ANNUAL ENVIRONMENTAL REPORT

For

GLENALLA LANDFILL SITE
Co. Donegal

Waste Licence Reference: W0125-1

By
Donegal County Council
For
Environmental Protection Agency

Reporting Period:

January to December 2014

May 2015

Contents

1 Introduction

1.1 This Annual Environmental Report (AER) has been prepared to meet the requirements of Schedule E and F of Waste Licence W0125-1 for Glenalla Landfill. This report provides an environmental review of the site from January to December 2014.

1.2 On the 4th of December 2001 the Environmental Protection Agency granted the Council a Waste Licence (registration number W0125-1) for the orderly closure, capping and restoration of the landfill facility, in accordance with the Third Schedule of the Waste Management Act, 1996. Donegal County Council ceased operational activity at Glenalla Landfill Site after the Christmas period in December 2001. Subsequently, Donegal County Council was only permitted to accept inert waste for disposal for the purposes of restoration and aftercare of the site. The quantity of inert waste to be accepted is limited to 46,000 tonnes. The site was formally restored in 2005/6. The Council continues to manage the facility to ensure that activities have not caused environmental pollution and carries out regular environmental monitoring. All monitoring data is submitted to the EPA.

1.3 Glenalla Landfill is an unlined, capped facility, historically operated on the dilute and disperse principle, whereby leachate generated by rainfall infiltration and the decomposition of the landfilled waste is allowed to disperse into the surrounding environment. The landfill site is situated in a low-lying hollow that has been infilled by peat deposits constituting an area of blanket bog. These deposits can represent an effective hydraulic barrier to the downward percolation of leachate. The disposal of waste was undertaken by the landraise method, whereby tipping took place directly onto the stripped ground surface raising its level to form an elevated landform flanked by low graded banks. As mentioned above the site was formally restored in 2005/6.

1.4 The landfill is situated in a fully rural setting, some 4km east of Milford in an area of moderate relief that forms part of the upper catchment of the Glenalla River. This watercourse dissects the southwest boundary of the landfill site. The ground surface of the closed hollow in which the landfill is based generally falls in a south to south westerly direction under a shallow gradient towards the Glenalla River. The downstream extent of the landfill is therefore represented by a small area situated on the southern site boundary. The area to the north and northeast of the site represents the principal upstream area.

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

Table 1.1 Facility Information Summary

AER Reporting Year	2014
Licence Register Number	W00125-01
Name of site	Glenalla Landfill Site
Site Location	Glenalla, Milford, County Donegal
NACE Code	3821
Class/Classes of Activity	Landfill

2 Waste Activities Carried Out at the Facility

Type of Waste

2.1 The licensed 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 the deposition of 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; and
- **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.

3 Quantities and Composition of Waste

Quantities of Waste for Restoration

3.1 In accordance with Condition 1 of the waste licence only inert waste may be deposited at the facility. A maximum of 46,000 tonnes shall be accepted for the purposes of restoration and aftercare. The quantity of waste received during the reporting period and each previous year at the facility are presented in Table 3.1.

3.2 Glenalla landfill site was closed in 2001 and no material was imported or exported until restoration works commenced during 2005. The material imported during 2005 was inert and specifically for the purpose of restoring the site.

Table 3.1 Waste Quantities Accepted (Tonnes)

Waste Types	1998	1999	2000	2001	2002	2003	2004	2005
Total (tonnes)	550	1,565	5,722	10,093	0	0	0	34,474*

* = inert material imported for restoration.

4 Summary Report of Emissions

Environmental Monitoring Requirements

4.1 There is no continuous air, groundwater, surface water or wastewater (sewer) monitoring at Glenalla landfill site. Periodic / non-continuous monitoring of groundwater, surface water, leachate and landfill gas is carried out at the site as per the schedule, and as agreed with the EPA, as set out in Tables A1, A2, A3 and A4 of Appendix A. It should be noted that annual parameters are in abeyance as agreed with the Agency.

4.2 Details of the monitoring locations are shown on drawing IBR0697/006.

Monitoring Results

4.3 Results of monitoring for the period for groundwater, surface water, leachate and gas are contained in tabular and graphical format in Appendix B.

Groundwater

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

- EPA Interim Guideline Values[1] (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 (GWR 2010).

4.5 GW1 is located up-gradient of the landfill and GW2 and GW3 are immediately downstream. GW2 was re-drilled during 2006. Parameters to be monitored and frequencies as required by the Waste Licence are listed in Appendix A. Since restoration the Agency has agreed to

[1]EPA (2003) Towards setting guideline values for the protection of groundwater in Ireland. Interim Report

reduce monitoring frequency to bi-annual and the requirement to test for annual frequency parameters has been dropped. All results in tabular and graphical format are contained in Appendix B.

Upgradient

4.6 The GWR 2010 guideline value for ammonia is 0.175 mg/l. Results for ammonia are only recorded in November of this monitoring period and no elevated concentrations of ammonia were recorded up gradient of the site in GW1 during the monitoring period. Trends for ammonia in groundwater are provided in graph format in Appendix B.

4.7 The IGV guideline value for potassium is 5 mg/l and up gradient of the site in borehole GW1 an elevated concentration of 6.66 mg/l was recorded in November 2014.

4.8 No elevated concentrations in exceedance of the appropriate GWR 2010 or IGV values up gradient of the site have been recorded for the remaining parameters measured throughout the monitoring period.

Down Gradient

4.9 A number of parameters monitored bi-annually in the down gradient boreholes exceed the GWR 2010 and / or IGV guideline values. These are summarised in Table 4.1 below and results are provided in table and graph format in Appendix B.

Table 4.1 Groundwater Quality Down Gradient

Parameter	GWR 2010	IGV	Borehole
Ammonia (mg/l N)	0.175		GW2, GW3
Potassium (mg/l)		5	GW2, GW3

4.10 Elevated concentrations of ammonia were recorded down gradient of the site in boreholes GW2 and GW3. These concentrations were elevated relative to the screening value on both occasions in borehole GW2 and ranging from 2.37 mg/l N to 3.67 mg/l N. In addition, an elevated concentration of ammonia, 1.42 mg/l, was recorded in borehole GW3 in November 2014. These results are consistent with previous results for these wells. It should also be noted that these groundwater wells are located in close proximity to the unlined waste body.

4.11 Elevated concentrations of potassium were recorded down gradient of the site in boreholes GW2 and GW3. These concentrations were consistently elevated in borehole GW2 and ranged from 6.68 mg/l to 8.8 mg/l. In addition, an elevated concentration of potassium, 6.63 mg/l, was recorded in borehole GW3 in November 2014. These concentrations are

comparable with previous results. It should be noted that elevated concentration above the IGV guideline value where also recorded up gradient of the site (GW1) during the monitoring period.

4.12 Significantly elevated concentrations of iron were recorded down gradient of the site in GW2 and GW3 when levels of 3874.5 µg/l and 1737.9 µg/l were recorded in May 2014 of the monitoring period. It should be noted that iron occurs naturally in Donegal groundwater as it is associated with naturally occurring conditions such as iron rich bedrock or the presence of reducing conditions, that is, anaerobic environment such as peat.

4.13 No elevated concentrations in exceedance of the appropriate GWR or IGV values down gradient of the site have been recorded for the remaining parameters measured throughout the monitoring period.

4.14 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 Glenalla are adjacent to / within the unlined waste body and it is expected that concentrations in groundwater have reduced further down gradient of the site. The graphs and results in Appendix B also show the seasonal variation in parameter concentration at the site which is consistent with historical data.

4.15 A hydrogeological risk assessment is currently being undertaken. Please refer to Section 6 for further details.

Surface Water

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

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

4.17 Surface water monitoring is carried out at SW1, SW2, SW3 and SW4. SW1 is reflective of the quality of the surface water upstream of the landfill site. The parameters and frequencies of monitoring required by the Waste Licence are as listed in Appendix A, however since restoration of the site the Agency has agreed to a frequency of bi-annual monitoring and to drop the requirement for the annual parameters. The results of monitoring in tabular and graphical format are presented in Appendix B.

