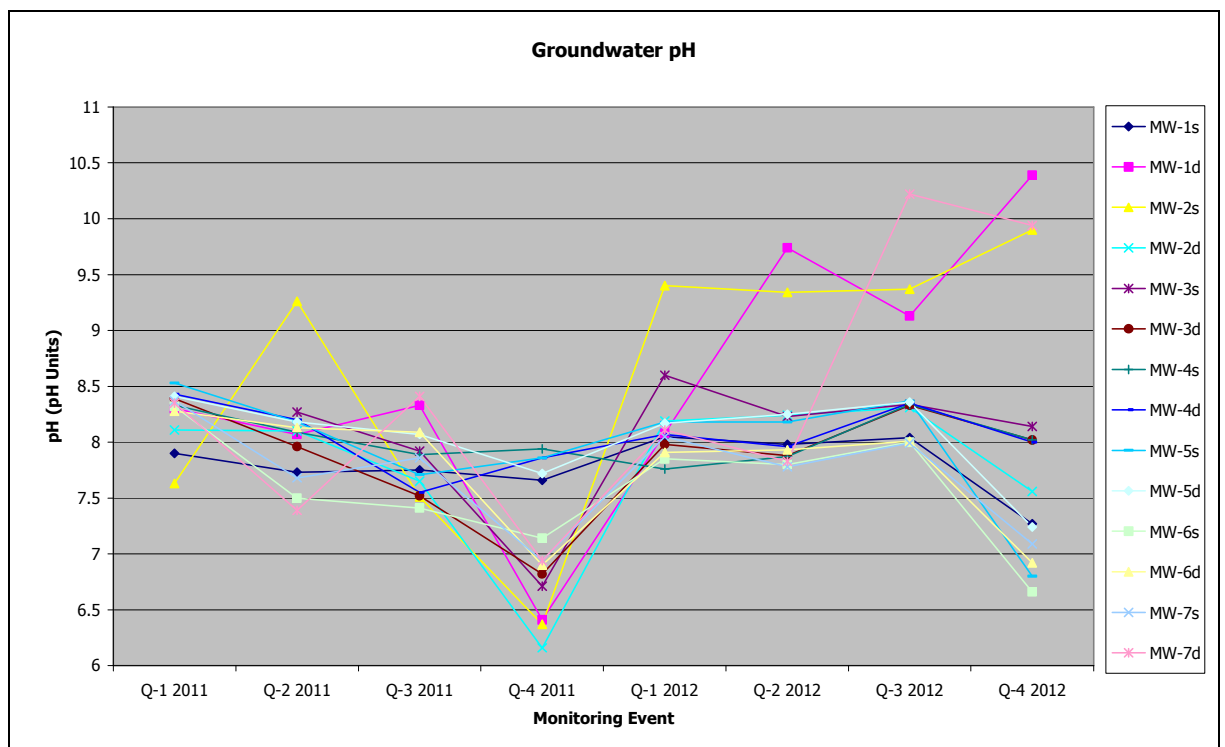
The groundwater analysis is compared to the licence specific trigger levels as well as the Interim Guideline Values (IGVs) for groundwater published by the Agency and the

Groundwater Regulations Threshold Value (GTV) which were introduced in 2010 (S.I. 9 of 2010).

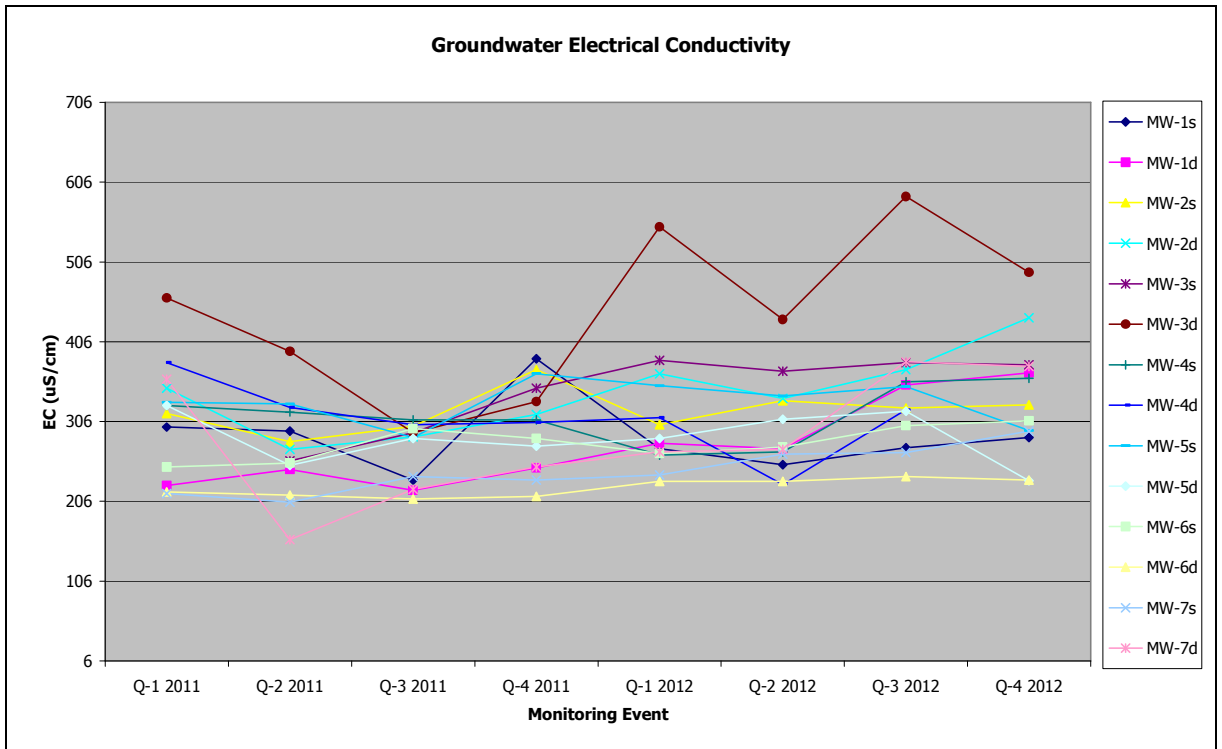
The IGV represent typical background or unpolluted conditions; however levels higher than the IGV may occur naturally depending on the local geological and hydrogeological conditions. While the GTV's are more appropriate for large scale abstraction wells used for potable supply, they can be used to assess the significance of contamination where present in non potable groundwater supplies. Because GTVs have not been established for all of the parameters monitored, the relevant IGV was used for comparative purposes.

The 2012 results were generally consistent with those obtained during the monitoring completed before the start of site development works. The monitoring programme confirms that the site activities are not impacting on groundwater quality. The monitoring detected elevated pH levels in groundwater wells, MW1d, MW2s and MW7d. There were slightly elevated levels of ammonia in MW-3s in Q-2 2012 with the levels falling in Q-4 2012. There was a slight increase in the levels of conductivity measured in M-3d in 2012. The trend of key indicator parameters analysed for in 2011 including pH, EC, chloride and ammonia are presented in Figures 3.1 to 3.4 below.

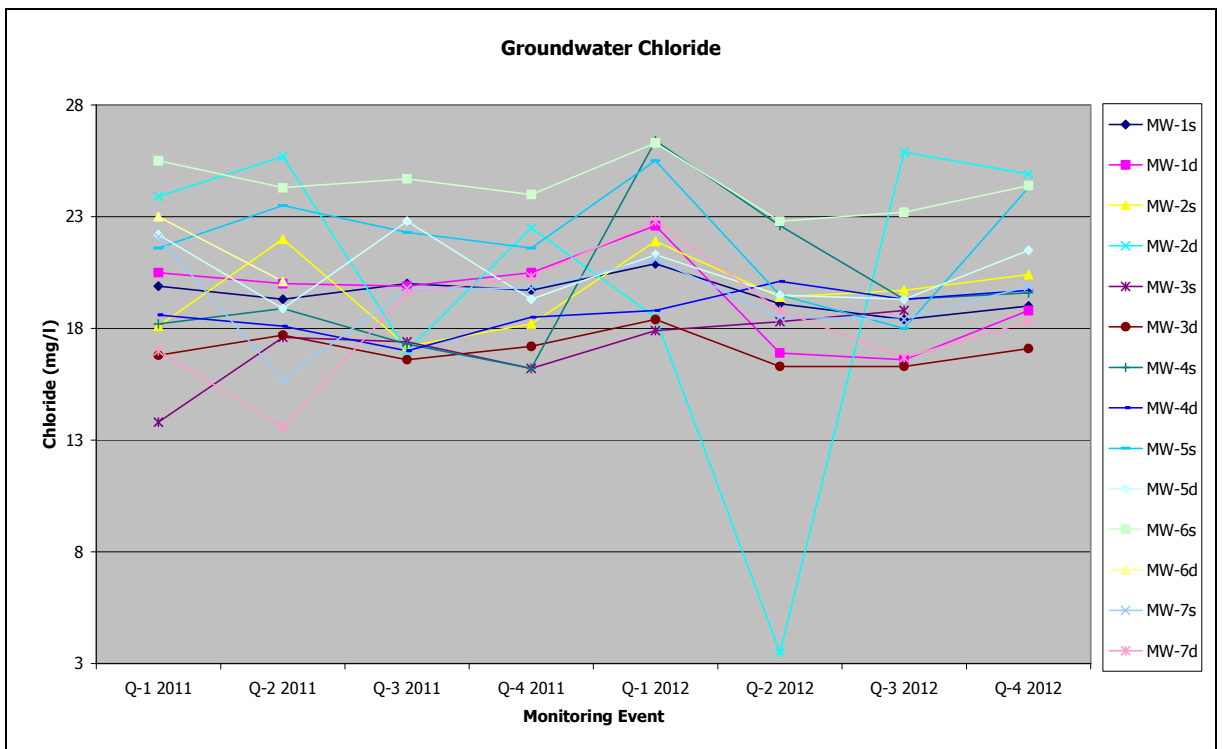
**Figure 3.1** Groundwater pH trend data



**Figure 3.2** Groundwater Electrical Conductivity trend data

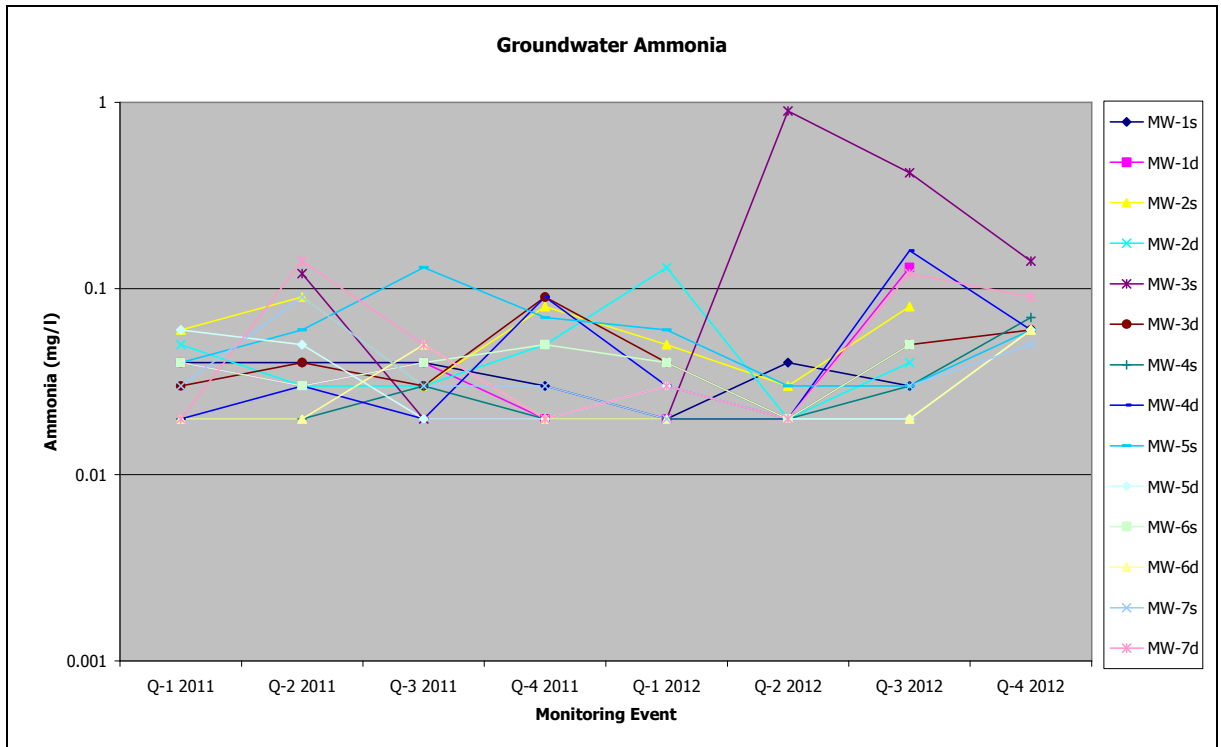


**Figure 3.3** Groundwater Chloride trend data





**Figure 3.4** Groundwater Ammonia trend data



### 3.2 Surface Water Monitoring

The site is within the catchment of three streams (Ballynagran, Ford and Killandra) as well as the Three Mile Water River. The catchments are characterised by sudden high flows coinciding with high rainfall periods and particularly low flows in the drier summer months.

#### 3.2.1 Visual Assessment

Greenstar carries out weekly inspections of the surface water drainage system. In May 2012 site staff noted the Longford River upstream of the site outfall was slightly green in colour and appeared to be possibly contaminated with some kind of agricultural effluent or slurry. The Agency and Wicklow County Council (Council) were informed of the observation and were supplied with a copy of the analysis. Greenstar collected a sample from the Longford Stream at SW-8 on the 10<sup>th</sup> May 2012. SW-8 is up stream of the discharge point from the on site lagoon. The analysis showed slightly elevated levels of BOD and COD when compared to the Q-4 2011, Q-1 and Q-2 2012 results. The results however do not indicate that a significant contamination event occurred.

The inspections completed in the remainder of 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 quarterly at the ten monitoring locations specified in the Licence and reported to the Agency on a quarterly basis. 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. The 2012 results confirm that site activities are not impacting on surface water quality.

### 3.3 Leachate

The monitoring programme involves the collection and testing of leachate samples from the collection sumps and the storage lagoon. The 2012 results indicate an increase in leachate strength throughout the monitoring period, which is expected given the age of the facility. Leachate is removed off site to a Waste Water Treatment Plant (WWTP) as agreed with the Agency.

### 3.4 Landfill Gas (LFG)

Landfill gas is monitored on a monthly basis in wells located outside the waste body. Ballynagran staff members conducted landfill gas monitoring for eleven of the twelve monitoring events, OCM staff conducted the gas monitoring on the remaining twelfth event. In total 23 no. landfill gas monitoring wells were monitored monthly at Ballynagran during 2012.

Monthly gas results are sent to OCM for inclusion in each quarterly environmental monitoring report. These were included as an appendix in each report sent to the Agency during 2012.

During 2012, methane levels were detected in levels above the licence emission limit value (ELV) of 1% at locations MG16 and MG17. The methane levels have fluctuated over the course of the year with a high of 26.3% v/v recorded in MG16 in August 2012. A high of 32.1% was detected in MG17 during the August 2012 monitoring round.

Elevated levels of Carbon Dioxide were detected in levels above the licence emission limit value of 1.5% v/v in monitoring wells in MG-2, 5, 8, 9, 10, 11, 16, 17, 18, 46 & 48 during 2012. The highest level detected was recorded in monitoring well MG17 in December 2012 at a level of 19.1% v/v.

The high CH<sub>4</sub> and CO<sub>2</sub> levels can be explained by the high baseline concentrations in these wells before the facility began accepting waste.

Historically, high concentrations of methane and carbon dioxide were recorded in MG15, MG16, MG17 and MG18 in October 2006, which was prior to the placement of any waste in the landfill. Background CH<sub>4</sub> and CO<sub>2</sub> concentrations continue to be elevated outside the perimeter of the landfill active waste area. These concentrations are consistent with baseline levels recorded prior to the period of active landfilling on the site. The concentrations may be as a result of the natural degradation of organic material and historical waste having been placed in the vicinity prior to the current operators being active at the site.

Analysis carried out in the vicinity of Ballynagran on two occasions in 2007 and 2010 reported by Odour Monitoring Ireland (OMI), showed a VOC profile that is significantly different when comparing perimeter gas wells with active gas wells. In their report, they state that it is highly unlikely that methane and carbon dioxide concentrations in the perimeter gas wells are the results of lateral or horizontal landfill gas migration.

The OMI report indicates that the most likely source of the high measurements is from disturbed ground from the construction phase and results represent natural degradation of organic material.

### **3.5 Noise Surveys**

Noise surveys were conducted on four occasions at the locations specified in Table D.1.1 of the Waste Licence. The surveys were carried out in accordance with International Standards Organisation 1996: Acoustics-description and Measurement of Environmental Noise (Parts 1, 2 and 3).

