

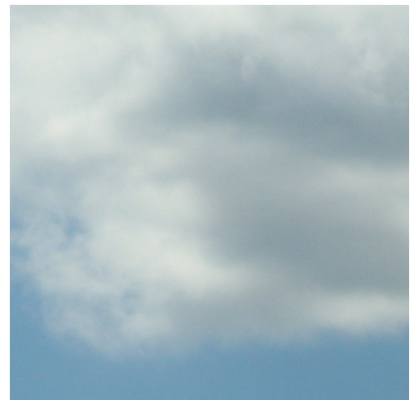
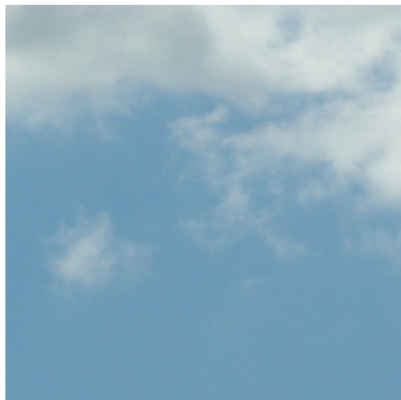
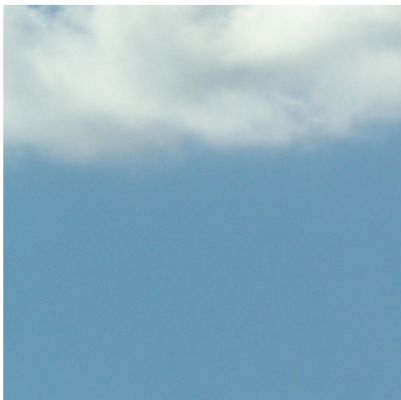
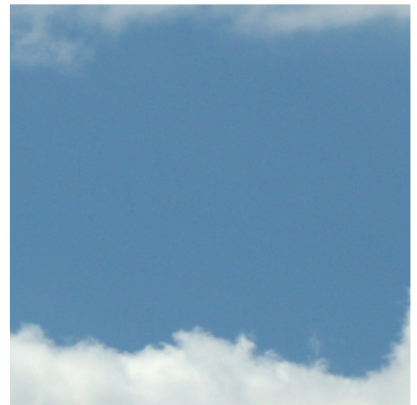
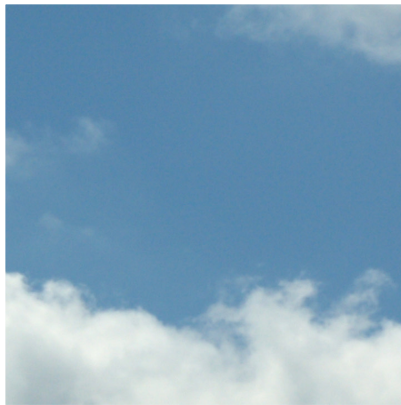
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# Donegal County Council

## Annual Environmental Report 2017

### Balbane Landfill Site

IBR1073 / April 2018



## Document Control Sheet

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## Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
<b>2</b>	<b>Report Period</b> .....	<b>2</b>
<b>3</b>	<b>Waste Activities Carried Out at the Facility</b> .....	<b>3</b>
<b>4</b>	<b>Quantity and Composition of Waste Received and Disposed of During the Reporting Period and each Previous Year</b> .....	<b>4</b>
<b>5</b>	<b>Summary Report on Emissions, Results and Interpretation of Environmental Monitoring</b> .	<b>5</b>
5.1	Environmental Monitoring Requirements .....	5
5.2	Monitoring Results .....	5
5.3	Groundwater .....	5
5.4	Surface Water .....	9
5.5	Leachate .....	13
5.6	Gas Monitoring .....	13
5.7	Dust Monitoring .....	13
<b>6</b>	<b>Volume of Leachate Produced and Volume of Leachate Transported / Discharged Off Site</b> .....	<b>14</b>
<b>7</b>	<b>Report on Development Work Undertaken during the Reporting Period and a Timescale for those Proposed during the Coming Year</b> .....	<b>15</b>
<b>8</b>	<b>Report on Restoration of Completed Cells / Phases</b> .....	<b>16</b>
<b>9</b>	<b>Site Survey showing Existing Levels of the Facility at the End of the Reporting Period ...</b>	<b>17</b>
<b>10</b>	<b>Annual Water Balance Calculation and Interpretation</b> .....	<b>17</b>
<b>11</b>	<b>Reported Incidents and Complaints Summaries</b> .....	<b>18</b>
<b>12</b>	<b>Review of Nuisance Controls</b> .....	<b>19</b>
<b>13</b>	<b>Report on Financial Provisions made under this License, Management and Staffing Structure of the Facility and a Programme for Public Information</b> .....	<b>20</b>
<b>14</b>	<b>Report on Staff Training</b> .....	<b>21</b>
<b>15</b>	<b>Resources and Energy Consumption Summary</b> .....	<b>21</b>
<b>16</b>	<b>Report on Environmental Management Programme</b> .....	<b>21</b>

## Appendices

Appendix A – Drawings

Appendix B - Monitoring Information

Appendix C - Results of Monitoring

Appendix D - Water Balance Calculation and Meteorological Data

Appendix E - E-PRTR (AER Electronic Reporting System)

# 1 Introduction

This Annual Environmental Report (AER) has been prepared to meet the requirements of Condition 11.5 of Waste Licence 90-1 for Balbane Landfill Site, and includes the information listed in Schedule F of the Licence.

Balbane Landfill Site, as shown on Drawing IBR1073/003, is located approximately 6.5 km north of Killybegs, in the townland of Balbane, County Donegal. The landfill covers an area of approximately 2.9 hectares. The landfill site was developed to operate on the dilute and disperse principle whereby leachate generated by rainfall was allowed to disperse into the surrounding environment.

Donegal County Council submitted an application to the Environmental Protection Agency for the continued operation of the landfill site, as required by the Waste Management (Licensing) Regulations 1997. On the 13th of November 2001 the Environmental Protection Agency granted the Council a Waste Licence (registration number 90-1) for the facility, in accordance with the Third Schedule of the Waste Management Act, 1996. The site closed in January 2004.

A summary of Facility Information is provided in Table 1.1 below.

**Table 1.1 Facility Information Summary**

<b>AER Reporting Year</b>	2017
<b>Licence Register Number</b>	W0090-01
<b>Name of site</b>	Balbane Landfill Site
<b>Site Location</b>	Balbane, County Donegal
<b>NACE Code</b>	3821
<b>Class/Classes of Activity</b>	Landfill

## 2 Report Period

The report period for this Annual Environmental Report (AER) is from January to December 2017.

### 3 Waste Activities Carried Out at the Facility

In accordance with Condition 1 of the waste licence only those waste types and quantities of waste listed in Schedule A shall be disposed of at the facility unless the prior agreement of the Agency has been obtained. The maximum annual tonnage of individual waste types for disposal is listed in Schedule A of the Waste Licence at 7,500 tonnes from the date of grant of licence for municipal waste and 70,000 tonnes of inert material of the purpose of restoration.

The licensed waste disposal activities in accordance with the Third Schedule of the waste Management Act, 1996 are restricted to those listed as follows:

- **Class 1:** Deposit on, in or under land (including landfill). This activity is limited to deposition of municipal and inert waste.
- **Class 4:** Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons. This activity is limited to leachate collection and treatment.
- **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 leachate collection and storage prior to treatment.

The site is closed and is now secured to prevent unauthorised entry.

## 4 Quantity and Composition of Waste Received and Disposed of During the Reporting Period and each Previous Year

A temporary computerised weighbridge was installed at the site in 2002 and this was used to record waste data figures until the facility closed in January 2004. No waste has been received at the site since closure. Annual figures for the period 1998-2004 are shown in Table 4.1.

**Table 4.1 Waste Quantities Accepted**

Waste Types	1998	1999	2000	2001	2002	2003	2004
Municipal Waste (20 03 01)	3228	3716	4721	4107	5069	2790	187
Street Cleanings (20 03 03)						57	3

## 5 Summary Report on Emissions, Results and Interpretation of Environmental Monitoring

### 5.1 Environmental Monitoring Requirements

There are no continuous air, groundwater, surface water or wastewater (sewer) monitoring at Balbane landfill site. Periodic/non-continuous monitoring of groundwater, surface water, leachate, and landfill gas are carried out at the site as per Schedule D of the licence, and as agreed with the EPA, as set out in Tables A2, A3 and A4 of Appendix B.

Details of the monitoring locations are shown on Drawing IBR1073/004 in Appendix A and are given in Table A1 of Appendix B.

### 5.2 Monitoring Results

Laboratory results certifications for groundwater, surface water, leachate and gas monitoring are contained in Appendix C. Trend graphs for key parameters are also provided.

### 5.3 Groundwater

The groundwater results contained in this report were assessed against the following:

- EPA Interim Guideline Values<sup>1</sup> (IGV);
- SI No 278 of 2007 EC (Drinking water) Regulations (DWR); and
- SI No 9 of 2010 European Communities Environmental Objectives (Groundwater) Regulations 2010 as amended Groundwater Threshold Values (GTV).

Groundwater locally flows in a south-easterly direction and GW1 reflects baseline conditions upgradient (UG) of the site. GW2 and GW4 are not considered to be downgradient of the site given their proximity to the waste body. It should be noted that BH2 is also located within waste and is considered to be a leachate well. The direction of groundwater flow is presented in Figure 5 in Appendix A.

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<sup>1</sup>EPA (2003) Towards setting guideline values for the protection of groundwater in Ireland. Interim Report



No samples were collected at GW4 during this monitoring period as it has become inaccessible due to a kink in the pipework.

The GTV for ammonium is 0.175 mg/l N. Elevated concentrations of ammonia N were recorded upgradient of the site in GW1 in 2 of the 4 monitoring dates which reflects the baseline conditions of the groundwater upgradient of the site. Concentrations in GW1 ranged from <0.005 to 0.55 mg/l.

Elevated concentrations of ammonia N were also recorded in GW2 (adjacent to waste) throughout the sampling period except in October (0.012 mg/l). Concentrations in GW2 ranged from 0.012 to 3.444 mg/l. Monitoring wells GW2 and GW4 are located adjacent to the waste body.

Electrical conductivity (EC) levels upgradient in GW1 were consistently below the GTV of 800-1875  $\mu\text{S}/\text{cm}$  ranging from 38 to 657  $\mu\text{S}/\text{cm}$ . EC levels in GW2 (adjacent to waste) were below the GTV ranging from 38 to 85.8  $\mu\text{S}/\text{cm}$ .

Chloride concentrations were consistently below the GTV of 185.7 mg/l in all boreholes. The highest chloride concentration was recorded in GW2 (adjacent to waste) in February (15 mg/l).

Potassium concentrations were below the IGV of 5 mg/l in GW1 (upgradient) and GW2.

The GTV for iron is 200  $\mu\text{g}/\text{l}$ . Elevated concentrations of iron above the GTV were recorded upgradient in GW1 in 3 of the 4 monitoring dates ranging from 0.38 to 2,700  $\mu\text{g}/\text{l}$ . Iron concentrations recorded in GW2 (adjacent to waste) were below the GTV ranging from 0.34 to 48  $\mu\text{g}/\text{l}$ .

pH levels were below the IGV range of 6.5 to 9.5 in GW2 (adjacent to waste) throughout the monitoring period ranging from 5.7 to 6.43.

Phenol concentrations were lower than the limit of detection in all boreholes throughout the monitoring period (<0.1 mg/l).

No elevated concentrations relative to the appropriate guideline values for the remaining parameters measured were recorded upgradient or downgradient during the monitoring period.

Analysis for annual parameters was undertaken in groundwater during this monitoring period on 25<sup>th</sup> October 2017, as agreed with the EPA to be undertaken every three years. Results

were below the relative guideline values or were less than the laboratory levels of detection for the methodology used for all parameters analysed except for:

- Manganese concentrations exceeded the IGV and DWR (50 µg/l) in GW1 (5,000 µg/l) and GW2 (55 µg/l);
- Ortho-phosphate concentrations exceeded the IGV (0.03 mg/l) in GW2 (0.784 mg/l);
- Zinc concentrations exceeded the IGV (0.1 mg/l) in GW1 (150 µg/l) and were equal to the IGV in GW2 (100 µg/l).

The landfill site was developed to operate on the dilute and disperse principle and results show that groundwater is being impacted from leachate generated within the landfill. It should be noted that groundwater monitoring boreholes in Balbane are adjacent to /within the unlined waste body and it is expected that concentrations in groundwater have reduced further downgradient of the site. The graphs in appendix C also show the seasonal variation in parameter concentration at the site.

A hydrogeological risk assessment was undertaken in 2015 and submitted to the EPA. The report found that the area of impact to groundwater from the landfill leachate is considered to be minor relative to the groundwater body catchment area of the Northwest Donegal GWB i.e. < 0.001%. To-date no remedial works have been completed at Balbane landfill and a remedial strategy has been submitted to the EPA for agreement. Please refer to Section 7.

A series of proposed mitigation measures and additional investigation have been proposed to address the data gaps at the site, to facilitate a more detailed understanding of the hydrogeological regime and to assess the risk posed to downgradient receptors. Proposed mitigation measures will be carried out when remediation works are underway.

