Comhairle Contae Chiarraí

Kerry County Council

Waste Licence Ref No. W0001-04

Annual Environmental Report for North Kerry Landfill

Reporting Period:

January 2011 – December 2011

Version 2

Amended Resubmitted October 2012

1.0 Contents

2.0 Introduction and Reporting Period

Kerry County Council (KCC) operates a municipal solid waste landfill facility at Muingnaminnane, Kielduff, Tralee, Co. Kerry.

It is located approximately 8km northeast of Tralee, in the Stacks Mountains.

The landfill site accepts solid waste for disposal. The landfill is operated under licence W0001-04.

This Annual Environment Report is prepared in accordance with Condition 12.6 and Schedule F of Waste Licence W0001-04.

The reporting period for this Annual Environmental Report is from January 1st 2011 to December 31st 2011.

3.0 Waste Activities carried out at the Facility

Waste disposal activities carried out at North Kerry Landfill are in accordance with Part 1 of Waste Licence W0001-04 which outlines the waste disposal activities licenced in accordance with the Third Schedule of the Waste Management Act 1996-2010.

Licenced activities include;

Class 2	Land treatment, including biodegradation of liquid or sludge discards in soils.
Class 4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
Class 5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
Class 6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule.
Class 7	Physico-chemical treatments not referred to elsewhere in this Schedule (including evaporation, drying and calcinations) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule.
Class 11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
Class 12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
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.

Waste recovery activities carried out at North Kerry Landfill are in accordance with Part 1 of Waste Licence W0001-04 which outlines the waste recovery activities licenced in accordance with the Fourth Schedule of the Waste Management Acts 1996-2008.

Licenced activities include:

Class 2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
Class 3	Recycling or reclamation of metals and metal compounds.

Class 4 Recycling or reclamation of other inorganic materials.

Class 10 The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.

Class 11 Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.

Class 13 Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

4.0 Quantity and composition of waste received, disposed and recovered

Waste tonnage disposed of at NKL during the reporting year 2011 decreased on the previous year to 16,545 tonnes.

This is due in part as the main private waste contractors disposed of their collected waste elsewhere for the reporting period and the amounts of waste presented via the public route declined.

The weight of the waste accepted into North Kerry Landfill Facility for disposal for the reporting period is set out in the Appendix A.

It sets out the monthly tonnage of waste accepted on site, a breakdown of waste by classification and origin accepted on site and waste collected on site for recovery/recycling/disposal off site.

Quantity of Waste disposed at facility

Since opening in May 1994 the total quantity of waste disposed of at the facility is 741,050 tonnes.

Appendix D shows a yearly break down of tonnage from 1994 – 2011.

BMW Percentage Composition of Waste disposed at facility

Total Qty MSW of which the BMW Condition Applies	Total Qty BMW	% BMW
16,315.41	10,301.91	63.14%

Appendix C shows the yearly breakdown of tonnage and %BMW entering the landfill site between 1st January – 31st December 2011 as submitted to the Agency.

5.0 Remaining Capacity and Projected Closure Date

Waste disposal/placement is currently being carried out in cell 16. It is estimated at current waste disposal trends that waste disposal/placement in cell 16 will cease in March 2012.

The development of three new cells 17, 18, 19 was completed in 2010, and the construction quality assurance reports for these cells have been lodged with the agency.

Cell 19 will be the first cell of the new development to receive waste. Appendix G contains outlines the proposed filling sequence for cells 17, 18 and 19.

The remaining developed void capacity is 107,770 m^3. This equates making allowance for cover requirements and compaction densities to approximately 95,000 tonnes.

Remaining undeveloped licensed capacity volume is 509,012 m^3 which equates to approximately 450,000 tonnes.

It is not credible to forecast a closure date assuming all undeveloped areas are constructed due to variability in intake volumes and the emergence of other disposal routes.

6.0 Method of Deposition of Waste at North Kerry Landfill

Large vehicle access/private customers with large trailers.

The current arrangement for disposing of waste in cell 16 is carried out on a pre-built pre-planned tip head.

The tip head height is normally kept at a height allowing for adequate working room for plant in the area.

At the latter stage of a cells life, it is not feasible to maintain the purpose built tip head an access road is constructed on top of the placed/compacted waste. A temporary level tip is constructed. Waste is deposited on the flat and a bull dozer is used to push the waste ahead of the compactor for placement and further compaction.

The placement of waste and tip head procedures that are currently being used in North Kerry Landfill will have to be reviewed once cell 16 has been filled. Appendix E contains proposed filling sequence for cells 17, 18 and 19.

Customers accessing the site with small quantities of waste.

The majority of customers do not access the tip head in order to dispose of their waste. These were directed to the public skip area to place their waste into a series of trailers. These trailers are removed from the public skip area on a regular basis and tipped at the tip head for placement/compaction. The weighbridge supervisor takes note of the weight of each trailer before it emptied and this information is added to the daily tonnage records and the end of every day.

Appendix E outlines the types of waste which are accepted in NKL for removal off site for recycling/recovery/disposal.

The civic amenity area contains a number of receptacles into which members of the public can deposit specific waste types free of charge for recovery/recycling/disposal. In addition to the concrete slab area there is a shed for the housing of WEEE and Hazardous waste collection.

Additionally the civic amenity area includes an area for the deposition of green waste. With the introduction of BMW target in July 2010, all green waste collected on site is being removed to the Bord na Mona licenced site at Kilberry Co Kildare for further processing and reuse.

7.0 Summary Report on Emissions for the Reporting Period.

Emissions to Water.

A full report prepared by the Environmental Laboratory of KCC is included in the Appendix F which covers the emission to water and ecological assessments undertaken.

The fish assessment section of monitoring is being progressed during 2012. it has not been completed in the recent past.

It is acknowledged that invertebrate monitoring at exact locations E1, E2, G1 No1 and G2 were inadvertently missed. This has been rectified going forward.

Emissions to Air.

Gas management practices at North Kerry Landfill is an interlinked system of mutually reinforcing actions no one of which can fully control or manage the generation of LFG from the deposited waste mass. In combination however, they comply fully with the requirements of the licence.

The Systems and operations include:

- Active management of the gas control infrastructure
- Introduction of new gas collection systems
- Odour patrol and consequent reactive measures
- Monitoring and testing of infrastructure

The infrastructure in place at North Kerry Landfill includes the construction of a basal liner and capping system.

Outside the footprint of the landfill is a network of LFG monitoring boreholes. There are constructed in a grid around the footprint of the area that waste has been deposited within. These wells are monitored on a prescribed cycle for the presence of a suite of indicator gases that would signal the possible migration of LFG.

Perimeter Gas Well no 6 continues to show methane and CO2 concentrations above the allowable throughout the year. This is a historically problematic well. In 2004 wells 6a-d were constructed to monitor the gas migration in the vicinity of the gas well. These perimeter gas wells also showed gas concentration levels in excess of the allowable at times during the year.

It is noted however that there is no odour of nuisance issue at the location or evidence of vegetation die back. The permanent capping of the adjacent cell should control this fugitive emission.

In November 2011 the gas to energy project was successfully commissioned. A Genset of nominal rating 300 kW is in operation at the facility.

The demand of the generation plant has been balanced against the generation output of the field. Field balancing and network management are vital components of a successful operation of the gas to energy project. These are actively managed to ensure maximum production.

8.0 Resource and Energy Consumption.

The following is the energy consumption for North Kerry Landfill for the reporting period.

Diesel

The diesel usage for the reporting period was 58,477 litres.

Electricity

The total usage for 2011 was 147,850 kWh for 2011; this is a significant reduction in energy consumption of 59,193 kWh.

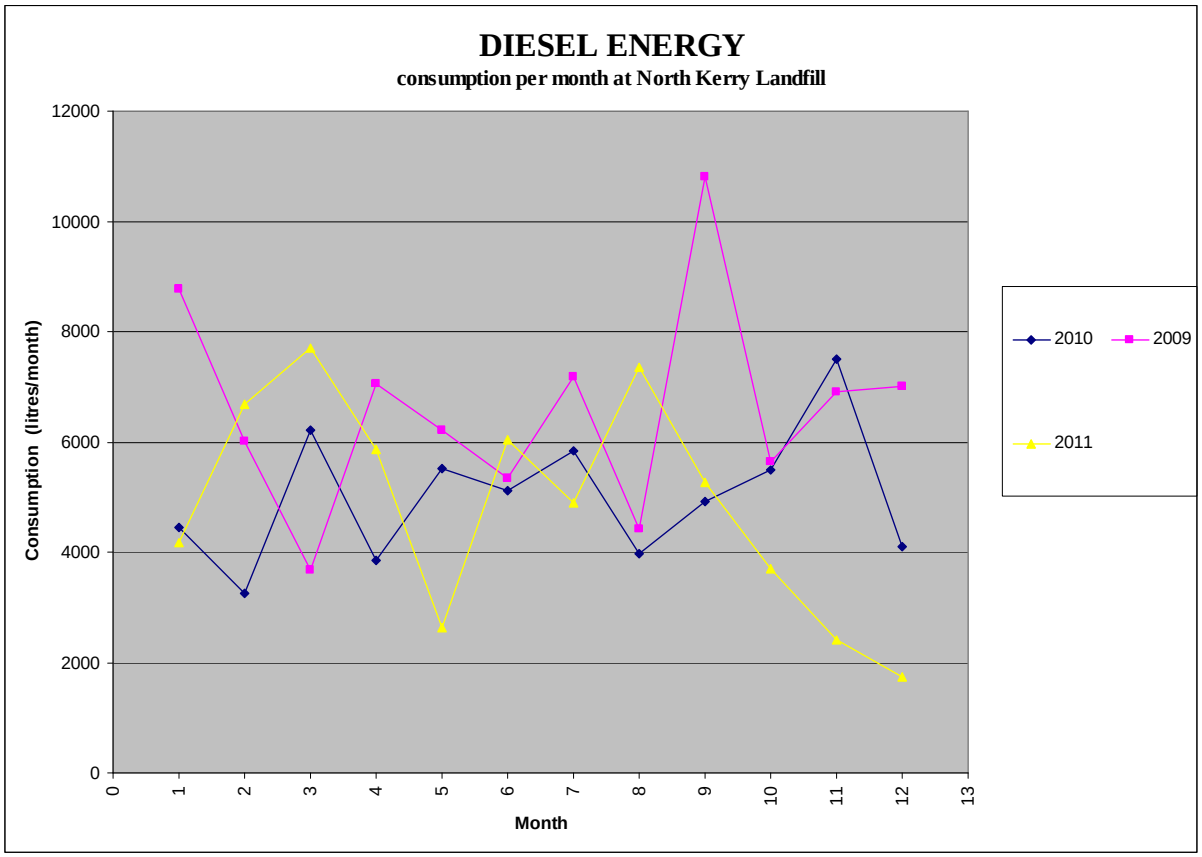
9.0 Energy Efficiency and Audit Report Summary

Diesel Consumption Efficiency
This is a reduction of 1,772 litres on 2010 figures. The diesel usage has reduced as follows over the past number of years:

Year	2009	2010	2011
Quantity	79,012	60,249	18,763
Reduction		-18,763	-1,772

There was a significant decline in the final quarter of 2011 due to a decrease in landfilling activity.

Figure 8.1: Diesel consumption North Kerry Landfill 2011



Electricity

The kW hour usage on site for 2011 is set out in the attached table.

It is expected that the usage will fall considerable in 2012 as the flare will be off line while the gas engine is in operation.

Table 8.2, kWh usage 2011

From	To	Day kWh	Night kWh
31/12/2010	28/02/2011	20,050	12,800
28/02/2011	30/04/2011	16,500	9,750
30/04/2011	30/06/2011	13,800	8,000
30/06/2011	31/08/2011	13,150	7,950
31/08/2011	31/10/2011	14,150	8,150
31/10/2011	31/12/2011	15,550	8,000
		93,200	54,650

10.0 Proposed Development of the Facility and timescale of the Development

The following projects are proposed for construction at North Kerry Landfill over 2012.

Gas to Energy Utilisation Project (ongoing)

This project was commissioned and started exporting electricity in November 2011.

The gas utilisation compound occupies the footprint of the previous public waste acceptance skips.

It comprises of:

- A Jenbacher JGC208GS Generation Set Engine and associated ancillary works (i.e. concrete pad)
- Two substation buildings for the ESB and 20kV equipment
- Cable and trenches ducts
- Installation of containerised office/welfare unit/storage unit.

A number of improvements have been completed on the collection network including which has improved the quantity of gas of a specific makeup that is required of the generation plant.

The remaining works refer to continual incremental improvements to the collection infrastructure with the focus on gas quality.

Leachate Pipeline Construction

This project has been brought to Part 8 stage (planning).

A report to the elected members is the next stage of the project.

Pilot Integrated Constructed Wetland Project

Notwithstanding the progress made on the pipeline project a pilot trial of a ICW is proposed for 2012.

The focus of this project will be to determine of ICW can proved a sustainable longer term solution to leachate management.

Sealing side slope rises

It is intended to have all side slope risers fully sealed (and be retrieving LFG from some) by the end of April 2012.

This will contribute to reducing fugitive emissions.

Intermediate capping cell 15B/16

Once the cells have reached profile the intermediate capping will be placed using site-won subsoil's – this will immediately follow the cells reaching profile.

Permanent gas wells

In advance of the permanent capping of the cells the vertical gas collection wells will be constructed and connected to the LFG gas management system. This will improve the gas control infrastructure on site. This is planned to be completed in the second quarter of 2012.

11.0 Volume of leachate produced and volume transported off site.

Over the reporting period 50,108 m^3 of leachate was produced on site.

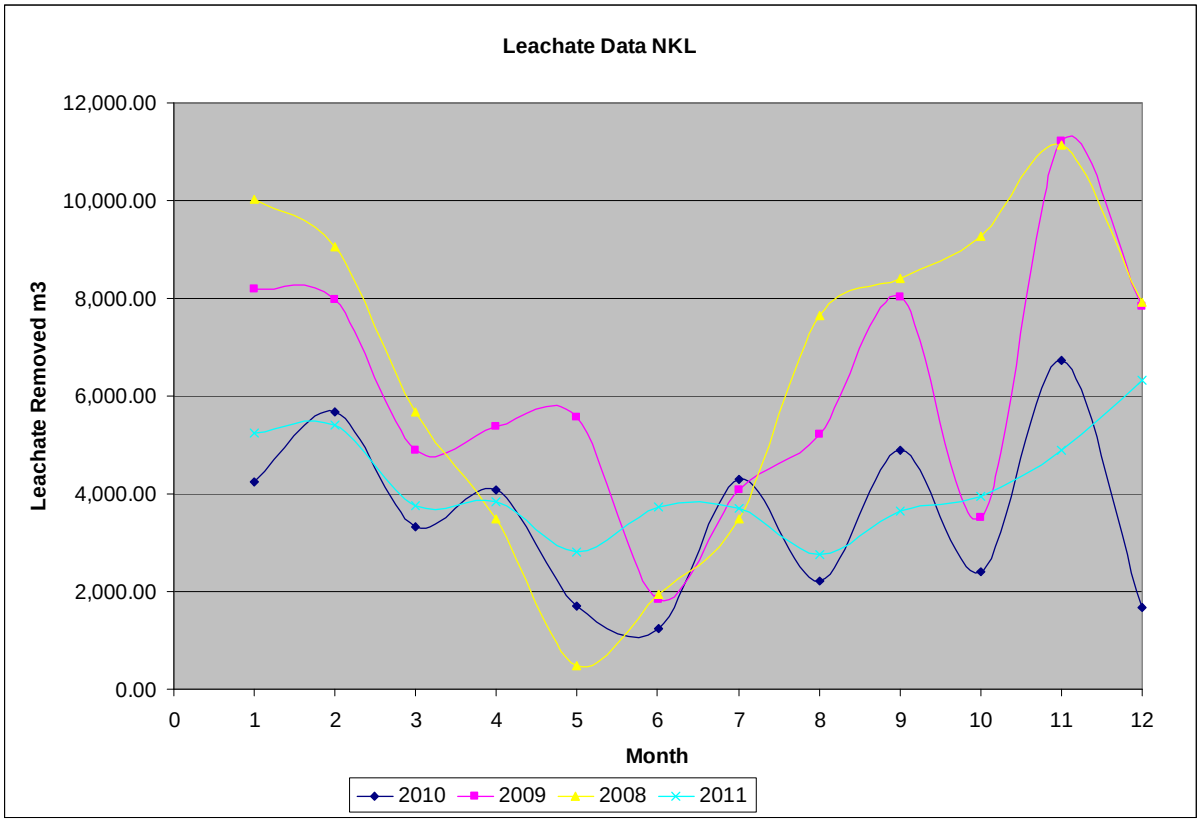
The total quantity of leachate produced site since the landfill site opened in May 1994 to the end of the reporting period is 653,568 m^3.