The results at the noise sensitive locations indicate that noise from the site complied with the licence limits.

### **3.6 Dust Monitoring**

Dust deposition is monitored monthly at seven monitoring locations (AD-6, 7, 8, 9, 10, 11 and 12) as specified in Table D.1.1 of the Waste Licence. The dust deposition limit of 350 mg/m<sup>2</sup>/day was exceeded in March 2012 at AD12 and at AD11 in April 2012. The levels detected were 1,778.34 and 596 mg/m<sup>2</sup>/day respectively. Incident reports were submitted to the Agency following the exceedances. The dust jars where the exceedances occurred were noted to have algal growth. This algal growth is what contributed to the exceedances. This is reflected by the very large portion of the dust which was organic. The quantity of algal growth inhibitor added to the dust jars was increased in the May monitoring event. All of the remaining 2012 monitoring results were less than the deposition limit set in the Licence (350 mg/m<sup>2</sup>/day) and dust is not an issue at the facility.

### 3.7 PM<sub>10</sub>

PM<sub>10</sub> levels were monitored on four occasions at the locations specified in Table D.1.1 in January, June, September and November 2012. All measurements were below the trigger level of 50 µ/m<sup>3</sup>.

### 3.8 Meteorological Monitoring

Climate data for 2012 was collected from the synoptic stations at Casement Aerodrome and Ashford Climatological Station which is located 16 km to the north of the facility. The rainfall data was taken from the Ashford station as it is closer to the landfill site than Casement. Table 3.1 below details summary monthly data for 2012.

**Table 3.1** Meteorological Data: Ashford and Casement Aerodrome – 2012

Ashford Station					Casement Aerodrome Station				
Month	Rainfall	Max Temp	Min Temp	Average Temp	Average Wind Speed	Average Wind Direction (Degrees from North)	Average MSL Pressure (hPa)	Average Relative Humidity (%)	Average Potential Evapotranspiration (mm)
Jan	74.8	13.6	-1.6	-1.6	13.4	209.8	1018.7	86.8	0.5
Feb	27.8	17.4	-5.4	-5.4	10.1	220.7	1028.8	87.5	0.6
Mar	28.4	19.4	-1.4	-1.4	8.6	198.1	1026.7	78.9	1.3
Apr	85.2	14.8	-0.2	-0.2	8.9	170.5	1006.2	80.4	1.5
May	69.2	21.5	-0.6	-0.6	7.2	131.1	1017.0	79.8	2.2
Jun	190.4	23.8	5.0	5.0	8.0	158.7	1008.5	83.6	2.3
Jul	72.4	25.5	5.0	5.0	8.1	198.4	1012.3	84.0	2.5
Aug	144.8	22.8	7.4	7.4	8.6	173.1	1010.0	82.7	2.1
Sep	76.6	22.7	2.8	2.8	10.2	215.5	1014.6	84.6	1.5
Oct	85.1	17.6	0.7	0.7	8.4	167.3	1009.4	91.4	0.7
Nov	136.7	15.3	-2.5	-2.5	10.9	209.0	1006.1	91.7	0.4
Dec	106.7	13.3	-2.4	-2.4	10.8	192.6	1005.4	93.5	0.2

### 3.9 Biological Monitoring

The annual biological assessment of the three streams (Ballynagran, Ford and Killandra) as well as the Three Mile Water River, Ballynagran Co. Wicklow was carried out on the 15<sup>th</sup> December 2012.

A Q Value of 3 (moderate) was assigned to all three sites in 2012. The Q values assigned in 2011 were the same as those awarded in 2010 and only slight differences in Q value have been recorded since 2008.

As there were no significant differences in results from the sites which can be considered up gradient of the landfill (SW1-SW3) and those considered down-gradient of the landfill (SW4-SW10) there are no indications that the landfill development is having a significant impact on water quality in the surrounding watercourses.

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## 4. SITE DEVELOPMENT WORKS

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### 4.1 Summary of Resource & Energy Consumption

The principal energy resources consumed at the site are electricity, water for potable supply oil, vehicle wheel cleaning and dust suppression, diesel fuel and hydraulic oils. All site vehicles are fuelled by diesel. Table 4.1 presents an estimate of the resources used on-site in 2012.

**Table 4.1** Resources Used On-Site

<b>Resource</b>	<b>Units</b>	<b>Total Consumption in 2012</b>
Electricity	kWh	373,916
Diesel Oil	Litres	179,388
Water, potable supply	Litres	52,000
Water, dust suppression	Litres	500,000
Water, wheelwash	Litres	100,000
Hydraulic Oils	Litres	1,000

### 4.2 Proposed Site Development Works 2013

Further permanent capping works of Cells 3, 4, 5/2 and 6 are planned for Quarter 2 2013 as part of the facility's restoration plan. The amount of landfill gas utilised as a resource for electricity generation is to increase with the addition of a further landfill gas engines in Quarter 3 2013.

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## 5. EMISSIONS

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### 5.1 Leachate

There are no direct emissions from leachate generated on-site as it is collected in the main leachate storage lagoon prior to removal off-site for treatment. The total volume of leachate tankered off-site during the reporting period January 2012 – December 2012 was 29,898.95m<sup>3</sup>. Detailed figures are presented in Table 5.1 below.

**Table 5.1** Leachate taken off site in 2012.

<b>Month 2010</b>	<b>Volume ( m3)</b>
January	1,179.96
February	2,346.80
March	1,336.04
April	2,574.94
May	2,236.24
June	2,873.30
July	4,448.26
August	2,946.09
September	2,232.32
October	2,141.77
November	2,586.56
December	2,996.67
<b>Total</b>	<b>29,898.95</b>

Water balance calculations were prepared using guidance in the Agency's Landfill Manual-Landfill Site Design and are based on total rainfall data from the Casement and Ashford Met stations and the volumes of waste deposited at the site during the reporting period. The calculations are presented in Table 5.2.

It was assumed that all of the incident rainfall on the active cells had the potential to generate leachate. An absorptive capacity of 0.025 m<sup>3</sup>/tonne was used based on a waste density of 0.8 tonnes/m<sup>3</sup>.

The calculations indicate that approximately 26,441m<sup>3</sup> of leachate was generated in 2012. The calculations take into account the placement of capping on 20,000m<sup>2</sup> of the landfill. The calculation assumes that the capping has been in place for the whole of 2012 and therefore underestimates the total amount of leachate generated. Therefore the estimated leachate volumes are slightly lower than the 29,898 m<sup>3</sup> of leachate that was removed during the reporting period.

## 5.2 Landfill Gas

The enclosed 2500 m<sup>3</sup>/hour landfill gas flare was installed in February 2008 and is connected to 110 No. vertically drilled and constructed gas wells, 40 No. gas wells (sacrificial) and 40 No. horizontal gas wells. A landfill gas engine was connected to the Haase Flare in January 2011 and fully commissioned.

Landfill gas infrastructure such as the different variety of wells is installed progressively as the waste is placed and the different gas well types are chosen to meet the specific needs of that particular landfill area.

A Landfill Utilisation Compound was constructed in late 2010 and one Landfill Gas Engine commissioned. The facility is currently exporting 0.75 MWhr to the national grid. The Main Enclosed flare which is connected to the landfill gas engine is extracting on average 2,300m<sup>3</sup>/hour of landfill gas presently. The facility installed a further Enclosed Flare in Cell 7 in May 2010 to replace two open flares situated there since December 2008. Currently this Enclosed Flare is extracting 1,300 m<sup>3</sup>/hour similar quality landfill gas from Cells 6 and 7.

## 5.3 Estimated Annual and Cumulative Quantity of Indirect Emissions to Groundwater

The potential sources of indirect emissions to groundwater from the facility are as follows:

- **Landfill Base** – The landfill has a composite base lining system comprising a HDPE geomembrane and a half metre thick layer of Bentonite Enhanced Soil. A leak detection survey of the HDPE geomembrane after placement of the drainage stone layer was completed and defects to the HDPE liner were repaired in accordance with industry standards.
- **Surface Water Collection and Treatment System** – Surface water from the paved access roads and landfill cell swale drain is collected and discharged into the surface water lagoon along with groundwater collected at the interceptor sump located below the landfill cells. Water from the lagoon discharges to the reed bed which further filters the water before it is finally discharged to the Ford Stream.
- **Treated Sewage Effluent** – There is a biocycle wastewater treatment plant located adjacent to the weighbridge which treats the canteen and office waste water prior to being pumped to the leachate holding tank via the foul-water sump. Leachate (containing foul water) is tankered off-site to a waste water treatment plant via a vacuum tanker.

In summary, as the landfill is fully contained, there are no indirect emissions to groundwater.



## **5.4 Surface Water**

Rainfall run-off on the undeveloped parts of the site discharges directly to the surface water drainage system. Rainfall on active fill areas is collected in the leachate collection system. The surface drainage from all roads is directed to the surface water retention pond via an oil interceptor. Drainage from the waste inspection and quarantine bays is directed to the leachate lagoon. The retention pond design and capacity meets the requirements of the Waste Licence. The inlet to the pond is fitted with a Class 1 Full Oil interceptor.

**Table 5.1** Annual Leachate Volume

Yr.	Active Cell No.	Active Area	Waste Input	Active Infiltration	Intermediate Restoration	Intermediate Restored Area	Intermediate Infiltration	Final Restoration	Restored Area	Restored Infiltration	Liquid Waste	Total Leachate	Absorptive Capacity	Annual Leachate
		Uncapped (m <sup>2</sup> )	(t)	(m <sup>3</sup> )	Cell No.	(m <sup>2</sup> )	(m <sup>3</sup> )	Cell No.	(m <sup>2</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )	(m <sup>3</sup> )	Generation
2012	3, 4, 5, 6, 7	40,000	230,184	<b>30,000</b>				1, 2, 3 & part of 5 & 6	20,000	<b>2196</b>	0	32,196	5,755	<b>26,441</b>
Cell area (m <sup>2</sup> )						-	Estimated maximum waste input ( t/year)						200,000	
Total rainfall (m/year)						<b>1.098</b>	Liquid waste input (t/year)						0	
Effective Rainfall post vegetation (m/year)						<b>0.189</b>	Final Infiltration						<b>0.1098</b>	10% of Effective Rainfall per annum
Density of <i>in-situ</i> waste (t/m <sup>3</sup> )						0.8	Intermediate Infiltration						<b>0.6588</b>	60% of Effective Rainfall per annum
Absorptive capacity (m <sup>3</sup> /t)						0.025								
Effective Rainfall before vegetation assumed to be (m)						0.45								

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## 6. NUISANCE CONTROL

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In accordance with Condition 7 of the waste licence, Greenstar is committed to ensuring that the facility does not give rise to nuisance at the facility or in the immediate area of the facility. The potential sources of nuisance at a landfill facility are odour, vermin, birds, flies, mud, dust and litter. A procedure, (F09j - Completion of Daily Site Condition Reports) has been drawn up to comply with Condition 7 and is being carried out at the facility.

### 6.1 Odour

In accordance with Condition 8.12.2 of the waste licence, Greenstar has submitted a programme to the Agency for the monitoring and assessment of odours emissions arising from the facility. An odour control and monitoring procedure (F 09 r) has been drawn up and carried out in 2012.

Good operational practices on site are the main controls to avoid odour nuisances. These include procedures relating to the Operation Start-Up and Shut-Down (F 09 001) and Waste Acceptance (F 09 a (IV)) (dealing with the handling, depositing and covering of waste at the facility). These procedures have been written in accordance with the Landfill Manual. Landfill Operational Practices., published by the Agency and are incorporated into the odour control and monitoring procedure onsite.

Landfill gas extraction wells and two landfill gas flares and one landfill gas engine which is connected to the national grid are currently in operation. Landfill gas drilling was carried out in February 2012 and August 2012 to supplement ongoing LFG extraction techniques such as constructed wells and horizontal wells. This active gas extraction system allows for the long term control of any potential odours. John Gibbons conducted monitoring on behalf of the Office of Environmental Enforcement in 2012 and found no non-compliances with our system. An external consultant Odour Monitoring Ireland conducted VOC survey emissions surveys in 2012. The PID/FID survey highlighted areas where there could be potential for VOC escape, by measuring VOC levels around the landfill area. Recommendations from their study of the site have been implemented.

In accordance with daily condition reports, odour inspections are carried out on a daily basis by site staff at the facility and also in response to any odour complaints. In the monitoring period there have been complaints in relation to odours and these are dealt more specifically in Reported Incidents and Complaints (Section 7).

## **6.2 Vermin and Birds**

Inspections for vermin are carried out on a weekly basis for rodents and on a daily basis for birds, in particular crows. Specialist contractors are employed by Greenstar to control vermin and birds at the facility. Vermin control measures; used as part of this programme, include internal and external bait boxes, rodenticide and insect control measures. The specialist contractor visits the site at regular intervals throughout the year to inspect the control measures and assess their effectiveness. These control measures have been found to be successful.

## **6.3 Flies**

Particularly during the warmer months, attention is paid to observations of flies. Any observations are recorded on the Daily Site Condition Report (F09(j)(i)). The Facility Manager or the Site Supervisor is notified immediately in order to take measures to eliminate any significant fly populations from establishing.

## **6.4 Dust and Mud**

The site roads are inspected on a daily basis for mud or dust and any observations recorded on the Daily Site Condition Report ((F09(j)(i)). Special attention is paid to dust during the dry months and mud during the wet months and the Site Supervisor or the Facility Manager is notified immediately in order to take measures to minimise or eliminate any potential nuisances arising from mud or dust accumulating on site roads. Some measures include the use of a wheelwash, road sweeper and the use of a water bowser to dampen access roads and stockpiles during periods of dry weather.

## **6.5 Litter**

Litter is controlled by fencing which was installed around the landfill footprint as specified in the waste 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. Litter inspections are carried out and recorded as part of the daily inspection, which is outlined in the Completion of Daily Site Condition Reports (F09j (i)) and the Procedure for Litter Prevention & Assembly/Disassembly of Nets (F 09 g). The presence of litter is noted on the Inspection Form and removed immediately if practicable. Any litter noted at or outside the boundary fence, which appears to be illegally dumped, is inspected for any indications of identity if possible and reported to the Facility Manager.

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

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### **7.1 Incidents**

There were twenty three minor incidents of Non Urgent Category 3 level with regard to trigger levels specified in Condition 6.4.2 of the licence and two minor incidents of Non Urgent Category 3 level excess emissions specified in Schedule C of the licence. These were reported to the agency as soon as the licensee was notified and did not cause any environmental impacts.

### **7.2 Register of Complaints**

Greenstar maintains a register of complaints in compliance with Condition 10.4. Details of all complaints received during the reporting period and the action taken by Greenstar are available at the facility.

The site received 144 complaints during 2012. All complaints received were related to odour. A table illustrating the date, the issue, the corrective action taken and date the complaint was closed is provided in Appendix 3.

Complaints were responded to via the complaints procedure.

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## 8. ENVIRONMENTAL MANAGEMENT SYSTEM

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### 8.1 Management Structure

The Management Structure as required by Condition 2.2.1 of the waste licence was submitted to the Agency on 14<sup>th</sup> December 2004, before the start of waste activities and updated in each AER.

#### 8.1.1 Site Management Structure

The day to day management of the facility and supervision of waste activities are the responsibility of the General Manager, nominated Deputy Manager(s) and the site operatives. The positions and names of the persons who provide management and supervision are set out below: -

- Greenstar in Receivership
- Operations Director, Geoff Bailey
- General Manager – Landfill Development and Management, Donal Monaghan
- Landfill Manager, Tomas Fingleton
- Assistant Landfill Manager, Robert Kirwan
- Site Foreman, Michael Macleod
- Landfill Clerk, Barry Mernagh
- General Operatives, Joseph Donohue, Joseph Moore and John Kinsella

#### 8.1.2 Responsibilities

Greenstar, as the licensee, is responsible for ensuring that the requisite resources are provided to operate the facility in accordance with the objective of the EMP and the Waste Licence conditions.

The General Manager or nominated Deputy is responsible for ensuring that the day to day operation of the facility is carried out in accordance with the EMP, the Waste Licence conditions and the Operating Procedures.

The General Manager or nominated Deputy is responsible for ensuring that the environmental monitoring programme is carried out and reports submitted to the

Agency in accordance with the schedule in the EMP and the Waste Licence conditions.

The General Manager or nominated Deputy is responsible for arranging that the specified engineering works, the leachate and landfill gas management programmes and the restoration programmes are properly implemented.

The General Manager or nominated Deputy is responsible for ensuring that the Corrective Action Procedures, Emergency Response Procedures and Contingency Arrangements specified in the EMP and the Waste Licence are implemented.

The General Manager or nominated Deputy is responsible for arranging appropriate training programmes for all facility personnel and for maintaining training records.