**Table 5.1 Groundwater Concentrations 2017**

Location	Sample Date	Ammonia N	Chloride	Conductivity @ 20°C	Dissolved Oxygen	Iron	pH	Phenols	Potassium	Temperature	Sodium	Total Organic Carbon	Total Oxidised Nitrogen	Depth
		mg/l	mg/l	µS/cm	mg/l	µg/l	pH units	mg/l	mg/l	°C	mg/l	mg/l	mg/l	m
GW1	15-Feb	0.086	14	657	7.68	0.38	7	< 0.1	2	9.3	30.5	9.75	0.27	0.5
GW2	15-Feb	<b>1.002</b>	15	85.8	4.77	0.34	<b>5.7</b>	< 0.1	1.1	10.2	8.1	2.09	0.34	3.26
GW1	16-May	<b>0.188</b>	4.9	468	3.49	<b>2600</b>	6.78	< 0.1	2.2	16.8	33.3	11.15	0.2	8.62
GW2	16-May	<b>0.579</b>	9.9	45.2	5.27	31	<b>6.14</b>	< 0.1	0.9	16.7	6.9	3	0.34	4.11
GW1	27-July	< 0.005	4.96	38	9.41	<b>210</b>	7.13	< 0.1	0.4	17.7	4.5	8.96	< 0.15	0.31
GW2	27-July	<b>3.444</b>	5.96	57.5	6.19	48	<b>6.31</b>	< 0.1	2.1	17.1	2.5	3.26	1.8	2.14
GW1	25-Oct	<b>0.55</b>	2	349	5.35	<b>2700</b>	6.61	< 0.1	2	12.9	29.9	4.86	0.72	0.3
GW2	25-Oct	0.012	0	38	10	29	<b>6.43</b>	< 0.1	1.1	14.5	7	1.37	1.3	2.1
GTV		0.175	187.5	1875							150			
IGV			30	1000	NAC	200	6.5-9.5	0.5 µg/l	5	25	150	NAC	NAC	

\*NAC = No Abnormal Change

## 5.4 Surface Water

The surface water results contained in this report were assessed against the following:

- SI No 272 of 2009 European Communities Environmental Objectives (Surface Water) Regulations 2009 Environmental Quality Standards (EQS); and
- SI No 294 of 1989 European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations Surface Water Quality Standards (SWQS).

S1 is upstream of the site, whilst S4–S7 inclusive are downstream. S2 and S3 were relocated and relabelled at the request of the EPA. S4 is situated above the confluence of the downgradient unnamed streams. S5 is located further downstream of S4. S6 is located on the blanket bog southeast of S4 and S5 and S7 is located downstream on the Balbane River. No samples were collected at S7 in October as it has become inaccessible.

The EQS for good status total ammonia is 0.14 mg N/l. Ammonia N concentrations were below the EQS at S1 (upstream) throughout the monitoring period except in July (1.997 mg/l). The source of this is unknown.

Elevated ammonia N concentrations relevant to the EQS were recorded downstream of the site for the majority of the sampling dates ranging from <0.005 (S7) to 11.906 mg/l (S5). In general the highest ammonia N concentrations downstream were recorded at S4 situated above the confluence of the downgradient unnamed streams.

Contamination levels appear to be reducing with distance from the site (S5, S6 and S7) except for an elevated ammonia N concentration recorded downstream at S5 in May (11.906 mg/l). A source of contamination independent of the landfill was assumed to be contributing to the elevated ammonia concentration at S5. There is a generalised reduction in ammonia N concentration over time as shown in graphs in Appendix C.

The EQS for good status BOD is 2.6 mg/l. BOD concentrations recorded at S1 (upstream) were below the EQS throughout the year ranging from <1 to 1.6 mg/l. These results reflect the baseline conditions of the surface water upstream of the site. Downstream BOD concentrations were below the EQS ranging from <1 to 1.7 mg/l.

Suspended solids concentrations were within the SWQS of 50 mg/l throughout the monitoring period ranging from <5 to 27 mg/l.

No elevated concentrations, relative to the appropriate guideline values of the remaining parameters measured were recorded upstream or downstream of the site during the monitoring period.

Analysis of annual parameters was undertaken in surface water during this monitoring period on 25<sup>th</sup> October 2017, as agreed with the EPA to be undertaken every three years. Results were below the relative guideline values or were less than the laboratory levels of detection for the methodology used for all parameters analysed except for:

- Iron concentrations exceeded the SWQS A1 (0.2 mg/l) in S4 (430 µg/l), S5 (370 µg/l) and S6 (450 µg/l);
- Manganese concentrations exceeded the SWQS A1 (0.05 mg/l) in S4 (190 µg/l), S5 (140 µg/l) and S6 (120 µg/l).

The restoration of this landfill has not been undertaken to date. A hydrogeological risk assessment was undertaken in 2015. The report found that the site in its present condition appears to be impacting significantly on surface waters immediately downstream from the landfill predominantly via surface water discharges from leachate breakout from the waste body and subsequent overland flow and shallow groundwater flow. Donegal County Council are actively developing remedial options for the site. Please refer to Section 7.

Graphs of the concentrations for key parameters are provided in Appendix C.

**Table 5.2 Surface Water Concentrations 2017**

Location	Sample Date	Ammonia N	BOD	Chloride	COD	Conductivity @ 20°C	Dissolved Oxygen	pH	Temperature	Suspended Solids
		mg/l	mg/l	mg/l	mg/l	µS/cm	mg/l	pH units	Degrees C	mg/l
S1	15-Feb	0.009	1.1	18	< 8	72.1	11.15	6.1	10	< 5
S4	15-Feb	<b>2.667</b>	1.4	34	< 8	358	11	7.4	10.2	< 5
S5	15-Feb	<b>3.196</b>	1.7	33	10	360	11.44	7.7	10.1	9
S6	15-Feb	<b>1.59</b>	1.6	31	< 8	292	10.97	7.3	9.7	< 5
S7	15-Feb	< 0.05	1	17	< 8	116.3	11.63	7.3	9.7	< 5
S1	16-May	< 0.005	< 1	4.9	22	36.7	8.83	7.18	17.6	6
S4	16-May	0.022	< 1	4.9	19	68.9	9.2	7.46	17.4	6
S5	16-May	<b>11.906</b>	< 1	34.7	16	165.5	9.1	7.33	17.4	6
S6	16-May	0.015	< 1	5.9	19	68.9	8.89	7.41	17.6	6
S7	16-May	< 0.005	< 1	3.9	16	51.2	9.19	7.19	17.5	6
S1	27-July	<b>1.997</b>	1.6	6.95	7	424	3.13	6.71	17.7	7
S4	27-July	<b>2.867</b>	< 1	48.64	9	83.1	9.59	7.35	16.9	6
S5	27-July	<b>0.184</b>	< 1	10.92	2	87.6	9.53	7.38	17.6	6
S6	27-July	0.065	< 1	10.92	5	74.6	9.41	7.24	18	6
S7	27-July	0.005	1.1	5.96	3	56.8	9.16	7.7	18	6
S1	25-Oct	0.009	1	10	< 20	56.7	10.88	6.71	13	27

Location	Sample Date	Ammonia N	BOD	Chloride	COD	Conductivity @ 20°C	Dissolved Oxygen	pH	Temperature	Suspended Solids
		mg/l	mg/l	mg/l	mg/l	µS/cm	mg/l	pH units	Degrees C	mg/l
S4	25-Oct	<b>3.797</b>	1	15	< 20	133.8	10.75	7.02	13	6
S5	25-Oct	<b>3.061</b>	1	24	< 20	133.3	10.86	7.27	13	6
S6	25-Oct	<b>3.47</b>	1	24	< 20	124.8	10.61	7.13	13	6
EQS		0.140	2.6							
SWQS				250	40	1000		5.5-8.5	25	50

## 5.5 Leachate

Leachate quality varies during the lifetime of a landfill depending on the stage of decomposition of waste. No samples were obtained from BH2 in 2017 as the well was inaccessible.

## 5.6 Gas Monitoring

The gas monitoring piezometers on the site at Balbane are located within waste, and are not perimeter wells. The results (Table 5.3) are similar to previous reporting period with landfill gas concentration being relatively low. BH2 and BH3 were not monitored during this monitoring period as they were inaccessible due to flooding.

**Table 5.3 Landfill Gas Results 2017**

Location	Date	Carbon Dioxide %v/v	Methane %v/v	Oxygen %v/v	Atmospheric Pressure
Bh1 (Gas)	15-Feb-17	9.2	18.4	1.4	1021
Bh1 (Gas)	16-May-17	8.9	17.6	1.3	994
Bh1 (Gas)	27-Jul-17	30.1	6.2	4.2	978
Bh1 (Gas)	25-Oct-17	4.6	16.4	1.7	996

## 5.7 Dust Monitoring

As previously agreed with the Agency, monitoring of dust ceased when the site closed. When any activity commences, such as restoration works for example, a dust-monitoring programme will be resumed as necessary.



## 6 Volume of Leachate Produced and Volume of Leachate Transported / Discharged Off Site

A water balance calculation has been undertaken and is presented in Appendix D. It estimates that 8,497 m<sup>3</sup> of leachate will have been generated from this waste body during the period. Due to a lack of collection infrastructure there is no leachate transported off site. Correspondingly it is assumed that all leachate generated disperses into the surrounding environment.

## **7 Report on Development Work Undertaken during the Reporting Period and a Timescale for those Proposed during the Coming Year**

The restoration of this landfill was delayed due to lack of funds available to Donegal County Council as a result of the removal of grant funding for such projects. The Council met with the Agency in November 2009 and discussed this issue. The Agency requested that the Council investigated the viability of carrying out some focused works to address leachate emissions, this being the significant environmental risk from the site. This was carried out and a proposal for leachate treatment was submitted to the Agency for consideration in 1st June 2010. The Council received a response from the Agency in May 2011 citing Condition 6.4.1 of the Licence and requesting a demonstration that leachate discharges will have no significant impact on receiving waters. This remained under consideration for a period thereafter due to the complexities of fulfilling the request. In the intervening years the Council investigated the viability of bio-technologies as engineering techniques to remediate landfills.

A site remediation scoping study to assess proposals for remediation works at Balbane landfill site has been compiled with a view to determining the most effective and sustainable option which achieves the goal of restoring the site in line with waste licensing requirements and minimising fugitive emissions to the environment.

This report considers what is the optimal restoration solution for this unengineered remote landfill site by assessing options and proposing the scope to the EPA for their preliminary approval to complete a Specified Engineering Works (SEW) for the restoration works. This has been submitted to the EPA for their approval.

The proposed scope of works was submitted to the EPA for approval but the OEE required a technical amendment to the Licence in order to consider the proposal. The amendment to the Licence was applied for and granted on 26<sup>th</sup> March 2018. The Council will develop its preferred solution and submit a SEW to the OEE for approval in the hope of proceeding to construction as soon as possible. The preferred option is a reduced engineered cap and the installation of an integrated constructed wetland (ICW) on the existing site. This would incorporate information derived from the commissioning of the ICW which is being utilised to treat leachate on Churchtown Landfill Site and it can be demonstrated that there would be no impact on receiving waters.

## 8 Report on Restoration of Completed Cells / Phases

The Restoration and Aftercare Plan was submitted to the Agency in October 2004 and approved in November 2004.

Balbane was scheduled to be restored last out of Donegal County Council's six closed landfill sites. The Council are currently progressing the planning and design of the remediation of the site. See also comments in Section 7 above.

## 9 Site Survey showing Existing Levels of the Facility at the End of the Reporting Period

A topographical survey of the site was last carried out in December 2002. This was included in the 2002 AER.

## 10 Annual Water Balance Calculation and Interpretation

A water balance calculation has been undertaken and is presented in Appendix D. The calculation for monthly water balance is as follows:

$$L_o = [ER (A) + LW + IRCA + ER (I)] - [aW]$$

Where

$L_o$  = leachate produced ( $m^3$ )

ER = effective rainfall

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

LW = liquid waste

IRCA = infiltration through restored areas and capped areas (m)

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

W = weight of waste deposited

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

## 11 Reported Incidents and Complaints Summaries

Other than the reporting of on-going emissions exceedances detected in the routine surface water and groundwater monitoring programme (9 in total), no other incidents occurred during the monitoring period and no complaints were received.

Results are currently screened using the following regulations/guidance:

- SI No 9 of 2010 European Communities Environmental Objectives (Groundwater) Regulations 2010 as amended Groundwater Threshold Values (GTV);
- EPA Interim Guideline Values (IGV);
- SI No 278 of 2007 EC (Drinking water) Regulations (DWR);
- SI No 272 of 2009 European Communities Environmental Objectives (Surface Water) Regulations 2009 Environmental Quality Standards (EQS); and
- SI No 294 of 1989 European Communities (Quality of Surface Water Intended for the Abstraction of Drinking Water) Regulations Surface Water Quality Standards (SWQS).

Revised screening levels for incident reporting based on a combination of compliance points derived from the hydrogeological review or standards as appropriate to each location were submitted to the EPA for approval for Balbane. These were not approved by the Agency.

A site visit was undertaken by the EPA on the 02/10/2017. One non-compliance was noted in the site visit report in relation to there being no leachate management at the facility. It operates on a "dilute and disperse" principle. This is non-compliant with Condition 3.8 and 6.4 of the waste licence.

The groundwater risk screening report was submitted on 16/12/15. See comments in Section 7 with regards to the restoration of the facility.

## 12 Review of Nuisance Controls

As the facility is no longer operational, all areas formerly used for the placement of municipal waste have been covered by clay and topsoil. There has been a resultant reduction in nuisance on foot of this and, by agreement with the Agency, monitoring programmes and control systems employed whilst operational are now in abeyance.

However, precautionary measures are employed to ensure the detection and appropriate management of any nuisances that may arise. As part of the Environmental Management System for the site a procedure has been developed to provide for regular inspections of the site as part of the quarterly monitoring programme. Should this inspection reveal the incidence of any type of nuisance (vermin, litter, dust, birds or odours) then appropriate action is initiated.

A VOC survey was carried out on 7th February 2013.

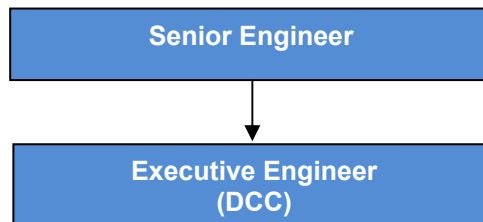
## 13 Report on Financial Provisions made under this Licence, Management and Staffing Structure of the Facility and a Programme for Public Information

Donegal County Council being a local authority is able to provide the necessary finances to ensure the proper management, development and restoration of Balbane Landfill Site.

Overall responsibility for the ongoing operations and development of the landfill site is held by the Senior Engineer. The Senior Engineer is assisted by an Executive Engineer assigned to the Environment Section of Donegal County Council.

As part of the Environmental Management System (EMS) for the site, a communication programme (in accordance with Condition 2.8 of waste licence) is provided in Section 2 of the EMS to ensure that members of the public can obtain information concerning the environmental performance of the facility at all reasonable times.

The Management Structure at Balbane Landfill site is set out in Figure 13.1 below.



**Figure 13.1 Management Structure**

An Environmental Liability Risk Assessment has not been carried out at this facility as the landfill site is closed it is not a requirement of the licence.

## 14 Report on Staff Training

No training has been undertaken as the facility is now closed and there are no operational personnel on the site.