4.18 The EQS guideline value for ammonia for good status is 0.140 mg/l N. Upstream of the site, at surface water monitoring point S1, no elevated concentrations of ammonia were recorded. This reflects the baseline conditions of the surface water upstream of the site.

4.19 One instance of an elevated concentration of ammonia was recorded downstream of the site at surface water monitoring point S3. At this location a concentration of ammonia of 1.62 mg/l N was recorded in November 2014.

4.20 Upstream of the site at SW1, the trend of results in 2014 shows decreasing concentrations of ammonia from 2013. In 2013, one instance of an elevated concentrations of ammonia was recorded in December 2013 of 1.08 mg/l N. Downstream of the site, the surface water results show reduced concentrations of ammonia in 2014 compared with the values recorded in 2013.

4.21 The SWQS guideline value for COD is 40 mg/l. Upstream of the site, at surface water monitoring point SW1, no elevated concentrations of COD were recorded. This reflects the baseline conditions of the surface water upstream of the site. One instance of an elevated concentration of COD was recorded downstream of the site at surface water monitoring point SW3. At this location a concentration of COD of 89 mg/l was recorded in November 2014.

4.22 No elevated concentrations in exceedance of the appropriate EQS and SWQS values have been recorded for all other parameters measured bi-annually throughout the monitoring period both upstream and downstream of the site. It should be noted that this is an unlined waste body which has been restored and the stream has very small assimilative capacity.

Leachate

4.23 Leachate is monitored at one location at the facility, L1. Leachate quality varies during the lifetime of a landfill depending on the stage of decomposition of waste. Results from L1 are presented in Appendix B. Some characteristic parameters have been compared with those of 'typical' raw leachate in Table 4.1 below.

Table 4.1 Raw Leachate Concentrations 2014

	Glenalla Landfill Site	From 30 samples from UK/Irish landfills accepting domestic waste Results in mg/l		
PARAMETER	Concentration	Min.Conc	Max.Conc	Mean
Ammonia (mg/N)	16.2	<0.2	1700	491
BOD	13.4	4.5	>4800	>834
COD	29	<10	33,700	3078
Chloride (mg/l)	107	27	3410	1256
Iron (mg/l)	-	0.4	664	54.4
Potassium (mg/l)	-	2.7	1480	491
Sodium (mg/l)	-	12	3000	904
TON (mg/l N)	10	/	/	/
Conductivity (μS/cm)	1422	503	19,200	7789
pH (pH units)	7.34	6.4	8.0	7.2

4.24 Table 4.1 compares raw leachate concentrations detected at Glenalla with 'typical leachate composition from 30 samples from UK / Irish Landfills accepting mainly domestic waste' (taken from EPA Manual for Landfill Operational Practices). Parameters measured are all consistent with typical leachate ranges shown and with the results issued last period. The leachate is weak.

Landfill Gas

4.25 Landfill gas is monitored at three locations at the facility, LG1, LG2, and LG3 which are all located in waste. Both LG1 and LG3 were replaced during restoration works. Maintenance works were carried out previously to secure access to these wells.

4.26 Monitoring of the landfill gas was undertaken during May and November of the monitoring period and results are available for LG1 and LG2. In LG1 a Methane value of 62% was recorded in May 2014,however, a value of 0.31% Methane was produced in LG1 in November 2014. Low levels of gas are continued to be produced in LG2.

Dust Monitoring

4.27 Dust monitoring was not undertaken in this reporting period.

5 Hydrogeological Risk Assessment

5.1 A hydrogeological risk assessment is currently being undertaken for Glenalla Landfill Site. This report is being on foot of a technical amendment to the waste licence by EPA: "Within eighteen months of the date of this technical amendment, the licensee shall carry out a risk screening and where necessary a technical assessment in accordance with the Guidance on the Authorisation of Discharges to Groundwater, published by the Environmental Protection Agency".

5.2 The objectives of this assessment will include the following:

- To consolidate all available geological, hydrogeological and hydrological data relating to the site and its immediate environs;
- To assess and interpret all available water quality data recorded to-date;
- To develop an appropriate Conceptual Site Model (CSM) for the site;
- To assess the level of risk posed to sensitive receptors; and
- To develop an appropriate compliance monitoring programme for the site.

5.3 This assessment will be submitted to EPA under a separate cover.

6 Volume of Leachate Produced and Volume of Leachate Discharged

6.1 A water balance calculation has been undertaken and is contained in Appendix C. This indicates that the estimated volume of leachate produced at the site for 2014 was approximately 2,487 m^3.

6.2 Leachate is tankered from the collection lagoon on the site twice per week. The total volume of leachate tankered during the last reporting period was 3,537m^3. Table 6.1 below shows a breakdown of volumes tankered.

Table 6.1 Breakdown of Leachate Volumes by Month in 2014

Month	Leachate Volume (m3)
January	379.70
February	265.56
March	265.10
April	296.02
May	284.72
June	256.96
July	332.38
August	198.94
September	397.20
October	264.20
November	265.06
December	331.44
Total:	**3,537**

7 Topographical Site Survey

7.1 A topographical survey of the site was carried out in May 2006 post restoration. Copies of the survey were forwarded to the Agency in March 2007.

8 Reported Incidents and Complaints Summaries

8.1 Other than the reporting of on-going emissions exceedances detected in the routine monitoring programme, no incidents occurred during the monitoring period and no complaints were received.

9 Review of Nuisance Controls

9.1 As the facility is not operational, and all areas formerly used for placement of municipal waste have been fully restored, the following list of nuisances are no longer deemed likely to cause problems. Regular site inspections are carried out to check for evidence of any of the following. Where any sign of these is detected appropriate control measures would be introduced.

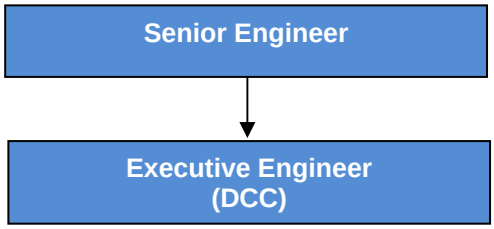
- Flies and vermin;
- Dust;
- Litter;
- Birds;
- Noise; and
- Odours.

10 Management Structure of the Site

Organisation

10.1 The Management Structure of Glenalla Landfill site is set out in Figure 10.1 below.

Figure 10.1 Management Structure



10.2 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.

Management Responsibility

10.3 Senior Engineer**:** Overall responsibility for the management of the site and ensuring compliance with the Waste Licence. Delegation of authority and responsibility to ensure the effective management of the facility and licence compliance.

10.4 Executive Engineer: Responsible for overall compliance with EPA Licence.

11 Programme for Public Information

11.1 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 Environmental Headquarters at Three Rivers Centre in Lifford. Details regarding this programme are contained in Section 2 of the Environmental Management System Manual.

12 Capping and Restoration of the Site

12.1 The site was fully restored in 2005/6 in accordance with the approved Restoration and Aftercare Plan dated May 2004.

12.2 It was agreed with the Agency in July 2006 that monitoring and reporting frequency would be reduced to bi-annually. It is hoped that when the benefits of restoration have been fully demonstrated that the Council can surrender the licence for this facility.

12.3 It was further agreed with the Agency in November 2009 that the annual parameters (including List I & II parameters) could be dispensed with on the restored sites such as Glenalla.

13 Report on Staff Training

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

14 Resources and Energy Consumption Summary

14.1 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. Energy consumption data for the site is unavailable.