The General Manager, nominated Deputy and designated staff are responsible for implementing the waste acceptance procedures, including the assessment of suitability of the waste for disposal and recording the data specified in the Waste Licence. They are responsible for receiving and recording complaints from members of the public at the facility and informing the General Manager or nominated Deputy of the complaints.

The General Manager, nominated Deputy, Site Foreman and designated staff are responsible for ensuring compliance with conditions relating to waste inspection, placement and nuisance control (e.g. daily cover, litter, dust, vermin, birds).

### *8.1.3 Staff Training*

All training was carried out as scheduled in the training plan for 2012. A summary of all training to date can be seen in Appendix 4.

Any facility staff who performs duties which involve interpretation of monitoring results or site inspections, will receive the appropriate training by the General Manager or nominated deputy, prior to carrying out such duties.

All facility staff will receive further training in their individual areas of activity. This training will comprise theoretical sessions as well as practical training. All such training will be recorded and documented in individual training files.

## **8.2 EMP**

Greenstar have implemented an Integrated Management System (IMS) in accordance with the requirements of Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 and International Standard Organisation (ISO) 14001:2004 in order to manage the Health, Safety and Environmental performance of their business and to control health and safety risk and to minimise their environmental aspects and impacts. Ballynagran Residual Landfill was the first Greenstar landfill to gain certification for both ISO14001 and ISO 18001 Environmental, Health and Safety management systems.

The IMS has been developed for the achievement of continual improvement taking into the requirements of the Waste Licence Conditions. Greenstar has prepared and effectively implemented documented procedures and instructions in accordance with the requirements of both the OHSAS 18001:2007 and ISO 14001:2004. The facility received an external ISO14001 and OHSAS 18001 audit in August 2012 from Certification Europe and the facility was found to be compliant with its conditions for standard certification for both management systems.

As part of this IMS Greenstar has developed a list of environmental, management, operating and maintenance procedures, details of which are outlined in Appendix 5. The schedule of Objectives and Targets, including their status for 2012 (Table 8.1), as well as the proposed Objectives and Targets for 2013 (Table 8.2) are presented below.

### *8.2.1 Schedule of Objectives 2012*

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

### *8.2.2 Schedule of Objectives 2013*

Greenstar has set a schedule of targets and objectives for 2013. These are presented in Table 8.2.

## **8.3 Communications Programme**

The Communications Programme required by Condition 2.4 of the waste licence, was established three months before the start of waste activities and has been submitted to the Agency.

In December 2011, a newsletter relating to activities at Ballynagran Residual Landfill was sent out to all local householders.



Ballynagran Landfill pursues an active programme of disseminating information on its operations to all interested parties. This is undertaken through a variety of means including site tours, the company website, presentations and open days. During 2008, a short film was produced detailing how the facility was constructed and is operated. The film is shown to all those visiting the facility.

The overall communications programme contains the following objectives:

- To promote public awareness of Greenstar's activities and environmental policies;
- To maintain an ongoing dialogue with authorities that have direct involvement with waste;
- To make available Environmental Performance Data to all interested parties;
- To disseminate information relating to the operation and management of the site;
- To encourage liaison between the site and local residents and those who may be affected by the site operations,
- To provide general information on waste management issues;
- To ensure all users and customers of the site are conversant with the requirements of the site waste licence;
- To ensure that all objectives are, where possible, measurable and quantifiable;

The objectives of the programme are met through the following elements as appropriate:

- Personal contact;
- Residents meetings/Liaison groups;
- Information displays;
- Information packs;
- Site visits;
- Web page;
- Educational links; and
- Published information

**Table 8.1** Progress Report on Schedule of Objectives and Targets for 2012

<b>1. Development of landfill gas infrastructure and gas utilisation plant</b>
Ballynagran Landfill extended the 355mm ring main into Cell 9. A further 18 landfill gas wells were drilled in February 2012 and August 2012. Horizontal and constructed wells were placed in the filled areas during waste deposition.
<b>2. Minimise risk of potential water pollution from generation of leachate</b>
Ballynagran Landfill continued to transport leachate for disposal to Wicklow WWTP, Drogheda WWTP, Ringsend WWTP, Rilta, ENVA to ensure leachate cell levels were for in compliance with our licence. In 2012 we permanently capped sections of cell 6, 3, 4 and 5 to reduce leachate generation.
<b>3. Reduce dust nuisance on environment and surrounding neighbours</b>
A tractor and bowser was operated during dry periods to reduce dust nuisance.
<b>4. Avoid contamination of groundwater after a spillage or emergency situation</b>
Ballynagran Landfill carried out spillage emergency response spill training
<b>5. To reduce the risk of site personnel being hit by a vehicle</b>
This was maintained as an objective in our H&S management system
<b>6. Review and assess the effectiveness of nuisance control procedures including bird, rats and mice</b>
An external contractor Pestguard carries out quarterly checks
<b>7. Minimise nuisance from vehicle movements and uploading / tipping</b>
Ballynagran Landfill ensured noise, dust, odour from vehicle movements are minimised by correct implementation of relevant operational protocols
<b>8. Continue to improve relationships with neighbouring communities / reduce environmental complaints</b>
Ballynagran Landfill responded to queries and complaints as promptly as possible and liaised with locals regarding an concerns they may have had in 2012
<b>9 Environmental monitoring</b>
Monitoring was carried in compliance with our licence W0165-02
<b>10. Monitor progress of planting programme on a regular basis</b>
Trees were restaked in certain areas following high winds
<b>11. Awareness and training programme</b>
Awareness and training was maintained throughout 2012
<b>12. H&amp;S Policy</b>
<ul style="list-style-type: none"> <li>Promotion of H&amp;S amongst all employees and the generation of an ethos of continual improvement</li> </ul>

- Diligent management of operations by employing control mechanisms, procedures and processes that are technologically proven and economically feasible
- Promotion of continual improvement, good health and safety work practices through continual review of O&Ts
- Fostering of openness, dialogue, enhanced communication and discussion with employees, clients, neighbours, suppliers, contractors and all interested parties regarding our H&S and our O&Ts
- Publication and communication of our policy internally and ensuring its availability to the public and interested parties on request so that it is understood implemented and maintained
- Measurement of performance by conducting regular audits and assessment of compliance with the OHSAS 18001:2007 standards, EHS policy, relevant legislation and regulatory requirements

**Table 8.2** Schedule of Objectives and Targets for 2013

Originated from	Objective	Target including timescale
F01 - impact no. 1 / AER 2008, 2009, 2010, 2011, 2012	Develop landfill gas collection infrastructure and gas utilisation plant.	Extend gas collection infrastructure into new cells, respond to increased gas generation by installing additional flares and engines, as required. Expand LFG utilisation plant and set up extra engines. Collect and burn approximately 100% of all landfill gas generated by the facility. In 2012 permanently cap sections of cell 6, 3, 4 and 5 to improve gas containment and increase FID surveys from biannually to quarterly.
F01 – impact no. 3 / AER 2009,2010, 2011 & 2012	Minimise risk of potential water pollution from generation of leachate	Minimise leachate generation. In 2012 permanently cap sections of cell 6, 3, 4 and 5 to reduce leachate generation.
F01 – impact no. 5 / AER 2009,2010, 2011 & 2012	Reduce dust nuisance on environment and surrounding neighbours	All dust emissions in accordance with Licence
F01 – impact no. 4 / AER 2009,2010, 2011& 2012	Avoid contamination of groundwater after a spillage or emergency situation	Carry out spillage emergency response training
F01 – impact no. 6 and AER 2008, 2009, 2010, 2011& 2012	Reduce risk of wind blown litter when the site is operating in adverse weather conditions	Ensure site remains compliant with Licence conditions which refer to wind blown litter
F03a No.1 AER 2012	To reduce the risk of site personnel being hit by a vehicle	To significantly reduce this type of incident on site.

<b>Originated from</b>	<b>Objective</b>	<b>Target including timescale</b>
F03a No.2 AER 2012	Reduce or eliminate the risk from tipper vehicles overturning	Actively discourage tipper type vehicles from the site in favour of more stable and safer type vehicles suitable to the landfill terrain.
F03a No.3 AER 2012	Ensure edge protection is adequate on all landfill haul roads	Construction of safety berms on all internal landfill site roads
F01 - impact no. 7 / AER 2007, 2008, 2009, 2010, 2011 & 2012	Review and assess the effectiveness of nuisance control procedures including bird, rats and mice	Continually review and assess all nuisance control procedures to ensure minimal impact on surrounding area. Update reports on bird control and odour abatement measures. Prepare and implement odour nuisance management plan (for timescale see project sheet)
AER 2007, 2008, 2009, 2010, 2011 & 2012	Minimise nuisance from vehicle movements and uploading / tipping	Ensure noise, dust, odour from vehicle movements are minimised by correct implementation of relevant operational protocols (for timescale see project sheet)
AER 2007, 2008, 2009, 2010, 2011 & 2012	Continue to improve relationships with neighbouring communities / reduce environmental complaints	Develop communications with site neighbours and respond to queries as quickly as reasonably practicable, ensuring that any complaints are followed up in writing as soon as possible after receipt of complaint (for timescale see project sheet).
AER 2007, 2008, 2009, 2010, 2011 & 2012	Environmental monitoring	Ensure monitoring results comply with Licence limits and investigate any exceedances of emission limit value (for timescale see project sheet).
AER 2007, 2008, 2009, 2010, 2011 & 2012	Monitor progress of planting programme on a regular basis	Regularly review planted woodland area and ensure the replacement of any failed trees to ensure visual impact of site is minimised (for timescale see project sheet).

Originated from	Objective	Target including timescale
AER 2008, 2009, 2010, 2011 & 2012	Awareness and training programme	Carry out continued ISO and Health and Safety Training
H&S Policy / AER 2009/AER 2010/AER 2011/AER 2012	<ul style="list-style-type: none"> <li>• Promotion of H&amp;S amongst all employees and the generation of an ethos of continual improvement</li> <li>• Diligent management of operations by employing control mechanisms, procedures and processes that are technologically proven and economically feasible</li> <li>• Promotion of continual improvement, good health and safety work practices through continual review of O&amp;Ts</li> <li>• Fostering of openness, dialogue, enhanced communication and discussion with employees, clients, neighbours, suppliers, contractors and all interested parties regarding our H&amp;S and our O&amp;Ts</li> <li>• Publication and communication of our policy internally and ensuring its availability to the public and interested parties on request so that it is understood implemented and maintained</li> <li>• Measurement of performance by conducting regular audits and assessment of compliance with the OHSAS 18001:2007 standards, EHS policy, relevant legislation and regulatory requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Improvement driven Safety Observation Audit Reports are to be undertaken bi-monthly focussing on swiftly resolving problems as they occur</li> <li>• Develop H&amp;S training giving more focus on empowering employees to become safety representatives, as applicable</li> <li>• Look to develop staff interaction enabling keen spotting of potential problem or hazards through training and communication</li> <li>• Encourage feedback on equipment and resources including adequacy of PPE in protective properties, wear ability and durability and look at alternatives, where appropriate</li> <li>• Develop neighbour relations by encouraging site visits to complainants or mediation through local groups such as the liaison committee or anti-dump group also handling complaints with higher degree of positive feedback</li> </ul>

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## **9. OTHER REPORTS**

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### **9.1 Financial Provision**

The licensee will submit the requested Section 53A Statement to the Agency in Quarter 2 of 2013

### **9.2 Landscape Programme**

There was no additional tree planting at the facility during 2012. There was maintenance carried out on all existing trees planted, in terms of weeding and pruning.

### **9.3 Surface Water and Leachate Management System Inspection and Slope Stability Assessment Report**

A surface water and leachate management system inspection and slope stability assessment report was prepared by Golder Associates in February 2012 and submitted to the Agency during the reporting period. The survey concluded that the slopes are not showing any signs of movement or distress and the surface water lagoon is in good condition.

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

Under the European Pollutant Release and Transfer Register Regulation (EC) No. 166/2006 Greenstar 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 Tank, drum, pipeline and bund testing and inspection report**

All integrity testing is carried out on site every three years. Testing was carried out on site in 2013 and the reports are appended. The testing for all infrastructure was found to be fit for purpose.

# **APPENDIX 1**

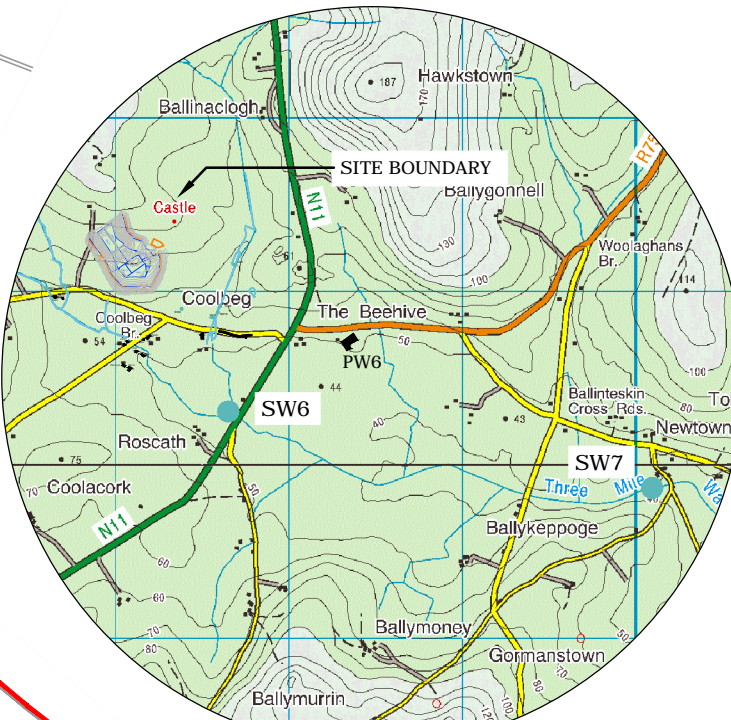
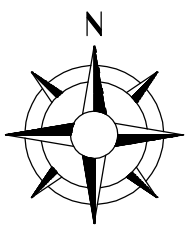
Topographic Survey with Monitoring Locations





TOWN CENTRE HOUSE, DUBLIN ROAD, NAAS, CO. KILDARE  
TEL.: 045 874411 - FAX: 045 874549 - www.golder.com

ORDNANCE SURVEY IRELAND  
LICENCE NUMBER  
AR0056012



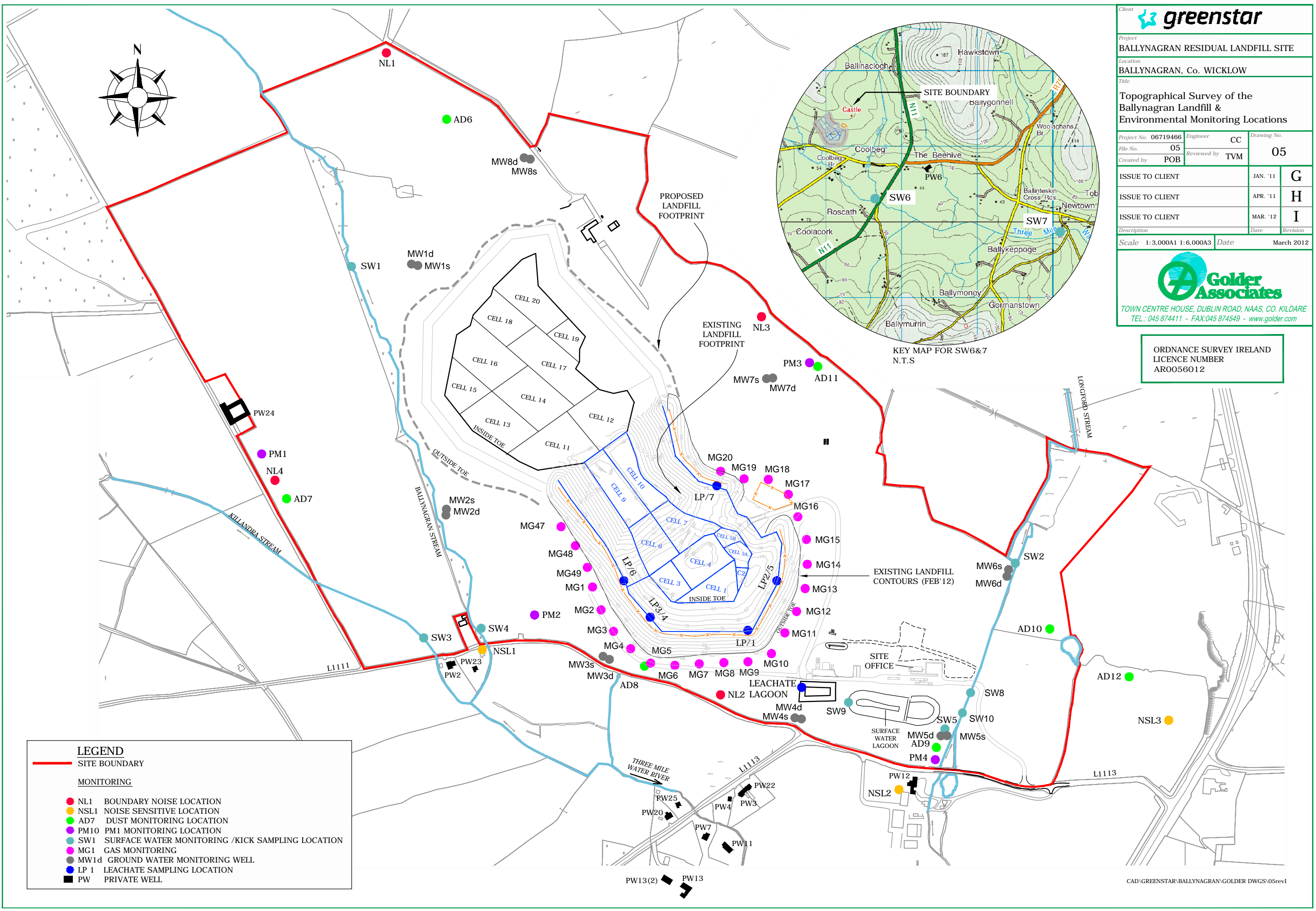
KEY MAP FOR SW6 & 7  
N.T.S

**LEGEND**

— SITE BOUNDARY

**MONITORING**

- NL1 BOUNDARY NOISE LOCATION
- NSL1 NOISE SENSITIVE LOCATION
- AD7 DUST MONITORING LOCATION
- PM10 PM1 MONITORING LOCATION
- SW1 SURFACE WATER MONITORING /KICK SAMPLING LOCATION
- MG1 GAS MONITORING
- MW1d GROUND WATER MONITORING WELL
- LP 1 LEACHATE SAMPLING LOCATION
- PW PRIVATE WELL