## 15 Resources and Energy Consumption Summary

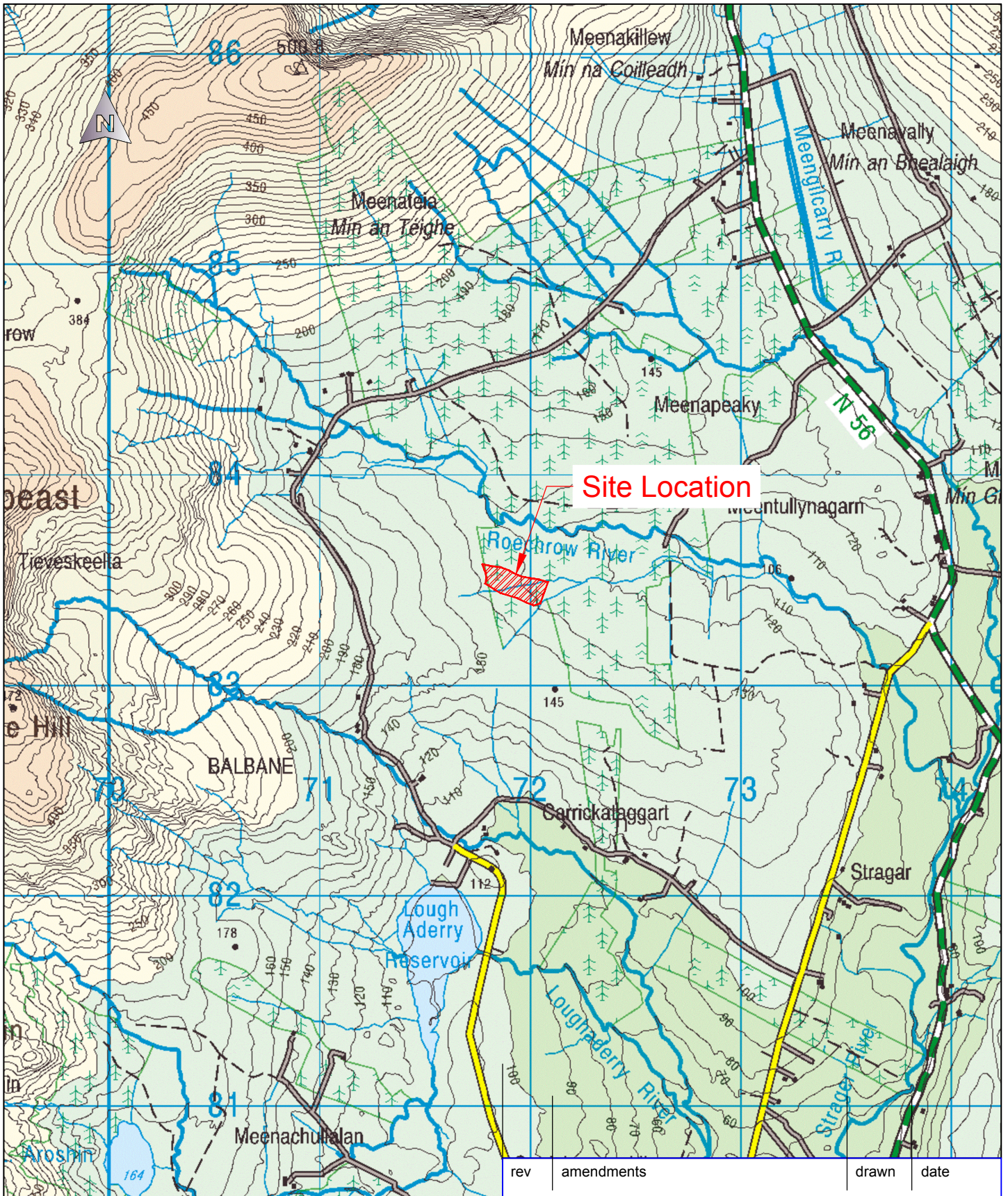
An energy efficiency audit has not been carried out at this facility as the landfill site is closed it is not a requirement of the licence. No energy was consumed on the site during the reporting period.

## 16 Report on Environmental Management Programme


An Environmental Management Programme (EMP) was revised in 2004 to take into consideration the closure of the site and was submitted in to the Agency in December 2004 for its agreement. A public communication programme has been initiated in accordance with Condition 2 of the Waste Licence to ensure that information concerning the environmental performance is available at reasonable times. The public may view environmental records at the Donegal County Council headquarters. Details regarding this are contained in Section 2 of the Environmental Management System Manual.

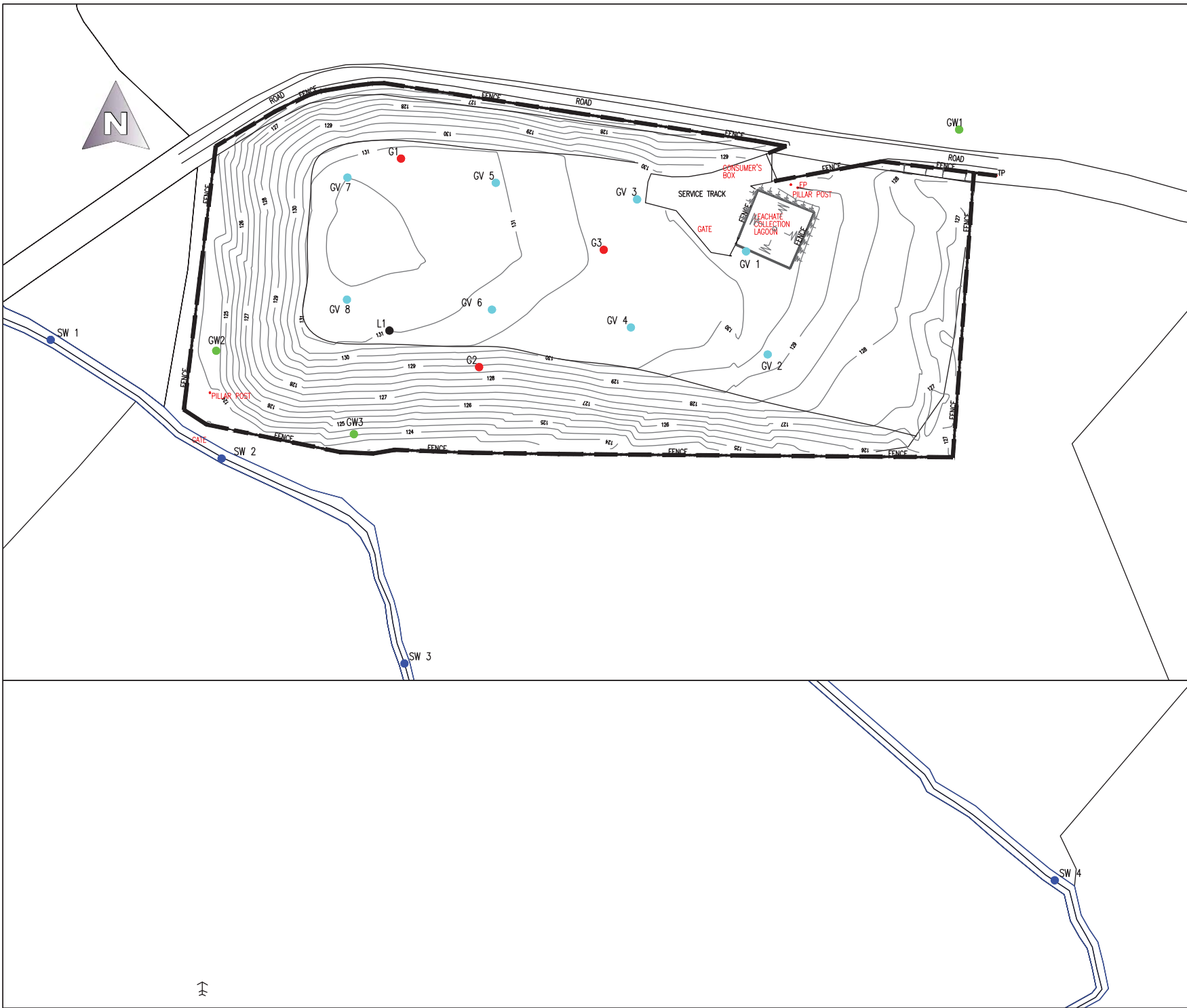


## Appendix A Drawings



rev	amendments	drawn	date
-----	------------	-------	------

 Enterprise Fund Business Centre Ballyraine Letterkenny Co. Donegal	T +353 74 9161927 F +353 74 9161928 W <a href="http://www.rpsgroup.com/ireland">www.rpsgroup.com/ireland</a> E <a href="mailto:ireland@rpsgroup.com">ireland@rpsgroup.com</a>	Drawing Number	Rev
		IBR1073/003	0
Project	Donegal Landfill Site Reporting 2017	Title	Balbane Landfill Site Location
Client	Donegal County Council	Architect	
Drawing Status	Sheet Size	Drawing Scale	Project Leader
Preliminary	A4	1:25,000	DD
			Drawn By
			AMB
			Date
			Apr '15
			Initial Review
			AMcG



**NOTES**

1. Verifying Dimensions.  
The contractor shall verify dimensions against such other drawings or site conditions as pertain to this part of the work.
2. Existing Services.  
Any information concerning the location of existing services indicated on this drawing is intended for general guidance only. It shall be the responsibility of the contractor to determine and verify the exact horizontal and vertical alignment of all cables, pipes, etc. (both underground and overhead) before work commences.
3. Issue of Drawings.  
Hard copies, dwf and pdf will form a controlled issue of the drawing. All other formats (dwg, dxf etc.) are deemed to be an uncontrolled issue and any work carried out based on these files is at the recipient's own risk. RPS will not accept any responsibility for any errors arising from the use of these files, either by human error by the recipient, listing of un-dimensioned measurements, compatibility issues with the recipient's software, and any errors arising when these files are used to aid the recipient's drawing production, or setting out on site.

4. Datum:

5. Keys:
- GV Gas Vents
  - L1 Leachate Monitoring Point
  - G1 Gas Monitoring Point
  - SW1 Surface Water Monitoring Point
  - GW1 Ground Waster Monitoring Point

A	Monitoring points updated	MC	Nov 15
rev	amendments	drawn	date

	RPS Consulting Engineers	T	+353 (0) 74 91 61927
	Enterprise Fund Business Centre	F	+353 (0) 74 91 61928
	Ballysine	W	www.rpsgroup.com/ireland
	Letterkenny	E	ireland@rpsgroup.com
Co. Donegal			

Client  
**Donegal County Council**

---

Project  
**Donegal Landfill Site Reporting 2017**

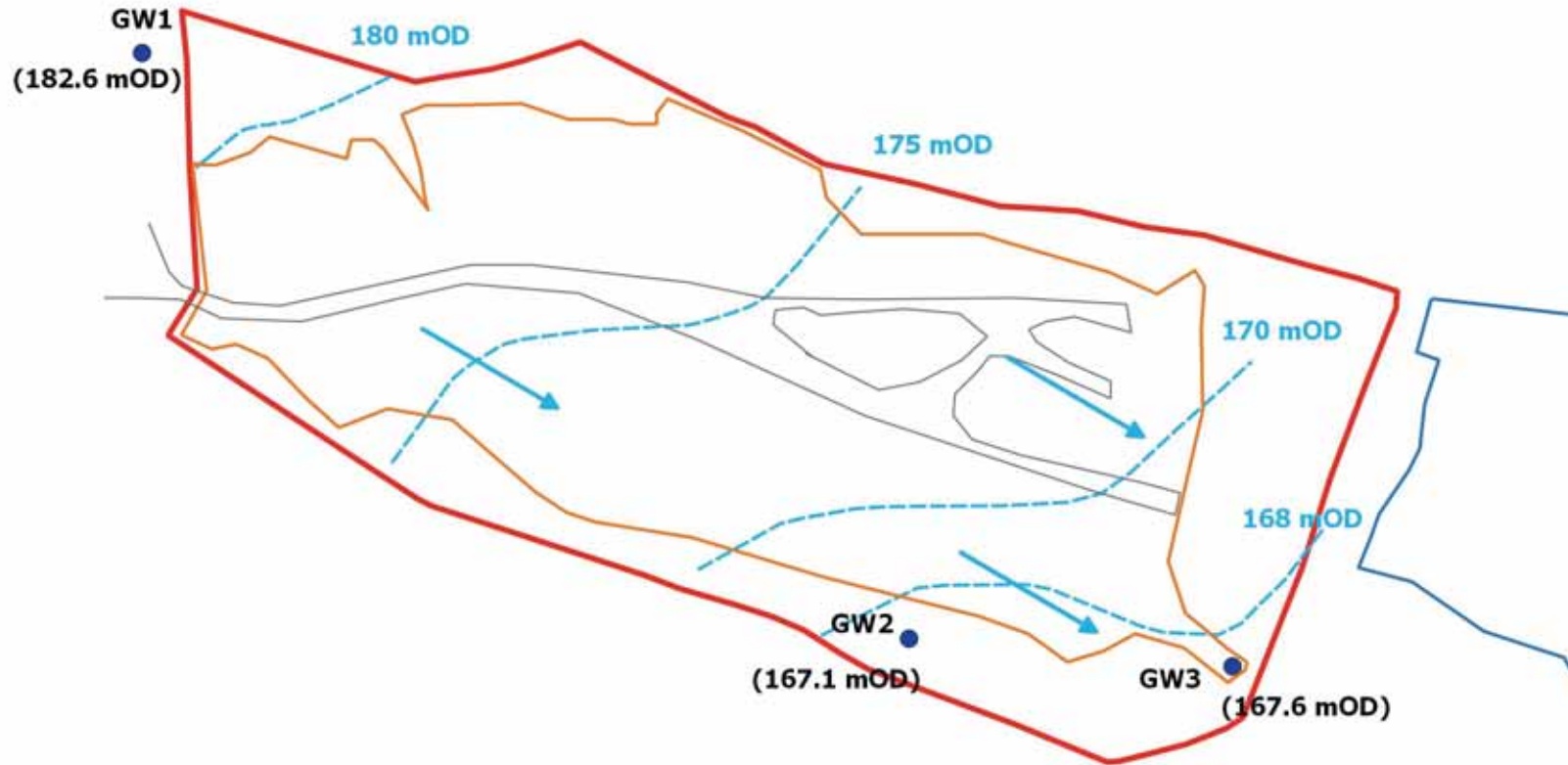
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Title  
**Glenalla LFS - Monitoring Points**