15 Report on Development Work Undertaken During the Reporting Period, and a Timescale for those Proposed During the Coming Year

15.1 None to report for the period.

Appendix A - Monitoring Information

Table A1 Groundwater Parameters and Monitoring Frequencies

Bi-Annually
Visual Inspection
Temperature
Groundwater Level
pH
Electrical Conductivity
Ammoniacal Nitrogen
Dissolved Oxygen
Chloride
Iron
Potassium
TOC
TON
Phenols
Sodium

Table A2 Surface Water Parameters and Monitoring Frequencies

Bi-Annually
Visual Inspection
Temperature
Total Suspended Solids
pH
Electrical Conductivity
Ammoniacal Nitrogen
Dissolved Oxygen
Chloride
BOD
COD

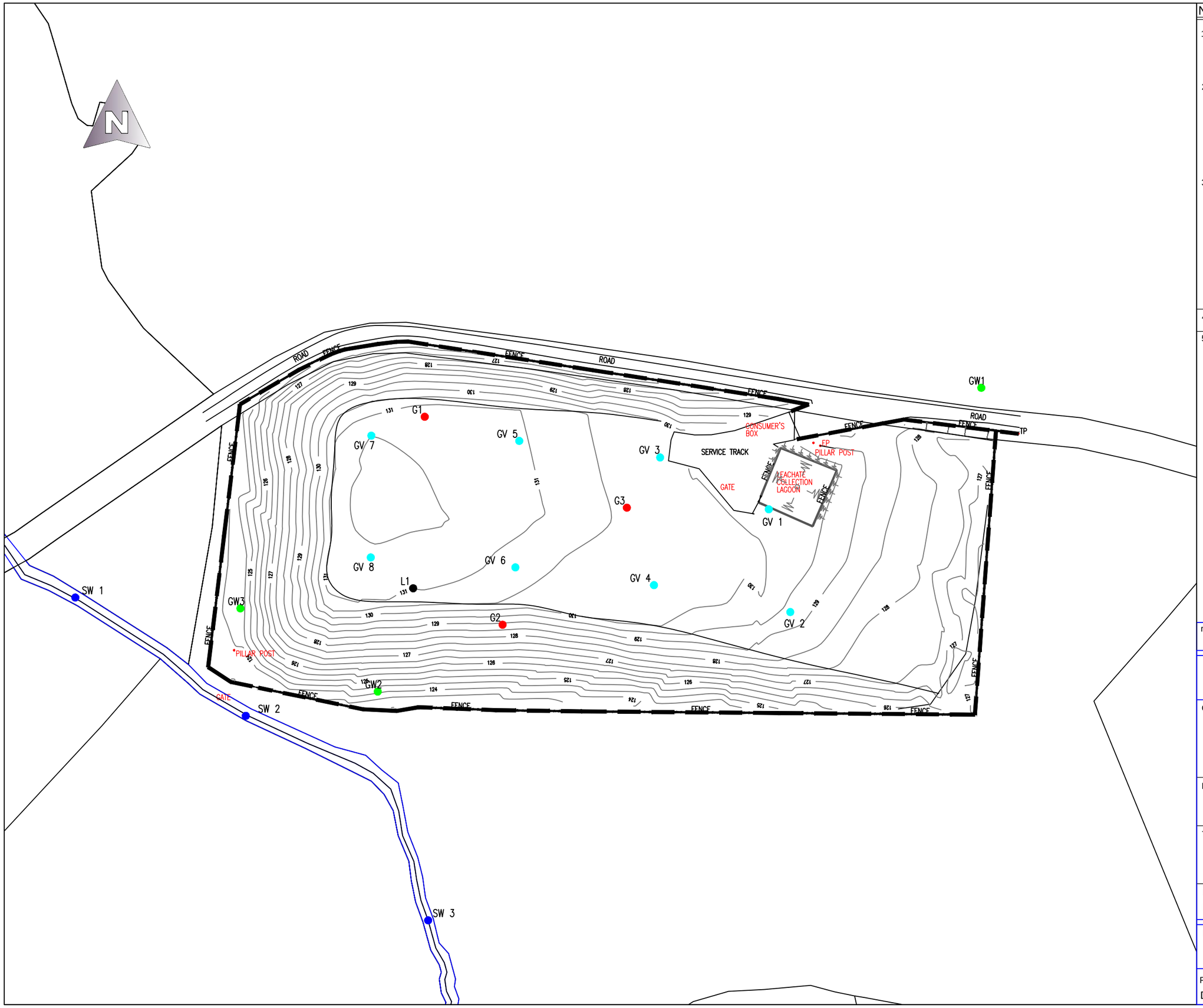
Table A3 Leachate Parameters and Monitoring Frequencies

Bi-Annually
Visual Inspection
Leachate Level
Temperature
pH
Electrical Conductivity

Ammoniacal Nitrogen
COD
BOD
Chloride
TON

Table A4 Landfill Gas Parameters and Monitoring Frequencies

Bi-Annually
Atmospheric Pressure
Carbon Dioxide
Methane
Oxygen
Temperature



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 recipients 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 recipients 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

rev	amendments	drawn	date

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

Client
Donegal County Council

Project
Donegal Landfill Site Reporting 2015

Title
Glenalla LFS - Monitoring Points

Drawing Status	Sheet Size	Drawing Scale
Preliminary	A3	1:1000

Drawing Number	Rev
IBR0697 /006	0

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

Appendix B - Results of Monitoring

Location	*Glenalla, Milford Co Donegal*											
Sample Type	Groundwater											
Site No	GW1											
Date of Sample	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Lab No												
pH											6.93	
Temp											11.7	
Electrical Conductivity											331	
Ammonical Nitrogen											0.042	
COD												
BOD												
Dissolved Oxygen											8.36	
SS												
Residue on Evaporator												
Calcium												
Cadmium												
Chromium												
Chloride											34	
Chlorine												
Copper												
Cyanide												
Dissolved Iron											0.004	
Lead												
Magnesium												
Manganese												
Mercury												
Nickel												
Potassium											6.66	
Sodium											19.59	
Sulphate												
Zinc												
Total Alkalinity as CaCO3												
Total Organic Carbon											2.52	
Total Oxidised Nitrogen											0.174	
Arsenic												
Barium												
Boron												
Fluoride												
Total Phenols											<0.15	
Phosphorous												
Selenium												
Silver												
Mircrotox												
Microtox												
Nitrite												
Nitrate												
Phosphate - ORTHO												
Phosphate - TOTAL												
Total Coliforms												
Facel Coliforms												
Depth											0.5	

Location	*Glenalla, Milford Co Donegal*										
Sample Type	Groundwater										
Site No	GW2										
Date of Sample	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14
Lab No											
pH					7.01						7.1
Temp					17.5						10.8
Electrical Conductivity					671						572
Ammonical Nitrogen					2.37						3.67
COD											
BOD											
Dissolved Oxygen					0.6						6.64
SS											
Residue on Evaporator											
Calcium											
Cadmium											
Chromium											
Chloride					40						43
Chlorine											
Copper											
Cyanide											
Dissolved Iron					3874.5						0.006
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium					8.8						6.68
Sodium					32.2						28.08
Sulphate											
Zinc											
Total Alkalinity as CaCO3											
Total Organic Carbon					5.24						3.56
Total Oxidised Nitrogen					NT						0.345
Arsenic											
Barium											
Boron											
Fluoride											
Total Phenols					<0.15						<0.15
Phosphorous											
Selenium											
Silver											
Mircrotox											
Microtox											
Nitrite											
Nitrate											
Phosphate - ORTHO											
Phosphate - TOTAL											
Total Coliforms											
Facel Coliforms											
Depth					1.5						2