## **APPENDIX 2**

Monitoring Results 2012

**Groundwater Data 2012**

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	MW-1S	MW-1S	MW-1S	MW-1S
pH	8.05	7.98	8.04	7.27
Electrical Conductivity	272	252	273	286
Chloride	20.9	19.1	18.4	19
Ammonia	0.02	0.04	0.03	<0.01
Potassium	0.7	0.8	0.7	0.8
Dissolved Oxygen	11	10	11	10
Total Chromium				<1.5
TOC	9	8	<2	4
Boron				<12
Cadmium				<0.5
Calcium				27.4
Copper				<7
Iron				<20
Lead				<5
Magnesium				4.6
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				15.6
Zinc				<3
Fluoride				<0.3
Sulphate				69.87
Ortho Phosphate				<0.06
TON				6.5
Total Cyanide				<0.01
Alkalinity				76
Total Solids				1489
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				<1
Faecal Coliforms				<1

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-1D</b>	<b>MW-1D</b>	<b>MW-1D</b>	<b>MW-1D</b>
pH	8.08	9.74	9.13	10.39
Electrical Conductivity	279	272	352	367
Chloride	22.6	16.9	16.6	18.8
Ammonia	0.02	0.02	0.13	<0.01
Potassium	0.6	1.1	1.1	1.2
Dissolved Oxygen	10	7	6	5
Total Chromium				<1.5
TOC	9	2	4	2
Boron				<12
Cadmium				<0.5
Calcium				37.8
Copper				<7
Iron				<20
Lead				<5
Magnesium				<0.1
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				20.2
Zinc				<3
Fluoride				<0.3
Sulphate				35.52
Ortho Phosphate				<0.06
TON				1.2
Total Cyanide				<0.01
Alkalinity				68
Total Solids				242
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				1
Faecal Coliforms				<1

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	MW-2S	MW-2S	MW-2S	MW-2S
pH	9.4	9.34	9.37	9.9
Electrical Conductivity	302	332	323	327
Chloride	21.9	19.4	19.7	20.4
Ammonia	0.05	0.03	0.08	<0.01
Potassium	1	1.2	1.6	1.2
Dissolved Oxygen	10	10	9	9
Total Chromium				2.2
TOC	11	4	3	5
Boron				16
Cadmium				<0.5
Calcium				17.3
Copper				<7
Iron				<20
Lead				<5
Magnesium				0.8
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				41.4
Zinc				<3
Fluoride				<0.3
Sulphate				70.91
Ortho Phosphate				<0.06
TON				0.9
Total Cyanide				<0.01
Alkalinity				70
Total Solids				294
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				19.7
Faecal Coliforms				10

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-2D</b>	<b>MW-2D</b>	<b>MW-2D</b>	<b>MW-2D</b>
pH	8.19	8.24	8.31	7.56
Electrical Conductivity	366	335	371	436
Chloride	18.5	3.5	25.9	24.9
Ammonia	0.13	0.02	0.04	<0.01
Potassium	1	1.2	1	0.7
Dissolved Oxygen	10	10	9	9
Total Chromium				<1.5
TOC	14	14	<2	8
Boron				40
Cadmium				<0.5
Calcium				61.4
Copper				<7
Iron				<20
Lead				<5
Magnesium				8.6
Manganese				4
Mercury				2
Nickel				<2
Sodium				10.9
Zinc				<3
Fluoride				<0.3
Sulphate				9.92
Ortho Phosphate				<0.06
TON				3
Total Cyanide				<0.01
Alkalinity				182
Total Solids				458
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				1732.9
Faecal Coliforms				30

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	MW-3S	MW-3S	MW-3S	MW-3S
pH	8.6	8.23	8.34	8.14
Electrical Conductivity	383	369	380	377
Chloride	16.2	17.9	18.3	18.8
Ammonia	0.02	0.9	0.42	0.14
Potassium	1.9	4.3	4.1	2.6
Dissolved Oxygen	7	4	9	8
Total Chromium				<1.5
TOC	<2	10	<2	9
Boron				100
Cadmium				2.2
Calcium				38.6
Copper				<7
Iron				<20
Lead				<5
Magnesium				6.4
Manganese				54
Mercury				<1
Nickel				<2
Sodium				24.8
Zinc				<3
Fluoride				<0.3
Sulphate				25.48
Ortho Phosphate				0.24
TON				<0.2
Total Cyanide				<0.01
Alkalinity				152
Total Solids				232
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				141.4
Faecal Coliforms				4



Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	MW-3D	MW-3D	MW-3D	MW-3D
pH	7.98	7.88	8.33	8.02
Electrical Conductivity	550	434	588	493
Chloride	18.4	16.3	16.3	17.1
Ammonia	0.04	0.02	0.05	0.06
Potassium	1.9	1.2	2.6	1.6
Dissolved Oxygen	9	4	8	7
Total Chromium				<1.5
TOC	11	6	<2	21
Boron				20
Cadmium				<0.5
Calcium				65.9
Copper				<7
Iron				<20
Lead				<5
Magnesium				12.5
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				13.6
Zinc				<3
Fluoride				<0.3
Sulphate				18.96
Ortho Phosphate				<0.06
TON				0.7
Total Cyanide				<0.01
Alkalinity				234
Total Solids				319
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				1986.3
Faecal Coliforms				2

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	MW-4S	MW-4S	MW-4S	MW-4S
pH	7.76	7.87	8.34	8.02
Electrical Conductivity	264	268	356	360
Chloride	26.4	22.6	19.3	19.6
Ammonia	0.02	0.02	0.03	0.07
Potassium	0.8	0.7	1.2	1.1
Dissolved Oxygen	9	8	7	7
Total Chromium				<1.5
TOC	11	5	<2	7
Boron				25
Cadmium				0.9
Calcium				41.3
Copper				<7
Iron				<20
Lead				<5
Magnesium				8.4
Manganese				160
Mercury				<1
Nickel				<2
Sodium				15.2
Zinc				<3
Fluoride				<0.3
Sulphate				16.67
Ortho Phosphate				<0.06
TON				1.1
Total Cyanide				<0.01
Alkalinity				196
Total Solids				242
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				3
Faecal Coliforms				<1

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-4D</b>	<b>MW-4D</b>	<b>MW-4D</b>	<b>MW-4D</b>
pH	8.07	7.96	8.35	8
Electrical Conductivity	311	227	321	<2
Chloride	18.8	20.1	19.3	19.7
Ammonia	0.03	0.02	0.16	0.06
Potassium	1.5	0.5	1.1	1
Dissolved Oxygen	9	7	3	8
Total Chromium				<1.5
TOC	6	5	6	7
Boron				14
Cadmium				1.1
Calcium				41
Copper				<7
Iron				<20
Lead				<5
Magnesium				8.3
Manganese				173
Mercury				<1
Nickel				<2
Sodium				15
Zinc				<3
Fluoride				<0.3
Sulphate				16.78
Ortho Phosphate				<0.06
TON				1.2
Total Cyanide				<0.01
Alkalinity				178
Total Solids				255
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				<1
Faecal Coliforms				<1

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-5S</b>	<b>MW-5S</b>	<b>MW-5S</b>	<b>MW-5S</b>
pH	8.18	8.18	8.37	6.8
Electrical Conductivity	351	338	350	295
Chloride	25.5	19.5	18	24.3
Ammonia	0.06	0.03	0.03	0.06
Potassium	1.2	1.1	1.2	0.7
Dissolved Oxygen	8	5	7	9
Total Chromium				<1.5
TOC	8	5	4	16
Boron				<12
Cadmium				<0.5
Calcium				26.3
Copper				<7
Iron				<20
Lead				<5
Magnesium				7.4
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				14.6
Zinc				<3
Fluoride				<0.3
Sulphate				7.73
Ortho Phosphate				<0.06
TON				6.1
Total Cyanide				<0.01
Alkalinity				92
Total Solids				461
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				16500
Faecal Coliforms				<1

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-5D</b>	<b>MW-5D</b>	<b>MW-5D</b>	<b>MW-5D</b>
pH	8.17	8.25	8.36	7.24
Electrical Conductivity	285	309	319	232
Chloride	21.3	19.5	19.3	21.5
Ammonia	0.03	0.02	0.02	0.06
Potassium	1.3	1.1	1.2	0.6
Dissolved Oxygen	7	6	3	10
Total Chromium				<1.5
TOC	9	4	3	4
Boron				<12
Cadmium				<0.5
Calcium				15.7
Copper				<7
Iron				<20
Lead				<5
Magnesium				6
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				16.8
Zinc				<3
Fluoride				<0.3
Sulphate				4.34
Ortho Phosphate				<0.06
TON				3.8
Total Cyanide				<0.01
Alkalinity				128
Total Solids				187
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				344.8
Faecal Coliforms				<1

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-6S</b>	<b>MW-6S</b>	<b>MW-6S</b>	<b>MW-6S</b>
pH	7.85	7.8	8	6.66
Electrical Conductivity	266	274	301	307
Chloride	26.3	22.8	23.2	24.4
Ammonia	0.04	0.02	0.05	<0.01
Potassium	0.9	0.6	0.8	0.8
Dissolved Oxygen	9	7	6	10
Total Chromium				<1.5
TOC	5	5	3	4
Boron				<12
Cadmium				<0.5
Calcium				28.6
Copper				<7
Iron				<20
Lead				<5
Magnesium				7.8
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				15.2
Zinc				<3
Fluoride				<0.3
Sulphate				8.43
Ortho Phosphate				<0.06
TON				6
Total Cyanide				<0.01
Alkalinity				94
Total Solids				576
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				5910
Faecal Coliforms				50

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-6D</b>	<b>MW-6D</b>	<b>MW-6D</b>	<b>MW-6D</b>
pH	7.91	7.93	8.01	6.92
Electrical Conductivity	231	231	237	233
Chloride	23	20.1	20.3	21.2
Ammonia	0.02	<0.01	0.02	0.06
Potassium	0.7	0.5	0.6	0.5
Dissolved Oxygen	10	7	6	9
Total Chromium				<1.5
TOC	7	4	5	4
Boron				<12
Cadmium				<0.5
Calcium				15.3
Copper				<7
Iron				<20
Lead				<5
Magnesium				5.8
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				16.5
Zinc				<3
Fluoride				<0.3
Sulphate				4.81
Ortho Phosphate				0.11
TON				3.7
Total Cyanide				<0.01
Alkalinity				84
Total Solids				176
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				8.3
Faecal Coliforms				<1

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-7S</b>	<b>MW-7S</b>	<b>MW-7S</b>	<b>MW-7S</b>
pH	8.05	7.78	7.99	7.09
Electrical Conductivity	239	265	267	294
Chloride	21.1	18.5	18.4	19.9
Ammonia	0.02	<0.01	0.03	0.05
Potassium	0.7	0.5	0.7	0.8
Dissolved Oxygen	11	9	9	10
Total Chromium				<1.5
TOC	8	6	4	<2
Boron				22
Cadmium				<0.5
Calcium				28.3
Copper				<7
Iron				<20
Lead				<5
Magnesium				4.9
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				15.5
Zinc				<3
Fluoride				<0.3
Sulphate				11.04
Ortho Phosphate				<0.06
TON				6.8
Total Cyanide				<0.01
Alkalinity				82
Total Solids				962
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				1
Faecal Coliforms				<1



<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-7D</b>	<b>MW-7D</b>	<b>MW-7D</b>	<b>MW-7D</b>
pH	8.11	7.83	10.22	9.94
Electrical Conductivity	268	271	381	375
Chloride	22.8	18.8	16.7	18.3
Ammonia	0.03	0.02	0.12	0.09
Potassium	0.7	0.6	1.4	1.2
Dissolved Oxygen	10	10	5	6
Total Chromium				<1.5
TOC	9	6	3	<2
Boron				21
Cadmium				<0.5
Calcium				41.8
Copper				<7
Iron				<20
Lead				<5
Magnesium				<0.1
Manganese				<2
Mercury				<1
Nickel				<2
Sodium				21.2
Zinc				<3
Fluoride				<0.3
Sulphate				41.54
Ortho Phosphate				<0.06
TON				1.6
Total Cyanide				<0.01
Alkalinity				110
Total Solids				302
VOCs				ND
sVOCs				ND
Pesticides				ND
Total Coliforms				<1
Faecal Coliforms				<1

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-8S</b>	<b>MW-8S</b>	<b>MW-8S</b>	<b>MW-8S</b>
pH	Dry	Dry	Dry	Dry
Electrical Conductivity	Dry	Dry	Dry	Dry
Chloride	Dry	Dry	Dry	Dry
Ammonia	Dry	Dry	Dry	Dry
Potassium	Dry	Dry	Dry	Dry
Dissolved Oxygen	Dry	Dry	Dry	Dry
Total Chromium	Dry	Dry	Dry	Dry
TOC	Dry	Dry	Dry	Dry
Boron				Dry
Cadmium				Dry
Calcium				Dry
Copper				Dry
Iron				Dry
Lead				Dry
Magnesium				Dry
Manganese				Dry
Mercury				Dry
Nickel				Dry
Sodium				Dry
Zinc				Dry
Fluoride				Dry
Sulphate				Dry
Ortho Phosphate				Dry
TON				Dry
Total Cyanide				Dry
Alkalinity				Dry
Total Solids				Dry
VOCs				Dry
sVOCs				Dry
Pesticides				Dry
Total Coliforms				Dry
Faecal Coliforms				Dry

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>MW-8D</b>	<b>MW-8D</b>	<b>MW-8D</b>	<b>MW-8D</b>
pH	Dry	Dry	Dry	Dry
Electrical Conductivity	Dry	Dry	Dry	Dry
Chloride	Dry	Dry	Dry	Dry
Ammonia	Dry	Dry	Dry	Dry
Potassium	Dry	Dry	Dry	Dry
Dissolved Oxygen	Dry	Dry	Dry	Dry
Total Chromium	Dry	Dry	Dry	Dry
TOC	Dry	Dry	Dry	Dry
Boron				Dry
Cadmium				Dry
Calcium				Dry
Copper				Dry
Iron				Dry
Lead				Dry
Magnesium				Dry
Manganese				Dry
Mercury				Dry
Nickel				Dry
Sodium				Dry
Zinc				Dry
Fluoride				Dry
Sulphate				Dry
Ortho Phosphate				Dry
TON				Dry
Total Cyanide				Dry
Alkalinity				Dry
Total Solids				Dry
VOCs				Dry
sVOCs				Dry
Pesticides				Dry
Total Coliforms				Dry
Faecal Coliforms				Dry

**Surface Water Data 2012**

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-1	SW-1	SW-1	SW-1
pH	6.74	7.65	7.68	7.72
Electrical Conductivity	241	165.2	233	259
Chloride	18.6	<50	17.24	27
Ammoniacal Nitrogen	0.06	<1	0.25	<0.03
Total Suspended Solids	<10	<2	3	<10
Dissolved Oxygen	12	8	10.4	10
BOD	<1	<2	<2	<1
COD	13	<8	18	<7
Boron				<12
Cadmium				<0.5
Calcium				20.2
Copper				<7
Iron				<20
Lead				<5
Magnesium				6.2
Manganese				<2
Mercury				<1
Nickel				<2
Potassium				1.9
Sodium				14.3
Zinc				<3
Total Chromium				<1.5
Sulphate				11.48
Ortho Phosphate				<0.06
Total Oxidised Nitrogen				4.5
Total Alkalinity				62