No leachate has been treated on site; all leachate is tankered off site for treatment.

Table 10.1, Leachate volumes tankered off –site, 2011.

Month	2008	2009	2010	2011
January	10,030.58	8,186.27	4,230.94	5,255.90
February	9,067.30	7,985.36	5,666.38	5,395.38
March	5,678.69	4,881.29	3,324.86	3,768.72
April	3,487.91	5,379.62	4,080.68	3,845.78
May	486.52	5,579.68	1,711.48	2,805.70
June	1,957.40	1,844.61	1,236.44	3,735.13
July	3,483.84	4,084.22	4,304.64	3,698.12
August	7,661.38	5,208.40	2,208.06	2,751.70
September	8,395.60	8,017.22	4,902.34	3,655.51
October	9,261.43	3,508.76	2,393.60	3,956.40
November	11,123.44	11,213.14	6,719.70	4,905.12
December	7,924.44	7,839.28	1,663.61	6,335.12
Total	***78,558.53***	***73,727.85***	***42,442.73***	**50,108.58**

Total Quantity of Leachate Removed from Site 2088 – 2011 (Trend Graph)



12.0 Report on Development Works Undertaken during the Reporting Period

No additional development works were carried out during the reporting period.

13.0 Report on Restoration of Completed Cells and Phases

Cells 1 – 15a are fully capped.

By the end of 2011 cells 15B and 16 were nearing profile height. It is intended to permanently cap these cells in 2012.

In the first instance intermediate capping (approximately 500mm of site won sub soils) will be placed to profile.

The sequence of works will then see the permanent vertical gas wells being installed and connected to the gas control infrastructure.

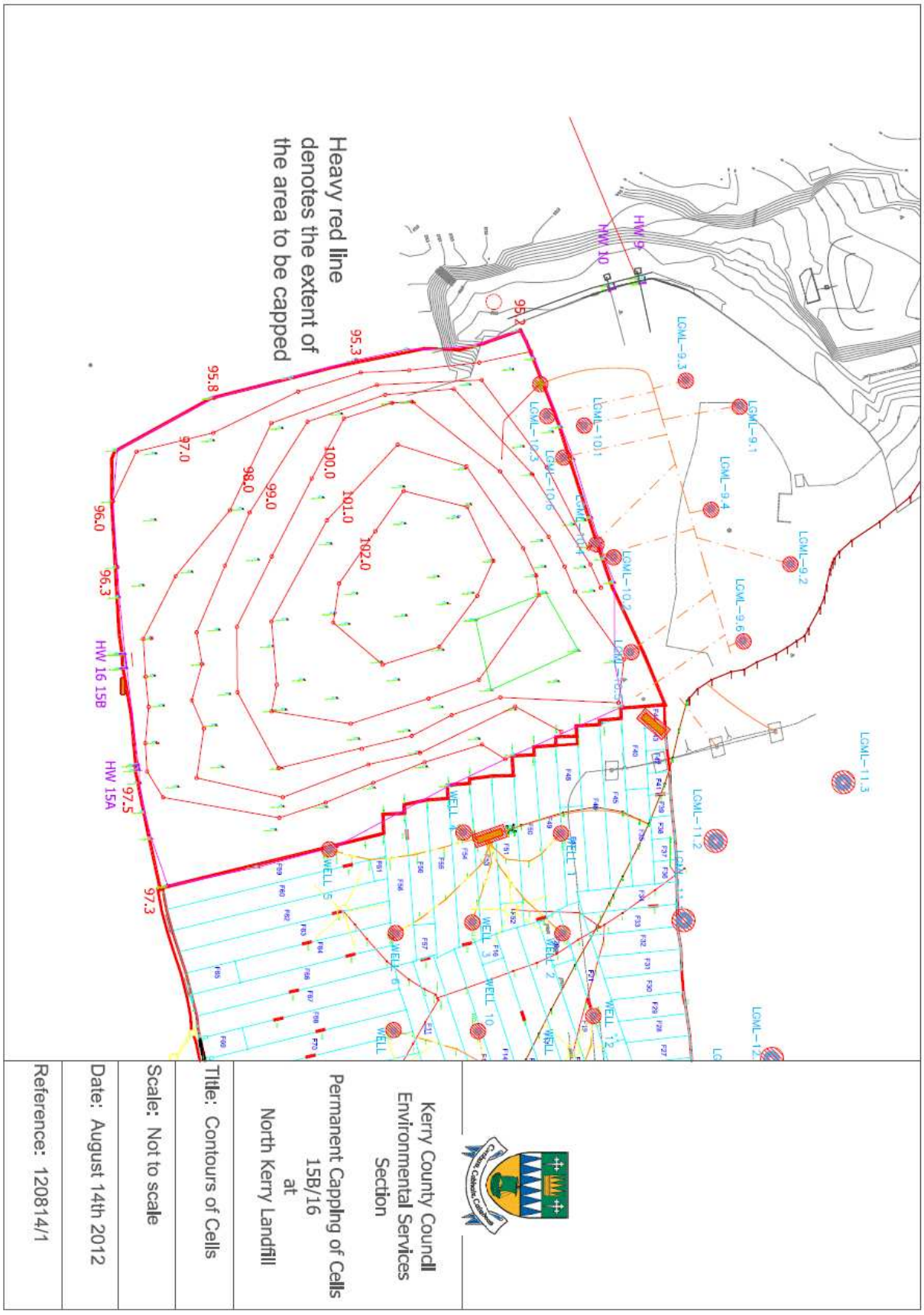
Permanent capping will follow in Q3/Q4 of the year subject to procurement.

Site Survey Showing Existing Levels of the Facility and the End of the Reporting Period.

The following page includes the design profile for Cell 15B/16 and was submitted part of the SEW for the permanent capping works

The target profile for the active cell (cell 16 is shown for reference).

14.0 Site Survey Showing existing Levels



Stability Assessment

With regard to stability assessments the following is confirmed:

- All side slopes above the anchor trench have been assessed;
- There are No signs of movement of the deposited material.
- There are a few localised areas where the peat capping has exhibited signs of movement with minor cracks in evidence (predominantly the northern side of cell 11/12 interface and the eastern side of cell 11).
- These have been assessed and refer to the peat layer only and is not significant with regard to the integrity of the deposited material.
- All retaining embankments have been visually inspected (North, South and West)
- There is No evidence of stress or movement in any of the embankments.

It is concluded therefore that the waste mass as deposited and embankments are in a satisfactory condition.

15.0 Estimated Annual and Cumulative quantities of landfill gas emitted from the facility – LandGem NKL

The following table show the landfill input and expected/modelled gas outputs for the landfill site over the design period. These figures were used in the estimation of landfill gas generation over the reporting period and submitted as part of the Landfill Gas Survey 2011 (Appendix I) and the PRTR 2011 (Appendix H).

Year	User Waste Acceptance Inputs *(Mg/year)*	User Waste-In Place *(Mg)*	Waste Acceptance *(Mg/year)*	Waste-In-Place *(Mg)*
1994	16,902	0	16,902	0
1995	23,505	16,902	23,505	16,902
1996	23,722	40,407	23,722	40,407
1997	25,582	64,129	25,582	64,129
1998	33,530	89,711	33,530	89,711
1999	57,873	123,241	57,873	123,241
2000	60,474	181,113	60,474	181,113
2001	63,946	241,587	63,946	241,587
2002	62,822	305,533	62,822	305,533
2003	50,235	368,354	50,235	368,354
2004	48,054	418,590	48,054	418,590
2005	34,431	466,644	34,431	466,644
2006	60,025	501,075	60,025	501,075
2007	56,794	561,100	56,794	561,100
2008	62,413	617,894	62,413	617,894
2009	39,755	680,307	39,755	680,307
2010	20,987	720,063	20,987	720,063
2011	16,546	741,050	16,546	741,050
2012	0	757,595	16,546	757,595
2013	0	757,595	16,546	774,141
2014	0	757,595	16,546	790,687
2015	0	757,595	16,546	807,233
2016	0	757,595	16,222	823,778
2017	0	757,595	0	840,000
2018	0	757,595	0	840,000
2019	0	757,595	0	840,000
2020	0	757,595	0	840,000
2021	0	757,595	0	840,000
2022	0	757,595	0	840,000
2023	0	757,595	0	840,000
2024	0	757,595	0	840,000
2025	0	757,595	0	840,000
2026	0	757,595	0	840,000
2027	0	757,595	0	840,000
2028	0	757,595	0	840,000
2029	0	757,595	0	840,000
2030	0	757,595	0	840,000
2031	0	757,595	0	840,000
2032	0	757,595	0	840,000
2033	0	757,595	0	840,000
2034	0	757,595	0	840,000
2035	0	757,595	0	840,000
2036	0	757,595	0	840,000
2037	0	757,595	0	840,000
2038	0	757,595	0	840,000
2039	0	757,595	0	840,000
2040	0	757,595	0	840,000
2041	0	757,595	0	840,000
2042	0	757,595	0	840,000
2043	0	757,595	0	840,000
2044	0	757,595	0	840,000
2045	0	757,595	0	840,000
2046	0	757,595	0	840,000
2047	0	757,595	0	840,000
2048	0	757,595	0	840,000
2049	0	757,595	0	840,000
2050	0	757,595	0	840,000
2051	0	757,595	0	840,000
2052	0	757,595	0	840,000
2053	0	757,595	0	840,000

RESULTS **Landfill Name or Identifier:** North Kerry Landfill

Closure Year (with 80-year limit) = 2016

Methane = 29 *% by volume*

Please choose a third unit of measure to represent all of the emission rates below.