Location	*Glenalla, Milford Co Donegal*										
Sample Type	Groundwater										
Site No	GW3										
Date of Sample	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14
Lab No											
pH					5.98						6.75
Temp					17.6						12.5
Electrical Conductivity					180						364
Ammonical Nitrogen					<0.04						1.42
COD											
BOD											
Dissolved Oxygen					3.73						7.76
SS											
Residue on Evaporator											
Calcium											
Cadmium											
Chromium											
Chloride					11						40
Chlorine											
Copper											
Cyanide											
Dissolved Iron					1737.9						3.05
Lead											
Magnesium											
Manganese											
Mercury											
Nickel											
Potassium					3.4						6.63
Sodium					11.4						15.94
Sulphate											
Zinc											
Total Alkalinity as CaCO3											
Total Organic Carbon					14.61						13.8
Total Oxidised Nitrogen					0.47						0.549
Arsenic											
Barium											
Boron											
Fluoride											
Total Phenols					<0.15						<0.15
Phosphorous											
Selenium											
Silver											
Mircrotox											
Microtox											
Nitrite											
Nitrate											
Phosphate - ORTHO											
Phosphate - TOTAL											
Total Coliforms											
Facel Coliforms											
Depth					2						1

Location		*Glenalla, Milford Co Donegal*											
Sample Type		Surface Water											
Site No		SW1											
Date of Sample		Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Lab No													
pH						6.97						6.96	
Temp	C					16						8.5	
Electrical Conductivity	uS/cm					99.1						94.9	
Ammonical Nitrogen	mg/l					0.059						<0.04	
COD	mg/l					20						27	
BOD	mg/l					<1						1.07	
Dissolved Oxygen	mg/l					9.24						11.7	
SS	mg/l					4						1	
Residue on Evaporator	mg/l												
Calcium	ug/l												
Cadmium	ug/l												
Chromium	ug/l												
Chloride	mg/l					23						28	
Chlorine	mg/l												
Copper	ug/l												
Cyanide	mg/l												
Dissolved Iron	ug/l												
Lead	ug/l												
Magnesium	ug/l												
Manganese	ug/l												
Mercury	ug/l												
Nickel	mg/l												
Potassium	mg/l												
Sodium	mg/l												
Sulphate	mg/l												
Zinc	ug/l												
Total Alkalinity as CaCO3	mg/l												
Total Organic Carbon	mg/l												
Total Oxidised Nitrogen	mg/l												
Arsenic	mg/l												
Barium	mg/l												
Boron	ug/l												
Fluoride	mg/l												
Total Phenols	mg/l												
Phosphorous	mg/l												
Selenium	mg/l												
Silver	mg/l												
Mircrotox	Toxic Units												
Microtox	Toxic Units												
Nitrite	mg/l												
Nitrate	mg/l												
Phosphate - ORTHO	mg/l												
Phosphate - TOTAL	mg/l												
Total Coliforms													
Facel Coliforms													
Depth	m												

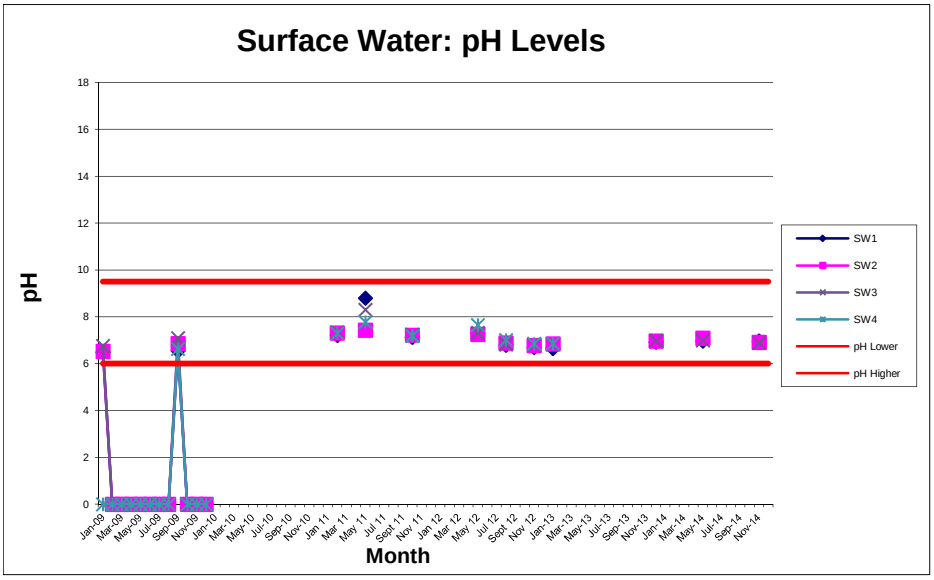
Location		*Glenalla, Milford Co Donegal*											
Sample Type		Surface Water											
Site No		SW2											
Date of Sample		Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Lab No													
pH						7.09						6.91	
Temp	C					16						8	
Electrical Conductivity	uS/cm					99.7						96	
Ammonical Nitrogen	mg/l					<0.04						<0.04	
COD	mg/l					15						31	
BOD	mg/l					<1						0.99	
Dissolved Oxygen	mg/l					9.26						11.49	
SS	mg/l					2						0.5	
Residue on Evaporator	mg/l												
Calcium	ug/l												
Cadmium	ug/l												
Chromium	ug/l												
Chloride	mg/l					23						31	
Chlorine	mg/l												
Copper	ug/l												
Cyanide	mg/l												
Dissolved Iron	ug/l												
Lead	ug/l												
Magnesium	ug/l												
Manganese	ug/l												
Mercury	ug/l												
Nickel	mg/l												
Potassium	mg/l												
Sodium	mg/l												
Sulphate	mg/l												
Zinc	ug/l												
Total Alkalinity as CaCO3	mg/l												
Total Organic Carbon	mg/l												
Total Oxidised Nitrogen	mg/l												
Arsenic	mg/l												
Barium	mg/l												
Boron	ug/l												
Fluoride	mg/l												
Total Phenols	mg/l												
Phosphorous	mg/l												
Selenium	mg/l												
Silver	mg/l												
Mircrotox	Toxic Units												
Microtox	Toxic Units												
Nitrite	mg/l												
Nitrate	mg/l												
Phosphate - ORTHO	mg/l												
Phosphate - TOTAL	mg/l												
Total Coliforms													
Facel Coliforms													
Depth	m												

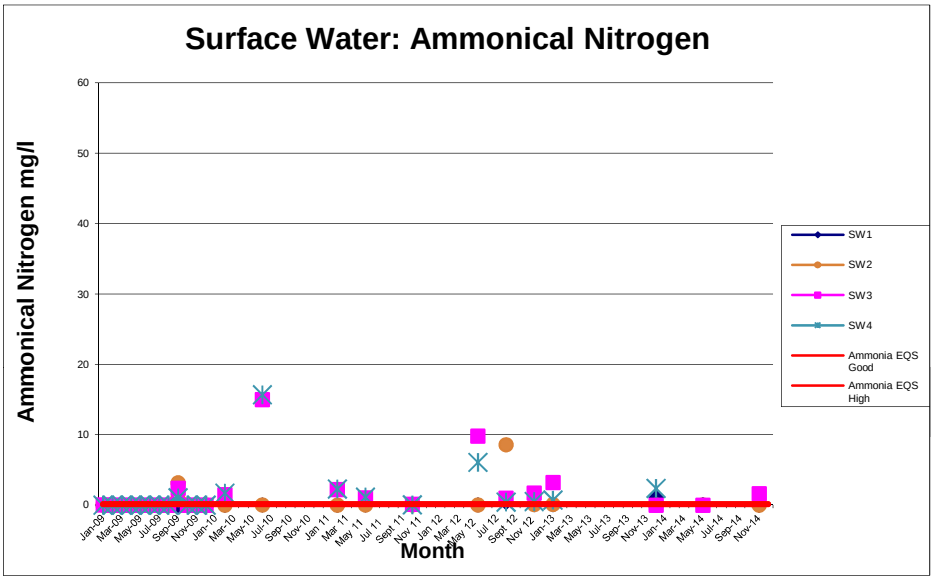
Location		*Glenalla, Milford Co Donegal*											
Sample Type		Surface Water											
Site No		SW3											
Date of Sample		Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Lab No													
pH						6.99						6.88	
Temp	C					16						8	
Electrical Conductivity	uS/cm					143.9						141.3	
Ammonical Nitrogen	mg/l					<0.04						1.62	
COD	mg/l					18						89	
BOD	mg/l					1.44						1.19	
Dissolved Oxygen	mg/l					9.28						11.22	
SS	mg/l					107						66	
Residue on Evaporator	mg/l												
Calcium	ug/l												
Cadmium	ug/l												
Chromium	ug/l												
Chloride	mg/l					25						31	
Chlorine	mg/l												
Copper	ug/l												
Cyanide	mg/l												
Dissolved Iron	ug/l												
Lead	ug/l												
Magnesium	ug/l												
Manganese	ug/l												
Mercury	ug/l												
Nickel	mg/l												
Potassium	mg/l												
Sodium	mg/l												
Sulphate	mg/l												
Zinc	ug/l												
Total Alkalinity as CaCO3	mg/l												
Total Organic Carbon	mg/l												
Total Oxidised Nitrogen	mg/l												
Arsenic	mg/l												
Barium	mg/l												
Boron	ug/l												
Fluoride	mg/l												
Total Phenols	mg/l												
Phosphorous	mg/l												
Selenium	mg/l												
Silver	mg/l												
Mircrotox	Toxic Units												
Microtox	Toxic Units												
Nitrite	mg/l												
Nitrate	mg/l												
Phosphate - ORTHO	mg/l												
Phosphate - TOTAL	mg/l												
Total Coliforms													
Facel Coliforms													
Depth	m												