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-2	SW-2	SW-2	SW-2
pH	7.28	7.54	7.58	6.79
Electrical Conductivity	261	270	239	246
Chloride	29.1	<50	29.27	27.3
Ammonia	0.06	<1	0.19	0.13
Potassium	<10	3	3	<10
Dissolved Oxygen	12	9	10.1	10
Total Chromium	<1	<2	<2	<1
TOC	14	<8	13	<7
Boron				<12
Cadmium				<0.5
Calcium				20.4
Copper				<7
Iron				<20
Lead				<5
Magnesium				6.2
Manganese				<2
Mercury				<1
Nickel				<2
Potassium				1.9
Sodium				14.4
Zinc				<3
Total Chromium				<1.5
Sulphate				11.74
Ortho Phosphate				<0.06
Total Oxidised Nitrogen				4.1
Total Alkalinity				54

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-3	SW-3	SW-3	SW-3
pH	7.41	7.41	7.61	6.74
Electrical Conductivity	199	193.9	196	200
Chloride	18.1	<50	19.98	17.7
Ammonia	0.11	<1	0.34	0.19
Potassium	<10	2	2	<10
Dissolved Oxygen	12	11	10.1	10
Total Chromium	<1	<2	<2	3
TOC	12	10	13	14
Boron				<12
Cadmium				<0.5
Calcium				14.4
Copper				<7
Iron				48
Lead				<5
Magnesium				6.7
Manganese				<2
Mercury				<1
Nickel				<2
Potassium				2.5
Sodium				9.6
Zinc				<3
Total Chromium				<1.5
Sulphate				10.33
Ortho Phosphate				0.08
Total Oxidised Nitrogen				4.3
Total Alkalinity				50

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>SW-4</b>	<b>SW-4</b>	<b>SW-4</b>	<b>SW-4</b>
pH	7.41	7.41	7.7	6.64
Electrical Conductivity	174	182	159	168
Chloride	18.2	<50	16.53	17.3
Ammonia	0.18	<1	0.28	0.03
Potassium	<10	<2	4	<10
Dissolved Oxygen	12	12	10.2	10
Total Chromium	<1	<2	<2	<1
TOC	17	<8	23	10
Boron				<12
Cadmium				<0.5
Calcium				12.9
Copper				<7
Iron				73
Lead				<5
Magnesium				4.6
Manganese				7
Mercury				<1
Nickel				<2
Potassium				1.1
Sodium				9.6
Zinc				<3
Total Chromium				<1.5
Sulphate				10.25
Ortho Phosphate				<0.06
Total Oxidised Nitrogen				2.5
Total Alkalinity				36



Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-5	SW-5	SW-5	SW-5
pH	7.68	7.56	7.65	6.78
Electrical Conductivity	273	279	237	250
Chloride	25.6	<50	29.07	27
Ammonia	0.09	<1	0.28	0.05
Potassium	11	8	<2	<10
Dissolved Oxygen	12	12	10	10
Total Chromium	<1	<2	<2	<1
TOC	14	12	14	9
Boron				<12
Cadmium				<0.5
Calcium				20.6
Copper				<7
Iron	70			<20
Lead				<5
Magnesium				6.2
Manganese	2			<2
Mercury				<1
Nickel				<2
Potassium				1.8
Sodium				14.5
Zinc				<3
Total Chromium				<1.5
Sulphate				11.32
Ortho Phosphate				<0.06
Total Oxidised Nitrogen				4
Total Alkalinity				52

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-6	SW-6	SW-6	SW-6
pH	7.76	7.73	7.83	6.81
Electrical Conductivity	250	256	227	236
Chloride	22.1	<50	24.49	22.7
Ammonia	0.1	<1	0.13	0.14
Potassium	<10	2	3	<10
Dissolved Oxygen	12	13	10.1	10
Total Chromium	2	<2	<2	1
TOC	19	12	13	9
Boron				<12
Cadmium				<0.5
Calcium				18.8
Copper				<7
Iron				<20
Lead				<5
Magnesium				6.4
Manganese				<2
Mercury				<1
Nickel				<2
Potassium				2.2
Sodium				12.3
Zinc				<3
Total Chromium				<1.5
Sulphate				10.68
Ortho Phosphate				<0.06
Total Oxidised Nitrogen				3.7
Total Alkalinity				52

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-7	SW-7	SW-7	SW-7
pH	7.97	7.78	7.93	7.18
Electrical Conductivity	280	367	320	309
Chloride	23.3	<50	26.28	27.5
Ammonia	0.15	<1	0.1	0.11
Potassium	11	<2	<2	<10
Dissolved Oxygen	12	12	10	10
Total Chromium	<1	<4	<2	1
TOC	20	8	15	<7
Boron				<12
Cadmium				<0.5
Calcium				35.5
Copper				<7
Iron				<20
Lead				<5
Magnesium				7.4
Manganese				<2
Mercury				<1
Nickel				<2
Potassium				2.2
Sodium				15.4
Zinc				<3
Total Chromium				<1.5
Sulphate				13.33
Ortho Phosphate				<0.06
Total Oxidised Nitrogen				4.8
Total Alkalinity				94

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-8	SW-8	SW-8	SW-8
pH	7.85	7.56	7.68	6.76
Electrical Conductivity	254	274	245	247
Chloride	29.1	<50	30.27	26.7
Ammonia	0.06	<1	0.08	0.03
Potassium	<10	5	<2	<10
Dissolved Oxygen	12	11	10.1	10
Total Chromium	<1	<4	<2	1
TOC	15	<8	14	<7
Boron				<12
Cadmium				<0.5
Calcium				20.4
Copper				<7
Iron				<20
Lead				<5
Magnesium				6.2
Manganese				<2
Mercury				<1
Nickel				<2
Potassium				1.8
Sodium				14.5
Zinc				<3
Total Chromium				<1.5
Sulphate				11.23
Ortho Phosphate				0.07
Total Oxidised Nitrogen				3.9
Total Alkalinity				54

Parameter	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
	SW-9	SW-9	SW-9	SW-9
pH	8.12	7.53	7.43	8.02
Electrical Conductivity	429	601	293	890
Chloride	16.6	<50	14.06	67.4
Ammonia	0.77	<1	0.2	21.17
Potassium	19	13	2	<10
Dissolved Oxygen	11	12	8.1	9
Total Chromium	2	<4	2	40
TOC	16	29	34	89
Boron				197
Cadmium				<0.5
Calcium				76.9
Copper				<7
Iron	<20			54
Lead				<5
Magnesium				13.1
Manganese	4			3
Mercury				<1
Nickel				11
Potassium				17.1
Sodium				50.9
Zinc				8
Total Chromium				3.9
Sulphate				74.76
Ortho Phosphate				0.09
Total Oxidised Nitrogen				1.3
Total Alkalinity				306

<b>Parameter</b>	<b>Q-1 2012</b>	<b>Q-2 2012</b>	<b>Q-3 2012</b>	<b>Q-4 2012</b>
	<b>SW-10</b>	<b>SW-10</b>	<b>SW-10</b>	<b>SW-10</b>
pH	8.04	7.54	7.65	6.75
Electrical Conductivity	265	282	246	175
Chloride	15.1	<50	29.88	26.9
Ammonia	0.1	<1	0.08	0.04
Potassium	41	6	<2	<10
Dissolved Oxygen	11	13	9.9	10
Total Chromium	2	<4	<2	<1
TOC	17	11	12	<7
Boron				<12
Cadmium				<0.5
Calcium				20
Copper				<7
Iron	22			<20
Lead				<5
Magnesium				6.1
Manganese	<2			<2
Mercury				<1
Nickel				<2
Potassium				1.9
Sodium				14.1
Zinc				<3
Total Chromium				<1.5
Sulphate				11.99
Ortho Phosphate				<0.06
Total Oxidised Nitrogen				4.2
Total Alkalinity				56

**Leachate Data 2012**

Parameter	Units	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
		LP-1	LP-1	LP-1	LP-1
pH	pH Units	8.7	8.01	8.73	8.3
Electrical Conductivity	µS/cm	25405	24,154	22063	23833
Chloride	mg/l	2030.2	1,810.00	1635.5	2670.8
Ammoniacal Nitrogen	mg/l	2982.3	2,580.92	2750.95	2893.6
BOD	mg/l	1124	1032	1031	1069
COD	mg/l	6660	5790	4900	5685
Boron	ug/l		3972		
Cadmium	ug/l		<0.5		
Calcium	mg/l		11.1		
Copper	ug/l		172		
Iron	ug/l		521		
Lead	ug/l		6		
Magnesium	mg/l		20.3		
Manganese	ug/l		259		
Mercury	ug/l		<1		
Nickel	ug/l		95		
Potassium	mg/l		877.3		
Sodium	mg/l		1720		
Zinc	ug/l		44		
Total Chromium	ug/l		250.7		
Fluoride	mg/l		<3.0		
Sulphate	mg/l		87.32		
Orthophosphate	mg/l		38.52		
Total Oxidised Nitrogen	mg/l		<0.2		
Total Cyanide	mg/l		0.07		



Parameter	Units	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
		LP-2/5	LP-2/5	LP-2/5	LP-2/5
pH	pH Units	8.66	8.09	8.86	8.18
Electrical Conductivity	µS/cm	24092	25,571	29153	27570
Chloride	mg/l	1895.2	2,254.10	2525.2	2460.3
Ammoniacal Nitrogen	mg/l	2904.19	2,638.55	2730.26	2441.27
BOD	mg/l	1126	442	848	353
COD	mg/l	7240	5070	6370	4290
Boron	ug/l		12240		
Cadmium	ug/l		<0.5		
Calcium	mg/l		<0.2		
Copper	ug/l		427		
Iron	ug/l		1808		
Lead	ug/l		11		
Magnesium	mg/l		0.2		
Manganese	ug/l		546		
Mercury	ug/l		<1		
Nickel	ug/l		148		
Potassium	mg/l		1.4		
Sodium	mg/l		2090		
Zinc	ug/l		136		
Total Chromium	ug/l		359.3		
Fluoride	mg/l		<3.0		
Sulphate	mg/l		18.96		
Orthophosphate	mg/l		37.78		
Total Oxidised Nitrogen	mg/l		<0.2		
Total Cyanide	mg/l		0.06		

Parameter	Units	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
		LP-3	LP-3	LP-3	LP-3
pH	pH Units	8.64	8.17	8.87	8.37
Electrical Conductivity	µS/cm	24331	30,082	27253	30006
Chloride	mg/l	2311.5	2,699.10	2327	2663.5
Ammoniacal Nitrogen	mg/l	2585.83	3,076.66	2657.98	2981.36
BOD	mg/l	328	1033	457	296
COD	mg/l	5960	1435	5940	5295
Boron	ug/l		23080		
Cadmium	ug/l		<0.5		
Calcium	mg/l		<0.2		
Copper	ug/l		217		
Iron	ug/l		578		
Lead	ug/l		16		
Magnesium	mg/l		<0.1		
Manganese	ug/l		270		
Mercury	ug/l		<1		
Nickel	ug/l		154		
Potassium	mg/l		0.3		
Sodium	mg/l		0.2		
Zinc	ug/l		146		
Total Chromium	ug/l		280.7		
Fluoride	mg/l		<3.0		
Sulphate	mg/l		42.35		
Orthophosphate	mg/l		68.71		
Total Oxidised Nitrogen	mg/l		<0.2		
Total Cyanide	mg/l		0.07		

Parameter	Units	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
		LP-6	LP-6	LP-6	LP-6
pH	pH Units	8.69	8.02	8.83	8.36
Electrical Conductivity	µS/cm	29615	22,964	27663	31501
Chloride	mg/l	2593.8	1,877.50	2276.6	2719.5
Ammoniacal Nitrogen	mg/l	3191.8	2,272.95	2600.13	3026.89
BOD	mg/l	1126	1050	1027	1081
COD	mg/l	10270	7075	9660	9375
Boron	ug/l		11670		
Cadmium	ug/l		<1.0		
Calcium	mg/l		<0.2		
Copper	ug/l		166		
Iron	ug/l		1424		
Lead	ug/l		19		
Magnesium	mg/l		<0.1		
Manganese	ug/l		-		
Mercury	ug/l		<2		
Nickel	ug/l		222		
Potassium	mg/l		0.4		
Sodium	mg/l		1901		
Zinc	ug/l		187		
Total Chromium	ug/l		733.4		
Fluoride	mg/l		<3.0		
Sulphate	mg/l		525.27		
Orthophosphate	mg/l		49.66		
Total Oxidised Nitrogen	mg/l		<0.2		
Total Cyanide	mg/l		0.06		

Parameter	Units	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
		LP-7	LP-7	LP-7	LP-7
pH	pH Units	8.47	7.89	8.82	8.08
Electrical Conductivity	µS/cm	21592	22,558	29106	30290
Chloride	mg/l	2070.7	2,142.70	2746.4	2096.6
Ammoniacal Nitrogen	mg/l	2057.09	1,982.61	3096.31	2058.61
BOD	mg/l	358	324	875	331
COD	mg/l	4260	3900	6950	3380
Boron	ug/l		2551		
Cadmium	ug/l		<0.5		
Calcium	mg/l		125.4		
Copper	ug/l		233		
Iron	ug/l		523		
Lead	ug/l		10		
Magnesium	mg/l		141.9		
Manganese	ug/l		454		
Mercury	ug/l		<1		
Nickel	ug/l		120		
Potassium	mg/l		1151		
Sodium	mg/l		2191		
Zinc	ug/l		182		
Total Chromium	ug/l		208.6		
Fluoride	mg/l		<3.0		
Sulphate	mg/l		33.86		
Orthophosphate	mg/l		49.58		
Total Oxidised Nitrogen	mg/l		<0.2		
Total Cyanide	mg/l		0.03		

Parameter	Units	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
		LP-9	LP-9	LP-9	LP-9
pH	pH Units		7.56	7.59	8.21
Electrical Conductivity	µS/cm		6,431	28040	26610
Chloride	mg/l		419	2782	2674.4
Ammoniacal Nitrogen	mg/l		245.93	1750.36	2104.17
BOD	mg/l		1060	1038	907
COD	mg/l		7880	43550	4775
Boron	ug/l		1169		
Cadmium	ug/l		2.5		
Calcium	mg/l		876.2		
Copper	ug/l		<7		
Iron	ug/l		53980		
Lead	ug/l		8		
Magnesium	mg/l		136		
Manganese	ug/l		16930		
Mercury	ug/l		<1		
Nickel	ug/l		202		
Potassium	mg/l		300		
Sodium	mg/l		412.8		
Zinc	ug/l		24		
Total Chromium	ug/l		58.8		
Fluoride	mg/l		<3.0		
Sulphate	mg/l		463		
Orthophosphate	mg/l		0.93		
Total Oxidised Nitrogen	mg/l		<0.2		
Total Cyanide	mg/l		0.04		

Parameter	Units	Q-1 2012	Q-2 2012	Q-3 2012	Q-4 2012
		Lagoon	Lagoon	Lagoon	Lagoon
pH	pH Units	8.57	8.1	8.89	Lagoon
Electrical Conductivity	µS/cm	23936	26,405	24594	8.3
Chloride	mg/l	2204.5	2,301.40	2170.1	23242
Ammoniacal Nitrogen	mg/l	2461.48	2,540.94	2627.7	2089.1
BOD	mg/l	950	1055	1045	2057.57
COD	mg/l	5960	6375	8330	926
Boron	ug/l		12930		4390
Cadmium	ug/l		<1.0		
Calcium	mg/l		<0.2		
Copper	ug/l		60		
Iron	ug/l		2783		
Lead	ug/l		20		
Magnesium	mg/l		<0.1		
Manganese	ug/l		749		
Mercury	ug/l		<2		
Nickel	ug/l		242		
Potassium	mg/l		<0.1		
Sodium	mg/l		<0.1		
Zinc	ug/l		743		
Total Chromium	ug/l		702.3		
Fluoride	mg/l		<3.0		
Sulphate	mg/l		19.14		
Orthophosphate	mg/l		54.8		
Total Oxidised Nitrogen	mg/l		<0.2		
Total Cyanide	mg/l		0.06		