User-specified Unit: *av ft^3/min*

Year	Waste Accepted		Waste-In-Place		Total landfill gas			Methane			Carbon dioxide			NMOC		
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
1994	16,902	18,592	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	23,505	25,856	16,902	18,592	3.233E+03	2.916E+06	1.960E+02	5.642E+02	8.458E+05	5.683E+01	3.790E+03	2.071E+06	1.391E+02	6.272E+00	1.750E+03	1.176E-01
1996	23,722	26,094	40,407	44,448	6.102E+03	5.504E+06	3.698E+02	1.065E+03	1.596E+06	1.072E+02	7.153E+03	3.908E+06	2.626E+02	1.184E+01	3.302E+03	2.219E-01
1997	25,582	28,140	64,129	70,542	7.569E+03	6.826E+06	4.587E+02	1.321E+03	1.980E+06	1.330E+02	8.872E+03	4.847E+06	3.257E+02	1.468E+01	4.096E+03	2.752E-01
1998	33,530	36,883	89,711	98,682	8.652E+03	7.804E+06	5.243E+02	1.510E+03	2.263E+06	1.521E+02	1.014E+04	5.541E+06	3.723E+02	1.678E+01	4.682E+03	3.146E-01
1999	57,873	63,660	123,241	135,565	1.071E+04	9.661E+06	6.491E+02	1.869E+03	2.802E+06	1.882E+02	1.256E+04	6.859E+06	4.609E+02	2.078E+01	5.797E+03	3.895E-01
2000	60,474	66,521	181,113	199,225	1.639E+04	1.478E+07	9.933E+02	2.860E+03	4.287E+06	2.881E+02	1.921E+04	1.050E+07	7.052E+02	3.179E+01	8.870E+03	5.960E-01
2001	63,946	70,341	241,587	265,746	1.971E+04	1.778E+07	1.194E+03	3.439E+03	5.155E+06	3.464E+02	2.310E+04	1.262E+07	8.480E+02	3.823E+01	1.067E+04	7.166E-01
2002	62,822	69,104	305,533	336,086	2.202E+04	1.986E+07	1.334E+03	3.843E+03	5.760E+06	3.870E+02	2.581E+04	1.410E+07	9.475E+02	4.271E+01	1.192E+04	8.007E-01
2003	50,235	55,259	368,354	405,190	2.295E+04	2.070E+07	1.391E+03	4.005E+03	6.004E+06	4.034E+02	2.691E+04	1.470E+07	9.876E+02	4.452E+01	1.242E+04	8.346E-01
2004	48,054	52,860	418,590	460,449	2.101E+04	1.895E+07	1.273E+03	3.666E+03	5.495E+06	3.692E+02	2.463E+04	1.345E+07	9.039E+02	4.075E+01	1.137E+04	7.639E-01
2005	34,431	37,874	466,644	513,309	1.963E+04	1.770E+07	1.189E+03	3.425E+03	5.133E+06	3.449E+02	2.301E+04	1.257E+07	8.444E+02	3.807E+01	1.062E+04	7.136E-01
2006	60,025	66,028	501,075	551,182	1.633E+04	1.473E+07	9.898E+02	2.850E+03	4.272E+06	2.870E+02	1.915E+04	1.046E+07	7.027E+02	3.168E+01	8.839E+03	5.939E-01
2007	56,794	62,474	561,100	617,210	1.959E+04	1.767E+07	1.187E+03	3.419E+03	5.125E+06	3.444E+02	2.297E+04	1.255E+07	8.431E+02	3.801E+01	1.060E+04	7.124E-01
2008	62,413	68,654	617,894	679,684	2.060E+04	1.858E+07	1.248E+03	3.594E+03	5.387E+06	3.619E+02	2.414E+04	1.319E+07	8.861E+02	3.995E+01	1.115E+04	7.489E-01
2009	39,755	43,731	680,307	748,338	2.217E+04	1.999E+07	1.343E+03	3.868E+03	5.798E+06	3.896E+02	2.598E+04	1.420E+07	9.538E+02	4.300E+01	1.200E+04	8.060E-01
2010	20,987	23,086	720,063	792,069	1.861E+04	1.679E+07	1.128E+03	3.248E+03	4.869E+06	3.271E+02	2.182E+04	1.192E+07	8.009E+02	3.611E+01	1.007E+04	6.768E-01
2011	16,546	18,200	741,050	815,155	1.328E+04	1.196E+07	8.035E+02	2.314E+03	3.468E+06	2.330E+02	1.554E+04	8.490E+06	5.705E+02	2.572E+01	7.175E+03	4.821E-01
2012	16,546	18,200	757,595	833,355	9.749E+03	8.793E+06	5.908E+02	1.701E+03	2.550E+06	1.713E+02	1.143E+04	6.243E+06	4.195E+02	1.891E+01	5.276E+03	3.545E-01
2013	16,546	18,200	774,141	851,555	8.007E+03	7.221E+06	4.852E+02	1.397E+03	2.094E+06	1.407E+02	9.385E+03	5.127E+06	3.445E+02	1.553E+01	4.333E+03	2.911E-01
2014	16,546	18,200	790,687	869,756	7.141E+03	6.441E+06	4.328E+02	1.246E+03	1.868E+06	1.255E+02	8.371E+03	4.573E+06	3.073E+02	1.385E+01	3.865E+03	2.597E-01
2015	16,546	18,200	807,233	887,956	6.712E+03	6.053E+06	4.067E+02	1.171E+03	1.756E+06	1.180E+02	7.867E+03	4.298E+06	2.888E+02	1.302E+01	3.632E+03	2.440E-01
2016	16,222	17,844	823,779	906,156	6.498E+03	5.861E+06	3.938E+02	1.134E+03	1.700E+06	1.142E+02	7.617E+03	4.161E+06	2.796E+02	1.261E+01	3.517E+03	2.363E-01
2017	0	0	840,000	924,000	6.330E+03	5.710E+06	3.836E+02	1.105E+03	1.656E+06	1.113E+02	7.420E+03	4.054E+06	2.724E+02	1.228E+01	3.426E+03	2.302E-01
2018	0	0	840,000	924,000	3.144E+03	2.835E+06	1.905E+02	5.485E+02	8.222E+05	5.525E+01	3.685E+03	2.013E+06	1.353E+02	6.098E+00	1.701E+03	1.143E-01
2019	0	0	840,000	924,000	1.561E+03	1.408E+06	9.460E+01	2.724E+02	4.083E+05	2.743E+01	1.830E+03	9.996E+05	6.717E+01	3.028E+00	8.448E+02	5.676E-02
2020	0	0	840,000	924,000	7.752E+02	6.992E+05	4.698E+01	1.353E+02	2.028E+05	1.362E+01	9.087E+02	4.964E+05	3.335E+01	1.504E+00	4.195E+02	2.819E-02
2021	0	0	840,000	924,000	3.849E+02	3.472E+05	2.333E+01	6.717E+01	1.007E+05	6.765E+00	4.512E+02	2.465E+05	1.656E+01	7.467E-01	2.083E+02	1.400E-02
2022	0	0	840,000	924,000	1.912E+02	1.724E+05	1.158E+01	3.336E+01	5.000E+04	3.359E+00	2.241E+02	1.224E+05	8.225E+00	3.708E-01	1.034E+02	6.951E-03
2023	0	0	840,000	924,000	9.493E+01	8.562E+04	5.753E+00	1.656E+01	2.483E+04	1.668E+00	1.113E+02	6.079E+04	4.084E+00	1.841E-01	5.137E+01	3.452E-03
2024	0	0	840,000	924,000	4.714E+01	4.252E+04	2.857E+00	8.226E+00	1.233E+04	8.284E-01	5.526E+01	3.019E+04	2.028E+00	9.144E-02	2.551E+01	1.714E-03
2025	0	0	840,000	924,000	2.341E+01	2.111E+04	1.419E+00	4.085E+00	6.123E+03	4.114E-01	2.744E+01	1.499E+04	1.007E+00	4.541E-02	1.267E+01	8.511E-04
2026	0	0	840,000	924,000	1.162E+01	1.048E+04	7.044E-01	2.028E+00	3.040E+03	2.043E-01	1.363E+01	7.444E+03	5.002E-01	2.255E-02	6.291E+00	4.227E-04
2027	0	0	840,000	924,000	5.772E+00	5.206E+03	3.498E-01	1.007E+00	1.510E+03	1.014E-01	6.767E+00	3.697E+03	2.484E-01	1.120E-02	3.124E+00	2.099E-04
2028	0	0	840,000	924,000	2.867E+00	2.585E+03	1.737E-01	5.002E-01	7.498E+02	5.038E-02	3.360E+00	1.836E+03	1.233E-01	5.560E-03	1.551E+00	1.042E-04
2029	0	0	840,000	924,000	1.423E+00	1.284E+03	8.626E-02	2.484E-01	3.723E+02	2.502E-02	1.669E+00	9.116E+02	6.125E-02	2.761E-03	7.703E-01	5.176E-05
2030	0	0	840,000	924,000	7.069E-01	6.376E+02	4.284E-02	1.234E-01	1.849E+02	1.242E-02	8.286E-01	4.527E+02	3.041E-02	1.371E-03	3.825E-01	2.570E-05
2031	0	0	840,000	924,000	3.510E-01	3.166E+02	2.127E-02	6.125E-02	9.181E+01	6.169E-03	4.115E-01	2.248E+02	1.510E-02	6.809E-04	1.900E-01	1.276E-05
2032	0	0	840,000	924,000	1.743E-01	1.572E+02	1.056E-02	3.042E-02	4.559E+01	3.063E-03	2.043E-01	1.116E+02	7.500E-03	3.381E-04	9.433E-02	6.338E-06
2033	0	0	840,000	924,000	8.656E-02	7.807E+01	5.246E-03	1.511E-02	2.264E+01	1.521E-03	1.015E-01	5.543E+01	3.724E-03	1.679E-04	4.684E-02	3.147E-06
2034	0	0	840,000	924,000	4.299E-02	3.877E+01	2.605E-03	7.501E-03	1.124E+01	7.554E-04	5.039E-02	2.753E+01	1.850E-03	8.338E-05	2.326E-02	1.563E-06
2035	0	0	840,000	924,000	2.135E-02	1.925E+01	1.294E-03	3.725E-03	5.583E+00	3.751E-04	2.502E-02	1.367E+01	9.184E-04	4.141E-05	1.155E-02	7.761E-07
2036	0	0	840,000	924,000	1.060E-02	9.561E+00	6.424E-04	1.850E-03	2.773E+00	1.863E-04	1.243E-02	6.788E+00	4.561E-04	2.056E-05	5.736E-03	3.854E-07
2037	0	0	840,000	924,000	5.264E-03	4.748E+00	3.190E-04	9.185E-04	1.377E+00	9.251E-05	6.170E-03	3.371E+00	2.265E-04	1.021E-05	2.849E-03	1.914E-07
2038	0	0	840,000	924,000	2.614E-03	2.358E+00	1.584E-04	4.561E-04	6.837E-01	4.594E-05	3.064E-03	1.674E+00	1.125E-04	5.070E-06	1.415E-03	9.504E-08
2039	0	0	840,000	924,000	1.298E-03	1.171E+00	7.866E-05	2.265E-04	3.395E-01	2.281E-05	1.522E-03	8.312E-01	5.585E-05	2.518E-06	7.024E-04	4.720E-08
2040	0	0	840,000	924,000	6.446E-04	5.814E-01	3.906E-05	1.125E-04	1.686E-01	1.133E-05	7.556E-04	4.128E-01	2.773E-05	1.250E-06	3.488E-04	2.344E-08
2041	0	0	840,000	924,000	3.201E-04	2.887E-01	1.940E-05	5.586E-05	8.372E-02	5.625E-06	3.752E-04	2.050E-01	1.377E-05	6.209E-07	1.732E-04	1.164E-08
2042	0	0	840,000	924,000	1.590E-04	1.434E-01	9.633E-06	2.774E-05	4.158E-02	2.793E-06	1.863E-04	1.018E-01	6.839E-06	3.083E-07	8.602E-05	5.780E-09
2043	0	0	840,000	924,000	7.893E-05	7.119E-02	4.783E-06	1.377E-05	2.066E-02	1.387E-06	9.253E-05	5.055E-02	3.396E-06	1.531E-07	4.272E-05	2.870E-09
2044	0	0	840,000	924,000	3.920E-05	3.535E-02	2.375E-06	6.840E-06	1.026E-02	6.889E-07	4.595E-05	2.510E-02	1.687E-06	7.603E-08	2.121E-05	1.425E-09
2045	0	0	840,000	924,000	1.946E-05	1.755E-02	1.180E-06	3.397E-06	5.091E-03	3.421E-07	2.282E-05	1.246E-02	8.375E-07	3.776E-08	1.053E-05	7.078E-10
2046	0	0	840,000	924,000	9.666E-06	8.719E-03	5.858E-07	1.687E-06	2.528E-03	1.699E-07	1.133E-05	6.190E-03	4.159E-07	1.875E-08	5.231E-06	3.515E-10
2047	0	0	840,000	924,000	4.800E-06	4.329E-03	2.909E-07	8.376E-07	1.255E-03	8.436E-08	5.627E-06	3.074E-03	2.065E-07	9.311E-09	2.598E-06	1.746E-10
2048	0	0	840,000	924,000	2.384E-06	2.150E-03	1.444E-07	4.159E-07	6.235E-04	4.189E-08	2.794E-06	1.526E-03	1.026E-07	4.624E-09	1.290E-06	8.667E-11
2049	0	0	840,000	924,000	1.184E-06	1.068E-03	7.173E-08	2.065E-07	3.096E-04	2.080E-08	1.387E-06	7.580E-04	5.093E-08	2.296E-09	6.406E-07	4.304E-11
2050	0	0	840,000	924,000	5.878E-07	5.301E-04	3.562E-08	1.026E-07	1.537E-04	1.033E-08	6.890E-07	3.764E-04	2.529E-08	1.140E-09	3.181E-07	2.137E-11
2051	0	0	840,000	924,000	2.919E-07	2.633E-04	1.769E-08	5.093E-08	7.635E-05	5.130E-09	3.422E-07	1.869E-04	1.256E-08	5.662E-10	1.580E-07	1.061E-11
2052	0	0	840,000	924,000	1.449E-07	1.307E-04	8.784E-09	2.529E-08	3.791E-05	2.547E-09	1.699E-07	9.282E-05	6.237E-09	2.812E-10	7.844E-08	5.270E-12
2053	0	0	840,000	924,000	7.198E-08	6.492E-05	4.362E-09	1.256E-08	1.883E-05	1.265E-09	8.437E-08	4.609E-05	3.097E-09	1.396E-10	3.895E-08	2.617E-12
2054	0	0	840,000	924,000	3.574E-08	3.224E-05	2.166E-09	6.237E-09	9.349E-06	6.282E-10	4.190E-08	2.289E-05	1.538E-09	6.933E-11	1.934E-08	1.300E-12
2055	0	0	840,000	924,000	1.775E-08	1.601E-05	1.076E-09	3.097E-09	4.643E-06	3.119E-10	2.081E-08	1.137E-05	7.637E-10	3.443E-11	9.605E-09	6.454E-13
2056	0	0	840,000	924,000	8.814E-09	7.950E-06	5.342E-10	1.538E-09	2.305E-06	1.549E-10	1.033E-08	5.644E-06	3.792E-10	1.710E-11	4.770E-09	3.205E-13
2057	0	0	840,000	924,000	4.377E-09	3.948E-06	2.653E-10	7.638E-10	1.145E-06	7.692E-11	5.131E-09	2.803E-06	1.883E-10	8.490E-12	2.369E-09	1.592E-13
2058	0	0	840,000	924,000	2.174E-09	1.960E-06	1.317E-10	3.793E-10	5.685E-07	3.820E-11	2.548E-09	1.392E-06	9.352E-11	4.216E-12	1.176E-09	7.903E-14
2059	0	0	840,000	924,000	1.079E-09	9.735E-07	6.541E-11	1.883E-10	2.823E-07	1.897E-11	1.265E-09	6.912E-07	4.644E-11	2.094E-12	5.841E-10	3.925E-14
2060	0	0	840,000	924,000	5.360E-10	4.834E-07	3.248E-11	9.353E-11	1.402E-07	9.420E-12	6.283E-10	3.432E-07	2.306E-11	1.040E-12	2.901E-10	1.949E-14
2061	0	0	840,000	924,000	2.662E-10	2.401E-07	1.613E-11	4.645E-11	6.962E-08	4.678E-12	3.120E-10	1.704E-07	1.145E-11	5.163E-13	1.440E-10	9.678E-15
2062	0	0	840,000	924,000	1.322E-10	1.192E-07	8.010E-12	2.306E-11	3.457E-08	2.323E-12	1.549E-10	8.464E-08	5.687E-12	2.564E-13	7.153E-11	4.806E-15
2063	0	0	840,000	924,000	6.564E-11	5.920E-08	3.978E-12	1.145E-11	1.717E-08	1.154E-12	7.694E-11	4.203E-08	2.824E-12	1.273E-13	3.552E-11	2.387E-15
2064	0	0	840,000	924,000	3.259E-11	2.940E-08	1.975E-12	5.688E-12	8.525E-09	5.728E-13	3.821E-11	2.087E-08	1.402E-12	6.322E-14	1.764E-11	1.185E-15
2065	0	0	840,000	924,000	1.619E-11	1.460E-08	9.809E-13	2.824E-12	4.234E-09	2.845E-13	1.897E-11	1.036E-08	6.964E-13	3.140E-14	8.759E-12	5.885E-16
2066	0	0	840,000	924,000	8.038E-12	7.249E-09	4.871E-13	1.403E-12	2.102E-09	1.413E-13	9.422E-12	5.147E-09	3.458E-13	1.559E-14	4.350E-12	2.922E-16
2067	0	0	840,000	924,000	3.991E-12	3.600E-09	2.419E-13	6.965E-13	1.044E-09	7.014E-14	4.679E-12	2.556E-09	1.717E-13	7.742E-15	2.160E-12	1.451E-16
2068	0	0	840,000	924,000	1.982E-12	1.788E-09	1.201E-13	3.459E-13	5.184E-10	3.483E-14	2.323E-12	1.269E-09	8.528E-14	3.845E-15	1.073E-12	7.207E-17
2069	0	0	840,000	924,000	9.842E-13	8.877E-10	5.965E-14	1.718E-13	2.574E-10	1.730E-14	1.154E-12	6.303E-10	4.235E-14	1.909E-15	5.326E-13	3.579E-17

RESULTS **Landfill Name or Identifier:** North Kerry Landfill

Closure Year (with 80-year limit) = 2016

Methane = 29 *% by volume*

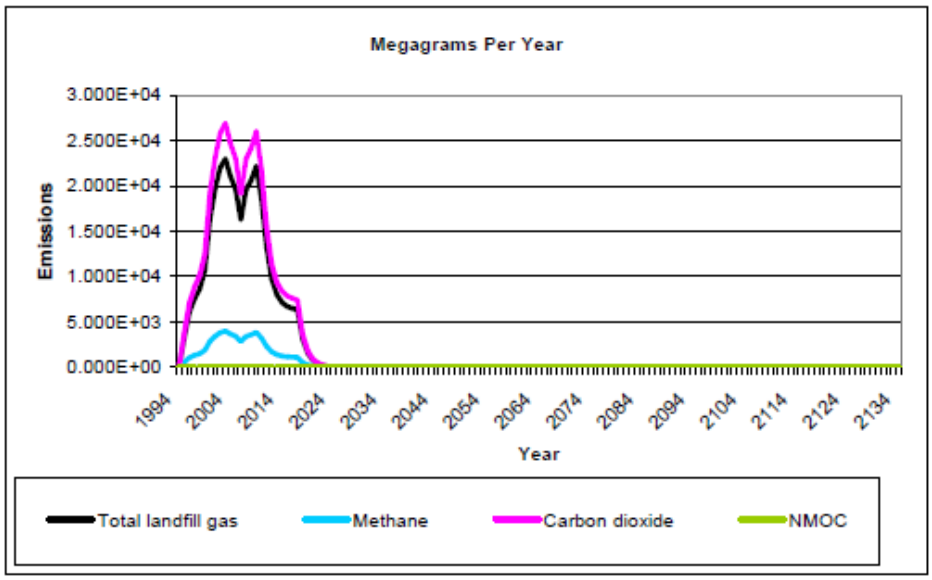
Please choose a third unit of measure to represent all of the emission rates below.