Drawing Status	Sheet Size	Drawing Scale
Preliminary	A3	1:1000

Drawing Number	Rev
<b>IBR1073 /006</b>	<b>A</b>

Project Leader	Drawn By	Date	Initial Review
DD	AMB	Apr '15	AMcG



### Legend

- Road
- Waste Boundary
- - - Groundwater Contours
- Stream
- Wells
- Site Boundary
- Groundwater Flow Direction

### Project

**Balbane Landfill  
Hydrogeological Risk  
Assessment**

Client

**Donegal County  
Council**

Drawing

**Figure 5**

Title

**Groundwater Contours  
September 2014**

**BlueRock**  
Environmental   
**The Hydrogeological and  
Contaminated Land Consultancy**

T 00353 863856884  
E admin@bluerockenv.ie  
W www.bluerockenvironmental.ie

File Ref : BRE14021  
Drawing Ref : BRE14021DG05  
Revision : V01  
Date : 09/09/2015  
Drawn by : SB  
Copyright : OSI EN0075112

## Appendix B

### Monitoring Information

**Appendix A - Monitoring Information**

**Table A1 Grid References of Monitoring Points**

Station Purpose	Station Name	Northing	Easting
Landfill Monitoring - Groundwater	Balbane GW 1	383193	171246
Landfill Monitoring - Groundwater	Balbane GW 2	383055	171427
Landfill Monitoring - Groundwater	Balbane GW 4	383048	171503
Landfill Monitoring - Surface Water	Balbane S 1	363215	171187
Landfill Monitoring - Surface Water	Balbane S 4	382720	171657
Landfill Monitoring - Surface Water	Balbane S 5	382673	171658
Landfill Monitoring - Surface Water	Balbane S 6	362314	171949
Landfill Monitoring - Surface Water	Balbane S 7	362297	171965
Landfill Monitoring - Leachates	BH 2 (Leachate)	383110	171339
Landfill Monitoring - Air Quality	BH1 (Gas)	383157	171300
Landfill Monitoring - Air Quality	BH2 (Gas)	383110	171339
Landfill Monitoring - Air Quality	BH3 (Gas)	383136	171476

**Table A2 Groundwater Parameters and Monitoring Frequencies**

Quarterly		Every Three Years (Due 2017)	
Temperature	Chloride	Boron	Magnesium
Groundwater Level	Dissolved Oxygen	Cadmium	Manganese
	Sodium	Calcium	Mercury
	TON	Chromium	Orthophosphate
	TOC	Copper	Zinc
	Phenols	Cyanide	
	Ammoniacal Nitrogen	Fluoride	
	Electrical Conductivity	Lead	
	pH	List I/II substances	
	Iron	Sulphate	
	Potassium		

**Table A3 Surface Water Parameters and Monitoring Frequencies**

Quarterly		Once Every Three Years (Due 2017)	
Temperature	Chloride	Iron	Magnesium
pH	Dissolved Oxygen	Cadmium	Manganese
Ammoniacal Nitrogen	COD	Calcium	Mercury
BOD		Chromium	Orthophosphate
Electrical Conductivity		Copper	Zinc
TSS		Sodium	Potassium
		Fluoride	TON
		Lead	Sulphate
		List I/II substances	

**Table A4 Landfill Gas Parameters and Monitoring Frequencies**

Quarterly
Atmospheric Pressure
Carbon Dioxide
Methane
Oxygen

## Appendix C

### Results of Monitoring





**Comhairle Contae Dhún na nGall**  
**Donegal County Council**  
**Central Laboratory, The Kube**  
**Magheranan**  
**Letterkenny**  
 074-9122787

<b>Sample No.:</b>	172500368	<b>Sample Date/Time:</b>	15/02/2017 @ 12:16
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane Gw 1	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly GW	<b>Analyst:</b>	ELS

**Sample Notes:**

**Customer Name:** Landfill Monitoring Donegal Co. Council  
**Contact Details:** Julie McMahon  
 Central Lab  
 The Kube, Magheranan  
 Letterkenny  
 0749122787: 0872861096  
 julie.mcmahon@donegalcoco.ie  
**Customer Ref:** Landfill Compliance Monitoring

**Sample No. Laboratory:** 172500368  
**Sample No. Customer:**  
**Date Received:** 15/02/2017  
**Mode Of Delivery:** cooler box  
**Condition On Delivery:** ok  
**Date Started:** 15/02/2017  
**Report Date:** 09/03/2017  
**Report Reference:** 17DL82

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l	5.4P-TMC20	--	--	15/02/17	380 ***
pH pH units	5.4P-TMC1	14	1	15/02/17	7
Ammonia N mg/l	5.4P-TMC5	--	--	17/02/17	0.086 ***
Chloride mg/l	5.4P-TMC14	--	--	17/02/17	14 ***
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	15/02/17	657
Depth m	5.4P-TMC27	--	--	15/02/17	0.5
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	15/02/17	7.68
Potassium mg/l		--	--	17/02/17	2 ***
Sodium mg/l		--	--	17/02/17	30.5 ***
Temperature Degrees C	5.4P-TMC1	100	--	15/02/17	9.3
Total Organic Carbon mg/l	5.4P-TMC10	--	--	17/02/17	9.75 ***
Total Oxidised Nitrogen N mg/l	5.4P-TMC5	--	--	17/02/17	0.27 ***
Visual Inspection Descriptive	5.4P-TMC26	--	--	15/02/17	Nothing Observed
Phenols mg/l		--	--	17/02/17	< 0.1 ***

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**27/03/2017**

*Dr. Joe Ferry, Laboratory Manager*

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 Original Test Report, unless otherwise indicated by the insertion of Supplementary Test Report in Report Reference section  
 In RESULT column, unaccredited in-house test result - no asterisk, \*inhouse accredited, \*\*unaccredited. & subcontracted, \*\*\* accredited. & sub-cont.



**Comhairle Contae Dhún na nGall**  
**Donegal County Council**  
**Central Laboratory, The Kube**  
**Magheranan**  
**Letterkenny**  
 074-9122787

<b>Sample No.:</b>	172500369	<b>Sample Date/Time:</b>	15/02/2017 @ 12:29
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane Gw 2	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly GW	<b>Analyst:</b>	ELS

**Sample Notes:**

**Customer Name:** Landfill Monitoring Donegal Co. Council  
**Contact Details:** Julie McMahon  
 Central Lab  
 The Kube, Magheranan  
 Letterkenny  
 0749122787: 0872861096  
 julie.mcmahon@donegalcoco.ie  
**Customer Ref:** Landfill Compliance Monitoring

**Sample No. Laboratory:** 172500369  
**Sample No. Customer:**  
**Date Received:** 15/02/2017  
**Mode Of Delivery:** cooler box  
**Condition On Delivery:** ok  
**Date Started:** 15/02/2017  
**Report Date:** 09/03/2017  
**Report Reference:** 17DL82

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l	5.4P-TMC20	--	--	17/02/17	340 ***
pH pH units	5.4P-TMC1	14	1	15/02/17	5.7
Ammonia N mg/l	5.4P-TMC5	--	--	17/02/17	1.002 **
Chloride mg/l	5.4P-TMC14	--	--	17/02/17	15 ***
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	15/02/17	85.8
Depth m	5.4P-TMC27	--	--	15/02/17	3.26
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	15/02/17	4.77
Potassium mg/l		--	--	17/02/17	1.1 ***
Sodium mg/l		--	--	17/02/17	8.1 ***
Temperature Degrees C	5.4P-TMC1	100	--	15/02/17	10.2
Total Organic Carbon mg/l	5.4P-TMC10	--	--	17/02/17	2.09 ***
Total Oxidised Nitrogen N mg/l	5.4P-TMC5	--	--	17/02/17	0.34 ***
Visual Inspection Descriptive	5.4P-TMC26	--	--	15/02/17	Nothing Observed
Phenols mg/l		--	--	17/02/17	< 0.1 ***

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*Seraldine Friel*

**27/03/2017**

*Dr. Joe Ferry, Laboratory Manager*

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**Comhairle Contae Dhún na nGall  
Donegal County Council  
Central Laboratory, The Kube  
Magheranan  
Letterkenny  
074-9122787**

<b>Sample No.:</b>	172500363	<b>Sample Date/Time:</b>	15/02/2017 @ 12:10
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 1	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	ELS

**Sample Notes:**

<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council	<b>Sample No. Laboratory:</b>	172500363
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787; 0872861096 julie.mcmahon@donegalcoco.ie	<b>Sample No. Customer:</b>	
<b>Customer Ref:</b>	Landfill Compliance Monitoring	<b>Date Received:</b>	15/02/2017
		<b>Mode Of Delivery:</b>	cooler box
		<b>Condition On Delivery:</b>	ok
		<b>Date Started:</b>	15/02/2017
		<b>Report Date:</b>	03/03/2017
		<b>Report Reference:</b>	17DL82

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	17/02/17	0.009 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	17/02/17	1.1 ***
Chloride mg/l	5.4P-TMC14	--	--	17/02/17	18 ***
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	15/02/17	72.1
pH pH units	5.4P-TMC1	--	--	15/02/17	6.1
Total Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	15/02/17	11.15
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/02/17	< 8 ***
Temperature Degrees C	5.4P-TMC1	--	--	15/02/17	10
Visual Inspection Descriptive	5.4P-TMC26	--	--	15/02/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***

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**27/03/2017**

PP. Dr. Joe Ferry, Laboratory Manager

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Original Test Report, unless otherwise indicated by the insertion of Supplementary Test Report in Report Reference section  
In RESULT column, unaccredited in-house test result - no asterisk, \*inhouse accred., \*\*unaccred. & subcontracted, \*\*\* accred. & sub-cont.



**Comhairle Contae Dhún na nGall**  
**Donegal County Council**  
**Central Laboratory, The Kube**  
**Magheranan**  
**Letterkenny**  
 074-9122787

<b>Sample No.:</b>	172500364	<b>Sample Date/Time:</b>	15/02/2017 @ 13:30
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 4	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	ELS

**Sample Notes:**

**Customer Name:** Landfill Monitoring Donegal Co. Council  
**Contact Details:** Julie McMahon  
 Central Lab  
 The Kube, Magheranan  
 Letterkenny  
 0749122787; 0872861096  
 julie.mcmahon@donegalcoco.ie  
**Customer Ref:** Landfill Compliance Monitoring

**Sample No. Laboratory:** 172500364  
**Sample No. Customer:**  
**Date Received:** 15/02/2017  
**Mode Of Delivery:** cooler box  
**Condition On Delivery:** ok  
**Date Started:** 15/02/2017  
**Report Date:** 03/03/2017  
**Report Reference:** 17DL82

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	17/02/17	2.667 **
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	17/02/17	1.4 ***
Chloride mg/l	5.4P-TMC14	--	--	17/02/17	34 ***
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	15/02/17	358
pH pH units	5.4P-TMC1	--	--	15/02/17	7.4
Total Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	15/02/17	11
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/02/17	< 8 ***
Temperature Degrees C	5.4P-TMC1	--	--	15/02/17	10.2
Visual Inspection Descriptive	5.4P-TMC26	--	--	15/02/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***

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*Geraldine Friel*

**27/03/2017**

*Dr. Joe Ferry, Laboratory Manager*

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**Comhairle Contae Dhún na nGall  
Donegal County Council  
Central Laboratory, The Kube  
Magheranan  
Letterkenny  
074-9122787**

<b>Sample No.:</b> 172500365	<b>Sample Date/Time:</b> 15/02/2017 @ 13:37
<b>Category:</b> Landfill Monitoring	<b>Sample Method:</b> Grab
<b>Entity:</b> Balbane Landfill	<b>Sampled By:</b> Fionnuala Bonner
<b>Station:</b> Balbane S 5	<b>Laboratory:</b> Donegal Co Co
<b>Template:</b> Balbane Quarterly SW	<b>Analyst:</b> ELS

<b>Sample Notes:</b>	<b>Sample No. Laboratory:</b> 172500365
<b>Customer Name:</b> Landfill Monitoring Donegal Co. Council	<b>Sample No. Customer:</b>
<b>Contact Details:</b> Julie McMahon	<b>Date Received:</b> 15/02/2017
Central Lab	<b>Mode Of Delivery:</b> cooler box
The Kube, Magheranan	<b>Condition On Delivery:</b> ok
Letterkenny	<b>Date Started:</b> 15/02/2017
0749122787: 0872861096	<b>Report Date:</b> 03/03/2017
julie.mcmahon@donegalcoco.ie	<b>Report Reference:</b> 17DL82
<b>Customer Ref:</b> Landfill Compliance Monitoring	

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	17/02/17	3.196 **
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	17/02/17	1.7 ***
Chloride mg/l	5.4P-TMC14	--	--	17/02/17	33 ***
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	15/02/17	360
pH pH units	5.4P-TMC1	--	--	15/02/17	7.7
Total Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	9 ***
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	15/02/17	11.44
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/02/17	10 ***
Temperature Degrees C	5.4P-TMC1	--	--	15/02/17	10.1
Visual Inspection Descriptive	5.4P-TMC26	--	--	15/02/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	9 ***

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*Geraldine Friel*

**27/03/2017**

*Dr. Joe Ferry, Laboratory Manager*

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**Comhairle Contae Dhún na nGall  
Donegal County Council  
Central Laboratory, The Kube  
Magheranan  
Letterkenny  
074-9122787**

<b>Sample No.:</b> 172500366	<b>Sample Date/Time:</b> 15/02/2017 @ 13:55
<b>Category:</b> Landfill Monitoring	<b>Sample Method:</b> Grab
<b>Entity:</b> Balbane Landfill	<b>Sampled By:</b> Fionnuala Bonner
<b>Station:</b> Balbane S 6	<b>Laboratory:</b> Donegal Co Co
<b>Template:</b> Balbane Quarterly SW	<b>Analyst:</b> ELS