**Landfill Gas Data 2012**

**Landfill Gas Results 2012 Ballynagran W0165-02**

Sample Station Number	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)	CH <sub>4</sub> (% v/v)
MG000001	0	0.1	0.1	0.1	0.2	0	0	0.4	0.4	0.3	0.3	0.3
MG000002	0	0	0	0	0.3	0.1	0.3	0.2	0.3	0.2	0.4	0.1
MG000003	0	0.1	0	0	0.2	0.1	0.2	0.3	0.2	0.2	0.2	0.2
MG000004	0	0	0.1	0.1	0.2	0	0	0.3	0.2	0.2	0.2	0.3
MG000005	0	0.1	0.1	0.1	0.2	0.1	0.2	0.4	0.4	0.3	0.3	0.3
MG000006	0	0	0.1	0.1	0.3	0	0.2	0.5	0.6	0.4	0.6	0.8
MG000007	0	0.1	0.1	0.1	0.2	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000008	Flooded	0.1	0	0	0.2	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000009	0	0.1	0	0	0.1	0.1	0.2	0.1	0.3	0.2	0.3	0.6
MG000010	0	0	0	0	0.2	0	0	0.2	0.2	0.2	0.2	0.3
MG000011	0	0	0.1	0.1	0.2	0	0	0.2	0.2	0.3	0.3	0.3
MG000012	0	0	0.1	0.1	0.2	0	0.2	0.2	0.5	0.4	0.4	0.5
MG000013	0	0	0.1	0.1	0.3	0	0.2	0.4	0.3	0.2	0.5	0.5
MG000014	0	0.1	0.1	0.1	0.2	0	0	0.1	0.3	0.2	0.6	0.7
MG000015	0	0	0.1	0.1	0.2	0.1	0.3	0.3	0.3	0.2	0.2	0.3
MG000016	0.1	11.2	17.8	15.4	19.4	0.1	7.6	26.3	16.3	12.3	16.3	19.3
MG000017	5.9	6.5	9.7	8.6	8.3	0.1	3.2	32.1	22.1	20.1	22.1	23.1
MG000018	0	0.4	0.1	0.1	0.2	0	0.2	3	0.7	0.9	0.6	0.7
MG000019	0	0.1	0.1	0.1	0.3	0	0.1	0.2	0.2	0.4	0.6	0.6
MG000020	Flooded	0.1	0.6	0.5	0.4	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000046					0.2	0		0.1	0.2	0.4	0.3	0.4
MG000047	0	0.1	0.1	0.1	0.2	0	0	0.3	0.3	0.2	0.3	0.3
MG000048	0	0	0.1	0.1	0.3	0	0	0.2	0.4	0.4	0.3	0.3
MG000049	0	0.1	0.1	0.1	0.2	0.1	0	0.1	0.1	0.2	0.2	0.4

# - Problem with gas meter therefore it was not possible to take



**Landfill Gas Results 2012 Ballynagran W0165-02**

Sample Station Number	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>	CO <sub>2</sub>
	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)
MG000001	0.4	0.5	0.4	0.4	0.4	0.1	0.3	0.5	0.7	0.7	0.7	0.7
MG000002	0.1	1.3	0.1	0.2	1.3	2.7	1.4	1.4	1.4	1.1	1.2	1.3
MG000003	0.3	0.5	0.4	0.3	0.3	0.1	0.3	0.4	0.8	0.7	0.7	0.6
MG000004	0.3	0.5	0.5	0.4	0.4	0.3	0.2	0.7	0.6	0.8	1.1	1
MG000005	1.3	2.2	2.3	2.1	2.1	3	1.4	0.3	0.2	0.3	0.3	0.4
MG000006	0.5	0.8	0.4	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.6	0.7
MG000007	1.1	0.1	0.4	0.4	0.6	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000008	Flooded	0.1	4.3	2.1	2.3	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000009	0.8	0.2	0.1	0.1	0.1	4	3.5	1.9	1.5	1.2	1.1	1.2
MG000010	5.6	0.1	0.1	0.2	0.2	4.9	4.4	3.2	2.1	1.3	1.4	1.3
MG000011	1.3	1.2	0.6	0.5	2.4	3.9	3.2	1.9	1.6	1.1	1.2	1.2
MG000012	0.5	0.4	0.3	0.4	0.4	0.8	0.9	0.6	0.5	0.5	0.5	0.6
MG000013	0.2	0.2	0.2	0.3	0.3	0	0.2	0.3	0.6	0.5	0.7	0.8
MG000014	0.6	0.3	0.3	0.4	0.4	1	1.1	1.1	1.3	1	1	1.1
MG000015	0.1	0.5	0.4	0.5	0.5	0.1	0.2	0.4	0.8	0.9	1.1	0.8
MG000016	1.3	3.1	3.1	2.9	3.8	0	4.5	6.7	12.7	13.8	16.7	18.7
MG000017	15.6	8.9	9.3	10.3	12.3	0	4.5	13.4	15.4	17.9	18.1	19.1
MG000018	4.6	2.3	1.3	1.2	1.2	0.9	0.7	0.5	0.6	0.8	0.8	0.7
MG000019	0.4	0.4	0.4	0.3	0.3	0	0.1	0.3	0.4	0.5	0.6	0.9
MG000020	Flooded	0.1	0.1	0.1	0.2	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000046					0.4	2.1		1.9	1.1	0.9	0.8	0.9
MG000047	1.4	0.4	0.4	0.5	0.5	1.4	1.1	1.4	1.1	0.8	0.8	0.8
MG000048	0.1	0.1	0.1	0.2	0.2	0.9	1.2	3.1	0.9	0.6	0.8	0.7
MG000049	0.1	0.1	0.1	0.1	0.2	0	0.7	0.4	0.5	0.6	0.5	0.5

# - Problem with gas meter therefore it was not possible to take

**Landfill Gas Results 2012 Ballynagran W0165-02**

Sample Station Number	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)	O <sub>2</sub> (% v/v)
MG000001	20.9	21.5	20.9	20.5	20.6	21.5	21.1	20.9	20.5	20.5	20.5	20.7
MG000002	20.8	18.5	21.1	20.9	20.1	16.5	18.5	19.8	19.6	19.9	20.6	20.6
MG000003	21.2	21.5	20.9	20.8	20.3	21.1	20.4	20.1	20.1	20.2	20.3	20.4
MG000004	21	21.3	20.7	20.6	20.4	21	20.8	20.6	20.2	20.2	20.3	20.3
MG000005	20.6	20.3	19.8	20.1	19.9	16.1	19.4	20.2	20.4	20.4	20.5	20.6
MG000006	18.5	15.5	18.5	18.7	20.3	15.2	18.2	20.4	20.6	20.6	20.4	20.5
MG000007	20.1	21.2	20.9	20.6	20.3	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000008	Flooded	21.2	17.1	18.3	19.5	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000009	20.7	21.6	21.1	20.9	20.9	17.5	16.9	17.8	18.8	19.8	20.8	20.9
MG000010	15.9	21.5	21.2	21.1	20.7	15.9	17.1	18.2	19.2	19.2	19.9	20.5
MG000011	20.3	20.5	20.6	20.5	20.4	17.5	17.8	18.3	19.3	19.4	19.8	20.3
MG000012	20.3	20.7	20.7	20.6	20.6	19.8	19.5	20.1	20.4	20.5	20.5	20.6
MG000013	21.1	21.4	21.1	21	20.5	21.5	20.9	20.7	20.6	20.7	20.6	20.6
MG000014	18.1	20.8	21	20.9	20.5	17.2	17.6	18.3	18.5	20.5	20.6	20.7
MG000015	21	21.3	21	21	20.5	21.2	21	16.9	17.4	20.4	20.5	20.4
MG000016	19.7	15	13.7	14.5	12.9	20.1	15.9	17.9	18.9	17.9	16.9	18.3
MG000017	7.9	15.1	9.3	10.1	12.8	21.1	17.8	16.5	16.2	17.2	17.6	18
MG000018	12	15.4	18.5	18.9	19.5	20.1	20.3	20.8	20.6	20.2	20.3	20.4
MG000019	21.1	21.4	21	20.9	20.2	21	20.9	20.3	20.5	20.5	20.6	20.4
MG000020	Flooded	21.5	21.3	20.8	19.9	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000046					20.1	18.1		19.8	19.9	20	20.4	20.2
MG000047	20.4	21.9	20.7	20.6	20.4	20.5	19.7	20.1	20.2	20.1	20.2	20.2
MG000048	21.1	21.7	20.9	20.8	20.7	20.2	20.7	20.6	20.5	20.5	20.5	20.6
MG000049	21	21.7	21.1	21	20.9	21.1	20.3	20.6	20.4	20.2	20.3	20.3

# - Problem with gas meter therefore it was not possible to take

**Landfill Gas Results 2012 Ballynagran W0165-02**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sample Station Number	Baromet	Baromet	Baromet	Baromet	Baromet	Baromet	Baromet	Baromet	Baromet	Baromet	Baromet	Baromet
	ric	ric	ric	ric	ric	ric	ric	ric	ric	ric	ric	ric
	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure	Pressure
MG000001	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000002	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000003	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000004	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000005	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000006	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000007	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000008	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000009	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000010	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000011	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000012	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000013	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000014	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000015	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000016	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000017	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000018	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000019	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000020	Flooded	1028	1002	1002	1004	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded	Flooded
MG000046					1004	994		999	1001	1006	1013	990
MG000047	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000048	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990
MG000049	1020	1028	1002	1002	1004	994	994	999	1001	1006	1013	990

measurement

**Noise Data 2012**

### Noise Results 2012 Ballynagran W0165-02 Q1

Location	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)				Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	Specific level*	
NL1	1034-1049	49	53	43	<43	No facility emissions audible. Distant traffic to S faintly audible. Rustling vegetation and wind noise more significant here due to exposure. Bird song/calls and aircraft.
NL2	0949-1004	44	46	39	39	Tracked excavator operating in active cell continuously audible at low level, not significant. No other onsite emissions audible. Distant road traffic continuously slightly audible to S. Sporadic road traffic audible outside site boundary. Bird song/calls and aircraft.
NL3	1012-1027	56	59	48	56	Tracked excavator and wheeled compactor in active cell area continuously clearly audible. Emissions from sporadic trucks accessing cell also audible. Ejector trailer donkey engines significant 1012-1020. Bird song/calls and aircraft. Offsite traffic noise not audible.
NL4	0910-0925	43	44	40	<40	No facility emissions audible. Distant traffic to S slightly audible continuously. Dog barking several hundred metres SW frequently audible. Bird song/calls and aircraft.
NSL1	0849-0904	44	45	36	<36	No facility emissions audible. Distant road traffic to S continuously audible at low level. Sporadic local traffic dominant when present. Bird song/calls and aircraft. Lightly rustling vegetation and nearby watercourse audible slightly audible.
NSL2	0829-0844	60	65	46	<46	No facility emissions audible apart from sporadic truck movements on facility access road. N11 traffic to E and SE continuously audible and significant. Intermittent local road traffic dominant when present. Bird song/calls and aircraft.

\* Specific level: Sound pressure level contribution considered attributable to facility, determined from field notes, time history profiles, statistical analysis, frequency spectra and other parameters.

**Noise Results 2012 Ballynagran W0165-02 Q2**

Location	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)				Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	Specific level*	
NL1	1314-1329	45	46	38	<<38	No Greenstar emissions audible apart from slightly audible reversing alarms on occasion. Distant road traffic continuously significant in background from several directions. Bird song/calls.
NL2	1227-1242	52	54	42	52	Emissions audible from occasional trucks and dump trucks passing on haul road. No other site emissions audible. Sporadic road traffic audible outside boundary. Distant road traffic to SE continuously audible. Bird song/calls and aircraft.
NL3	1251-1306	47	49	45	47	Site emissions from plant in and above active cell, from gas flare plant, and from mobile plant near latter, continuously audible and dominant. N11 traffic continuously audible in background. Bird song/calls and aircraft.
NL4	1157-1212	51	53	37	<<37	No Greenstar emissions audible apart from occasionally audible faint reversing alarms. Local bird calls and bird song significant. Distant traffic audible to E and S. Aircraft.
NSL1	1134-1149	45	47	40	<40	6x6 dump truck emissions sporadically audible at low level when passing on nearest onsite haul road. No other site emissions audible. Sporadic local traffic dominant, distant local road traffic significant, and distant N11 traffic audible. Bird song/calls and aircraft.
NSL2	1115-1130	61	56	44	45	No emissions audible from Greenstar facility apart from occasional trucks on access road and through weighbridge. However, from 1124, continuous emissions clearly audible from bowser near weighbridge, codominant with N11. N11 traffic continuously audible and significant along long corridor. Intermittent local traffic dominant when present. Bird song/calls and aircraft. Agricultural or quarry plant slightly audible to S occasionally.
NSL3	1055-1110	63	66	53	<<53	No facility emissions audible. N11 traffic along corridor continuously audible to N, S and E. No other noise audible apart from intermittent traffic on side road, and local birdsong.

**Noise Results 2012 Ballynagran W0165-02 Q3**

Location	Time	Measured Noise Levels (dB re. 2x10 <sup>-5</sup> Pa)				Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	Specific level*	
NL1	1449-1504	45	48	41	<41	No emissions audible from site apart from faint reversing alarms on occasion, and sporadic donkey engines. Offsite, tractor continuously audible in field and yard nearby. Bird song/calls and aircraft. Rustling vegetation.
NL2	1350-1405	49	50	35	49	Operations in active cell area not audible. Intermittent truck movements on adjacent haul road dominant when present. Extraneous noise audible from public road traffic outside boundary, bird song/calls, aircraft and rustling vegetation.
NL3	1420-1435	48	51	43	43	Emissions from trucks and plant in cell audible at low level, screened by intervening mound. Gas flare plant faintly audible. Bird song/calls and aircraft.
NL4	1238-1253	42	46	33	<33	Truck movements on W haul road at Greenstar facility occasionally faintly audible. No other noise audible apart from rustling vegetation, aircraft and bird song/calls.
NSL1	1215-1230	51	46	34	<34	Site emissions audible at low level occasionally from truck and dump truck movements on nearest haul road, not significant. Sporadic local road traffic dominant when present. Bird song/calls and aircraft. Rustling vegetation.
NSL2	1155-1210	64	63	44	<44	Site emissions audible occasionally at low level, from truck movements on access road and haul road. Offsite, passing road traffic intermittently dominant. Bird song/calls and aircraft. Rustling vegetation.
NSL3	1520-1535	61	63	54	<<54	No Greenstar emissions audible. N11 traffic continuously audible and dominant. Side road traffic and bird song also audible.

**Noise Results 2012 Ballynagran W0165-02 Q4**

Location	Time	Pa)				Comments
		L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A90</sub>	Specific level*	
NL1	1600-1615	48	48	44	<44	Onsite excavator bucket occasionally slightly audible. No other site emissions audible. Distant road traffic continuously dominant. Aircraft. Cattle occasionally lowing at nearby yard.
NL2	1515-1530	48	50	46	43	Onsite excavator on mound continuously audible at low level. No other site emissions audible. N11 traffic to E and SE continuously audible and significant. Sporadic traffic outside site boundary clearly audible when present. Bird song/calls and aircraft.
NL3	1538-1553	51	49	46	43	Onsite excavator on mound continuously slightly audible. Gas engine also slightly audible. Distant road traffic to S and SE significant. Bird song decreasing. Aircraft.
NL4	1446-1501	41	42	39	<39	Excavator at site continuously slightly audible. Distant traffic, dog barking, bird song/calls and aircraft.
NSL1	1424-1439	51	47	41	38	Facility excavator continuously audible at low level. No other site emissions audible. Sporadic local traffic dominant when present. Distant road traffic to SE also continuously audible in background. Bird song/calls and aircraft. Occasional dog barking at nearby dwelling.
NSL2	1403-1418	63	57	46	<46	Occasional emissions from excavator near maintenance garage audible at low level, not significant. Sporadic local road traffic dominant when passing. N11 traffic to SE and S continuously significant in background. Bird song/calls and aircraft.
NSL3	1343-1358	65	67	58	<<58	No site emissions audible. N11 traffic continuously intrusive. No other noise audible other than local road traffic and local birdsong.