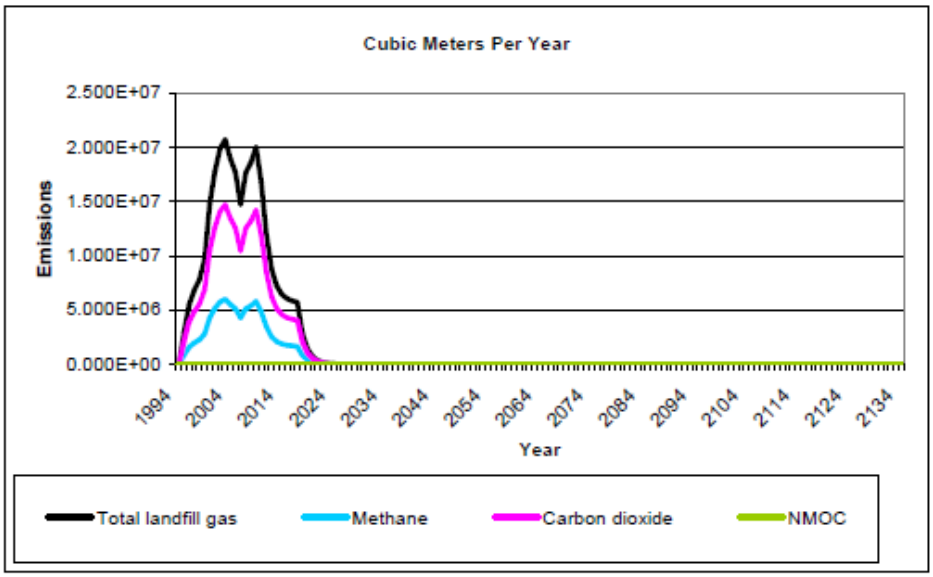
User-specified Unit: *av ft^3/min*

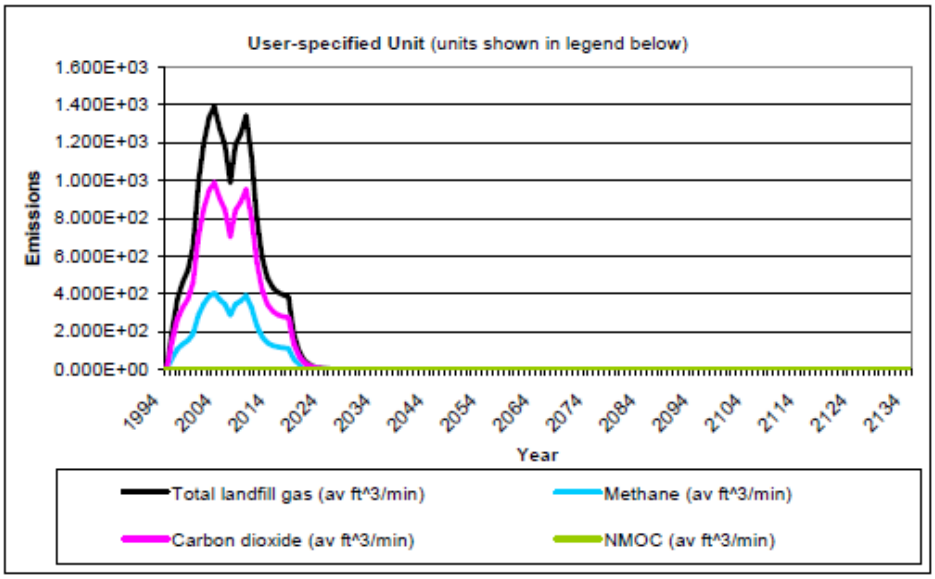
Year	Waste Accepted		Waste-In-Place		Total landfill gas			Methane			Carbon dioxide			NMOC		
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*	*(Mg/year)*	*(m^3/year)*	*(av ft^3/min)*
2070	0	0	840,000	924,000	4.888E-13	4.408E-10	2.962E-14	8.529E-14	1.278E-10	8.590E-15	5.729E-13	3.130E-10	2.103E-14	9.481E-16	2.645E-13	1.777E-17
2071	0	0	840,000	924,000	2.427E-13	2.189E-10	1.471E-14	4.235E-14	6.348E-11	4.265E-15	2.845E-13	1.554E-10	1.044E-14	4.708E-16	1.313E-13	8.825E-18
2072	0	0	840,000	924,000	1.205E-13	1.087E-10	7.304E-15	2.103E-14	3.153E-11	2.118E-15	1.413E-13	7.718E-11	5.186E-15	2.338E-16	6.522E-14	4.382E-18
2073	0	0	840,000	924,000	5.985E-14	5.398E-11	3.627E-15	1.044E-14	1.566E-11	1.052E-15	7.016E-14	3.833E-11	2.575E-15	1.161E-16	3.239E-14	2.176E-18
2074	0	0	840,000	924,000	2.972E-14	2.681E-11	1.801E-15	5.186E-15	7.774E-12	5.223E-16	3.484E-14	1.903E-11	1.279E-15	5.765E-17	1.608E-14	1.081E-18
2075	0	0	840,000	924,000	1.476E-14	1.331E-11	8.944E-16	2.576E-15	3.860E-12	2.594E-16	1.730E-14	9.452E-12	6.350E-16	2.863E-17	7.987E-15	5.367E-19
2076	0	0	840,000	924,000	7.329E-15	6.611E-12	4.442E-16	1.279E-15	1.917E-12	1.288E-16	8.591E-15	4.693E-12	3.154E-16	1.422E-17	3.966E-15	2.665E-19
2077	0	0	840,000	924,000	3.640E-15	3.283E-12	2.206E-16	6.351E-16	9.520E-13	6.396E-17	4.266E-15	2.331E-12	1.566E-16	7.060E-18	1.970E-15	1.323E-19
2078	0	0	840,000	924,000	1.807E-15	1.630E-12	1.095E-16	3.154E-16	4.727E-13	3.176E-17	2.119E-15	1.157E-12	7.777E-17	3.506E-18	9.781E-16	6.572E-20
2079	0	0	840,000	924,000	8.975E-16	8.095E-13	5.439E-17	1.566E-16	2.348E-13	1.577E-17	1.052E-15	5.747E-13	3.862E-17	1.741E-18	4.857E-16	3.263E-20
2080	0	0	840,000	924,000	4.457E-16	4.020E-13	2.701E-17	7.777E-17	1.166E-13	7.833E-18	5.224E-16	2.854E-13	1.918E-17	8.645E-19	2.412E-16	1.621E-20
2081	0	0	840,000	924,000	2.213E-16	1.996E-13	1.341E-17	3.862E-17	5.789E-14	3.890E-18	2.594E-16	1.417E-13	9.523E-18	4.293E-19	1.198E-16	8.048E-21
2082	0	0	840,000	924,000	1.099E-16	9.913E-14	6.660E-18	1.918E-17	2.875E-14	1.932E-18	1.288E-16	7.038E-14	4.729E-18	2.132E-19	5.948E-17	3.996E-21
2083	0	0	840,000	924,000	5.458E-17	4.923E-14	3.307E-18	9.524E-18	1.428E-14	9.592E-19	6.398E-17	3.495E-14	2.348E-18	1.059E-19	2.954E-17	1.984E-21
2084	0	0	840,000	924,000	2.710E-17	2.444E-14	1.642E-18	4.729E-18	7.089E-15	4.763E-19	3.177E-17	1.736E-14	1.166E-18	5.257E-20	1.467E-17	9.855E-22
2085	0	0	840,000	924,000	1.346E-17	1.214E-14	8.156E-19	2.349E-18	3.520E-15	2.365E-19	1.578E-17	8.619E-15	5.791E-19	2.611E-20	7.283E-18	4.894E-22
2086	0	0	840,000	924,000	6.683E-18	6.028E-15	4.050E-19	1.166E-18	1.748E-15	1.175E-19	7.834E-18	4.280E-15	2.876E-19	1.296E-20	3.617E-18	2.430E-22
2087	0	0	840,000	924,000	3.319E-18	2.993E-15	2.011E-19	5.791E-19	8.681E-16	5.833E-20	3.890E-18	2.125E-15	1.428E-19	6.438E-21	1.796E-18	1.207E-22
2088	0	0	840,000	924,000	1.648E-18	1.486E-15	9.988E-20	2.876E-19	4.311E-16	2.896E-20	1.932E-18	1.055E-15	7.091E-20	3.197E-21	8.919E-19	5.993E-23
2089	0	0	840,000	924,000	8.184E-19	7.382E-16	4.960E-20	1.428E-19	2.141E-16	1.438E-20	9.594E-19	5.241E-16	3.521E-20	1.588E-21	4.429E-19	2.976E-23
2090	0	0	840,000	924,000	4.064E-19	3.666E-16	2.463E-20	7.092E-20	1.063E-16	7.143E-21	4.764E-19	2.603E-16	1.749E-20	7.884E-22	2.199E-19	1.478E-23
2091	0	0	840,000	924,000	2.018E-19	1.820E-16	1.223E-20	3.522E-20	5.279E-17	3.547E-21	2.366E-19	1.292E-16	8.684E-21	3.915E-22	1.092E-19	7.338E-24
2092	0	0	840,000	924,000	1.002E-19	9.039E-17	6.074E-21	1.749E-20	2.621E-17	1.761E-21	1.175E-19	6.418E-17	4.312E-21	1.944E-22	5.424E-20	3.644E-24
2093	0	0	840,000	924,000	4.977E-20	4.489E-17	3.016E-21	8.685E-21	1.302E-17	8.747E-22	5.834E-20	3.187E-17	2.141E-21	9.654E-23	2.693E-20	1.810E-24
2094	0	0	840,000	924,000	2.471E-20	2.229E-17	1.498E-21	4.313E-21	6.464E-18	4.343E-22	2.897E-20	1.583E-17	1.063E-21	4.794E-23	1.337E-20	8.986E-25
2095	0	0	840,000	924,000	1.227E-20	1.107E-17	7.437E-22	2.142E-21	3.210E-18	2.157E-22	1.439E-20	7.859E-18	5.281E-22	2.381E-23	6.642E-21	4.462E-25
2096	0	0	840,000	924,000	6.094E-21	5.497E-18	3.693E-22	1.063E-21	1.594E-18	1.071E-22	7.144E-21	3.903E-18	2.622E-22	1.182E-23	3.298E-21	2.216E-25
2097	0	0	840,000	924,000	3.026E-21	2.730E-18	1.834E-22	5.281E-22	7.916E-19	5.319E-23	3.548E-21	1.938E-18	1.302E-22	5.871E-24	1.638E-21	1.100E-25
2098	0	0	840,000	924,000	1.503E-21	1.356E-18	9.108E-23	2.623E-22	3.931E-19	2.641E-23	1.762E-21	9.624E-19	6.466E-23	2.915E-24	8.133E-22	5.465E-26
2099	0	0	840,000	924,000	7.463E-22	6.731E-19	4.523E-23	1.302E-22	1.952E-19	1.312E-23	8.748E-22	4.779E-19	3.211E-23	1.448E-24	4.039E-22	2.714E-26
2100	0	0	840,000	924,000	3.706E-22	3.343E-19	2.246E-23	6.467E-23	9.694E-20	6.513E-24	4.344E-22	2.373E-19	1.595E-23	7.189E-25	2.006E-22	1.348E-26
2101	0	0	840,000	924,000	1.840E-22	1.660E-19	1.115E-23	3.211E-23	4.814E-20	3.234E-24	2.157E-22	1.179E-19	7.919E-24	3.570E-25	9.959E-23	6.692E-27
2102	0	0	840,000	924,000	9.139E-23	8.243E-20	5.538E-24	1.595E-23	2.390E-20	1.606E-24	1.071E-22	5.852E-20	3.932E-24	1.773E-25	4.946E-23	3.323E-27
2103	0	0	840,000	924,000	4.538E-23	4.093E-20	2.750E-24	7.919E-24	1.187E-20	7.976E-25	5.320E-23	2.906E-20	1.953E-24	8.803E-26	2.456E-23	1.650E-27
2104	0	0	840,000	924,000	2.254E-23	2.033E-20	1.366E-24	3.933E-24	5.895E-21	3.961E-25	2.642E-23	1.443E-20	9.697E-25	4.372E-26	1.220E-23	8.194E-28
2105	0	0	840,000	924,000	1.119E-23	1.009E-20	6.782E-25	1.953E-24	2.927E-21	1.967E-25	1.312E-23	7.167E-21	4.815E-25	2.171E-26	6.056E-24	4.069E-28
2106	0	0	840,000	924,000	5.557E-24	5.012E-21	3.368E-25	9.698E-25	1.454E-21	9.767E-26	6.514E-24	3.559E-21	2.391E-25	1.078E-26	3.007E-24	2.021E-28
2107	0	0	840,000	924,000	2.760E-24	2.488E-21	1.672E-25	4.816E-25	7.218E-22	4.850E-26	3.235E-24	1.767E-21	1.187E-25	5.353E-27	1.493E-24	1.003E-28
2108	0	0	840,000	924,000	1.370E-24	1.236E-21	8.305E-26	2.391E-25	3.585E-22	2.408E-26	1.606E-24	8.776E-22	5.897E-26	2.658E-27	7.416E-25	4.983E-29
2109	0	0	840,000	924,000	6.805E-25	6.138E-22	4.124E-26	1.188E-25	1.780E-22	1.196E-26	7.977E-25	4.358E-22	2.928E-26	1.320E-27	3.683E-25	2.475E-29
2110	0	0	840,000	924,000	3.379E-25	3.048E-22	2.048E-26	5.897E-26	8.839E-23	5.939E-27	3.961E-25	2.164E-22	1.454E-26	6.555E-28	1.829E-25	1.229E-29
2111	0	0	840,000	924,000	1.678E-25	1.514E-22	1.017E-26	2.928E-26	4.390E-23	2.949E-27	1.967E-25	1.075E-22	7.221E-27	3.255E-28	9.082E-26	6.102E-30
2112	0	0	840,000	924,000	8.334E-26	7.517E-23	5.050E-27	1.454E-26	2.180E-23	1.465E-27	9.769E-26	5.337E-23	3.586E-27	1.617E-28	4.510E-26	3.030E-30
2113	0	0	840,000	924,000	4.138E-26	3.733E-23	2.508E-27	7.222E-27	1.082E-23	7.273E-28	4.851E-26	2.650E-23	1.781E-27	8.028E-29	2.240E-26	1.505E-30
2114	0	0	840,000	924,000	2.055E-26	1.854E-23	1.245E-27	3.586E-27	5.375E-24	3.612E-28	2.409E-26	1.316E-23	8.842E-28	3.986E-29	1.112E-26	7.472E-31
2115	0	0	840,000	924,000	1.021E-26	9.204E-24	6.184E-28	1.781E-27	2.669E-24	1.793E-28	1.196E-26	6.535E-24	4.391E-28	1.980E-29	5.523E-27	3.711E-31
2116	0	0	840,000	924,000	5.068E-27	4.571E-24	3.071E-28	8.843E-28	1.326E-24	8.906E-29	5.940E-27	3.245E-24	2.180E-28	9.830E-30	2.742E-27	1.843E-31
2117	0	0	840,000	924,000	2.517E-27	2.270E-24	1.525E-28	4.391E-28	6.582E-25	4.423E-29	2.950E-27	1.612E-24	1.083E-28	4.882E-30	1.362E-27	9.150E-32
2118	0	0	840,000	924,000	1.250E-27	1.127E-24	7.573E-29	2.181E-28	3.269E-25	2.196E-29	1.465E-27	8.003E-25	5.377E-29	2.424E-30	6.763E-28	4.544E-32
2119	0	0	840,000	924,000	6.206E-28	5.597E-25	3.761E-29	1.083E-28	1.623E-25	1.091E-29	7.274E-28	3.974E-25	2.670E-29	1.204E-30	3.358E-28	2.256E-32
2120	0	0	840,000	924,000	3.082E-28	2.780E-25	1.868E-29	5.378E-29	8.061E-26	5.416E-30	3.612E-28	1.973E-25	1.326E-29	5.978E-31	1.668E-28	1.121E-32
2121	0	0	840,000	924,000	1.530E-28	1.380E-25	9.274E-30	2.670E-29	4.003E-26	2.689E-30	1.794E-28	9.800E-26	6.585E-30	2.968E-31	8.282E-29	5.564E-33
2122	0	0	840,000	924,000	7.599E-29	6.854E-26	4.605E-30	1.326E-29	1.988E-26	1.336E-30	8.908E-29	4.866E-26	3.270E-30	1.474E-31	4.112E-29	2.763E-33
2123	0	0	840,000	924,000	3.774E-29	3.404E-26	2.287E-30	6.585E-30	9.871E-27	6.632E-31	4.424E-29	2.417E-26	1.624E-30	7.320E-32	2.042E-29	1.372E-33
2124	0	0	840,000	924,000	1.874E-29	1.690E-26	1.136E-30	3.270E-30	4.902E-27	3.293E-31	2.197E-29	1.200E-26	8.063E-31	3.635E-32	1.014E-29	6.814E-34
2125	0	0	840,000	924,000	9.306E-30	8.393E-27	5.639E-31	1.624E-30	2.434E-27	1.635E-31	1.091E-29	5.959E-27	4.004E-31	1.805E-32	5.036E-30	3.384E-34
2126	0	0	840,000	924,000	4.621E-30	4.168E-27	2.800E-31	8.064E-31	1.209E-27	8.121E-32	5.417E-30	2.959E-27	1.988E-31	8.964E-33	2.501E-30	1.680E-34
2127	0	0	840,000	924,000	2.295E-30	2.070E-27	1.391E-31	4.004E-31	6.002E-28	4.033E-32	2.690E-30	1.470E-27	9.874E-32	4.451E-33	1.242E-30	8.344E-35
2128	0	0	840,000	924,000	1.140E-30	1.028E-27	6.906E-32	1.989E-31	2.981E-28	2.003E-32	1.336E-30	7.298E-28	4.903E-32	2.211E-33	6.167E-31	4.144E-35
2129	0	0	840,000	924,000	5.659E-31	5.104E-28	3.429E-32	9.875E-32	1.480E-28	9.945E-33	6.633E-31	3.624E-28	2.435E-32	1.098E-33	3.062E-31	2.058E-35
2130	0	0	840,000	924,000	2.810E-31	2.535E-28	1.703E-32	4.904E-32	7.350E-29	4.939E-33	3.294E-31	1.800E-28	1.209E-32	5.451E-34	1.521E-31	1.022E-35
2131	0	0	840,000	924,000	1.395E-31	1.259E-28	8.457E-33	2.435E-32	3.650E-29	2.452E-33	1.636E-31	8.936E-29	6.004E-33	2.707E-34	7.552E-32	5.074E-36
2132	0	0	840,000	924,000	6.930E-32	6.250E-29	4.199E-33	1.209E-32	1.813E-29	1.218E-33	8.123E-32	4.438E-29	2.982E-33	1.344E-34	3.750E-32	2.520E-36
2133	0	0	840,000	924,000	3.441E-32	3.104E-29	2.085E-33	6.005E-33	9.001E-30	6.048E-34	4.034E-32	2.204E-29	1.481E-33	6.675E-35	1.862E-32	1.251E-36
2134	0	0	840,000	924,000	1.709E-32	1.541E-29	1.036E-33	2.982E-33	4.470E-30	3.003E-34	2.003E-32	1.094E-29	7.353E-34	3.315E-35	9.248E-33	6.213E-37