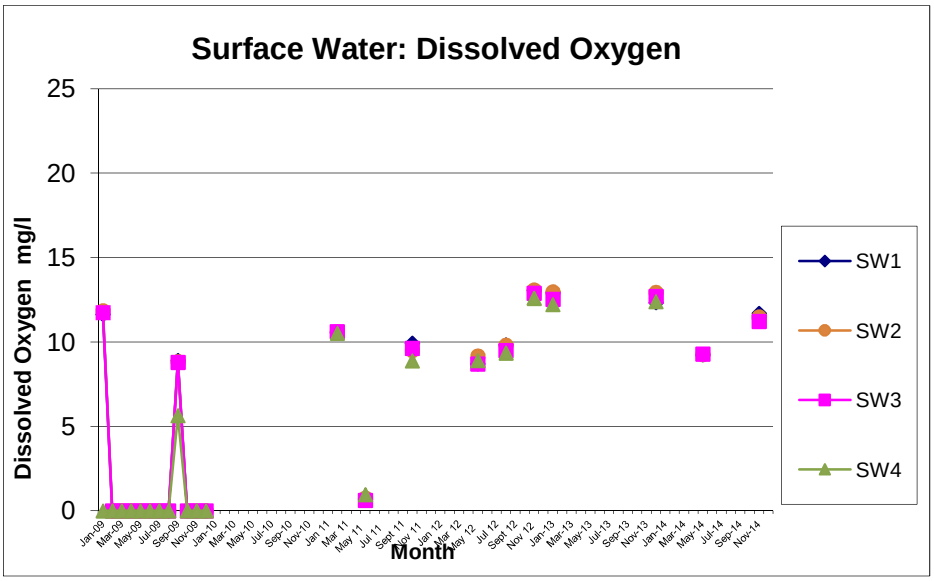
Location		*Glenalla, Milford Co Donegal*											
Sample Type		Leachate											
Site No		L1											
Date of Sample		Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Lab No													
pH						7.34							
Temp	C					18.00							
Electrical Conductivity	uS/cm					1422							
Ammonical Nitrogen	mg/l					16.20							
COD	mg/l					29							
BOD	mg/l					13.40							
Dissolved Oxygen	mg/l												
SS	mg/l												
Residue on Evaporator	mg/l												
Calcium	ug/l												
Cadmium	ug/l												
Chromium	ug/l												
Chloride	mg/l					107							
Chlorine	mg/l												
Copper	ug/l												
Cyanide	mg/l												
Dissolved Iron	ug/l												
Lead	ug/l												
Magnesium	ug/l												
Manganese	ug/l												
Mercury	ug/l												
Nickel	mg/l												
Potassium	mg/l												
Sodium	mg/l												
Sulphate	mg/l												
Zinc	ug/l												
Total Alkalinity as CaCO3	mg/l												
Total Organic Carbon	mg/l												
Total Oxidised Nitrogen	mg/l					10							
Arsenic	mg/l												
Barium	mg/l												
Boron	ug/l												
Fluoride	mg/l												
Total Phenols	mg/l												
Phosphorous	mg/l												
Selenium	mg/l												
Silver	mg/l												
Mircrotox	Toxic Units												
Microtox	Toxic Units												
Nitrite	mg/l												
Nitrate	mg/l												
Phosphate - ORTHO	mg/l												
Phosphate - TOTAL	mg/l												
Total Coliforms													
Facel Coliforms													
Depth	m					1.50							