**Dust Data 2012**

**Dust Results 2012 Ballynagran W0165-02**

	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>AD6</b>	9.5	34.45	41.49	159	169	*	18.2	50.91	34.37	59.64	124.3	18.22
<b>AD7</b>	13.2	29.86	18.15	183	345	22	24.2	21.43	64.86	108.9	61.1	36.98
<b>AD8</b>	11.5	35.03	33.19	131	143	13	9.8	58.95	130.83	50.31	57.3	43.94
<b>AD9</b>	57.4	41.34	60.16	104	267	17.6	23.4	26.26	76.51	53.94	60	66.99
<b>AD10</b>	27.6	32.73	19.71	320	52	36	41.3	*	87.59	57.57	16.1	19.29
<b>AD11</b>	36.7	37.9	29.56	596	305	*	35.7	35.91	44.35	59.12	20.4	80.92
<b>AD12</b>	14.4	26.41	1,778.34	211	109	54	68.2	127	242.82	64.83	13.4	105.57

\*Sample Contaminated - Analysis Not Completed

NS - denoted not sampled


**PM10 Data 2012**

**PM10 Results 2012 Ballynagran W0165-02**

<b>Location</b>	<b>January PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>	<b>June PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>	<b>September PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>	<b>November PM<sub>10</sub> Concentration (µg/m<sup>3</sup>)</b>
Location PM1	12	13	15	8
Location PM2	15	8	16	10
Location PM3	13	9	21	8
Location PM4	9	12	14	11
<b>Limit Value</b>	<b>50</b>	<b>50</b>	<b>50</b>	<b>50</b>


# **APPENDIX 3**

Complaints and Incidents 2012


Document Type	FORM	
Title	Complaints register	
Document No.	F06b(i)	

### Complaints Register

<b>266</b>	<b>09.01.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>267</b>	<b>13.01.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>268</b>	<b>16.01.12</b>	<b>Mr. Pat King</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>269</b>	<b>23.01.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>270</b>	<b>04.02.12 &amp; 06.02.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>271</b>	<b>01.02.12 - 08.02.12</b>	<b>Mr. Mark Doyle</b>	<b>1</b>	<b>Odour</b>	<b>I</b>
<b>272</b>	<b>13.02.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>273</b>	<b>13.02.12 &amp; 14.02.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>274</b>	<b>24.02.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>275</b>	<b>01.03.12</b>	<b>Mr. Pat King</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>276</b>	<b>05.03.12 &amp; 06.03.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>277</b>	<b>18.03.12, 21.03.12 &amp; 22.03.12</b>	<b>Mr. Michael Mulvihill</b>	<b>3</b>	<b>Odour</b>	<b>F</b>
<b>278</b>	<b>18.03.12 &amp; 26.03.12</b>	<b>Mrs. Liz Hayden</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>279</b>	<b>28.03.12, 29.03.12 &amp; 02.04.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>280</b>	<b>30.03.12 &amp; 31.03.12</b>	<b>Mrs. Liz Hayden</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>281</b>	<b>30.03.12 &amp; 31.03.12</b>	<b>Mrs. Joanne Verdes</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>282</b>	<b>12.04.12 &amp; 14.04.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>283</b>	<b>18.04.12</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	<b>F</b>


Document Type	FORM	
Title	Complaints register	
Document No.	F06b(i)	

<b>284</b>	<b>25.04.12 &amp; 26.04.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>285</b>	<b>02.05.12 &amp; 03.05.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>286</b>	<b>15.05.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>287</b>	<b>15.05.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>288</b>	<b>17.05.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>289</b>	<b>17.05.12, 19.05.12 &amp; 24.05.12</b>	<b>Mr. Michael Mulvihill</b>	<b>3</b>	<b>Odour</b>	<b>F</b>
<b>290</b>	<b>25.05.12</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>291</b>	<b>26.05.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>292</b>	<b>05.06.12 &amp; 07.06.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>293</b>	<b>11.06.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>294</b>	<b>11.06.12 &amp; 12.06.12 x 2 (am &amp; pm)</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>295</b>	<b>17.06.12</b>	<b>Mr. Michael Mulvihill</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>296</b>	<b>27.06.12</b>	<b>Mrs. Fidelma King</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>297</b>	<b>06.07.12, 08.07.12 &amp; 09.07.12</b>	<b>Mr. Michael Mulvihill</b>	<b>3</b>	<b>Odour</b>	<b>F</b>
<b>298</b>	<b>04.07.12</b>	<b>Mrs. Fidelma King</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>299</b>	<b>06.07.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>300</b>	<b>13.07.12 x 2 (0809hrs and 1543hrs), 15.07.12 (1418hrs, 16.07.12 (1118hrs &amp; 1620hrs) x 2, 17.07.12</b>	<b>Mrs. Liz Hayden</b>	<b>6</b>	<b>Odour</b>	<b>F</b>

Document Type	FORM	
Title	Complaints register	
Document No.	F06b(i)	

	(0941hrs)				
<b>301</b>	13.07.12 x 2 & 18.07.12	<b>Mr. Michael. Mulvihill</b>	<b>3</b>	<b>Odour</b>	<b>F</b>
<b>302</b>	20.07.12	<b>Mrs. Joanne Verdes</b>	<b>1</b>	<b>Odour</b>	<b>I</b>
<b>303</b>	20.07.12 & 25.07.12 & 26.07.12	<b>Mr. Michael. Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>304</b>	20.07.12 & 25.07.12 x 4 & 26.07.12	<b>Mrs. Liz Hayden</b>	<b>6</b>	<b>Odour</b>	<b>F</b>
<b>305</b>	25.07.12 & 26.07.12	<b>Mrs. Delphine Geoghegan</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>306</b>	20.07.12 & 21.07.12 & 24.07.12	<b>Mrs. Fidelma King</b>	<b>3</b>	<b>Odour</b>	<b>F</b>
<b>307</b>	27.07.12	<b>Mr. Michael. Mulvihill</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>308</b>	27.07.12 & 30.07.12	<b>Mrs. Pauline. Delahunt</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>309</b>	05.08.12	<b>Mr. Michael. Mulvihill</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>310</b>	08.08.12	<b>Mrs. Fidelma King</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>311</b>	10.08.12 x 2	<b>Mrs. Liz Hayden</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>312</b>	10.08.12 & 11.08.12	<b>Ms. Jennifer Cope</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>313</b>	13.08.12	<b>Mr. Robert Sally</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>314</b>	24.08.12, 25.08.12, 30.08.12 & 30.08.12	<b>Mr. Michael. Mulvihill</b>	<b>4</b>	<b>Odour</b>	<b>F</b>
<b>315</b>	30.08.12	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>316</b>	30.08.12	<b>Mrs. Joanne Verdes</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>317</b>	04.09.12 x 2 & 05.09.12 & 07.09.12	<b>Mr. Michael. Mulvihill</b>	<b>4</b>	<b>Odour</b>	<b>F</b>




Document Type	FORM	
Title	Complaints register	
Document No.	F06b(i)	


<b>318</b>	<b>05.09.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>319</b>	<b>10.09.12,15.09.12, 18.09.12 &amp; 21.09.12</b>	<b>Mrs. Liz Hayden</b>	<b>4</b>	<b>Odour</b>	<b>F</b>
<b>320</b>	<b>21.09.12 &amp; 24.09.12 &amp; 25.09.12 x 2</b>	<b>Mr. Michael. Mulvihill</b>	<b>4</b>	<b>Odour</b>	<b>F</b>
<b>321</b>	<b>26.09.12 &amp; 08.10.12 &amp; 09.10.12</b>	<b>Mrs. Liz Hayden</b>	<b>3</b>	<b>Odour</b>	<b>F</b>
<b>322</b>	<b>08.10.12 &amp; 09.10.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>323</b>	<b>01.11.12, 27.10.12, 26.10.12, 23.10.12 &amp; 22.10.12, 21.10.12, 19.10.12</b>	<b>Mrs. Liz Hayden</b>	<b>7</b>	<b>Odour</b>	<b>F</b>
<b>324</b>	<b>19.10.12 x 2, 22.10.12, 26.10.12, 27.10.12 &amp; 29.10.12</b>	<b>Mr. Michael Mulvihill</b>	<b>6</b>	<b>Odour</b>	<b>F</b>
<b>325</b>	<b>05.11.12 &amp; 19.11.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>326</b>	<b>23.11.12, 24.11.12, 25.11.12 &amp; 27.11.12</b>	<b>Mr. Michael Mulvihill</b>	<b>4</b>	<b>Odour</b>	<b>F</b>
<b>327</b>	<b>29.11.12, 04.12.12, 09.12.12 &amp; 11.12.12</b>	<b>Mr. Michael Mulvihill</b>	<b>4</b>	<b>Odour</b>	<b>F</b>
<b>328</b>	<b>10.12.12</b>	<b>Mrs. Liz Hayden</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>329</b>	<b>11.12.12</b>	<b>Mrs. David Tyrell</b>	<b>1</b>	<b>Odour</b>	<b>F</b>
<b>330</b>	<b>18.12.12, 20.12.12 x 3</b>	<b>Mrs. Liz Hayden</b>	<b>4</b>	<b>Odour</b>	<b>F</b>
<b>331</b>	<b>16.12.12 &amp; 18.12.12</b>	<b>Mrs. Fidelma King</b>	<b>2</b>	<b>Odour</b>	<b>F</b>
<b>332</b>	<b>19.12.12 &amp; 20.12.12</b>	<b>Mr. Michael Mulvihill</b>	<b>2</b>	<b>Odour</b>	<b>F</b>

# **APPENDIX 4**

## Staff Training Records


Document type	FORM	
Title	Training Schedule	
Document No.	F05	

<b>Trainee</b> (C denotes a course where a certificate has been received and is on display in the offices)	JONES, John	MACLEOD, Michael	KIRWAN, Robbie	MENZIES, Neil	POWELL, Matthew	DONOHUE, Joseph	MOORE, Joseph	HEALY, Kevin	KINSELLA, John	BATES, Angela	DUNN, Domic	MURPHY, Noel	FITZGERALD, David	DONOHUE, Michael
Course / Trainer											Renton Plant			
Adverse Weather / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06	Jun-07	Oct-06	Dec-05				
Ascon Safety Induction	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06	Jun-07	Oct-06	Oct-06				
Banksman Procedures	Jun-11				Jun-11		Jun-11	Jun-11	Jun-11					
Chainsaw Course / NIGEL KEANE consafe@mail.ie] - EXPIRY DATE		Mar-14				Apr-14								
Chemical Handling / Olivier Gardelle		May-15	May-15			May-15	May-15		May-15					
CIWM Member	Yes		Yes C											
Communication Skills / LGR Training	Aug-08	Aug-08												
Compactor Operation / Safety Solutions EXPIRY DATES		Oct-12 C				Oct-12 C	Oct-12 C							
Complaints Procedure / John Jones	Oct-06	Oct-06	Oct-06							Oct-06				
Daily Inspections / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06		Oct-06	Dec-05				
Driver qualification card EXPIRY DATE					Jan-15									
Dumptruck / Jo Donohue		Jun-07				Jun-07	Jun-07		Jun-07					
Dumptruck Operation / T Duignan - EXPIRY DATES (CSCS)		Sept-12 C				Sept-12 C	Jan-13 C	Jan-13 C	Jan-13 C					
Energy Policy and awareness training / Robert Kirwan	Mar-10	Mar-10	Mar-10		Jul-10	Mar-10	Mar-10	Mar-10	Mar-10	Mar-10				
Environmental Awareness training / Robert Kirwan	Jun-08	Jun-08	Jun-08		Jun-10	Jun-08	Jun-08	Jun-08	Jun-08		Sep-09	Sep-09	Sep-08	Sep-08
Excavator Operation / T Duignan - EXPIRY DATES (CSCS)		Mar-15				Dec-12 C								
FAS Waste Management Course	Complete C	Complete C	Complete C	Autumn 07						Winter 09				
Fire Safety and Procedures / John Lennon		Jan-07				Jan-07	Jan-07		Jan-07	Dec-05				
Fire Warden		Apr-12	Apr-12											
First Aid / NB Training Services or James Maye EXPIRY DATES		May-14							May-14					
First Line Supervisory Skills / Legal Island		Sept-07 C												
Fleet insurance procedures training	Feb-11	Feb-11	Feb-11		Feb-11	Feb-11								
Gas Management / CIWM	Jul-07	Jul-08	Mar-08 C	Sep-07										
Gas System Checks and Balancing / John Jones/Ciaran Geoghegan		Apr-07	Jan-08			Apr-07	Apr-07							
Hazard Identification & Risk Assessment Workshop / Oliver Callan		Mar-09 C												
Refresher Gas system check and balancing / Robert Kirwan			Jan-09				Jan-09	Jan-09	Jan-09					
H&S Induction / John Lennon	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06		Oct-06	Dec-05				
H&S Statement and Risk Assessments / Jim Duff		May-07		May-07	Jun-10	May-07	May-07		May-07	May-07				
Refresher H&S Statement and Risk Assessments / Jim Duff	Apr-08	Apr-08	Apr-08			Apr-08	Apr-08	Apr-08	Apr-08					
Housekeeping Procedures / J Jones	Nov-06	Nov-06				Nov-06	Nov-06		Nov-06					
HR Induction / Fiona Gilboy	Nov-06	Nov-06		Feb-07		Nov-06	Nov-06		Nov-06	Dec-05				
HR Disciplinary / Grievance Policy	Apr-09	Mar-09	Apr-09											
IOSH Managing Safety Course	Jan-08		Jan-08							Feb-10				
ISO 14001 EMS internal auditors course / SGS UK Ltd				Sep-07						Sept-07 C				
ISO 18001 OH&S internal auditors course / SGS UK Ltd										Oct-09				
ISO Training / Robbie Kirwan	Apr-08	Apr-08	Apr-08			Apr-08	Apr-08	Apr-08	Apr-08	Apr-08			Sep-08	Sep-08
KTK Gas System / Dominic				May-07			May-07							
KNK EMS system / R Wilkes										Apr-08				
Landfill Construction / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06		Oct-06	Dec-05				
Licence Conditions / John Jones	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06	Jun-07	Oct-06	Dec-05				

Document type	Issue Date	Constantly updated	Revision 1	Authorised by	JJ
Title	FORM				
Document No.	Training Schedule				
	F05				

Trainee (C denotes a course where a certificate has been received and is on display in the offices)	JONES, John	MACLEOD, Michael	KIRWAN, Robbie	MENZIES, Neil	POWELL, Matthew	DONOHUE, Joseph	MOORE, Joseph	HEALY, Kevin	KINSELLA, John	BATES, Angela	DUNNE, Dornonic	MURPHY, Noel	FITZGERALD, David	DONOHUE, Michael
Course / Trainer											Renton Plant			
Licence Refresher Training (Cond. 5 and 7) / Neil Menzies		Apr-07				Apr-07	Apr-07		Apr-07					
Manual Handling Training - EXPIRY DATES	Jun-14	Jun-14	Jun-14		Jun-14	Jun-14		Jun-14	Jun-14					
Mobile elevating work platform operation - EXPIRY DATES		Aug-17				Aug-17								
Off site training / KTK	Oct-06	Oct-06	Oct-06			Oct-06	Oct-06		Oct-06					
Report Writing / Professional Development training				Nov-07										
Safe Pass - EXPIRY DATES	Jul-15	Oct-13	Oct-13		Jun-13	Jul-13	Jul-15	Nov-13	Jun-14					
Safety, Health & Welfare Programme FETEC level 5 / NISO										Feb-10				
Senior Management Legal Briefing / Ray Byrne NIFAST	Nov 08 C													
Site Induction / John Jones	Oct-06	Oct-06	Oct-06	Feb-07		Oct-06	Oct-06		Oct-06	Oct-06				
Skid Steer / Michael Macleod				Jun-07		Jun-07	Jun-07		Jun-07	Jun-07				
Skid Steer Certification / T Duignan - EXPIRY DATES (CSCS)		Sept-12 C				Sept-12 C	Sept-12 C	Sept-12 C	Sept-12 C					
Supervising Safety Course / NIFAST	Nov-07	Nov-07				Nov-07								
TBT Slips and Trips / J Jones	Jan-07	Jan-07				Jan-07	Jan-07		Jan-07					
TBT Banks Mans Procedure / John Jones		Feb-07				Feb-07	Feb-07		Feb-07	Feb-07				
TBT Weil's Disease Refresher / John Jones		Mar-07				Mar-07	Mar-07		Mar-07	Mar-07				
TBT Fire Safety DVD / J Jones		May-07		May-07		May-07	May-07		May-07	May-07				
TBT Working in Confined Spaces / Neil Menzies	Jun-07	Jun-07		Jun-07		Jun-07	Jun-07							
TBT Correct use of Safety Belts / John Jones		Jul-07		Jul-07		Jul-07	Jul-07	Jul-07	Jul-07	Jul-07				
TBT Manual handling / M Macleod	Aug-07	Aug-07		Aug-07		Aug-07	Aug-07		Aug-07	Aug-07				
TBT Banksmans Procedures / John Jones		Oct-07		Oct-07		Oct-07	Oct-07	Oct-07	Oct-07	Oct-07				
TBT Material Safety Data Sheets / John Jones	Dec-07	Dec-07	Dec-07			Dec-07	Dec-07	Dec-07	Dec-07	Dec-07				
TBT Safe use of Pressure Washer / Micheal Macleod	Feb-08	Feb-08	Feb-08			Feb-08	Feb-08	Feb-08	Feb-08	Feb-08				
TBT Compaction of covering waste / John Jones	Mar-08	Mar-08				Mar-08	Mar-08	Mar-08	Mar-08	Mar-08				
TBT Horrific Accidents DVD / J Jones	Apr-08	Apr-08	Apr-08			Apr-08	Apr-08	Apr-08	Apr-08	Apr-08				
TBT Slips, Trips and Falls / DVD Safety Media	Jun-08	Jun-08				Jun-08	Jun-08	Jun-08	Jun-08	Jun-08			Jun-08	
TBT Fire Safety DVD / J Jones	Aug-08		Aug-08			Aug-08	Aug-08	Aug-08	Aug-08	Aug-08			Aug-08	Aug-08
TBT Manual handling DVD / J Jones	Sep-08	Sep-08	Sep-08			Sep-08	Sep-08	Sep-08	Sep-08	Sep-08				
TBT Banksmans Procedures / John Jones	Oct-08	Oct-08	Oct-08			Oct-08	Oct-08	Oct-08	Oct-08	Oct-08			Oct-08	
TBT Litter prevention and litter cages assembly / disassembly / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Suppression of dust / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Vermin control / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Handling tipping vehicles / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Random inspection of incoming loads / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Lone working process / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Handling and storage of batteries / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Record of tipping location / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Procedure for construction of landfill gas vents / MM	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08	Nov-08	Nov-08	Nov-08			Nov-08	Nov-08
TBT Ken Woodward Complete Safety	Jan-09	Jan-09				Jan-09	Jan-09	Jan-09	Jan-09	Jan-09			Jan-09	Jan-09
TBT Tractor Safety / DVD Safety Media	Jan-09	Jan-09	Jan-09			Jan-09	Jan-09	Jan-09	Jan-09	Jan-09			Jan-09	Jan-09
TBT Covering down procedure	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09
TBT DVD on landfill operation and facility management / in house	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09	Feb-09	Feb-09	Feb-09			Feb-09	Feb-09
TBT Risk assessment DVD / Safety Media	Apr-09	Apr-09	Apr-09			Apr-09	Apr-09	Apr-09	Apr-09	Apr-09			Apr-09	
TBT Computer and workstation safety DVD	May-09	May-09	May-09			May-09	May-09	May-09	May-09	May-09			May-09	May-09
TBT Manual handling and electrical safety - farming DVD	Jun-09	Jun-09	Jun-09			Jun-09	Jun-09	Jun-09	Jun-09	Jun-09			Jun-09	Jun-09
TBT Procedure for handling needle stick (F09 005) / refresher	Jul-09	Jul-09	Jul-09			Mar-10	Jul 09 / Feb 10	Jul 09 / Feb 10	Jul 09 / Feb 10	Jul-09				