GRAPHS

Landfill Name or Identifier: North Kerry Landfill







16.0 Estimated Annual and Cumulative quantities of Indirect Emissions to Groundwater

None to report

17.0 Annual Water Balance Calculation and Interpretation

The predicted Water Mass Balance calculation shows predicted leachate production for 2011.

Lo= [ER(A) + LW + IRCA + ER(l)] - [aW]

			1		2		3					
year	Active Phase	Active Area	Active Area infiltration	Restored Phase No.	Liquid Waste	Restored Area	Restored Area Infiltration	Total Water	Absorptive Capacity	Predicted Leachate Produced	Actual Leachate	Difference
		A (m2)	R(A) m3		LW (m3)	RCA (m2)	IRCA (m3)	1 +2+3 (m3)	aW (m3)	Lo (m3)	m3	
2002	5	11,800.00	19918.4	1,2,3	0	22,050.00	2840.04	22,758.44	1770.8075	23,885.63	34,218.23	10,332.60
2003	6	16,100.00	20946.1	1,2,3,4	0	25,450.00	2547.545	23,493.65	879.11758	24,866.78	30,721.59	5,854.81
2004	6	19,500.00	32416.8	1,2,3,4	0	27,550.00	3306	35,722.80	840.95323	37,947.25	45,130.40	7,183.15
2005	6,7	16,200.00	27596.7	1,2,3,4,5	0	29,600.00	4004.88	31,601.58	602.53935	34,155.79	54,784.59	20,628.80
2006	7	28,800.00	27596.7	1,2,3,4,5	0	29,600.00	4025.6	31,622.30	1050.4414	33,361.86	60,922.61	27,560.75
2007	7	14,400.00	24036.48	1,2,3,4,5,6	0	53,340.00	6769.913	30,806.39	1391.4589	33,307.30	55,436.15	22,128.85
2008	8	24,300.00	50,517.27	1,2,3,4,5,6	0.00	53,340.00	6,931.00	57,448.27	1,528.82	59,811.81	78,558.23	18,746.42
2009	8	32,400.00	62,763.98	1,2,3,4,5,6	0	53,340.00	2997.015	65,761.00	439.04833	66,586.16	73,727.85	7,141.69
2010	8	32,400.00	44,248.68	1,2,3,4,5,6,7	0	63,340.00	3558.885	47,807.56	439.04833	48,632.72	42,442.00	-6,190.72
2011	8	32,400.00	45,392.40	1,2,3,4,5,6,7	0	63,340.00	3558.885	48,951.28	439.04833	49,776.44	50,108.00	331.55

18.0 Report on the Progress towards Achievement of Environmental Objectives contained in previous AER

Target Area	*Objective*	*Works Carried Out*	*Results*
Odour Management *Reduction in Fugitive Gas Emissions*	Reduction in number of off site odour experienced	Regular patrol of gas collection infrastructure to ensure that there is no blockages on the lines. Application of horizontal gas extraction from active cells. Adequate intermediate capping on capped cells prior to final cap Gas extraction of intermediately capped cells	Odour Complaints reduced from 6 in 2010 to 1 in 2011
Surface Water Emissions	Keep Surface Water Emissions within agreed limits	Proper management of leachate on site Regular inspection of surface water drains Regular servicing of TOC/Turbidity Meters on site. Regular monitoring of TOC and Turbidity monitors at Lagoons Regular inspection of bunded area for integrity on site	No licenced limits exceeded
Ground Water Emissions	Keep Ground Water Emissions to within agreed limits	Proper management of leachate levels on site Regular inspection of bunded area for integrity on site	No licenced limits exceeded
Leachate Management	Reduction in the quantity of leachate produced on site	Capping of intermediately capped cells within 1 year of final placement of waste Reduction in the fill area of cell into	Reduction in leachate produced on site during reporting period due to capping of phase 7

		which surface water flows.	
Dust	Keep dust deposit limits within allowable level	Regular spray of site roads with water at time of dry and windy weather.	No licenced limits exceeded
Vermin	Keep vermin population on site to a minimum	Regular baiting of bait boxes through out the site Particular attention to be paid to area of know or sighted vermin activity	No visible activity of vermin on site
Bird Control	Keep number of crow and sea gulls on site to a minimum	Bird control on site from Dawn to dusk to aid in the reduction in the number of bird on site during day light.	No bird nuisance during reporting period
Flies	Keep the fly population on site down in the active cell	Regular spray of the waste in the active cell at times of heat and particular emphasis on spraying during summer months	New fly spraying procedure introduced on site
Litter – windblown on site	No windblown litter visible outside the active cell area	Proper and complete netting around the active cell Regular litter picking patrols on site to pick up any windblown litter. Stopping the access to the site of rota-press vehicles at times of high winds	No visible wind blown litter on site during reporting period
Litter – On main road to landfill site	Reduction in the number of bags of waste lost from trailer on the way to the landfill	Enforcement of the three strikes and you're out rule in operation on site in relation to uncovered loads entering the landfill site. Quick response to clean up any reported waste on the main road to the landfill	Continued enforcement of covered loads to landfill site and regular litter patrols on main access routes to landfill site

Energy Resources	Reduce the quantity of diesel and electricity used on site		Reduction in diesel and electricity consumption on site
Reduction of BMW entering the landfill site	Reduce the percentage of biological municipal waste entering the landfill site to 47%	Provide organic bin for cold callers to the site and have such material removed for further processing. Cease the use of green waste as cover material. Continue to take green waste on site but charge the true cost of treatment for the green waste and have it removed by contractor for further processing.	Removal of green waste from site for further processing during reporting period.

19.0 Schedule of Environmental Objectives and Targets for the Forthcoming Year.

The following tables sets out the environmental objectives for the facility under a range of headings.

Target Area	Objective	Actions to be progressed and methods	By	2012	2013	2014	2015	2016
Odour Management Reduction in Fugitive Gas Emissions	Reduction in number of off site odour experienced	o Regular patrol of gas collection infrastructure to ensure satisfactory operation o Intermediate capping of cell 15B/16 o Permanent gas wells to intermediately capped cells o Sealing of side slope risers	FM SEE	Ongoing Complete Q3/4 Complete	Ongoing	Ongoing	Ongoing	Ongoing
Surface Water Emissions	Keep surface water emissions within limits	o Proper management of leachate on site o Regular inspection of surface water drains o Regular inspection of bunded area for integrity on site	FM FM FM	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing
Ground Water Emissions	No emissions	o Proper management of leachate on site o Regular inspection of bunded area for integrity on site	FM FM	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing
Leachate Management	Reduction in the quantity of leachate produced on site	o Capping of intermediately capped cells o Reduction in the fill area of cell into which surface water flows. o ICW trial	SEE SEE	Q3/4 Complete Q3/4				
Dust	Keep dust deposit limits within allowable level	o Regular spray of site roads with water at time of dry and windy weather.	FM	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Vermin	Keep vermin population on site to a minimum	o Regular baiting of bait boxes through out the site o Particular attention to be paid to area of known or sighted vermin activity	FM	Ongoing Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Bird Control	Minimise bird nuisance	o Bird control on site from to aid in the reduction in the number of birds on site.	FM	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Flies	Minimise fly nuisance	o Regular spray of the waste in the active cell at times of heat and particular emphasis on spraying during summer months	FM	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Litter – windblown on site	No windblown litter visible outside the active cell area	o Proper and complete netting around the active cell o Regular litter picking patrols on site to pick up any windblown litter.	 FM	Complete Ongoing	 Ongoing	 Ongoing	 Ongoing	 Ongoing

Target Area	Objective	Actions to be progressed and methods	By	2012	2013	2014	2015	2016
		o						
Energy Resources	Reduce the quantity of diesel and electricity used on site	o Progress gas to energy project		Complete				
Reduction of BMW entering the landfill site	Reduce the percentage of biological municipal waste entering the landfill site to 47%	o Provide organic bin for cold callers to the site and have such material removed for further processing. o Cease the use of green waste as cover material. o Continue to take green waste on site but charge the true cost of treatment for the green waste and have it removed by contractor for further processing.		Complete Complete Ongoing				
Leachate Management	Develop Integrate Constructive Wetland in order to reduce Environmental Emissions and the strength and Volume of Leachate leaving the Facility Site	o Obtained the Required EPA Approval	FM\SE	Complete Q3				
		o Construct Pilot ICW in accordance with Approval	FM\SE	Q4				
		o Commission ICW	FM\SE		Q1			
		o Operate & Monitor ICW	FM\SE		Q1	Ongoing	Ongoing	Ongoing
		o Present Results to EPA of Project	FM\SE		Ongoing	Ongoing	Ongoing	Ongoing

FM – Facility Manager
SE – Senior Engineer
SEE – SEE Waste Management

20.0 Summary of Procedures Developed by the Licensee

The following are the procedures and documents developed by the licensee:

Procedures

- Gas Monitoring Procedure (perimeter wells)
- Leachate Level Monitoring Procedure
- Waste Acceptance Procedure – Uncovered loads entering landfill site
- Complaints Management Procedure.

Plans

- Operational Risk Assessment
- Environmental Liability Risk Assessment
- Closure Remediation Aftercare Management Plan

21.0 Tank, Pipeline and Bund Testing and Inspection Report

None under taken during the reporting period.

22.0 Environmental Incidents and Complaints

Environmental Incidents

The incidents reported to the agency refer the exceedances experienced in perimeter gas wells. This in the main refers to wells 6, 6A – D.

There is a time established record of these. It is hoped that the permanent capping of cells 15B/16 will eliminate this fugitive emission.

It is noted that there is no odour nuisance of vegetative die back and it is thought that the readings refer to a sump effect in a rock fill embankment that is at a finished construction height above the original ground level.

Complaints

There were 21 complaints received for the reporting period (19 in 2010). The complaints can be broken down into the following categories:

Table 18.1: Breakdown of complaints received.