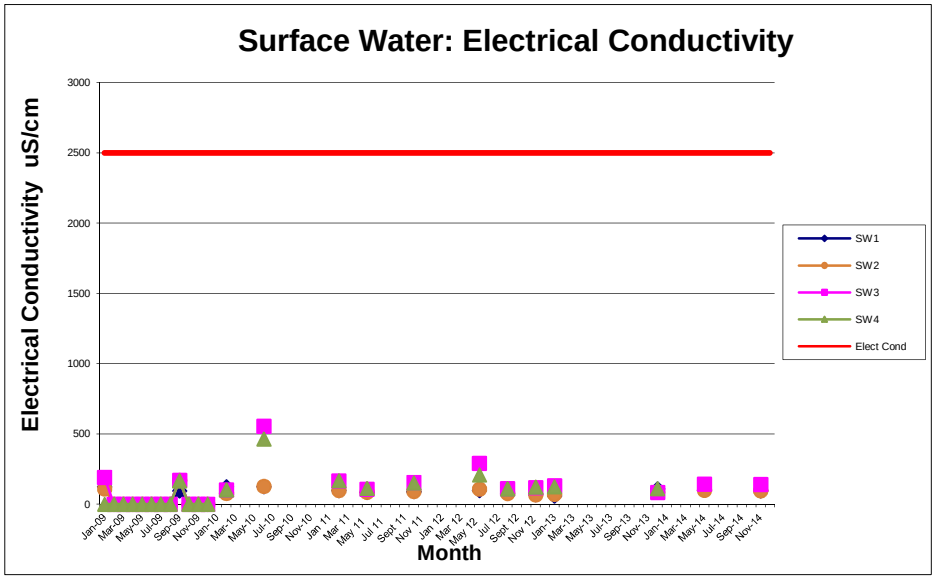
Landfill Gas Results

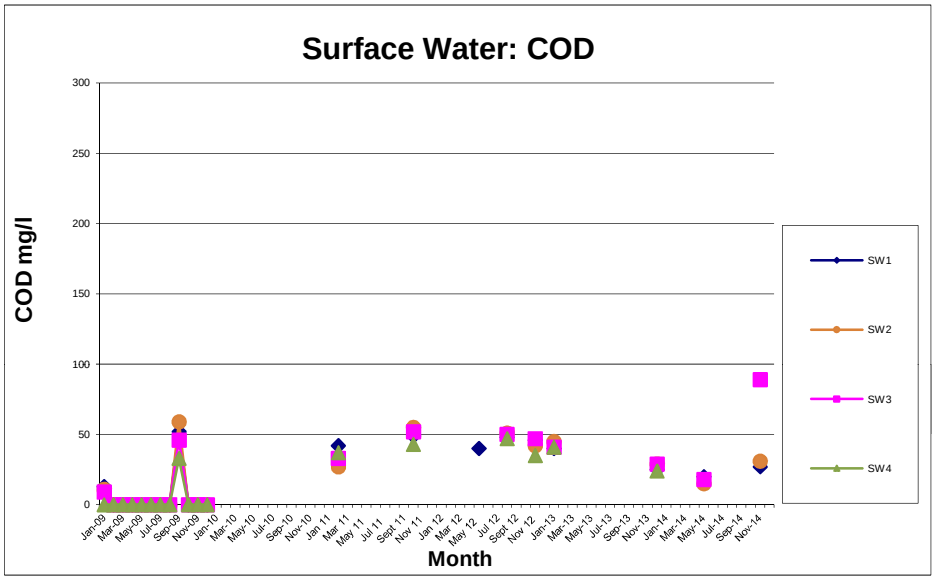
StationName	SampleDate	Atmospheric Pressure	Carbon Dioxide	Methane	Oxygen
Glenalla LG1	27/05/2014	998	30.9	62	0
Glenalla LG2	27/05/2014	999	1.5	0.8	18.3
Glenalla LG3	27/05/2014	NT	NT	NT	NT
Glenalla LG1	25/11/2014	998	0.2	0.31	20.1
Glenalla LG2	25/11/2014	998	0.1	0.1	21.5
Glenalla LG3	25/11/2014	NT	NT	NT	NT

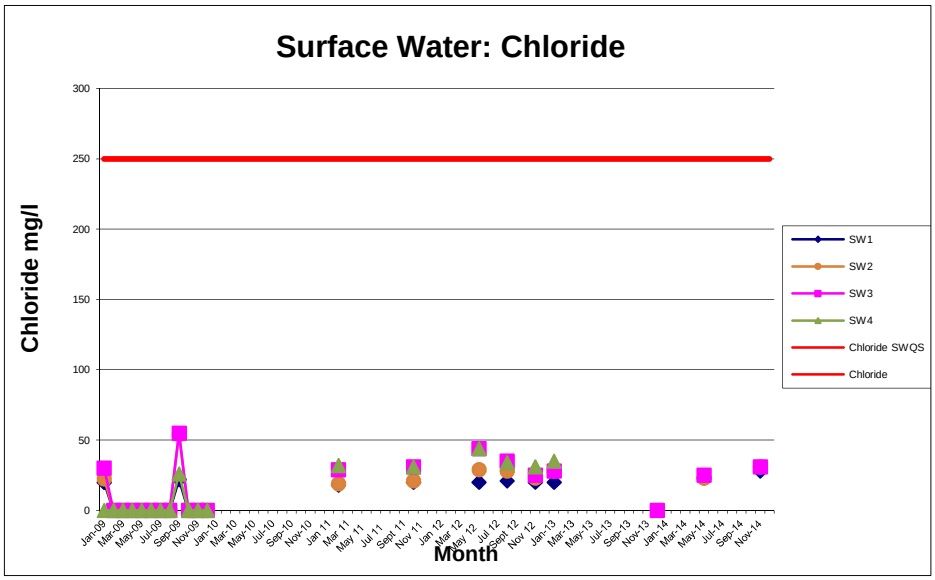

Surface Water: pH Levels
pH
Month
SW1
SW2
SW3
SW4
pH Lower
pH Higher

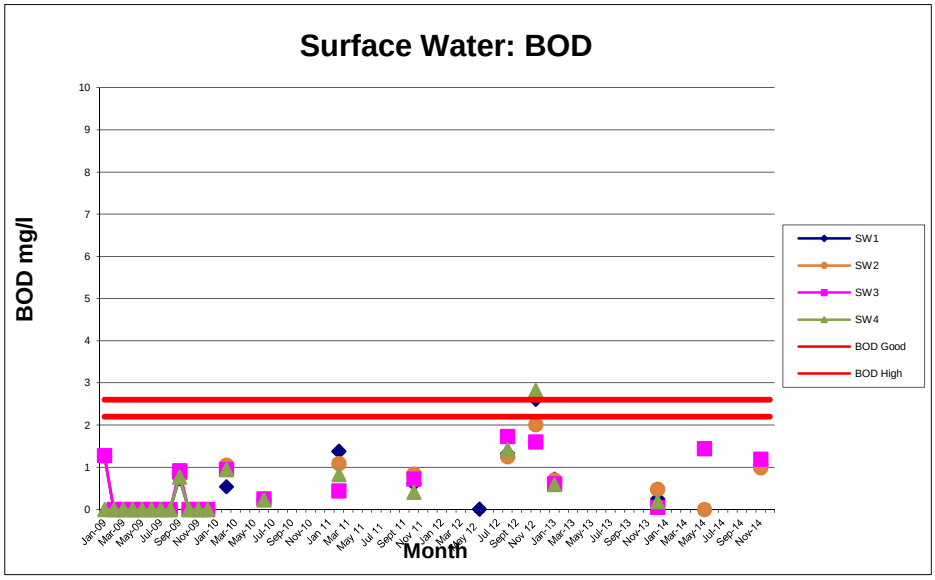

Surface Water: Ammonical Nitrogen
Ammonical Nitrogen mg/l
Month
SW1
SW2
SW3
SW4
Ammonia EQS Good
Ammonia EQS High