<b>Sample Notes:</b>	<b>Sample No. Laboratory:</b> 172500366
<b>Customer Name:</b> Landfill Monitoring Donegal Co. Council	<b>Sample No. Customer:</b>
<b>Contact Details:</b> Julie McMahon	<b>Date Received:</b> 15/02/2017
Central Lab	<b>Mode Of Delivery:</b> cooler box
The Kube, Magheranan	<b>Condition On Delivery:</b> ok
Letterkenny	<b>Date Started:</b> 15/02/2017
0749122787: 0872861096	<b>Report Date:</b> 03/03/2017
julie.mcmahon@donegalcoco.ie	<b>Report Reference:</b> 17DL82
<b>Customer Ref:</b> Landfill Compliance Monitoring	

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	17/02/17	1.59 **
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	17/02/17	1.6 ***
Chloride mg/l	5.4P-TMC14	--	--	17/02/17	31 ***
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	15/02/17	292
pH pH units	5.4P-TMC1	--	--	15/02/17	7.3
Total Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	15/02/17	10.97
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/02/17	< 8 ***
Temperature Degrees C	5.4P-TMC1	--	--	15/02/17	9.7
Visual Inspection Descriptive	5.4P-TMC26	--	--	15/02/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***

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*Geraldine Friel*

**27/03/2017**

*R. Dr. Joe Ferry, Laboratory Manager*

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**Comhairle Contae Dhún na nGall**  
**Donegal County Council**  
**Central Laboratory, The Kube**  
**Magheranan**  
**Letterkenny**  
 074-9122787

<b>Sample No.:</b>	172500367	<b>Sample Date/Time:</b>	15/02/2017 @ 14:08
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 7	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	ELS

<b>Sample Notes:</b>		<b>Sample No. Laboratory:</b>	172500367
<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council	<b>Sample No. Customer:</b>	
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie	<b>Date Received:</b>	15/02/2017
		<b>Mode Of Delivery:</b>	cooler box
		<b>Condition On Delivery:</b>	ok
		<b>Date Started:</b>	15/02/2017
<b>Customer Ref:</b>	Landfill Compliance Monitoring	<b>Report Date:</b>	27/03/2017
		<b>Report Reference:</b>	17DL82

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	17/02/17	0.031 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	17/02/17	1 ***
Chloride mg/l	5.4P-TMC14	--	--	17/02/17	17 ***
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	15/02/17	116.3
pH pH units	5.4P-TMC1	--	--	15/02/17	7.3
Total Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	15/02/17	11.63
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/02/17	< 8 ***
Temperature Degrees C	5.4P-TMC1	--	--	15/02/17	9.7
Visual Inspection Descriptive	5.4P-TMC26	--	--	15/02/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	17/02/17	< 5 ***

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**27/03/2017**

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**Comhairle Contae Dhún na nGall  
Donegal County Council  
Central Laboratory, The Kube  
Magheranan  
Letterkenny  
074-9122787**

<b>Sample No.:</b>	172500573	<b>Sample Date/Time:</b>	15/02/2017 @ 12:21
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Nigel Breslin
<b>Station:</b>	Bh1 (Gas)	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Landfill Monitoring - Landfill Gas	<b>Analyst:</b>	ELS

<b>Sample Notes:</b>		<b>Sample No. Laboratory:</b>	172500573
<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council	<b>Sample No. Customer:</b>	
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie	<b>Date Received:</b>	15/02/2017
		<b>Mode Of Delivery:</b>	Field Test
		<b>Condition On Delivery:</b>	N/A
		<b>Date Started:</b>	15/02/2017
<b>Customer Ref:</b>	Landfill Compliance Monitoring	<b>Report Date:</b>	09/03/2017
		<b>Report Reference:</b>	17DL82

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Pressure mBar	5.4P-TMC23	--	--	15/02/17	1021
Carbon Dioxide %	5.4P-TMC23	--	--	15/02/17	9.2
Methane %	5.4P-TMC23	--	--	15/02/17	18.4
Oxygen %	5.4P-TMC23	--	--	15/02/17	1.4

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**27/03/2017**

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**Comhairle Contae Dhún na nGall**  
**Donegal County Council**  
**Central Laboratory,**  
**Stranorlar Wastewater Treatment Plant,**  
**Railway Road, Stranorlar, Co. Donegal.**  
 074-9153900

<b>Sample No.:</b>	172501359	<b>Sample Date/Time:</b>	16/05/2017 @ 13:30
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane Gw 1	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Quarterly GW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council	<b>Sample No. Laboratory:</b>	172501359
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie	<b>Sample No. Customer:</b>	
		<b>Date Received:</b>	16/05/2017
		<b>Mode Of Delivery:</b>	cooler box
		<b>Condition On Delivery:</b>	ok
		<b>Date Started:</b>	16/05/2017
<b>Customer Ref:</b>	Landfill Compliance Monitoring	<b>Report Date:</b>	08/06/2017
		<b>Report Reference:</b>	17DL222

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l	5.4P-TMC20	--	--	18/05/17	2600 **
pH pH units	5.4P-TMC1	14	1	16/05/17	6.78
Ammonia N mg/l	5.4P-TMC5	--	--	18/05/17	0.188 ***
Chloride mg/l	5.4P-TMC14	--	--	17/05/17	4.9
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	16/05/17	468
Depth m	5.4P-TMC27	--	--	16/05/17	8.62
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	16/05/17	3.49
Potassium mg/l		--	--	18/05/17	2.2 ***
Sodium mg/l		--	--	18/05/17	33.3 ***
Temperature Degrees C	5.4P-TMC1	100	--	16/05/17	16.8
Total Organic Carbon mg/l	5.4P-TMC10	--	--	18/05/17	11.15 ***
Total Oxidised Nitrogen N mg/l	5.4P-TMC5	--	--	18/05/17	0.2 ***
Visual Inspection Descriptive	5.4P-TMC26	--	--	16/05/17	Nothing Observed
Phenols mg/l		--	--	18/05/17	< 0.1 ***
Ortho-Phosphate P mg/l	5.4P-TMC6	--	--		
Nitrite N mg/l	5.4P-TMC6	--	--		
Nitrate N mg/l	5.4P-TMC6	--	--		
Iron Dissolved µg/l		--	--		

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**Donegal County Council**  
**Central Laboratory,**  
**Stranorlar Wastewater Treatment Plant,**  
**Railway Road, Stranorlar, Co. Donegal.**  
 074-9153900

<b>Sample No.:</b>	172501360	<b>Sample Date/Time:</b>	16/05/2017 @ 13:59
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane Gw 2	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Quarterly GW	<b>Analyst:</b>	Fionnuala Bonner

<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council	<b>Sample No. Laboratory:</b>	172501360
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie	<b>Sample No. Customer:</b>	
		<b>Date Received:</b>	16/05/2017
		<b>Mode Of Delivery:</b>	cooler box
		<b>Condition On Delivery:</b>	ok
		<b>Date Started:</b>	16/05/2017
		<b>Report Date:</b>	08/06/2017
<b>Customer Ref:</b>	Landfill Compliance Monitoring	<b>Report Reference:</b>	17DL222

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l	5.4P-TMC20	--	--	18/05/17	31 **
pH pH units	5.4P-TMC1	14	1	16/05/17	6.14
Ammonia N mg/l	5.4P-TMC5	--	--	18/05/17	0.579 ***
Chloride mg/l	5.4P-TMC14	--	--	17/05/17	9.9
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	16/05/17	45.2
Depth m	5.4P-TMC27	--	--	16/05/17	4.11
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	16/05/17	5.27
Potassium mg/l		--	--	18/05/17	0.9 ***
Sodium mg/l		--	--	18/05/17	6.9 ***
Temperature Degrees C	5.4P-TMC1	100	--	16/05/17	16.7
Total Organic Carbon mg/l	5.4P-TMC10	--	--	18/05/17	3 ***
Total Oxidised Nitrogen N mg/l	5.4P-TMC5	--	--	18/05/17	0.34 ***
Visual Inspection Descriptive	5.4P-TMC26	--	--	16/05/17	Nothing Observed
Phenols mg/l		--	--	18/05/17	< 0.1 ***
Ortho-Phosphate P mg/l	5.4P-TMC6	--	--		
Nitrite N mg/l	5.4P-TMC6	--	--		
Nitrate N mg/l	5.4P-TMC6	--	--		
Iron Dissolved µg/l		--	--		

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**Central Laboratory,**  
**Stranorlar Wastewater Treatment Plant,**  
**Railway Road, Stranorlar, Co. Donegal.**  
 074-9153900

<b>Sample No.:</b>	172501338	<b>Sample Date/Time:</b>	16/05/2017 @ 13:37
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 1	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council	<b>Sample No. Laboratory:</b>	172501338
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie	<b>Sample No. Customer:</b>	
		<b>Date Received:</b>	16/05/2017
		<b>Mode Of Delivery:</b>	cooler box
		<b>Condition On Delivery:</b>	ok
		<b>Date Started:</b>	16/05/2017
		<b>Report Date:</b>	08/06/2017
<b>Customer Ref:</b>	Landfill Compliance Monitoring	<b>Report Reference:</b>	17DL222

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	18/05/17	< 0.005 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	19/05/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	17/05/17	4.9
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	16/05/17	36.7
pH pH units	5.4P-TMC1	--	--	16/05/17	7.18
Total Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	16/05/17	8.83
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/05/17	22
Temperature Degrees C	5.4P-TMC1	--	--	16/05/17	17.6
Visual Inspection Descriptive	5.4P-TMC26	--	--	16/05/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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**Central Laboratory,**  
**Stranorlar Wastewater Treatment Plant,**  
**Railway Road, Stranorlar, Co. Donegal.**  
 074-9153900

<b>Sample No.:</b>	172501355	<b>Sample Date/Time:</b>	16/05/2017 @ 14:30
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 4	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

<b>Sample Notes:</b>	
<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie
<b>Sample No. Laboratory:</b>	172501355
<b>Sample No. Customer:</b>	
<b>Date Received:</b>	16/05/2017
<b>Mode Of Delivery:</b>	cooler box
<b>Condition On Delivery:</b>	ok
<b>Date Started:</b>	16/05/2017
<b>Report Date:</b>	08/06/2017
<b>Report Reference:</b>	17DL222

**Customer Ref:** Landfill Compliance Monitoring

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	18/05/17	0.022 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	19/05/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	17/05/17	4.9
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	16/05/17	68.9
pH pH units	5.4P-TMC1	--	--	16/05/17	7.46
Total Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	16/05/17	9.2
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/05/17	19
Temperature Degrees C	5.4P-TMC1	--	--	16/05/17	17.4
Visual Inspection Descriptive	5.4P-TMC26	--	--	16/05/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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*Fionnuala Bonner*

**08/06/2017**

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**Stranorlar Wastewater Treatment Plant,**  
**Railway Road, Stranorlar, Co. Donegal.**  
 074-9153900

<b>Sample No.:</b>	172501356	<b>Sample Date/Time:</b>	16/05/2017 @ 14:36
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 5	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council	<b>Sample No. Laboratory:</b>	172501356
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie	<b>Sample No. Customer:</b>	
		<b>Date Received:</b>	16/05/2017
		<b>Mode Of Delivery:</b>	cooler box
		<b>Condition On Delivery:</b>	ok
		<b>Date Started:</b>	16/05/2017
		<b>Report Date:</b>	08/06/2017
<b>Customer Ref:</b>	Landfill Compliance Monitoring	<b>Report Reference:</b>	17DL222

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	18/05/17	11.906 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	19/05/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	17/05/17	34.7
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	16/05/17	165.5
pH pH units	5.4P-TMC1	--	--	16/05/17	7.33
Total Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	16/05/17	9.1
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/05/17	16
Temperature Degrees C	5.4P-TMC1	--	--	16/05/17	17.4
Visual Inspection Descriptive	5.4P-TMC26	--	--	16/05/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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Comhairle Contae Dhún na nGall  
Donegal County Council  
Central Laboratory,  
Stranorlar Wastewater Treatment Plant,  
Railway Road, Stranorlar, Co. Donegal.  
074-9153900

Sample No.: 172501357      Sample Date/Time: 16/05/2017 @ 14:45  
Category: Landfill Monitoring      Sample Method: Grab  
Entity: Balbane Landfill      Sampled By: Fionnuala Bonner  
Station: Balbane S 6      Laboratory: Donegal Co Council  
Template: Balbane Quarterly SW      Analyst: Fionnuala Bonner

## Sample Notes:

Customer Name: Landfill Monitoring Donegal Co. Council      Sample No. Laboratory: 172501357  
Contact Details: Julie McMahon      Sample No. Customer:  
Central Lab      Date Received: 16/05/2017  
The Kube, Magheranan      Mode Of Delivery: cooler box  
Letterkenny      Condition On Delivery: ok  
0749122787: 0872861096      Date Started: 16/05/2017  
julie.mcmahon@donegalcoco.ie      Report Date: 08/06/2017  
Customer Ref: Landfill Compliance Monitoring      Report Reference: 17DL222

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	18/05/17	0.015 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	19/05/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	17/05/17	5.9
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	16/05/17	68.9
pH pH units	5.4P-TMC1	--	--	16/05/17	7.41
Total Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	16/05/17	8.89
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/05/17	19
Temperature Degrees C	5.4P-TMC1	--	--	16/05/17	17.6
Visual Inspection Descriptive	5.4P-TMC26	--	--	16/05/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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**Central Laboratory,**  
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 074-9153900

**Sample No.:** 172501358      **Sample Date/Time:** 16/05/2017 @ 14:56  
**Category:** Landfill Monitoring      **Sample Method:** Grab  
**Entity:** Balbane Landfill      **Sampled By:** Fionnuala Bonner  
**Station:** Balbane S 7      **Laboratory:** Donegal Co Council  
**Template:** Balbane Quarterly SW      **Analyst:** Fionnuala Bonner

**Sample Notes:**

**Customer Name:** Landfill Monitoring Donegal Co. Council      **Sample No. Laboratory:** 172501358  
**Contact Details:** Julie McMahon      **Sample No. Customer:**  
 Central Lab      **Date Received:** 16/05/2017  
 The Kube, Magheranan      **Mode Of Delivery:** cooler box  
 Letterkenny      **Condition On Delivery:** ok  
 0749122787: 0872861096      **Date Started:** 16/05/2017  
 julie.mcmahon@donegalcoco.ie      **Report Date:** 08/06/2017  
**Customer Ref:** Landfill Compliance Monitoring      **Report Reference:** 17DL222