Issue	2008	2009	2010	2011
Odour	26	9	6	1
Illegal Dumping	8	3	7	6
Rubbish on Main Road	3	3	1	2
Uncovered/unsecure loads being admitted into landfill site	3	0	0	0
Flies	2	0	1	5
Site Infrastructure	2	1	3	6
Speeding Leachate Trucks	0	1	0	0
Noise from Leachate Lorries at Treatment Plant	2	1	1	1
Windblown litter	1	0	0	0
Total Number of Complaints	47	18	19	21

23.0 Review of Nuisance Controls

Odour.

Significant works have been undertaken on the gas collection network and the entire network is actively managed as part of the gas to energy project.

The side slope risers will be fully sealed by April 2012.

Intermediate capping followed by permanent vertical gas wells in cells 15B/16 will be progressed from April 2012.

Illegal Dumping.

Quicker response time to complaints received, closer co-operation with litter warden for the area. The warden is immediately notified of the location of the dumping in order to retrieve evidence.

Signage is being erected in (black spot) locations advising of covert camera operations – this is being followed with deployment of the cameras. This is being co-ordinated by the waste enforcement unit.

Regular road side clean ups being carried on main road leading to the landfill site Larger items which have fallen from vehicles carrying waste to the landfill site are removed once a complaint is received in relation to them.

Site Infrastructure.

These complaints referred to the layout of the CAS – the comments were noted and acted upon as appropriate. Signage has been improved.

Noise from Leachate Lorries at Waste Water Treatment Plant early morning.

New driver for the contractor left his vehicle at the treatment plant overnight causing the noise problem. This practice ceased and the contractor contacted the member of the public directly and apologies for the inconvenience cause.

A full list of all complaints received is included in the appendices.

Fly nuisance.

There were shortcomings in the preparation on site in the early part of 2011 with respect to the placement of the insecticide. The sprayer was damaged while being picked up by the site excavator and this coincided with favourable conditions for fly breeding.

The frame on the sprayer has been modified.

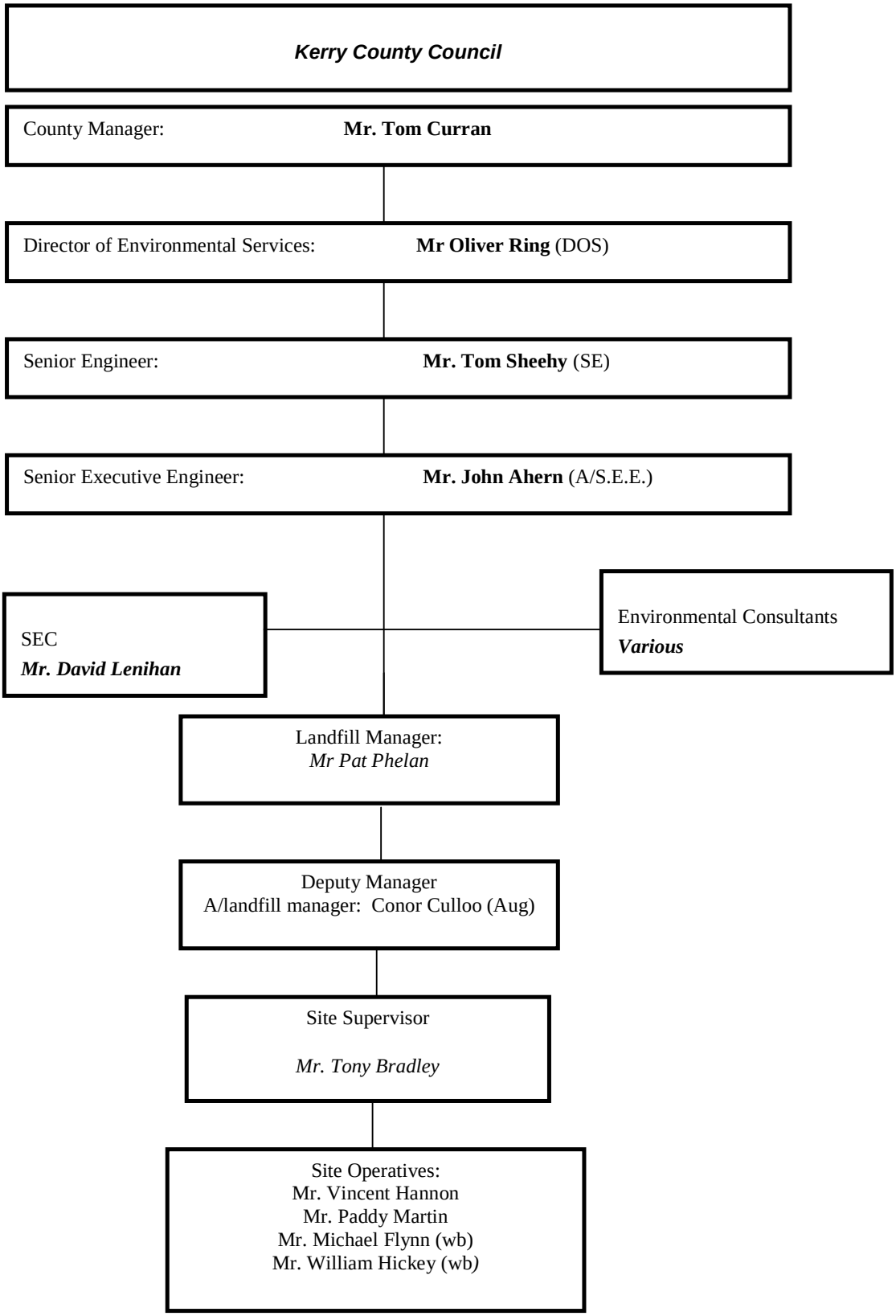
24.0 Report on Financial Provision

Kerry County Council has a Landfill Aftercare and Development Fund.

The CRAMP report as submitted estimates that is required to maintain the landfill site both during its active phase and closed phase. Kerry County Council is well positioned to meet its financial liabilities.

A submission under Section 53A of the Waste Management Act was submitted to the Agency in August 2012 which details the financial standing of the facility.

25.0 Management and Staffing Structure at the Facility 2011



26.0 Programme of Public Information

The following files are available for inspection on site by members of the public:

- AER of previous reporting years
- All correspondence with the Agency
- Surface Water Monitoring Results
- Ground Water Monitoring Results
- Perimeter Gas Detection Well Monitoring Results
- Nuisance Control Documentation
- Leachate Chemical Analysis results
- Leachate quantities produced
- Tonnage of waste accepted on site
- Characterisation of waste accepted for landfilling on site
- Operational Procedure Manual
- Waste Acceptance Procedure
- Environmental Management System.

In main office a notice board is on site which contains information in relation to the management structure of the site, waste tonnages accepted over the relevant years, emergency procedure in relation to fire or accident on site and other environmental information as required.

27.0 Training of Staff

	SafePass	CSCS Card	Waste Management Certificate	Landfill Compactor Training	Domestic Waste at Civic Amenity Site	Waste Facility Operations	Hazardous Spillage and Chemical Control	Managing Safety in Construction
Facility Manager	X		X		x		x	
Supervisor	X	X		X				
Weighbridge Supervisor	X					X		X
Operatives	x	x		x		x	X	

	Safe Use of Pesticides and Herbicides	Banksman	Tractor Driving					
Facility Manager								
Supervisor	X	X	X					
Weighbridge Supervisor	X	X	X					
Operatives		x	X					

28.0 Report on the use of the Community Fund.

The Community Fund is operated under the Local Government Act, 2001 Section 109.-(1) In this section "community initiative" means any project or programme which in the opinion of the local authority will benefit the local community and includes the provision or improvement of amenity, recreational, cultural or heritage facilities, the protection or enhancement of the environment and programmes to promote social inclusion and community development.

Kerry County Council allocated €57,419 (Consumer Index Link) to the Community Fund, which was used varies projects such as establishment of a Sliabh Luachra Community Walk, Refurbishment of St Brendan Community Centre, hedgecutting, provision of transport for senior citizens for the Kielduff Community Centre, and contribution towards the Cill Dubh Brownies.

27.0 Statement on Cost of Landfill

The following table gives a break down of the financial outlay under the recycling and landfilling headings.

Table 22.2, Financial outlay 2011

Category	*Recycling*	*Landfill*
Wages/salaries	63,503	286,061
Contracts	37,547	395,789
Plant, equipment, maintenance	2,823	124,762
Office	1,463	32,816
Charges	2,487	33,042
Energy	5,048	64,078
Total	€ 112,063	€ 936,558

28.0 Metrological, Noise and Dust Monitoring Results

There are data gaps this was due to site works and arranging moving the monitoring equipment to a new location close to the new administration building.

Taking the 2010 data to estimate the data gap gives an annual precipitation amount of 1,729mm. There is however a distortion in the profile when the effect of the extended cold spells in late 2010/11 is considered.

Table 23.1, Rainfall data 2010/2011

	2011			2010		
	Rainfall (mm)	True Evaporation (mm)	Effective Rainfall (mm)	Rainfall (mm)	True Evaporation (mm)	Effective Rainfall (mm)
Jan	146.9	108.18	38.72	164.5	97.08	67.42
Feb	159.5	126.23	33.37	73.5	-39.82	113.32
Mar	74.3	47.79	26.51	125.9	-39.64	165.54
Apr	74.2	21.8	52.4	91.4	60.6	30.8
May	174.7	140.68	34.02	51.5	48.96	2.54
Jun	No data	No data	No data	67.8	84.56	-16.76
Jul	No data	No data	No data	186.7	42.96	143.74
Aug	No data	No data	No data	73.8	60.48	13.32
Sep	155.4	134.22	21.8	171.9	24.97	146.93
Oct	145.2	-153.84	-8.14	130	12.6	117.4
Nov	215.2	-218.26	-3.06	163.8	165.84	-2.04
Dec	251.6	-253.48	-1.88	64.9	99.27	-34.37
Total	*1,401.20*	*1198,98*	*219.9*	*1365.7*	*617.86*	*747.84*

Noise Monitoring

Southern Scientific were commissioned by Kerry County Council to undertake a noise survey at North Kerry Landfill. The LAeq(30min) levels detected during the survey were within the prescribed limit of 55dB at two of the three monitoring locations.

No Limit was exceeded.

Table 23.2, Noise monitoring data

Location	Laeq 30min dB	Laf10 30min	Laf90 30min
N1	40.8	43.5	35.8
N2	50.7	44.3	35.4
N3	53.7	47.3	41.1
E1	46.8	40.5	34.3
E2	52.7	52.0	34.8
E3	61.2	50.9	31.0

Please note:

The noise levels measured were below 55dB(A) $L_{Aer(30min)}$ at five of the six monitoring locations. The elevated noise levels measured at the site entrance (E3) were primarily attributed to traffic on the public road and vehicles accessing the landfill site. of particular significance here was a truck entering the site and passing close to the measuring location. This is demonstrated in the L_{A10} result, which is comparatively low to the L_{AEq} result. This demonstrates that the high sound pressure levels occurred in less than 10% of the time. Background noise is given by the L_{A90} and was recorded at 31 dB(A) at this location, which is typical of a rural area. The 1/3 Octave Frequency Spectra shows that there was No prominent tonal noise present when assessed following criteria in Annex D of ISO 1996 (Part 2), 2007. Having regard to the monitoring results obtained in this survey, and the distances to nearest noise sensitive receptors, it is concluded that activities at the landfill are unlikely to adversely impact upon the noise environment at the noise sensitive receptors in the locality.

Dust Monitoring

Southern Scientific was commissioned by Kerry County Council to carry out monthly dust deposition monitoring at four locations at North Kerry Landfill.

Table 23.3, Dust Monitoring Results

27/11 to 28/11	Total particulates, $mg/m^2/d$	130	90	58	36
	Inorganic particulates, $mg/m^2/d$	53	29	32	<10

29.0 Statement on the Achievement of the Waste Acceptance and Treatment Obligations

BMW Percentage Composition of Waste disposed at facility

Total Qty MSW of which the BMW Condition Applies	Total Qty BMW	% BMW
16,315.41	10,301.91	63.14%

Appendix C shows the yearly breakdown of tonnage and %BMW entering the landfill site between 1st January – 31st December 2011 as submitted to the Agency.

Comment:

Kerry County Council has been carrying out a review of options available for waste collection and disposal during the reporting period. It is the intention of Kerry County Council at this stage to close North Kerry Landfill Site prior to July 2013. In the interim it is our intention to provide segregation facilities at each of our transfer station and landfill site to facilitate the segregation of organic waste being brought directly to these facilities.

We are currently in a very uncertain policy environment and Kerry County Council are constantly evaluating the options available. In this context every effort is being made to minimise the BMW content of waste entering North Kerry Landfill Site.

Appendix A: Waste Acceptance

Section A. Kerbside collections (this means any waste delivered directly from the household, business or other premises where it was first generated, but not from another waste facility)

Name of EACH collector directly delivering waste from kerbside	Source of waste	Waste description	EWC code	Total Quantity waste accepted (tonnes)	Check	January	February	March	April	May	June	July	August	September	October	November	December
KCC Refuse and Reycling Service		2 bin household and commercial collection service	20 03 01	2617.55	2617.55	279.24	207.53	275.68	242.38	217.38	213.4	236.44	292.88	245.9	200.14	206.58	0
	Household	2 bin household collection	20 03 01	2355.80		251.32	186.78	248.11	218.14	195.64	192.06	212.80	263.59	221.31	180.13	185.92	0.00
	Commercial	2 bin commercial bin collection	20 03 01	261.76		27.92	20.75	27.57	24.24	21.74	21.34	23.64	29.29	24.59	20.01	20.66	0.00
TTC Refuse and Recycling Service		2 bin household and commercial collection service	20 03 01	2632.64	2632.64	288.98	226.88	272.64	236.28	239.78	240.46	224.14	244.26	206.18	204.06	231.6	17.38
	Household	2 bin household collection	20 03 01	2369.38		260.05	204.19	245.38	212.65	215.80	216.41	201.73	219.83	185.56	183.65	208.44	15.64
	Commercial	2 bin commercial bin collection	20 03 01	263.26		28.90	22.69	27.26	23.63	23.98	24.05	22.41	24.43	20.62	20.41	23.16	1.74
LTC Refuse and Recycling Service		3 Bin Household and Commercial Collection	20 03 01	462.92	462.92	46.98	38.26	44.74	39.94	36.3	47.84	37.38	34.04	56.56	33.02	47.86	0
	Household	3 bin household collection	20 03 01	416.63		42.28	34.43	40.27	35.95	32.67	43.06	33.64	30.64	50.90	29.72	43.07	0.00
	Commercial	3 bin commerical collection	20 03 01	46.29		4.70	3.83	4.47	3.99	3.63	4.78	3.74	3.40	5.66	3.30	4.79	0.00
Public Domestic Waste	Household	Weighed Waste directed to landfill	20 03 01	514.52	514.52	62.84	45.5	45.64	39.48	49.52	42	45.98	36.1	39.24	29.4	43.62	35.2
Public Commercial (Incl Account Holders)**	Commercial	Commercial waste dielvered directly to the landfill site	20 03 01	171.31	171.31	13.94	7.15	15.62	13.04	11.8	11.48	16.26	15.14	14.58	8.02	15	29.28
KCC Internal Department Waste	Commercial	KCC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	42.50	42.50	1.7	2.56	4.6	17.52	1.52	1.42	0.28	1.78	1	1.38	2.48	6.26
KCC Housing Department Waste	Household	Household waste from KCC houses	20 03 01	12.74	12.74	1.7	1.18	1.74	2.7	1.16	2.26	0.42	0.52	0.44	0	0.62	0
KCC Litter and Street Cleaning	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	44.40	44.40	0	0.82	3.82	1.28	0.16	0	9.76	14.12	8.1	1.14	5.2	0
Kerry County Council - Litter Warden and Environment Clean Up	Household	Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 03	235.42	235.42	47.26	40.46	27.78	11.08	1.6	7.34	3.66	1.02	64.48	19.28	1.06	10.38
Kerry County Council	Park and Cemetery	Graveyard Clean Up	20 02 03	4.52	4.52	2	0	0	0.88	0	0	0	1.64	0	0	0	0
LTC Internal Department Waste	Commercial	LTC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	20.46	20.46	0.88	8.16	1.38	0	2.04	7.4	0	0	0	0	0	0.6
LTC Graveyard Waste	Park and Cemetery	Graveyard Clean Up	20 02 03	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0
LTC Roadsweeping	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0
LTC Clean Up	Household	Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 03	5.68	5.68	0	0	0	0	0	0	1.02	0	0	0	4.66	0
TTC Internal Department Waste	Commercial	LTC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	15.32	15.32	0	0	0	0	0	0	0	0	0	15.32	0	0
TTC Graveyard Waste	Park and Cemetery	Graveyard Clean Up	20 02 03	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0	0
TTC Roadsweeping	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	497.64	497.64	61.46	48.08	43.04	48.48	47.98	36	47.92	34.46	35.2	20.14	37.28	37.6
TTC Street Cleaning	Household	Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 03	563.46	563.46	72.14	58.86	62.8	46.3	37.06	45.18	34.12	39.54	50.62	44.94	34.26	37.64
Colite	Household	Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 03	17.67	17.67	1.84	4.87	3.12	3.58	0.34	0.48	0	0.6	0.64	1.62	0.26	0.32
Kerry County Council	Industrial	Water Treatment waste not otherwise specified in EWC	19 09 99	235.94	235.94	0	0	235.94	0	0	0	0	0	0	0	0	0
				8094.69	8094.69	880.98	690.31	1038.54	702.94	646.64	655.26	657.38	716.10	722.94	578.46	630.48	174.66