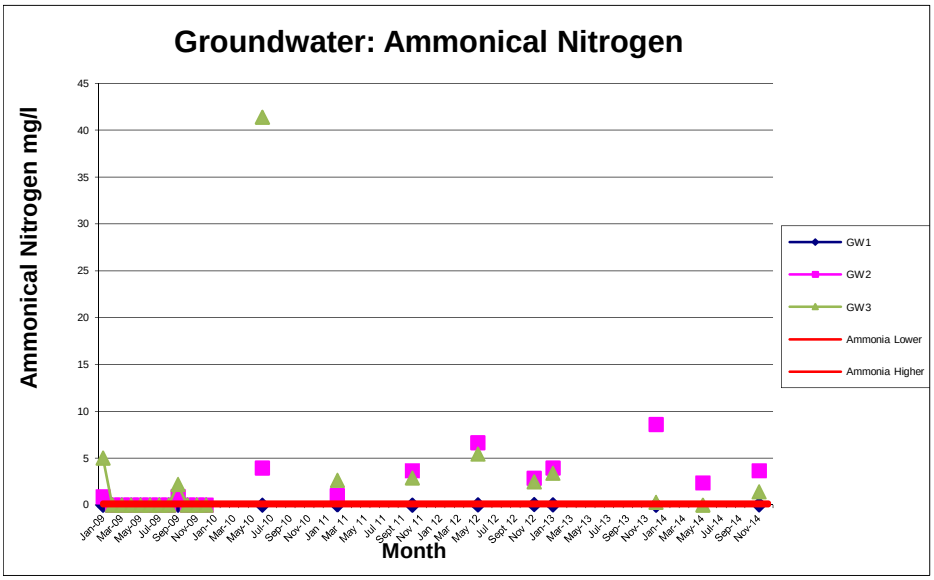

Surface Water: Dissolved Oxygen
Dissolved Oxygen mg/l
Month
SW1
SW2
SW3
SW4

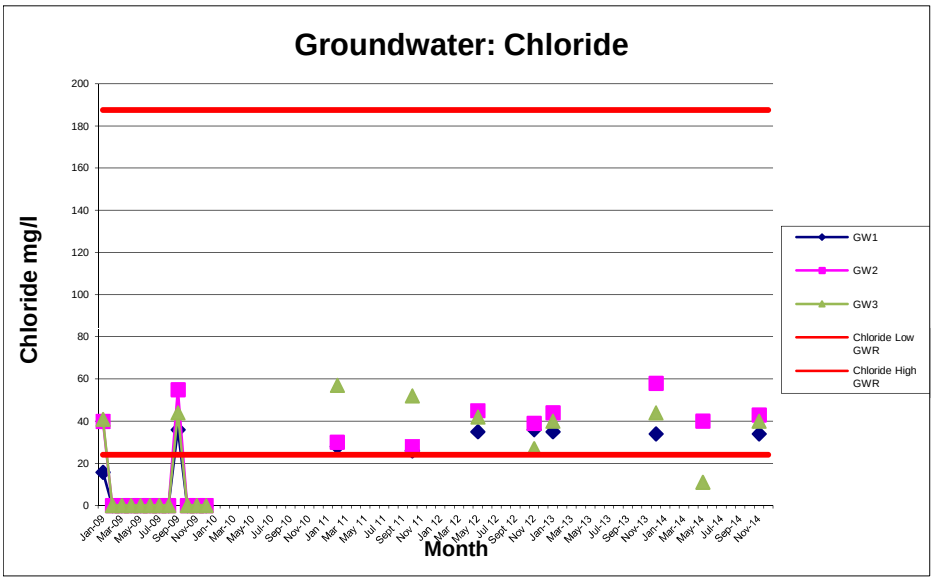

Surface Water: Electrical Conductivity
Electrical Conductivity uS/cm
3000
2500
2000
1500
1000
500
0
SW1
SW2
SW3
SW4
Elect Cond
Month

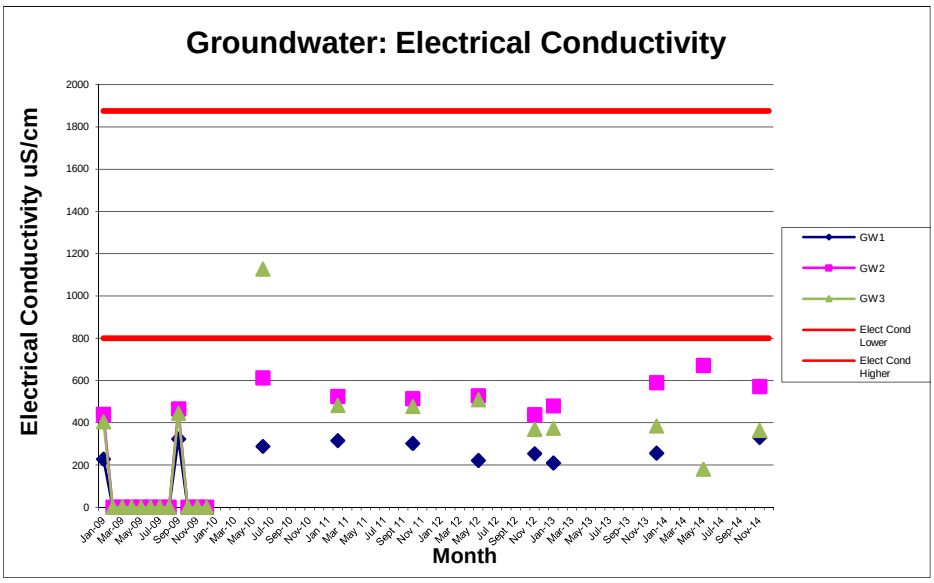

Surface Water: COD
COD mg/l
300
250
200
150
100
50
0
SW1
SW2
SW3
SW4
Month

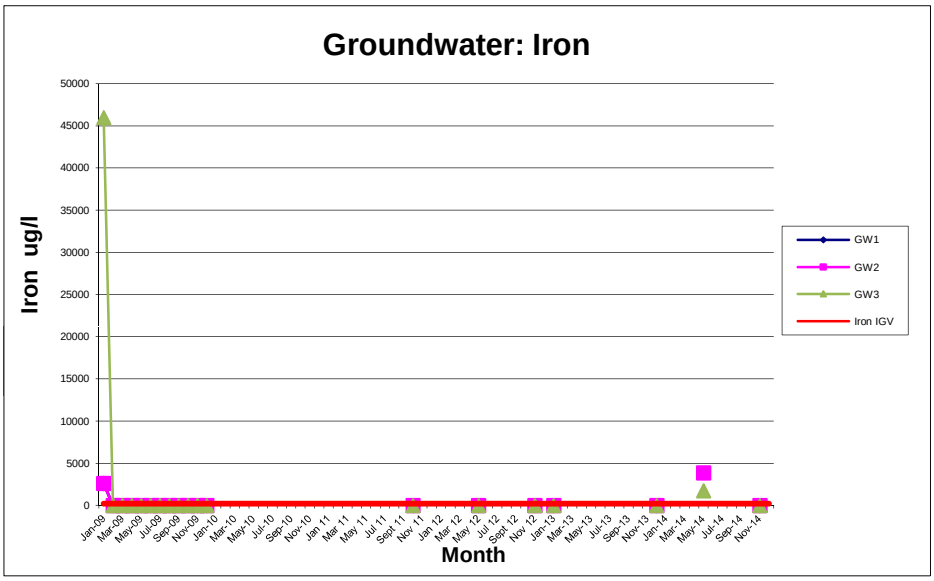

Surface Water: Chloride
Chloride mg/l
300
250
200
150
100
50
0
SW1
SW2
SW3
SW4
Chloride SWQS
Chloride
Month