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	18/05/17	< 0.005 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	19/05/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	17/05/17	3.9
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	16/05/17	51.2
pH pH units	5.4P-TMC1	--	--	16/05/17	7.19
Total Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	16/05/17	9.19
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	17/05/17	16
Temperature Degrees C	5.4P-TMC1	--	--	16/05/17	17.5
Visual Inspection Descriptive	5.4P-TMC26	--	--	16/05/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	16/05/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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<b>Sample No.:</b>	172501347	<b>Sample Date/Time:</b>	16/05/2017 @ 13:44
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Bh1 (Gas)	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Landfill Monitoring - Landfill Gas	<b>Analyst:</b>	Fionnuala Bonner

<b>Sample Notes:</b>	
<b>Customer Name:</b>	Landfill Monitoring Donegal Co. Council
<b>Contact Details:</b>	Julie McMahon Central Lab The Kube, Magheranan Letterkenny 0749122787: 0872861096 julie.mcmahon@donegalcoco.ie
<b>Customer Ref:</b>	Landfill Compliance Monitoring
<b>Sample No. Laboratory:</b>	172501347
<b>Sample No. Customer:</b>	
<b>Date Received:</b>	16/05/2017
<b>Mode Of Delivery:</b>	Field Test
<b>Condition On Delivery:</b>	N/A
<b>Date Started:</b>	16/05/2017
<b>Report Date:</b>	30/05/2017
<b>Report Reference:</b>	17DL222

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Pressure mBar	5.4P-TMC23	--	--	16/05/17	994
Carbon Dioxide %	5.4P-TMC23	--	--	16/05/17	8.9
Methane %	5.4P-TMC23	--	--	16/05/17	17.6
Oxygen %	5.4P-TMC23	--	--	16/05/17	1.3

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<b>Sample No.:</b> 172502453	<b>Sample Date/Time:</b> 27/07/2017 @ 12:40
<b>Category:</b> Landfill Monitoring	<b>Sample Method:</b> Grab
<b>Entity:</b> Balbane Landfill	<b>Sampled By:</b> Fionnuala Bonner
<b>Station:</b> Balbane Gw 1	<b>Laboratory:</b> Donegal Co Co
<b>Template:</b> Balbane Quarterly GW	<b>Analyst:</b> Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l	5.4P-TMC20	--	--	31/07/17	210 ***
pH pH units	5.4P-TMC1	14	1	27/07/17	7.13
Ammonia N mg/l	5.4P-TMC5	--	--	31/07/17	< 0.005 ***
Chloride mg/l	5.4P-TMC14	--	--	27/07/17	4.96
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	27/07/17	38
Depth m	5.4P-TMC27	--	--	27/07/17	0.31
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	27/07/17	9.41
Potassium mg/l		--	--	31/07/17	0.4 ***
Sodium mg/l		--	--	31/07/17	4.5 ***
Temperature Degrees C	5.4P-TMC1	100	--	27/07/17	17.7
Total Organic Carbon mg/l	5.4P-TMC10	--	--	31/07/17	8.96 ***
Total Oxidised Nitrogen N mg/l	5.4P-TMC5	--	--	31/07/17	< 0.15 ***
Visual Inspection Descriptive	5.4P-TMC26	--	--	27/07/17	Nothing Observed
Phenols mg/l		--	--	31/07/17	< 0.1 ***
Ortho-Phosphate P mg/l	5.4P-TMC6	--	--		
Nitrite N mg/l	5.4P-TMC6	--	--		
Nitrate N mg/l	5.4P-TMC6	--	--		
Iron Dissolved µg/l		--	--		

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<b>Sample No.:</b>	172502454	<b>Sample Date/Time:</b>	27/07/2017 @ 13:30
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane Gw 2	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly GW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l	5.4P-TMC20	--	--	31/07/17	48 ***
pH pH units	5.4P-TMC1	14	1	27/07/17	6.31
Ammonia N mg/l	5.4P-TMC5	--	--	31/07/17	3.444
Chloride mg/l	5.4P-TMC14	--	--	27/07/17	5.96
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	27/07/17	57.5
Depth m	5.4P-TMC27	--	--	27/07/17	2.14
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	27/07/17	6.19
Potassium mg/l		--	--	31/07/17	2.1 ***
Sodium mg/l		--	--	31/07/17	2.5 ***
Temperature Degrees C	5.4P-TMC1	100	--	27/07/17	17.1
Total Organic Carbon mg/l	5.4P-TMC10	--	--	31/07/17	3.26 ***
Total Oxidised Nitrogen N mg/l	5.4P-TMC5	--	--	31/07/17	1.8 ***
Visual Inspection Descriptive	5.4P-TMC26	--	--	27/07/17	Nothing Observed
Phenols mg/l		--	--	31/07/17	< 0.1 ***
Ortho-Phosphate P mg/l	5.4P-TMC6	--	--		
Nitrite N mg/l	5.4P-TMC6	--	--	31/07/17	--
Nitrate N mg/l	5.4P-TMC6	--	--		
Iron Dissolved µg/l		--	--		

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*Fionnuala Bonner*

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<b>Sample No.:</b>	172502448	<b>Sample Date/Time:</b>	27/07/2017 @ 12:47
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 1	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	31/07/17	1.997
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	31/07/17	1.6 ***
Chloride mg/l	5.4P-TMC14	--	--	27/07/17	6.95
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	27/07/17	424
pH pH units	5.4P-TMC1	--	--	27/07/17	6.71
Total Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	7
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	27/07/17	3.13
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	31/07/17	7
Temperature Degrees C	5.4P-TMC1	--	--	27/07/17	17.7
Visual Inspection Descriptive	5.4P-TMC26	--	--	27/07/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	7
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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*Samuel Bonner*

**03/10/2017**

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<b>Sample No.:</b>	172502449	<b>Sample Date/Time:</b>	27/07/2017 @ 13:35
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 4	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	31/07/17	2.867
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	31/07/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	27/07/17	48.64
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	27/07/17	83.1
pH pH units	5.4P-TMC1	--	--	27/07/17	7.35
Total Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	27/07/17	9.59
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	31/07/17	9
Temperature Degrees C	5.4P-TMC1	--	--	27/07/17	16.9
Visual Inspection Descriptive	5.4P-TMC26	--	--	27/07/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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*Fionnuala Bonner*

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<b>Sample No.:</b>	172502450	<b>Sample Date/Time:</b>	27/07/2017 @ 13:42
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 5	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	31/07/17	0.184 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	31/07/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	27/07/17	10.92
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	27/07/17	87.6
pH pH units	5.4P-TMC1	--	--	27/07/17	7.38
Total Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	27/07/17	9.53
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	31/07/17	2
Temperature Degrees C	5.4P-TMC1	--	--	27/07/17	17.6
Visual Inspection Descriptive	5.4P-TMC26	--	--	27/07/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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<b>Sample No.:</b>	172502451	<b>Sample Date/Time:</b>	27/07/2017 @ 13:59
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 6	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	31/07/17	0.065 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	31/07/17	< 1 ***
Chloride mg/l	5.4P-TMC14	--	--	27/07/17	10.92
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	27/07/17	74.6
pH pH units	5.4P-TMC1	--	--	27/07/17	7.24
Total Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	27/07/17	9.41
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	31/07/17	5
Temperature Degrees C	5.4P-TMC1	--	--	27/07/17	18
Visual Inspection Descriptive	5.4P-TMC26	--	--	27/07/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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<b>Sample No.:</b>	172502452	<b>Sample Date/Time:</b>	27/07/2017 @ 14:07
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 7	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Balbane Quarterly SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l	5.4P-TMC5	--	--	31/07/17	0.005 ***
Biological Oxygen Demand mg/l	5.4P-TMC9	--	--	31/07/17	1.1 ***
Chloride mg/l	5.4P-TMC14	--	--	27/07/17	5.96
Conductivity @ 20°C µS/cm	5.4P-TMC2	--	--	27/07/17	56.8
pH pH units	5.4P-TMC1	--	--	27/07/17	7.7
Total Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Dissolved Oxygen mg/l	5.4P-TMC18	--	--	27/07/17	9.16
COD Chemical Oxygen Demand mg/l	5.4P-TMC3	--	--	31/07/17	3
Temperature Degrees C	5.4P-TMC1	--	--	27/07/17	18
Visual Inspection Descriptive	5.4P-TMC26	--	--	27/07/17	Nothing Observed
Suspended Solids mg/l	5.4P-TMC4	--	--	31/07/17	6
Ortho-Phosphate P mg/l	5.4P-TMC5	--	--		
Nitrite N mg/l	5.4P-TMC5	--	--		
Nitrate N mg/l	5.4P-TMC5	--	--		

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**Railway Road, Stranorlar, Co. Donegal.**  
 074-9153900

<b>Sample No.:</b>	172500721	<b>Sample Date/Time:</b>	25/10/2017 @ 11:52
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane Gw 1	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Annual GW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l		--	--	27/10/17	2700
pH pH units		14	1	25/10/17	6.61
Ammonia N mg/l		--	--	27/10/17	0.55
Boron µg/l		--	--	27/10/17	0.05 ***
Cadmium µg/l		--	--		
Calcium µg/l		--	--	27/10/17	52 ***
Chloride mg/l		--	--	31/10/17	2
Chromium µg/l		--	--	27/10/17	< 1 ***
Conductivity @ 20°C µS/cm		--	--	25/10/17	349
Copper µg/l		--	--	27/10/17	< 0.003 ***
Cyanide µg/l		--	--	27/11/17	< 1 ***
Depth m		--	--	25/10/17	0.3
Dissolved Oxygen mg/l		--	--	25/10/17	5.35
Fluoride mg/l		--	--	27/10/17	< 0.1 ***
Lead µg/l		--	--	27/10/17	< 0.3 ***
Magnesium µg/l		--	--	27/10/17	5900 ***
Manganese µg/l		--	--	27/11/17	5000
Mercury µg/l		--	--	27/10/17	< 0.02 ***
Ortho-Phosphate P mg/l		--	--	27/10/17	0.006 ***
Phenols µg/l		--	--	27/10/17	< 0.1 ***
Potassium mg/l		--	--	27/10/17	2 ***
Dry Residues mg/l		--	--		
Sodium mg/l		--	--	27/10/17	29.9 ***
Sulphate mg/l		--	--	27/10/17	7.9 ***
Temperature Degrees C		100	--	25/10/17	12.9
Total Organic Carbon mg/l		--	--	27/10/17	4.86 ***
Total Oxidised Nitrogen N mg/l		--	--	27/10/17	0.72 ***
Total Phosphorus P mg/l		--	--	27/11/17	0.006 ***
Visual Inspection Descriptive		--	--	25/10/17	Nothing Observed
Zinc µg/l		--	--	27/10/17	150

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*F. Bonner*

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<b>Sample No.:</b>	172500722	<b>Sample Date/Time:</b>	25/10/2017 @ 12:25
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane Gw 2	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Annual GW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Iron µg/l		--	--	27/10/17	29 ***
pH pH units		14	1	25/10/17	6.43
Ammonia N mg/l		--	--	27/10/17	0.012 ***
Boron µg/l		--	--	27/10/17	0.05 ***
Cadmium µg/l		--	--		
Calcium µg/l		--	--	27/10/17	2.4 ***
Chloride mg/l		--	--	31/10/17	0
Chromium µg/l		--	--	27/10/17	< 1 ***
Conductivity @ 20°C µS/cm		--	--	25/10/17	38
Copper µg/l		--	--	27/10/17	0.003 ***
Cyanide µg/l		--	--	27/10/17	< 1 ***
Depth m		--	--	27/11/17	2.1
Dissolved Oxygen mg/l		--	--	27/11/17	10
Fluoride mg/l		--	--	27/10/17	< 0.1 ***
Lead µg/l		--	--	27/10/17	< 0.3 ***
Magnesium µg/l		--	--	27/10/17	600 ***
Manganese µg/l		--	--	27/10/17	55 ***
Mercury µg/l		--	--	25/10/17	0.11 ***
Ortho-Phosphate P mg/l		--	--	27/10/17	0.784
Phenols µg/l		--	--	25/10/17	< 0.1 ***
Potassium mg/l		--	--	25/10/17	1.1 ***
Dry Residues mg/l		--	--		
Sodium mg/l		--	--	25/10/17	7 ***
Sulphate mg/l		--	--	27/10/17	< 1 ***
Temperature Degrees C		100	--	25/10/17	14.5
Total Organic Carbon mg/l		--	--	25/10/17	1.37 ***
Total Oxidised Nitrogen N mg/l		--	--	27/10/17	1.3 ***
Total Phosphorus P mg/l		--	--	27/11/17	0.784
Visual Inspection Descriptive		--	--	25/10/17	Nothing Observed
Zinc µg/l		--	--	25/10/17	100

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<b>Sample No.:</b>	172500262	<b>Sample Date/Time:</b>	25/10/2017 @ 11:45
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 1	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Annual SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l		--	--	27/10/17	0.009
Biological Oxygen Demand mg/l		--	--	31/10/17	1
Chloride mg/l		--	--	31/10/17	10
Conductivity @ 20°C µS/cm		--	--	25/10/17	56.7
pH pH units		--	--	25/10/17	6.71
Total Suspended Solids mg/l		--	--	27/10/17	27
Cadmium µg/l		--	--	27/10/17	< 0.1
Calcium µg/l		--	--	27/10/17	3100
COD Chemical Oxygen Demand mg/l		--	--	31/10/17	< 20
Chromium µg/l		--	--	27/10/17	< 1
Copper µg/l		--	--	27/10/17	< 0.003
Dissolved Oxygen mg/l		--	--	25/10/17	10.88
Iron µg/l		--	--	27/10/17	150
Lead µg/l		--	--	27/10/17	< 0.3
Magnesium µg/l		--	--	27/10/17	1
Manganese µg/l		--	--	27/10/17	28
Mercury µg/l		--	--	27/10/17	0.15
Ortho-Phosphate P mg/l		--	--	27/10/17	< 0.005
Potassium mg/l		--	--	27/10/17	0
Sodium mg/l		--	--	27/10/17	9
Sulphate mg/l		--	--	27/10/17	< 1
Temperature Degrees C		--	--	25/10/17	13
Total Oxidised Nitrogen N mg/l		--	--	27/10/17	< 0.15
Total Phosphorus P mg/l		--	--		
Visual Inspection Descriptive		--	--	25/10/17	Nothing Observed
Zinc µg/l		--	--	27/10/17	78.6