Section B. Waste from waste facilities (this means any waste delivered from another waste facility, whether it was treated there or not)

Name of EACH facility from which waste was delivered	Licence/permit no. of facility from which waste was delivered	Source of Waste	Waste description	EWC code	Quantity waste accepted (tonnes)	January	February	March	April	May	June	July	August	September	October	November	December
Civic Amenity Area NKL	W0001-03	Household	Public Household waste presented in black bags	20 03 01	270.90	32.16	21.74	24.46	26.78	27.08	25.1	20.66	28.74	21.66	22.02	20.5	
Caherolveen Transfer Station	W0087-01	KCC Refuse and Recycling Service	Mixed Municipal Soild Waste	20 03 01	370.24	48.96	24.3	27.78	19.68	33.6	28.1	40.96	62.58	30.42	24.54	29.32	0
			KCC Refuse and Recycling Service - Domestic	20 03 01	333.216	44.064	21.87	25.002	17.712	30.24	25.29	36.864	56.322	27.378	22.086	26.388	0
			KCC Refuse and Recycling Service - Commercial	20 03 01	37.024	4.896	2.43	2.778	1.968	3.36	2.81	4.096	6.258	3.042	2.454	2.932	0
Caherolveen Transfer Station	W0087-01	Public Household	Weighed Waste directed to TS	20 03 01	365.24	39.28	25.58	29.78	32.22	26.64	33.04	35.48	43.28	24.1	22.94	27.18	25.72
Caherolveen Transfer Station	W0087-01	Public Household	Ticketed Waste directed to TS	20 03 01	174.34	22.36	0	34.44	17.14	13.22	2.54	25.66	10.36	22.36	13.48	7.86	4.92
Caherolveen Transfer Station	W0087-01	Public Commercial (Incl Account Holders)**	Weighed Waste directed to TS	20 03 01	55.48	4.24	6.5	3.42	2.82	2.42	6.92	4.8	10.08	6.98	2.24	2.54	2.52
Caherolveen Transfer Station	W0087-01	KCC Housing Department Waste	Household waste from KCC houses	20 03 01	3.1	0.54	0.48	0.44	0	0.72	0.54	0	0	0	0	0	0.38
Caherolveen Transfer Station	W0087-01	Commercial	KCCCommercial Internal Dept levied waste 2 bin commercial	20 03 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Caherolveen Transfer Station	W0087-01	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	29.84	4.02	1.78	2.06	2.18	1.32	1.96	3.06	3.42	3	2.34	3.14	1.56
Caherolveen Transfer Station	W0087-01	Household	Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 01	34.36	2.68	1.8	2.44	5.78	2.84	3.58	5.26	4.84	2.16	1.38	1	0.62
Caherolveen Transfer Station	W0087-01	Park and Cemetery	Graveyard Clean Up	20 02 03	1.02	0	0	0	0.32	0.52	0	0	0.18	0	0	0	0
Caherolveen Transfer Station	W0087-01	Total			1033.62	122.08	60.44	100.36	80.12	81.26	76.68	115.22	134.74	88.84	66.92	71.84	35.72
	Caherolveen Total to NKL				1035.38	122.00	59.96	103.16	67.66	81.26	89.20	115.10	123.66	100.58	66.88	70.96	35.84
Coolcaslagh Transfer Station	W0072-1	KCC Refuse and Recycling Service	Mixed Municipal Soild Waste	20 03 01	526.98	68.52	43.16	58.6	40.8	41.98	43.1	41.92	58.82	46.52	41.64	41.92	0
			KCC Refuse and Recycling Service - Domestic	20 03 01	474.28	61.668	38.844	52.74	36.72	37.782	38.79	37.728	52.938	41.868	37.476	37.728	0
			KCC Refuse and Recycling Service - Commercial	20 03 01	52.70	6.852	4.316	5.86	4.08	4.198	4.31	4.192	5.882	4.652	4.164	4.192	0
Coolcaslagh Transfer Station	W0072-1	KTC Refuse and Recycling Service	Mixed Municipal Soild Waste	20 03 01	1107.24	104.78	83.8	114.84	98.18	94.38	86.22	88.5	95.82	92.88	80.08	86.08	81.68
			KTC Refuse and Recycling Service - Domestic	20 03 01	923.00	94.302	75.42	103.356	88.362	84.942	77.598	79.65	86.238	83.592	72.072	77.472	73.512
			KTC Refuse and Recycling Service - Commercial	20 03 01	102.56	10.478	8.38	11.484	9.818	9.438	8.622	8.85	9.582	9.288	8.008	8.608	8.168
Coolcaslagh Transfer Station	W0072-1	Public Household	Weighed Waste directed to TS	20 03 01	812.62	100.96	64.54	89.44	60.76	70.84	70.2	74.7	63	49.52	57.84	59.14	51.68
Coolcaslagh Transfer Station	W0072-1	Public Household	Ticketed Waste directed to TS	20 03 01	586.88	51.26	45.18	24.88	68.58	56.76	35.32	53	54.22	53.8	43.28	53.94	46.66
Coolcaslagh Transfer Station	W0072-1	Public Commercial (Incl Account Holders)**	Weighed Waste directed to TS	20 03 01	33.46	2.64	3.06	4.44	3.32	2.5	4.12	2.68	4.3	1.94	1.5	1.8	1.16
Coolcaslagh Transfer Station	W0072-1	KCC Housing Department Waste	Household waste from KCC houses	20 03 01	34.52	3.54	4.34	0.78	1.8	4.56	6.12	2.14	0	1.78	0.7	8.58	0.18
Coolcaslagh Transfer Station	W0072-1	Commercial	KCC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	3.06	0	0	0	0	0	2.1	0	0.96	0	0	0	0
Coolcaslagh Transfer Station	W0072-1	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	6.38	0.5	0.6	0.08	0.88	0.62	0.62	0.22	0.12	0.22	1.78	0.42	0.34
Coolcaslagh Transfer Station	W0072-1	Household	KCC Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 01	46.32	1.6	3.32	4.86	8.16	8.52	2.78	2.74	1.84	2.68	2	2.24	5.58
Coolcaslagh Transfer Station	W0072-1	Park and Cemetery	Graveyard Clean Up	20 02 03	13.98	1.28	1.12	1.08	0.88	1.3	2.46	2.66	0	1.5	0	0	1.72
Coolcaslagh Transfer Station	W0072-1	KTC Housing Department Waste	Household waste from KTC houses	20 03 01	7.24	1.28	1.08	0.98	0.52	0	0	0	0.16	1.62	0	0.66	0.94
Coolcaslagh Transfer Station	W0072-1	KTC Roadsweeping and Street Cleaning	Road Side and Street Cleaning	20 03 03	192.76	23.2	24.22	14.66	16.14	15.74	17.24	17.7	13.44	12.02	9.32	15.04	14.04
Coolcaslagh Transfer Station	W0072-1	KTC Park and Cemetery	Graveyard Clean Up	20 02 03	11.9	3.08	5.6	0	1.44	0	0	1.06	0.62	0.1	0	0	0
Coolcaslagh Transfer Station	W0072-1	Commercial	KTC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Coolcaslagh Transfer Station	W0072-1	Household	KTC Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 01	4.44	0	0	0	0	0.5	0	0	0	0.24	0	3.7	0
Coolcaslagh Transfer Station	W0072-1	Total			3387.78	362.54	280.02	314.64	301.42	297.78	270.28	287.32	293.30	264.82	238.14	273.52	203.98
	Coolcashlagh Weighbridge Variance				10.94	0.84	0.66	2.06	1.34	1.04	0.84	0.64	1.46	0.74	0.3	0.34	0.68
	Coolcashlagh Total to NKL				3398.72	363.48	280.68	316.70	302.76	298.74	271.12	287.96	294.76	265.56	238.44	273.86	204.66
Kenmare Transfer Station	W0086-01	KCC Refuse and Recycling Service	Mixed Municipal Soild Waste	20 03 01	102.6	6.3	7.3	6.88	16.34	12.24	12.98	7.8	12.18	6.62	5.9	8.06	0
Kenmare Transfer Station	W0086-01	Public Household	Weighed Waste directed to TS	20 03 01	281.24	31.02	21.26	21.72	27.14	20	22.68	29.58	25.48	23.32	22.32	20.38	16.34
Kenmare Transfer Station	W0086-01	Public Household	Ticketed Waste directed to TS	20 03 01	439.48	39.88	36.94	27.82	47.36	32.98	36	41.44	44	43.22	21.38	31.54	36.92
Kenmare Transfer Station	W0086-01	Public Commercial (Incl Account Holders)**	Weighed Waste directed to TS	20 03 01	233.02	15.44	20.26	19.24	21.24	22.94	22.38	25.02	26.5	14.54	15.82	19.52	10.12
Kenmare Transfer Station	W0086-01	KCC Housing Department Waste	Household waste from KCC houses	20 03 01	8.84	1.16	0.88	1.1	1.52	0	1.08	0.28	1.56	0.08	1.18	0	0
Kenmare Transfer Station	W0086-01	Commercial	KCC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	10.12	0	0	0	2.1	0.14	0	2.7	0.22	4.68	0	0.28	0
Kenmare Transfer Station	W0086-01	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	4.3	0	0	0	0	0	0	0	4.3	0	0	0	0
Kenmare Transfer Station	W0086-01	Household	KCC Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 01	18.98	1.74	0.88	4.26	3.26	1.42	0.94	1.48	1.34	1.66	0.82	0.32	0.86
Kenmare Transfer Station	W0086-01	Park and Cemetery	Graveyard Clean Up	20 02 03	1	0	0	0	0	0	0	0	0	0	0	0	1
Kenmare Transfer Station	W0086-01	Total			1099.58	95.54	87.52	81.02	118.96	89.72	96.06	108.30	115.58	94.12	67.42	80.1	65.24

	Kenmare Weighbridge Variance				18.08	1.92	-0.34	10	-8.24	10.34	0.7	0.5	0.52	0.58	1	0.54	0.56
	Kenmare Total to NKL				1117.66	97.46	87.18	91.02	110.72	100.06	96.76	108.80	116.10	94.7	68.42	80.64	65.8
Milltown Transfer Station	W0069-01	KCC Refuse and Recycling Service	Mixed Municipal Solid Waste	20 03 01	650.38	70.08	50.78	53.06	72.3	45.64	62.08	50.4	88.56	59.6	45.12	51.4	1.36
			KTC Refuse and Recycling Service - Domestic	20 03 01	585.342	63.072	45.702	47.754	65.07	41.076	55.872	45.36	79.704	53.64	40.608	46.26	1.224
			KTC Refuse and Recycling Service - Commercial	20 03 01	65.038	7.008	5.078	5.306	7.23	4.564	6.208	5.04	8.856	5.96	4.512	5.14	0.136
Milltown Transfer Station	W0069-01	Public Household	Weighed Waste directed to TS	20 03 01	808.26	83.9	70.66	69	75.28	72.12	69.76	69.66	70.44	58.16	53.38	58.86	57.04
Milltown Transfer Station	W0069-01	Public Household	Ticketed Waste directed to TS	20 03 01	640.06	58.42	49.24	52.32	45.12	56.64	36.82	74.72	72.2	49.5	35.08	55.24	54.76
Milltown Transfer Station	W0069-01	Public Commercial (Incl Account Holders)**	Weighed Waste directed to TS	20 03 01	129.36	8.62	8.54	10.58	8.14	14.2	13.36	14.38	19.16	10.22	7.38	6.9	7.88
Milltown Transfer Station	W0069-01	KCC Housing Department Waste	Household waste from KCC houses	20 03 01	9.58	1.88	0	0.58	0	0	4.62	0.94	0	1.5	0.06	0	0
Milltown Transfer Station	W0069-01	Commercial	KCC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Milltown Transfer Station	W0069-01	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	84.44	5.42	5.16	4.9	5.14	5.7	10.54	10.82	12.6	10.3	4.38	6.3	3.18
Milltown Transfer Station	W0069-01	Household	KCC Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 01	54.78	3.26	1.72	2.96	8.9	3.3	0.56	2.6	28.08	0.56	0.38	0.76	1.7
Milltown Transfer Station	W0069-01	Park and Cemetery	Graveyard Clean Up	20 02 03	0	0	0	0	0	0	0	0	0	0	0	0	0
Milltown Transfer Station	W0069-01	Total			2376.86	231.58	186.10	193.40	214.88	197.60	197.74	223.52	291.04	189.84	145.78	179.46	125.92
	Milltown Weighbridge Variance				10.72	1.16	0.84	1.4	1.02	1.54	0.72	1.28	0.52	-13.78	14.62	0.98	0.42
	Milltown Total to NKL				2387.58	232.74	186.94	194.80	215.90	199.14	198.46	224.80	291.56	176.06	160.4	180.44	126.34
Dingle CA	W0225-01	Public Household	Weighed Waste directed to TS	20 03 01	67.04	6.36	3.58	6.74	8.14	4.62	5.52	6.24	6.98	5.8	3.8	4.54	4.72
Dingle CA	W0225-01	Public Household	Ticketed Waste directed to TS	20 03 01	144.24	11.42	7.54	11.02	8.96	14.52	3	21.86	14.46	15.8	5.1	17	13.56
Dingle CA	W0225-01	Public Commercial (Incl Account Holders)**	Weighed Waste directed to TS	20 03 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Dingle CA	W0225-01	KCC Housing Department Waste	Household waste from KCC houses	20 03 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Dingle CA	W0225-01	Commercial	KCC Commercial Internal Dept levied waste 2 bin commercial	20 03 01	0	0	0	0	0	0	0	0	0	0	0	0	0
Dingle CA	W0225-01	Litter Street Cleaning	Road Side and Street Cleaning	20 03 03	0	0	0	0	0	0	0	0	0	0	0	0	0
Dingle CA	W0225-01	Household	KCC Fly tipped Household waste as Collected by Litter Warden and Environment Clean Ups	20 03 01	7.08	0.62	0.16	0.72	1.46	0.48	0.6	0.86	0.92	0.34	0.48	0.16	0.28
Dingle CA	W0225-01	Park and Cemetery	Graveyard Clean Up	20 02 03	0.16	0	0	0.16	0	0	0	0	0	0	0	0	0
Dingle CA	W0069-01	Total			218.52	18.40	11.28	18.64	18.56	19.62	9.12	28.96	22.36	21.94	9.38	21.7	18.56
	Dingle Weighbridge Variance				0.20	0.04	-0.02	-0.04	0.2	-9.6	9.6	0.08	-0.16	0.04	-0.1	0.06	0.1
	Dingle Total to NKL				218.72	18.44	11.26	18.60	18.76	10.02	18.72	29.04	22.20	21.98	9.28	21.76	18.66