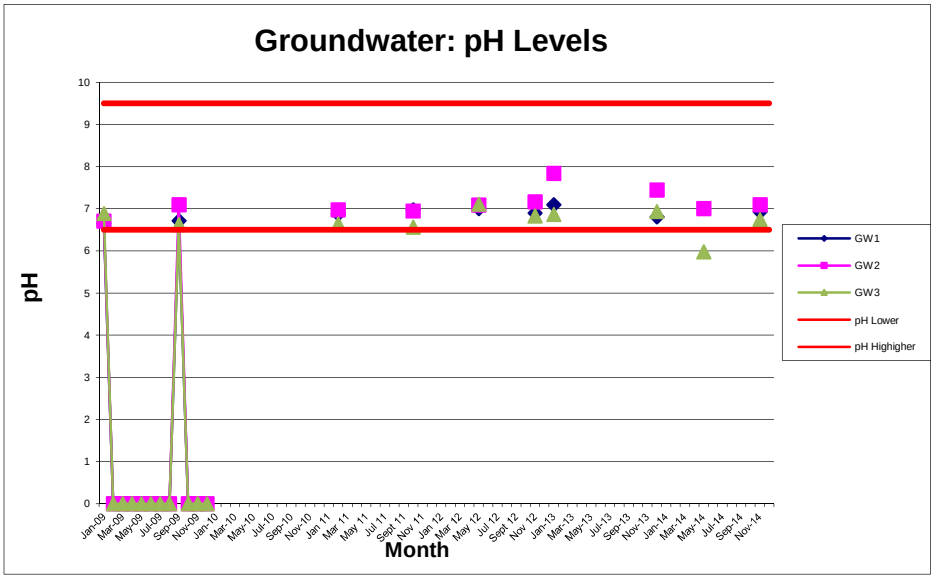

Surface Water: BOD
BOD mg/l
Month
SW1
SW2
SW3
SW4
BOD Good
BOD High

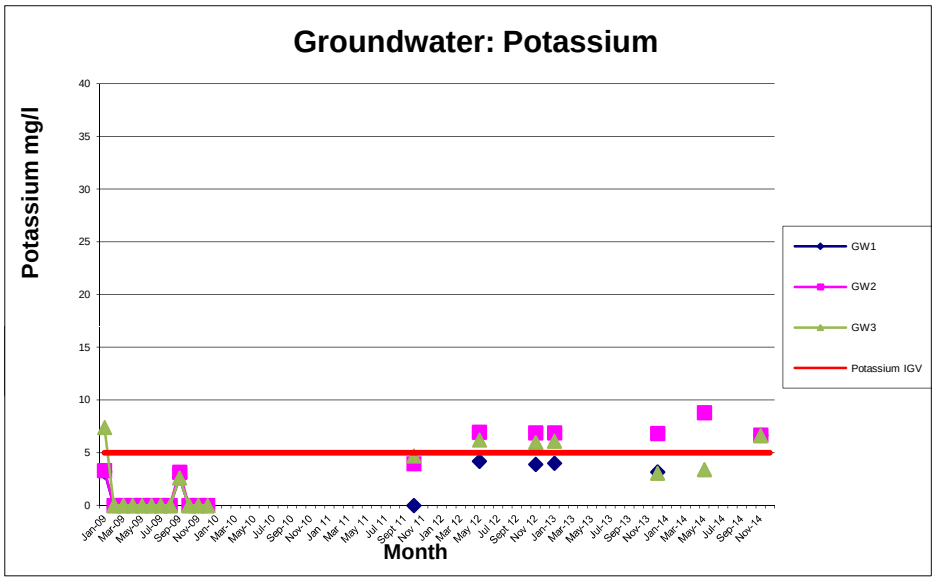

Groundwater: Ammonical Nitrogen
Ammonical Nitrogen mg/l
45
40
35
30
25
20
15
10
5
0
Jan-09 Mar-09 May-09 Jul-09 Sep-09 Nov-09 Jan-10 Mar-10 May-10 Jul-10 Sep-10 Nov-10 Jan 11 Mar 11 May 11 Jul 11 Sept 11 Nov 11 Jan 12 Mar 12 May 12 Jul 12 Sept 12 Nov 12 Jan-13 Mar-13 May-13 Jul-13 Sep-13 Nov-13 Jan-14 Mar-14 May-14 Jul-14 Sep-14 Nov-14
Month
GW1
GW2
GW3
Ammonia Lower
Ammonia Higher


Groundwater: Chloride
Chloride mg/l
200
180
160
140
120
100
80
60
40
20
0
Jan-09 Mar-09 May-09 Jul-09 Sep-09 Nov-09 Jan-10 Mar-10 May-10 Jul-10 Sep-10 Nov-10 Jan 11 Mar 11 May 11 Jul 11 Sept 11 Nov 11 Jan 12 Mar 12 May 12 Jul 12 Sept 12 Nov 12 Jan-13 Mar-13 May-13 Jul-13 Sep-13 Nov-13 Jan-14 Mar-14 May-14 Jul-14 Sep-14 Nov-14
Month
GW1
GW2
GW3
Chloride Low GWR
Chloride High GWR


Groundwater: Electrical Conductivity
Electrical Conductivity uS/cm
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Jan-09
Mar-09
May-09
Jul-09
Sep-09
Nov-09
Jan-10
Mar-10
May-10
Jul-10
Sep-10
Nov-10
Jan 11
Mar 11
May 11
Jul 11
Sept 11
Nov 11
Jan 12
Mar 12
May 12
Jul 12
Sept 12
Nov 12
Jan-13
Mar-13
May-13
Jul-13
Sep-13
Nov-13
Jan-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Month
GW1
GW2
GW3
Elect Cond Lower
Elect Cond Higher


Groundwater: Iron
Iron ug/l
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Jan-09
Mar-09
May-09
Jul-09
Sep-09
Nov-09
Jan-10
Mar-10
May-10
Jul-10
Sep-10
Nov-10
Jan 11
Mar 11
May 11
Jul 11
Sept 11
Nov 11
Jan 12
Mar 12
May 12
Jul 12
Sept 12
Nov 12
Jan-13
Mar-13
May-13
Jul-13
Sep-13
Nov-13
Jan-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Month
GW1
GW2
GW3
Iron IGV


Groundwater: pH Levels
pH
Month
GW1
GW2
GW3
pH Lower
pH Highigher


Groundwater: Potassium
Potassium mg/l
Month
GW1
GW2
GW3
Potassium IGV

Appendix C - Water Balance Calculation and Meteorological Data

GLENNALLA WATER BALANCE CALCULATION

Year	Status	Rainfall (mm)	Temp Restored area Area	Temp Restored area infiltration IRCA(m3)	Restored area Area	Restored area infiltration IRCA(m3)	Total Water	Leachate produced Lo(m3)	Leachate Volume Tankered
2014	Closed	1,213	0		20,500	2,487	2487	2,487	4,581
Total		1,213						2,487	4,581

Assumptions

IRCA=	Fully Capped/Restored area infiltration of rainfall estimated (2-10% of ER),EPA Manual	10%	%
Restored area	Area capped is 20,500.	20,500	m^2
Rainfall Data	Data taken from Met Eireann Station Malin Head, Total Rainfall used.	1213.1	mm

Appendix D - E-PRTR Return

(AER Electronic Reporting System)

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.18

REFERENCE YEAR	2014

1. FACILITY IDENTIFICATION

Parent Company Name	Donegal County Council
Facility Name	Glenalla Landfill Site
PRTR Identification Number	W0125
Licence Number	W0125-01

Classes of Activity

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

Address 1	Glenalla
Address 2	Milford
Address 3	
Address 4	
	Donegal
Country	Ireland
Coordinates of Location	-7.63731 55.0981
River Basin District	GBNIIENW
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Julie McMahon
AER Returns Contact Email Address	julie.mcmahon@donegalcoco.ie
AER Returns Contact Position	0749122787
AER Returns Contact Telephone Number	0872861096
AER Returns Contact Mobile Phone Number	0749161304
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	1
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

Activity Number	**Activity Name**
50.1	General
50.1	General

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

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

4. WASTE IMPORTED/ACCEPTED ONTO SITE

Guidance on waste imported/accepted onto site

Do you import/accept waste onto your site for on-site treatment (either recovery or disposal activities) ?	

4.2 RELEASES TO WATERS

Link to previous years emissions data

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

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

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

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

SECTION B : REMAINING PRTR POLLUTANTS

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

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

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

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

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

3

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	19 07 03	No	3537.28	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Donegal County Council,D0009-01	Thorn rd,Magheranan ,Letterkenny WWTP,Letterkenny County Donegal,Ireland		

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

4.1 RELEASES TO AIR Link to previous years emissions data | PRTR# : W0125 | Facility Name : Glenalla Landfill Site | Filename : W0125_2014.xls | Return Year : 2014 | 29/04/2015 14:38

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

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

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	C	OTH	landgem-v302	0.0	43432.5	0.0	43432.5
03	Carbon dioxide (CO2)	C	OTH	landgem-v302	0.0	119168.6	0.0	119168.6
02	Carbon monoxide (CO)	C	OTH	landgem-v302	0.0	21.24	0.0	21.24
07	Non-methane volatile organic compounds (NMVOC)	C	OTH	landgem-v302	0.0	280.03	0.0	280.03
55	1,1,1-trichloroethane	C	OTH	landgem-v302	0.0	0.35	0.0	0.35
56	1,1,2,2-tetrachloroethane	C	OTH	landgem-v302	0.0	1.0	0.0	1.0
34	1,2-dichloroethane (EDC)	C	OTH	landgem-v302	0.0	0.22	0.0	0.22
62	Benzene	C	OTH	landgem-v302	0.0	0.8	0.0	0.8
58	Trichloromethane	C	OTH	landgem-v302	0.0	0.02	0.0	0.02
35	Dichloromethane (DCM)	C	OTH	landgem-v302	0.0	6.44	0.0	6.44
65	Ethyl benzene	C	OTH	landgem-v302	0.0	2.64	0.0	2.64
73	Toluene	C	OTH	landgem-v302	0.0	19.46	0.0	19.46
78	Xylenes	C	OTH	landgem-v302	0.0	6.9	0.0	6.9
57	Trichloroethylene	C	OTH	landgem-v302	0.0	1.99	0.0	1.99
60	Vinyl chloride	C	OTH	landgem-v302	0.0	2.47	0.0	2.47

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

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

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

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

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) flare 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: Glenalla Landfill Site

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
Total estimated methane generation (as per site model)	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	