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 074-9153900

<b>Sample No.:</b>	172500717	<b>Sample Date/Time:</b>	25/10/2017 @ 12:59
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 4	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Annual SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l		--	--	27/10/17	3.797
Biological Oxygen Demand mg/l		--	--	31/10/17	1
Chloride mg/l		--	--	31/10/17	15
Conductivity @ 20°C µS/cm		--	--	25/10/17	133.8
pH pH units		--	--	25/10/17	7.02
Total Suspended Solids mg/l		--	--	27/10/17	6
Cadmium µg/l		--	--	27/10/17	< 0.1
Calcium µg/l		--	--	27/10/17	8600
COD Chemical Oxygen Demand mg/l		--	--	31/10/17	< 20
Chromium µg/l		--	--	27/10/17	< 1
Copper µg/l		--	--	27/10/17	< 0.003
Dissolved Oxygen mg/l		--	--	25/10/17	10.75
Iron µg/l		--	--	27/10/17	430
Lead µg/l		--	--	27/10/17	< 0.3
Magnesium µg/l		--	--	27/10/17	2300
Manganese µg/l		--	--	27/10/17	190
Mercury µg/l		--	--	27/10/17	0.04
Ortho-Phosphate P mg/l		--	--	27/10/17	< 0.005
Potassium mg/l		--	--	27/10/17	1
Sodium mg/l		--	--	27/10/17	12
Sulphate mg/l		--	--	27/10/17	< 1
Temperature Degrees C		--	--	25/10/17	13
Total Oxidised Nitrogen N mg/l		--	--	27/10/17	0.52
Total Phosphorus P mg/l		--	--		
Visual Inspection Descriptive		--	--	25/10/17	Nothing Observed
Zinc µg/l		--	--	27/10/17	122

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<b>Sample No.:</b>	172500718	<b>Sample Date/Time:</b>	25/10/2017 @ 13:11
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 5	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Annual SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l		--	--	27/10/17	3.061
Biological Oxygen Demand mg/l		--	--	31/10/17	1
Chloride mg/l		--	--	31/10/17	24
Conductivity @ 20°C µS/cm		--	--	25/10/17	133.3
pH pH units		--	--	25/10/17	7.27
Total Suspended Solids mg/l		--	--	27/10/17	6
Cadmium µg/l		--	--	27/10/17	< 0.1
Calcium µg/l		--	--	27/10/17	9700
COD Chemical Oxygen Demand mg/l		--	--	31/10/17	< 20
Chromium µg/l		--	--	27/10/17	< 1
Copper µg/l		--	--	27/10/17	< 0.003
Dissolved Oxygen mg/l		--	--	25/10/17	10.86
Iron µg/l		--	--	27/10/17	370
Lead µg/l		--	--	27/10/17	< 0.3
Magnesium µg/l		--	--	27/10/17	2500
Manganese µg/l		--	--	27/10/17	140
Mercury µg/l		--	--	27/10/17	0.11
Ortho-Phosphate P mg/l		--	--	27/10/17	< 0.005
Potassium mg/l		--	--	27/10/17	1
Sodium mg/l		--	--	27/10/17	13
Sulphate mg/l		--	--	27/10/17	< 1
Temperature Degrees C		--	--	25/10/17	13
Total Oxidised Nitrogen N mg/l		--	--	27/10/17	0.77
Total Phosphorus P mg/l		--	--		
Visual Inspection Descriptive		--	--	25/10/17	Nothing Observed
Zinc µg/l		--	--	27/10/17	110.7

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<b>Sample No.:</b>	172500719	<b>Sample Date/Time:</b>	25/10/2017 @ 13:22
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Fionnuala Bonner
<b>Station:</b>	Balbane S 6	<b>Laboratory:</b>	Donegal Co Council
<b>Template:</b>	Balbane Annual SW	<b>Analyst:</b>	Fionnuala Bonner

**Sample Notes:**

Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Ammonia N mg/l		--	--	25/10/17	3.47
Biological Oxygen Demand mg/l		--	--	31/10/17	1
Chloride mg/l		--	--	31/10/17	24
Conductivity @ 20°C µS/cm		--	--	25/10/17	124.8
pH pH units		--	--	25/10/17	7.13
Total Suspended Solids mg/l		--	--	27/10/17	6
Cadmium µg/l		--	--	27/10/17	< 0.1
Calcium µg/l		--	--	27/10/17	8
COD Chemical Oxygen Demand mg/l		--	--	31/10/17	< 20
Chromium µg/l		--	--	27/10/17	< 1
Copper µg/l		--	--	27/10/17	< 0.003
Dissolved Oxygen mg/l		--	--	25/10/17	10.61
Iron µg/l		--	--	27/10/17	450
Lead µg/l		--	--	27/10/17	< 0.3
Magnesium µg/l		--	--	27/10/17	2200
Manganese µg/l		--	--	27/10/17	120
Mercury µg/l		--	--	27/10/17	0.08
Ortho-Phosphate P mg/l		--	--		
Potassium mg/l		--	--	27/10/17	1
Sodium mg/l		--	--	27/10/17	12
Sulphate mg/l		--	--		
Temperature Degrees C		--	--	25/10/17	13
Total Oxidised Nitrogen N mg/l		--	--	25/10/17	1.805
Total Phosphorus P mg/l		--	--		
Visual Inspection Descriptive		--	--	25/10/17	Nothing Observed
Zinc µg/l		--	--	27/10/17	119.1

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<b>Sample No.:</b>	172504115	<b>Sample Date/Time:</b>	25/10/2017 @ 12:01
<b>Category:</b>	Landfill Monitoring	<b>Sample Method:</b>	Grab
<b>Entity:</b>	Balbane Landfill	<b>Sampled By:</b>	Nigel Breslin
<b>Station:</b>	Bh1 (Gas)	<b>Laboratory:</b>	Donegal Co Co
<b>Template:</b>	Landfill Monitoring - Landfill Gas	<b>Analyst:</b>	Nigel Breslin

**Sample Notes:**

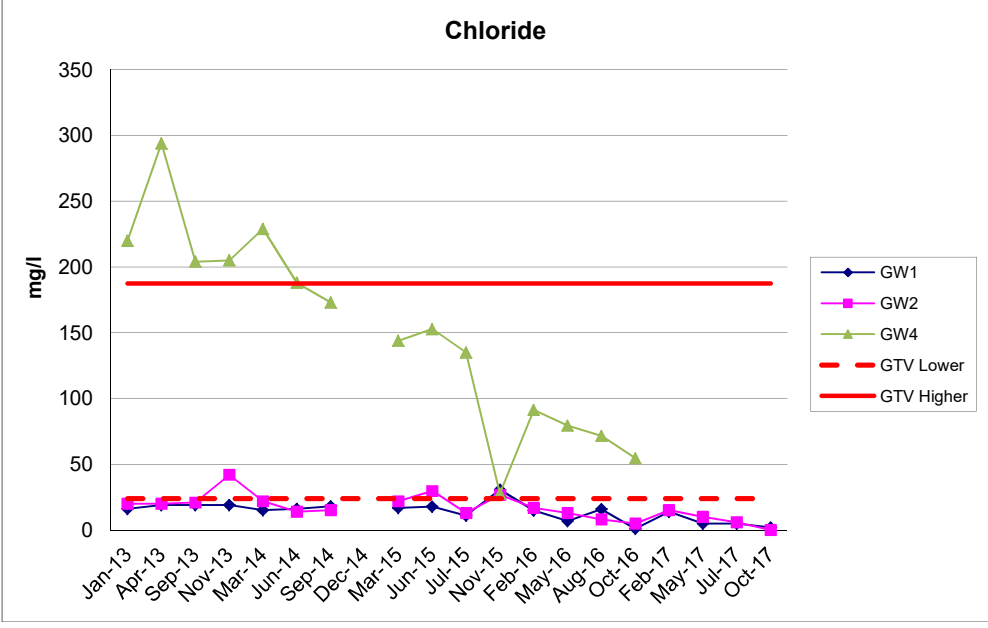
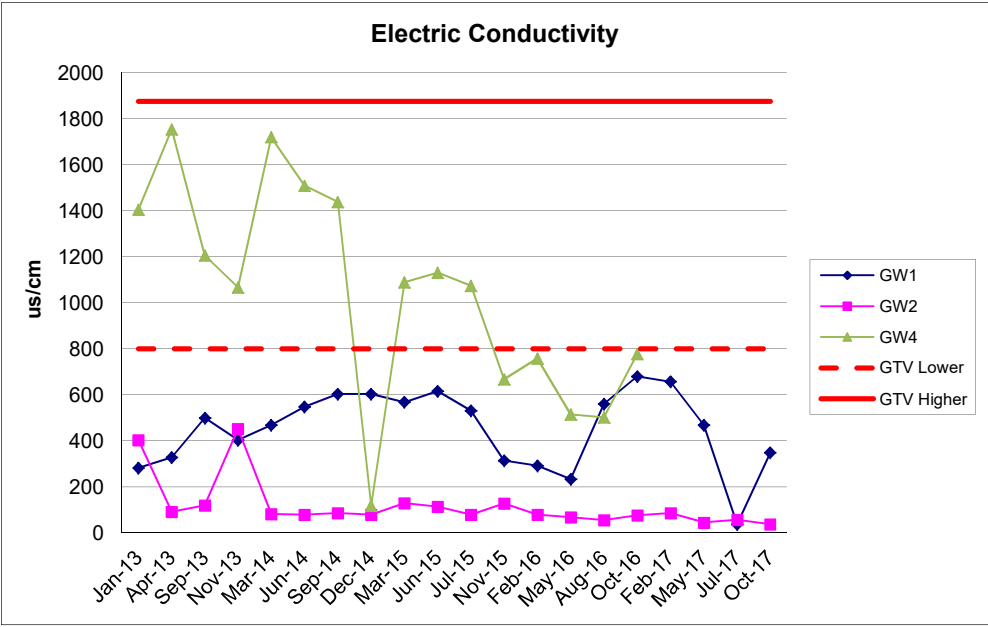
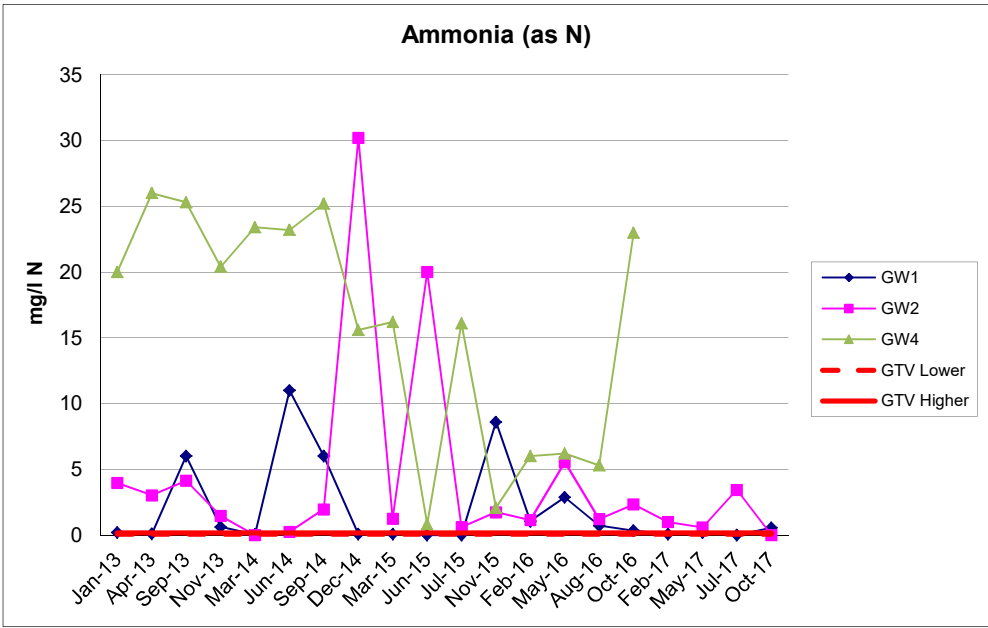
Parameter/Unit	Test Method	Maximum Limit	Minimum Limit	Test Date	Test RESULT
Pressure mBar	5.4P-TMC23	--	--	25/10/17	996
Carbon Dioxide %	5.4P-TMC23	--	--	25/10/17	4.6
Methane %	5.4P-TMC23	--	--	25/10/17	16.4
Oxygen %	5.4P-TMC23	--	--	25/10/17	1.7