Issue Date	Constantly updated	Revision 1	Authorised by	JJ
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Document type	FORM	
Title	Training Schedule	
Document No.	F05	

Trainee (C denotes a course where a certificate has been received and is on display in the offices)	JONES, John	MACLEOD, Michael	KIRWAN, Robbie	DONOHUE, Joseph	MOORE, Joseph	HEALY, Kevin	KINSELLA, John	BATES, Angela	POWELL, Matthew	DUNNE, Dornic	MURPHY, Noel	DONOHUE, Michael
Course / Trainer	Renton Plant											
TBT swine flu information	Aug-09	Aug-09	Aug-09		Aug-09	Aug-09	Aug-09	Aug-09				
TBT waste acceptance	Sep-09	Sep-09	Sep-09	Sep-09	Sep-09	Sep-09	Sep-09	Sep-09		Sep-09		
TBT accident investigation	Oct-09	Oct-09		Oct-09	Oct-09	Oct-09	Oct-09			Oct-09	Oct-09	Oct-09
TBT Occupational H&S system awareness	Nov-09	Nov-09	Nov-09	Nov-09	Nov-09	Nov-09	Nov-09	Nov-09	Jul-10	Nov-09	Nov-09	Nov-09
TBT Safe use of lifting equipment and working in adverse weather conditions	Jan-10	Jan-10	Jan-10		Jan-10	Jan-10	Jan-10	Jan-10				
TBT Reversing vehicles	Feb-10	Feb-10	Feb-10	Feb-10	Feb-10	Feb-10	Feb-10	Feb-10				
TBT Vehicle and pedestrian collisions	Mar-10	Mar-10	Mar-10		Mar-10	Mar-10	Mar-10	Mar-10				
TBT Wheelwash procedure	Apr-10	Apr-10	Apr-10	Apr-10	Apr-10	Apr-10	Apr-10	Apr-10				
TBT Hearing protection	May-10	May-10	May-10	Jul-10	May-10	May-10	May-10	May-10				
TBT Vehicle tipovers	Aug-10	Aug-10	Aug-10	Aug-10	Aug-10		Aug-10	Aug-10				
TBT H&S whats is all about and working at heights	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10	Sep-10				
TBT Covering down procedure		Oct-10	Oct-10	Oct-10	Oct-10	Oct-10		Oct-10				
TBT slips and falls	Jan-11	Jan-11	Jan-11	Jan-11	Jan-11	Jan-11	Jan-11	Jan-11				Jan-11
TBT welding gas pipes	Mar-11	Mar-11	Mar-11	Mar-11	Mar-11	Mar-11	Mar-11	Mar-11				Mar-11
TBT lawnmower and strimmer safety	Apr-11	Apr-11		Apr-11	Apr-11	Apr-11	Apr-11	Apr-11	Apr-11			
TBT H&S issues concerned with capping project	Jul-11	Jul-11	Jul-11	Jul-11	Jul-11	Jul-11	Jul-11	Jul-11				
Tractor and Bowser / Jo Donohue		May-07			Jun-07		Jun-07					
VDU assessments	Jan-10	Jan-10	Jan-10		Jan-10	Jan-10		Jan-10				
Waste Acceptance Seminar / Greenstar					Apr-07			Apr-07				
Weighbridge Training / on site		Jul-07	Jan-08	Feb-07		Jul-07	Jun-07					
British Geomembrance Association - welding course		Jul-11			01-Aug-12	Jul-11	Jul-11					

Issue Date	Constantly updated	Revision 1	Authorised by	JJ
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# **APPENDIX 5**

## Procedures Index

<b>Doc. No.: Control</b>	<b>Revision No.: As Shown</b>	<b>Issue Date: As Shown</b>
<b>Approved By:</b>	Malcolm Dowling – <i>Group Environmental Manager</i> Oliver Callan – <i>Group H&amp;S Manager</i>	<b>Page 1 of 4</b>

**Integrated Procedures - IP**

IP-01	Document & Record Control Procedure	Rev 01, 05/07/10
IP-02	Health & Safety Risk Assessment Procedure	Rev 01, 05/07/10
IP-03	Environmental Aspects & Impacts Procedure	Rev 01, 05/07/10
IP-04	Legal & Regulatory Requirements Procedure	Rev 02, 05/11/10
IP-05	Objectives, Targets & Management Programmes Procedure	Rev 01, 05/07/10
IP-06	Competence, Training & Awareness Procedure	Rev 01, 05/07/10
IP-07	Communication & Consultation Procedure	Rev 01, 05/07/10
IP-08	Monitoring, Measurement & Improvement Procedure	Rev 01, 05/07/10
IP-09	Evaluation of Compliance Procedure	Rev 02, 15/09/11
IP-10	Non Conformances, Corrective/Preventive Actions Procedure	Rev 03, 01/02/11
IP-11	Internal Audit Procedure	Rev 03, 28/05/12
IP-12	Management Review Procedure	Rev 01, 05/07/10
IP-13	Control of Contractors/Visitors Procedure	Rev 03, 08/06/12
IP-14	Health & Safety & Environmental Monitoring	Rev 02, 29/10/10
IP-15	Emergency Preparedness & Response Procedure	Rev 02, 01/02/11

**Safety Procedures - SP**

SP-01	Permit to Work Procedure	Rev 02, 03/05/12
SP-02	Maintenance & Calibration Procedure	Rev 03, 04/04/11
SP-03	Mobile Plant Procedure	Rev 01, 05/07/10
SP-04	Fork Truck Procedure	Rev 01, 05/07/10
SP-05	Operation of Fixed Plant Procedure	Rev 01, 05/07/10
SP-06	Lock Out / Tag Out Procedure	Rev 01, 05/07/10
SP-07	Health & Safety Notification Procedure	Rev 01, 05/07/10
SP-08	Motor Claim Notification Procedure	Rev 01, 01/02/11
SP-09	MSW Shredder routine Maintenance & Clearing of Blockages Procedure (SCGT)	Rev 01, 01/12/11
SP-10	Weighbridge & Tipping Procedure (SCGT)	Rev 01, 01/12/11
SP-11	Cleaning of Washing Bay (Greenogue)	Rev 01, 05/05/12



<b>Doc. No.: Control</b>	<b>Revision No.: As Shown</b>	<b>Issue Date: As Shown</b>
<b>Approved By:</b>	Malcolm Dowling – <i>Group Environmental Manager</i> Oliver Callan – <i>Group H&amp;S Manager</i>	<b>Page 2 of 4</b>

<b>Environmental Procedures - EP</b>		
EP-01	Office Waste & Energy Management Procedure	Rev 01, 05/07/10
EP-02	Decommissioning and Aftercare Procedure	Rev 02, 14/09/11
EP-03	Environment Communications Procedure	Rev 02, 13/09/10
EP-04	Waste Permits & Licences Procedure	Rev 01, 05/07/10
EP-05	Waste Acceptance Procedure	Rev 01, 05/07/10
EP-06	Unacceptable Waste Procedure	Rev 01, 05/07/10
EP-07	Waste & Material Storage Procedure	Rev 01, 05/07/10
EP-08	Waste Processing Procedure	Rev 01, 05/07/10
EP-09	Site Infrastructure Procedure	Rev 01, 05/07/10
EP-10	Nuisance Management Procedure (Site Specific)	(Site Specific)
EP-11	Civic Amenity Site Procedure	Rev 01, 05/07/10



<b>Doc. No.: Control</b>	<b>Revision No.: As Shown</b>	<b>Issue Date: As Shown</b>
<b>Approved By:</b>	Malcolm Dowling – <i>Group Environmental Manager</i>	<b>Page 3 of 4</b>
	Oliver Callan – <i>Group H&amp;S Manager</i>	

**Amendment History**

Date	Amendment No.	Procedure No:	Revision No:	Comment	Authorised By
05.07.10	01	All	01	Initial Issue	M.D & O.C
13.09.10	02	EP-03	02	Issue of Incident Reports	M.D
20.09.10	03	IP-10	02	Env issues not logged on WIMS Database	M.D
29.10.10	04	IP-13	02	Use of M&M equipment by contractors	M.D & O.C
29.10.10	05	IP-14	02	Use of M&M equipment by contractors	M.D & O.C
29.10.10	06	SP-02	02	Inclusion of Maintenance Schedule	M.D & O.C
05.11.10	07	IP-04	02	Inclusion of other requirements	S.B & O.C
01.02.11	08	SP-08	01	Inclusion of new procedure	O.C
01.02.11	09	IP-10	03	Inclusion of SP-08	O.C
01.02.11	10	IP-15	02	Removal of SF-022	O.C
01.02.11	11	Contents	As shown	EP-10 Site Specific	M.D & O.C
01.02.11	12	Circ List	02	Amendment to document control	M.D & O.C
04.04.11	13	SP-02	03	Inclusion of Site Specific Maintenance schedules	O.C
07.06.11	14	IP-11	02	Inclusion of H&S & Env Internal Audit Schedules	M.D & O.C
14/09/11	15	EP-02	02	Inclusion of decommissioning of plant/equipment	S.B
15/09/11	16	IP-09	02	Inclusion of Statutory Inspections	O.C
01/12/11	17	SP-09	01	Inclusion of new procedure for SCGT	O.C
01/12/11	18	SP-10	01	Inclusion of new procedure for SCGT	O.C
03/05/12	19	SP-01	02	Amendment to remove SF 028	O.C
05/05/12	20	SP-11	01	Inclusion of a new procedure for Greenogue	O.C
28/05/12	21	IP-11	03	General Amendments to internal audit procedure	M.D & O.C
08/06/12	22	IP-13	03	Grammatical amendment	M.D & O.C



<b>Doc. No.:</b> Control	<b>Revision No.:</b> 02	<b>Issue Date:</b> 1 <sup>st</sup> February 2011
<b>Approved By:</b>	Malcolm Dowling – Group Environmental Manager Oliver Callan – Group H&S Manager	<b>Page 4 of 4</b>

**Circulation List**

The Integrated Procedures Manual is a controlled document. Copies of the Integrated Procedures Manual are available as follows;

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1 (Master Copy)	Environmental, Health & Safety (EHS) Executive
2	Greenstar Limited Intranet – Electronic Copy

# **APPENDIX 6**

E-PRTR Returns



Environmental Protection Agency

| PRTR#: W0165 | Facility Name : Ballynagran Residual Landfill | Filename : W0165\_2012.xls | Return Year : 2012 |

[Guidance to completing the PRTR workbook](#)

# AER Returns Workbook

Version 1.1.15

<b>REFERENCE YEAR</b>	2012
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## 1. FACILITY IDENTIFICATION

Parent Company Name	Greenstar Holdings Limited
Facility Name	Ballynagran Residual Landfill
PRTR Identification Number	W0165
Licence Number	W0165-02

Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
3.1	Deposit on, in or under land (including landfill).
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.4	Recycling or reclamation of other inorganic materials.
4.9	Use of any waste principally as a fuel or other means to generate energy.
Address 1	Ballynagran
Address 2	Coolbeg and Kilcandra
Address 3	Co Wicklow
Address 4	
	Wicklow
Country	Ireland
Coordinates of Location	-8.41098 51.914
River Basin District	IEEA
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
<b>AER Returns Contact Name</b>	Robert Kirwan
<b>AER Returns Contact Email Address</b>	robert.kirwan@greenstar.ie
<b>AER Returns Contact Position</b>	Deputy Facility Manager
<b>AER Returns Contact Telephone Number</b>	+353 (0)404 25440
<b>AER Returns Contact Mobile Phone Number</b>	+353 (0)868586338
<b>AER Returns Contact Fax Number</b>	+353 (0)404 22515
<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>	0
<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
5(d)	Landfills
50.1	General

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

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

## 4. WASTE IMPORTED/ACCEPTED ONTO SITE

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

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	
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This question is only applicable if you are an IPPC or Quarry site

4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

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**SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS**

POLLUTANT		METHOD			Please enter all quantities in this section in KGs		
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Flares Emission Point 1	Engine Emission Point 2	QUANTITY
				Method Used	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
03	Carbon dioxide (CO2)	C	OTH	GasSim2 Calculation	3910000.0	0.0	3910000.0
01	<b>Methane (CH4)</b>	C	OTH	GasSim2 Calculation	8103000.0	0.0	8756790.0
05	Nitrous oxide (N2O)	C	EN 14792:2005	OMI Report	5347.22	8336.58	13683.8
11	Sulphur oxides (SOx/SO2)	M	EN 14791:2005	OMI Report	38984.9	17238.4	56223.3

\* 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			
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
				Method Used				
					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			
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
				Method Used				
					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

**Additional Data Requested from Landfill operators**

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

Landfill: Please enter summary data on the quantities of methane flared and / or utilised	Ballynagran Residual Landfill				
	T (Total) kg/Year	M/C/E	Method Code	Designation or Description	Facility Total Capacity m3 per hour
Total estimated methane generation (as per site model)	8103000.0	C	OTH	GasSim2 calculation	N/A
Methane flared	6049507.0	M	PER	Facility on-site monitoring	0.0 (Total Flaring Capacity)
Methane utilised in engine/s	1399703.0	M	PER	Facility on-site monitoring	0.0 (Total Utilising Capacity)
Net methane emission (as reported in Section A above)	653790.0	C	PER	Modelling - Monitoring	N/A

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

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Please enter all quantities on this sheet in Tonnes

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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 : Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	19 07 03	No	471.54	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	Enniskerry WWTP ,D0088-01	,,.,.,.,ireland	Enva,184-01	Clonminam Industrial Estate,Portlaoise ,County Laois,Laois,Ireland
Within the Country	19 07 03	No	954.6	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	Enva,184-01	Clonminam Industrial Estate,Portlaoise ,County Laois,,Ireland		
Within the Country	19 07 03	No	2643.21	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	Drogheda WWTP,D0041-01	Drogheda ,County Louth,-,-,ireland		
Within the Country	19 07 03	No	738.36	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	KTK Landfill,W0081-04	Brownstown ,Kilcullen Co. Kildare ,Co. Kildare ,-,-,ireland		
Within the Country	19 07 03	No	3341.5	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	Leixlip WWTP,D004-01	Leixlip ,Kildare,-,-,ireland		
Within the Country	19 07 03	No	3028.56	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	Rilta Environmental Ltd,W0192-01	Block 402 ,Grant's Drive ,Greenogue Business Park. Rathcoole ,Dublin,Ireland		
Within the Country	19 07 03	No	6860.85	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	Ringsend WWTP,D00-34-01	Ringsend ,Dublin,-,-,ireland		
Within the Country	19 07 03	No	11853.05	landfill leachate other than those mentioned in 19 07 02	R3	M	Weighed	Offsite in Ireland	Veolia,D0012-01	Wicklow,,.,.,.,Ireland		