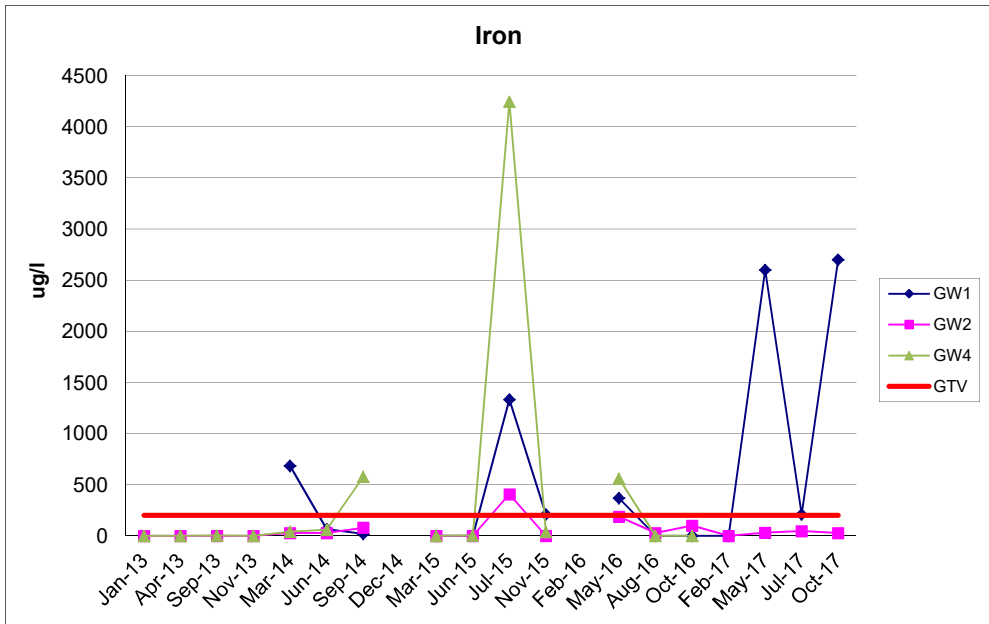
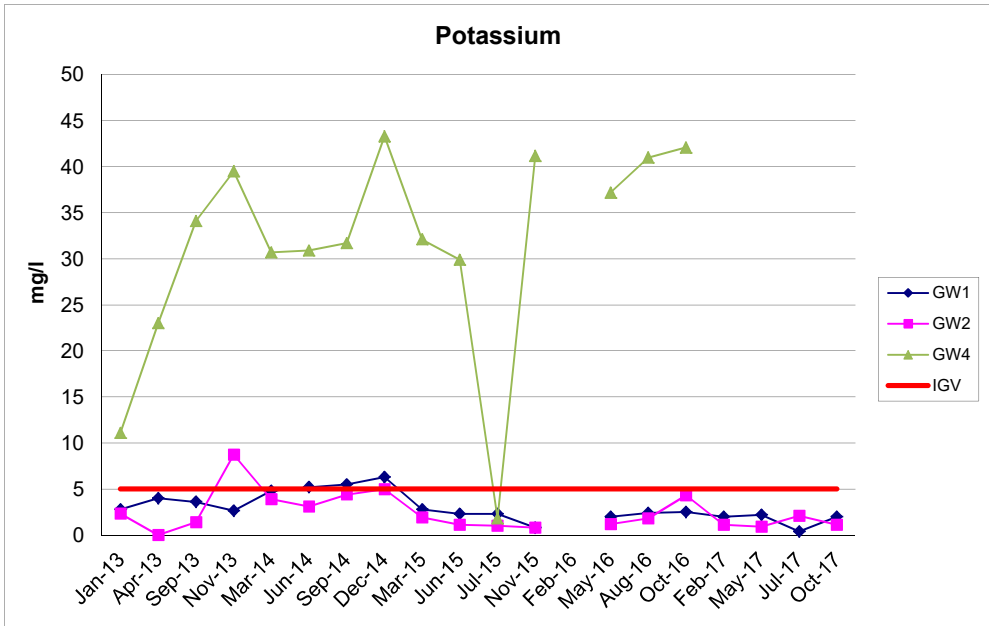
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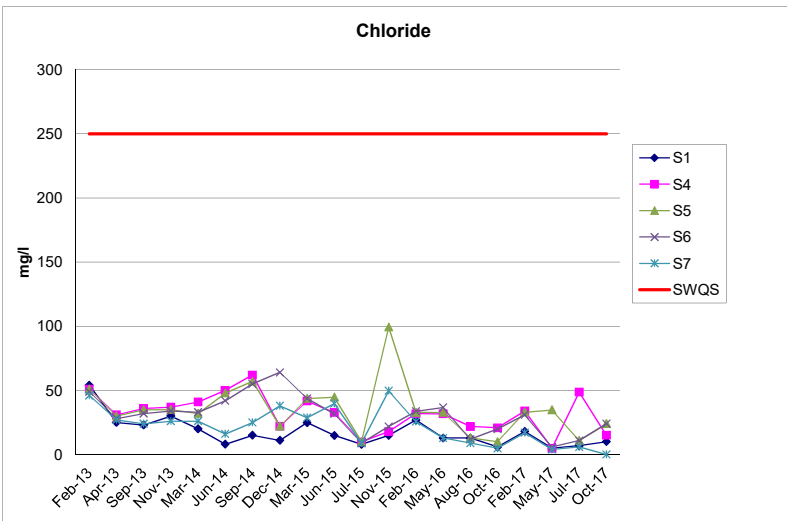
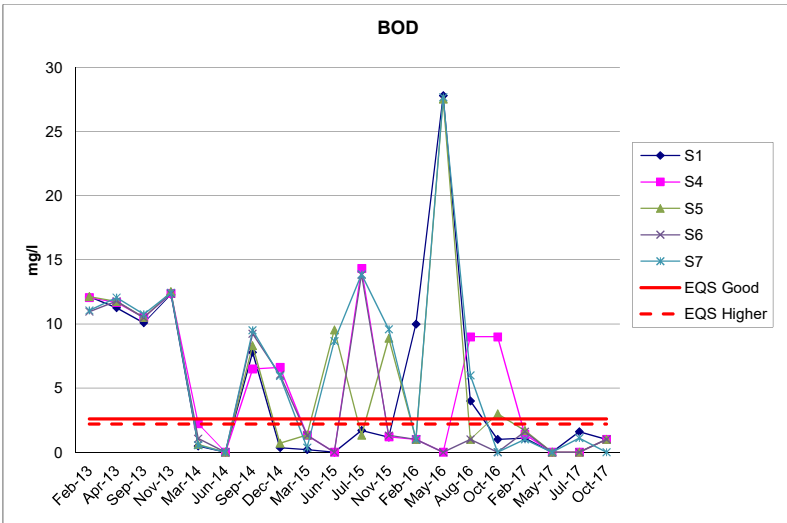
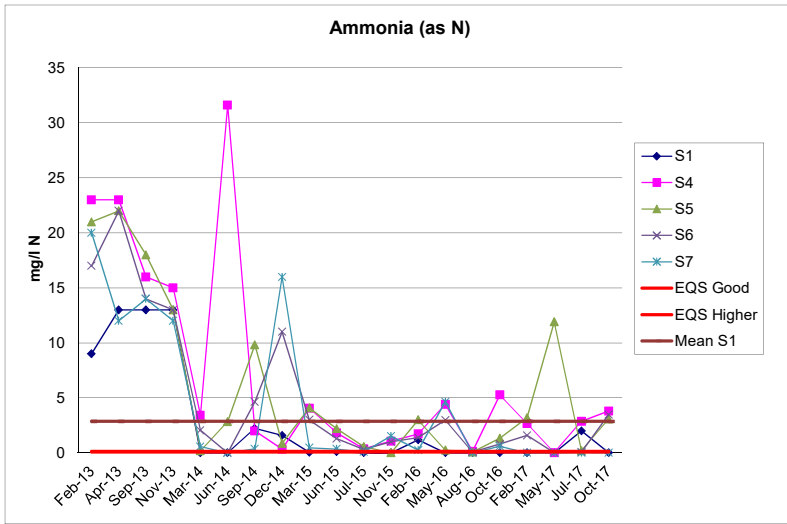
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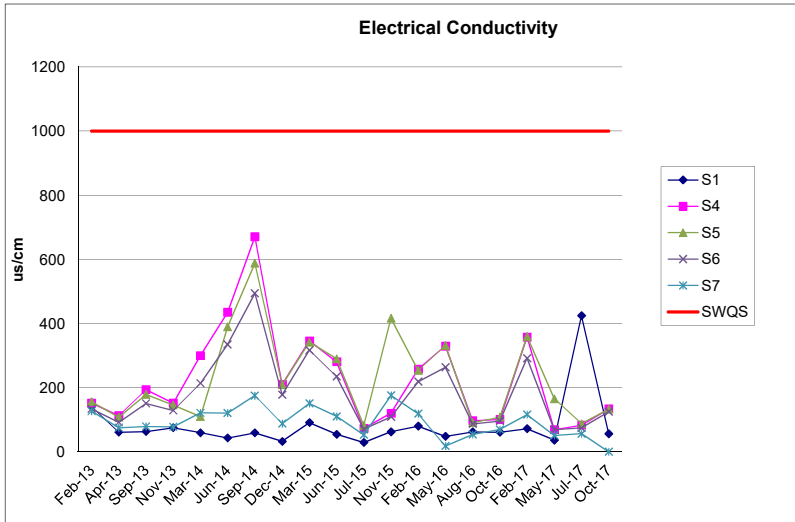
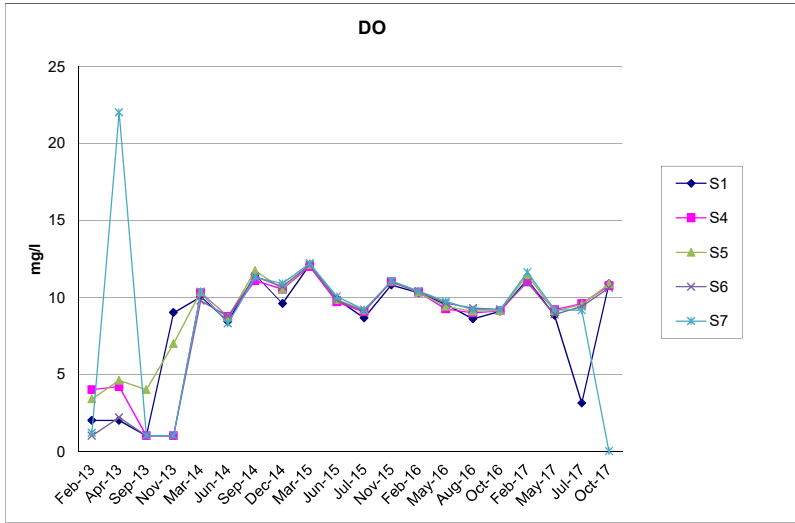
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## Appendix D

# Water Balance Calculation and Meteorological Data

**BALBANE WATER BALANCE CALCULATION**

Year	Status	Rainfall (mm)	Restored area	Temp Restored area RCA(m <sup>2</sup> )	Temp Restored area infiltration IRCA(m <sup>3</sup> )	Total Water	Leachate produced Lo(m <sup>3</sup> )
2017	Closed	1,152	0	29,500	8,497	8,497	8,497
<b>Total</b>							8,497

**Assumptions**

<b>IRCA=</b>	Temp restored area infiltration of rainfall estimated % (25-30% of annual rainfall, EPA Manual )	30%	%
<b>Temporary restored area</b>	Area of landfill site temporary restored, site closed in Jan 2004	29,500	m <sup>2</sup>
<b>Rainfall Data</b>	Data taken from Malin Head. Evaporation losses have not been included	1,152	mm

Total rainfall in millimetres for Malin_head	Year	2017	2016	2015	2014	2013	2012
	<b>Jan</b>	56.7	166.3	176.0	162.2	140.9	134.7
	<b>Feb</b>	85.1	130.7	85.8	189.9	74.1	68.1
	<b>Mar</b>	96.9	72.7	123.1	71.6	61.7	29.8
	<b>Apr</b>	41.1	52.9	64.7	33.4	61.6	46.3
	<b>May</b>	50.9	65.6	137.0	86.8	102.5	50.7
	<b>Jun</b>	77.7	72.4	56.1	48.6	85.5	141.1
	<b>Jul</b>	114.6	109.9	132.7	86.0	56.5	91.4
	<b>Aug</b>	172.5	79.9	111.0	95.3	92.6	87.3
	<b>Sep</b>	90.2	94.7	29.7	23.0	69.7	139.2
	<b>Oct</b>	111.9	37.6	71.9	131.4	103.8	123.5
	<b>Nov</b>	137.5	113.9	222.9	134.4	116.0	87.4
	<b>Dec</b>	117	76.0	272.9	150.5	178.6	149.3
	<b>Annual</b>	1152.1	1072.6	1483.8	1213.1	1143.5	1148.8

## **Appendix E**

### **E-PRTR**

### **(AER Electronic Reporting System)**



Environmental Protection Agency

| PRTR# : W0090 | Facility Name : Balbane Landfill Site | Filename : W0090\_2017.xls |  
Return Year : 2017 |

[Guidance to completing the PRTR workbook](#)

# PRTR Returns Workbook

Version 1.1.19

<b>REFERENCE YEAR</b>	2017
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## 1. FACILITY IDENTIFICATION

Parent Company Name	Donegal County Council
Facility Name	Balbane Landfill Site
PRTR Identification Number	W0090
Licence Number	W0090-01

### Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	Balbane
Address 2	Killybegs
Address 3	
Address 4	
	Donegal
Country	Ireland
Coordinates of Location	-8.44483 54.6955
River Basin District	GBNIIENW
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
<b>AER Returns Contact Name</b>	Julie McMahon
<b>AER Returns Contact Email Address</b>	julie.mcmahon@donegalcoco.ie
<b>AER Returns Contact Position</b>	Executive Engineer
<b>AER Returns Contact Telephone Number</b>	0749122787
<b>AER Returns Contact Mobile Phone Number</b>	0872861096
<b>AER Returns Contact Fax Number</b>	0749161304
<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>	1
<b>User Feedback/Comments</b>	
<b>Web Address</b>	

## 2. PRTR CLASS ACTIVITIES

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

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

Is it applicable?	
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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4.1 RELEASES TO AIR

[Link to previous years emissions data](#)

| PRTR# : W0090 | Facility Name : Balbane Landfill Site | Filename : W0090\_2017.xls | Return Year : 2017 |

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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 Used		Emission Point 1	QUANTITY		
			Method Code	Designation or Description		T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	C	OTH	Landgem	0.0	140614.11	0.0	140614.11
03	Carbon dioxide (CO2)	C	OTH	Landgem	0.0	385812.15	0.0	385812.15
02	Carbon monoxide (CO)	C	OTH	Landgem	0.0	68.75	0.0	68.75
07	Non-methane volatile organic compounds (NMVOC)	C	OTH	Landgem	0.0	906.59	0.0	906.59
55	1,1,1-trichloroethane	C	OTH	Landgem	0.0	1.12	0.0	1.12

\* 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 Used		Emission Point 1	QUANTITY		
			Method Code	Designation or Description		T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
56	1,1,2,2-tetrachloroethane	C	OTH	Landgem	0.0	3.24	0.0	3.24
34	1,2-dichloroethane (EDC)	C	OTH	Landgem	0.0	0.71	0.0	0.71
62	Benzene	C	OTH	Landgem	0.0	2.6	0.0	2.6
58	Trichloromethane	C	OTH	Landgem	0.0	0.06	0.0	0.06
35	Dichloromethane (DCM)	C	OTH	Landgem	0.0	20.85	0.0	20.85
65	Ethyl benzene	C	OTH	Landgem	0.0	8.56	0.0	8.56
73	Toluene	C	OTH	Landgem	0.0	63.0	0.0	63.0
60	Vinyl chloride	C	OTH	Landgem	0.0	8.0	0.0	8.0
78	Xylenes	C	OTH	Landgem	0.0	22.34	0.0	22.34
57	Trichloroethylene	C	OTH	Landgem	0.0	6.45	0.0	6.45

\* 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 Used		Emission Point 1	QUANTITY		
			Method Code	Designation or Description		T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

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

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