Appendix B: Waste Category

North Kerry Landfill Residual Waste - Tonnage Period 01/01/11 to 31/12/2011

	Residual Waste to which Levy Applies																																Non Levied Waste Direct to TS	
	Transfer Stations													Direct to North Kerry Landfill																				
	Coolcaslagh			Milltown			Caherciveen		Kenmare		Dingle		Totals	Kerry LA's			Public										Non Levied Waste Direct to NKL									
Month	KCC Refuse	KTC Refuse	Others	KCC Refuse	KTC/TTC Refuse	Others	KCC Refuse	Others	KCC Refuse	Others	KCC Refuse	Others	Total TS Levied Waste	KCC Refuse	TTC Refuse	LTC Refuse	Public Car Household	Public Commerical	Public Skip*	A/C Holders	KCC Internal Depts	TTC Internal Depts	LTC Internal Depts	Total direct to NKL	Total Levied Waste	KCC Road Sweeping/ Road Clean	TTC Road Sweeping Street Cleaning	LTC Rd Sweeping	Grave Yard Waste	TC Clean Ups /F'tipp	KCC Clean Ups/ F'tipp	Stabalised Landfill Cover	Colite Fly Tipping	Total Non Levied at NKL	Roadsweeping/ Graveyard Waste/ Flytipping/ Clean ups	Grand Totals
January 2011	68.52	104.78	163.60	70.08	0.00	153.98	48.96	66.34	6.30	89.42	0	17.82	789.80	279.24	288.98	46.98	62.84	6.58	32.16	7.36	3.40	0	0.88	728.42	1518.22	0	133.60	0	2.00	0	47.28	0.00	1.84	184.72	44.32	1747.26
January 2010	85.12	127.86	189.74	164.53	9.36	190.03	42.44	76.10	4.04	108.70	0	18.46	1016.38	287.54	445.58	49.66	102.68	3.46	43.11	246.24	5.22	0	0	1183.49	2199.87	0	111.12	0	0	0	2.98	0	1.12	115.22	36.42	2351.51
February 2011	43.16	83.80	124.46	50.78	0	129.28	24.30	31.02	7.30	79.00	0	11.1	584.20	207.53	226.68	38.26	45.5	4.35	21.74	2.80	3.74	0	8.16	558.96	1143.16	0.82	106.94	0	0	0	40.46	0	4.87	153.09	40.76	1337.01
February 2010	50.10	112.00	169.20	61.88	0	141.64	25.58	59.18	8.34	75.64	0	16.02	719.78	203.80	340.88	42.78	81.6	4.18	22.64	140.42	3.72	0	0	840.02	1559.80	0	92.48	0	0	0	0.98	0	0	93.46	42.32	1695.58
March 2011	58.6	114.84	122.58	53.06	0	133.88	27.78	70.88	6.88	79.88	0	17.72	686.10	275.68	272.64	44.74	45.64	5.56	24.46	10.06	6.34	0	1.38	686.50	1372.60	3.82	105.84	0	0	0	27.78	235.94	3.12	376.50	38.18	1787.28
March 2010	46.70	121.64	177.62	52.64	0.00	188.42	28.14	51.68	11.12	100.90	0.00	15.46	794.32	236.64	407.14	40.40	96.44	5.90	26.12	5.38	14.94	39.30	0.00	872.46	1666.78	0.00	81.86	0.00	6.22	18.06	55.46	0.00	0.00	161.60	34.28	1862.66
April 2011	40.80	98.18	137.76	72.30	0	129.56	19.68	39.72	16.34	91.12	0	17.30	662.76	242.38	236.28	39.94	39.48	5.32	26.78	7.72	20.22	0	0	618.12	1280.88	1.28	94.78	0	0.88	0	11.08	0	3.58	111.60	53.04	1445.52
April 2010	54.78	119.56	197.12	60.72	0	177.84	35.46	72.42	11.08	94.64	0	24.68	848.30	236.3	388.04	49.32	87.8	6.78	30.02	7.76	16.06	0	0	822.08	1670.38	1	111.26	0	0	0	55.52	0	0.08	167.86	69.12	1907.36
May 2011	41.98	94.38	135.70	45.64	0.00	144.50	33.60	42.98	12.24	86.40	0.00	9.54	645.96	217.38	239.76	36.30	49.52	5.42	27.08	6.38	2.68	0.00	2.04	586.58	1233.54	0.16	85.04	0.00	0.00	0.00	1.60	0.00	0.34	87.14	42.26	1362.94
May 2010	45.35	107.88	161.41	57.28	0	173.6	42.26	44.38	16.72	110.58	0	17.04	776.5	236.86	358.5	42.38	95.2	4.08	29.06	9.74	1.42	0	0.92	778.16	1554.66	0.46	85.54	0	0	0	2.52	0	0.04	88.56	35.58	1678.80
June 2011	43.10	86.22	118.70	62.08	0	125.28	28.10	55.56	12.98	82.84	0	18.12	632.98	213.4	240.46	47.84	42	5.3	25.1	6.18	3.68	0	7.4	591.36	1224.34	0	81.18	0	0	0	7.34	0	0.48	89	41.28	1354.62
June 2010	62.36	110.8	169.14	70.8	0	181.7	40.04	67.56	9.28	104.12	0	15.84	831.64	276.04	363.7	52.4	87.28	6.2	27.8	57.2	28.28	0	0	898.90	1730.54	0	66.5	0	1.96	0	3.38	0	2.56	74.4	43.36	1848.30
July 2011	41.92	88.5	134.22	50.4	0	160.96	40.96	65.82	7.8	99.52	0	28.18	718.3	236.44	224.14	37.38	45.98	7.86	20.66	8.4	0.7	0	0	581.56	1299.86	9.76	82.04	0	0	1.02	3.66	0	0	96.48	47.4	1443.74
July 2010	43.42	116.80	183.00	108.66	0	184.36	42.1	86.76	9.26	115.72	0	27.92	918.00	261.42	343.74	38.28	89.06	15.52	40.58	10.16	13.88	0	0	812.64	1730.64	0.66	96.64	0	0	0	0.72	0	0	98.02	41.84	1870.50
August 2011	58.82	95.82	124.72	88.56	0	162.32	62.58	52.64	12.18	98.28	0	21.28	777.20	292.88	244.26	34.04	36.1	6.88	28.74	8.26	2.3	0	0	653.46	1430.66	14.12	74.00	0	1.64	0	1.02	0	0.6	91.38	71.08	1593.12
August 2010	36.98	118.16	152.4	79.22	0	177.7	75.76	87.64	14.5	109.44	0	29.28	881.08	244.56	358.18	39.44	72.06	4.8	40.5	11.64	18.44	13.72	0	803.36	1684.44	1.14	70.6	0	0.46	0	1.76	0	1.32	75.5	71.58	1831.52
September 2011	46.52	92.88	109.5	59.60	0	105.60	30.24	65.18	6.62	86.42	0.00	21.64	624.20	245.9	206.18	56.56	39.24	6.68	21.66	7.9	1.44	0	0	585.56	1209.76	8.10	85.82	0	0	0	64.48	0	0.64	159.04	34.68	1403.48
September 2010	43.06	109.18	140.28	54.56	0	159.46	39.92	69.6	8.16	85.72	0	17.96	727.90	225.56	340.18	65.36	78.18	3.58	33.36	5.54	1.74	0	0	753.50	1481.4	14.1	74.34	0	0	0	3.84	0	3	95.28	37.18	1613.86
October 2011	41.64	80.08	103.62	45.12	0	110.52	24.54	38.62	5.9	61.7	0	8.8	520.54	200.14	204.06	33.02	29.4	2.96	22.02	5.06	1.38	15.32	0	513.36	1033.90	1.14	65.08	0	0	0	19.28	0	1.62	87.12	22.88	1143.90
October 2010	40.66	91.16	117.92	54.96	0	130.3	27.04	59.6	8.08	90.94	0	19.38	640.04	211.44	290.28	38.78	72.04	4.76	24.04	5.1	3.1	25.34	0	674.88	1314.92	0	77.12	0	4.04	0	2.7	0	2.84	86.7	26.96	1428.58
November 2011	41.92	86.08	124.46	51.4	0	121.96	29.32	37.5	8.06	72.26	0	21.6	594.56	206.58	231.6	47.86	43.62	5.84	20.5	9.16	3.1	0	0	568.26	1162.84	5.2	71.54	0	0	4.66	1.06	0	0.26	82.72	33.08	1278.64
November 2010	51.18	95.6	125.58	47.88	0	136.68	37.42	39.7	7.14	78.78	0	8.64	628.60	273.54	258.06	40.1	41.5	5.66	25.14	9.42	212.1	0	0	865.52	1494.12	0	143.62	0	3.06	0	0.88	0	2.36	149.92	25.6	1669.64
December 2011	0	81.68	101.3	1.36	0	120.1	0	33.66	0	63.94	0	18.38	420.42	0	17.38	0	35.2	3.86	22.24	25.42	6.26	0	0.6	110.96	531.38	0	75.24	0	0	0	10.38	0	0.32	85.94	30.88	648.20
December 2010	43.22	91.82	115.46	47.64	0	128.92	23.54	40.68	6.82	57.1	0	17.82	573.02	203.74	205.42	58.26	27.78	2.96	24.28	4.42	1.58	0	0	528.44	1101.46	8.78	85.7	0	3.58	0	0.8	0	0.3	99.16	28.06	1228.68
Total Tonnage 2011	526.98	1107.24	1500.62	650.38	0.00	1597.98	370.06	599.92	102.60	990.78	0.00	211.48	7658.04	2617.55	2632.64	462.92	514.52	66.61	293.14	104.70	55.24	15.32	20.46	6783.10	14441.14	44.40	1061.10	0.00	4.52	5.58	235.42	235.94	17.67	1604.73	499.84	16545.71
Total Tonnage 2010	602.93	1322.46	1898.87	860.77	9.36	1970.85	459.70	755.30	114.54	1132.28	0.00	228.50	9355.56	2697.64	4099.7	557.16	931.64	67.88	366.65	513.02	320.5	76.36	0.92	9833.45	19189.01	26.14	1097	0	19.3	18.06	131.54	0	13.6	1305.68	452.3	20986.99
Total Levied Waste 2011	3134.84			2248.36			969.98		1093.38		211.48			6783.10												1604.73										
Total Non Levied Waste 2011	263.88			139.22			65.22		24.28		7.24																									
Total Residual Waste 2011	3398.72			2387.58			1035.2		1117.66		218.72																									
Grand Total	8157.88													8387.83																						16545.71

Appendix C: % BMW Report 2011

Biodegradable Municipal Waste Reporting
Landfill Submission Report

Waste licence number: W0001-04 North Kerry Landfill Site

Report created on: 20/01/2012 11:51

Submission details

Year: 2011 Quarter: 4

Reporting period: October - December

Reference number: R-W0001-2011-4

Site details

License number: W0001-04

Parent company name: Kerry County Council

Facility name: North Kerry Landfill Site

Facility address: Muingnaminnane, Tralee, Co. Kerry,

Contact details of person who made the return

Contact name: John Ahern Contact position: Act. Senior Executive Engineer

Email address: jahern@kerrycoco.ie Telephone number: 0667162000

Mobile number: Fax number:

BMW details

Summary for Q4 2011

Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
2-bin residual commercial waste	229.81	EPA Approved factor	0.75	172.36		75.00
2-bin residual household waste	687.81	EPA Approved factor	0.63	433.32		63.00
3-bin residual commercial waste	8.09	EPA Approved factor	0.68	5.50		68.00
3-bin residual household waste	72.79	EPA Approved factor	0.47	34.21		47.00
Residual MSW from civic amenity facility	173.56	EPA Approved factor	0.63	109.34		63.00
Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	255.98	EPA Approved factor	0.65	166.39		65.00
Other	54.84	Site Specific factor	0.63	34.55	Dingle Civic Amenity Site	63.00
Other	467.18	Site Specific factor	0.64	299.00	Milltown transfer station	64.00
Other	716.96	Site Specific factor	0.60	430.18	Coolcaslgh Transfer Station	60.00
Other	214.86	Site Specific factor	0.66	141.81	Kenmare Transfer Station	66.00
Other	173.68	Site Specific factor	0.65	112.89	Caherciveen Transfer Station	65.00
Other	21.1	Site Specific factor	0.54	11.39	KWD Recycling Ltd	53.98
	3076.66			1950.94		63.41

Cumulative report for year

Quarter	Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
Q1	2-bin residual commercial waste	91.62	EPA Approved factor	0.75	68.72		75.01
Q1	2-bin residual household waste	1519.94	EPA Approved factor	0.63	957.56		63.00
Q1	3-bin residual household waste	129.98	EPA Approved factor	0.47	61.09		47.00
Q1	Other	284.06	Site Specific factor	0.64	181.80	Caherciveen TS	64.00
Q1	Other	960.86	Site Specific factor	0.59	566.91	Coolcashlagh	59.00
Q1	Other	48.30	Site Specific factor	0.63	30.43	Dingle CA	63.00
Q1	Other	275.66	Site Specific factor	0.66	181.94	Kenmare TS	66.00
Q1	Other	614.48	Site Specific factor	0.64	393.27	Milltown TS	64.00
Q1	Other	2.00	Site Specific factor	0.00	0.00	Graveyard Waste	0.00
Q1	Residual MSW from civic amenity facility	232.34	EPA Approved factor	0.63	146.37		63.00
Q1	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	476.37	EPA Approved factor	0.65	309.64		65.00
Q2	2-bin residual commercial waste	350.28	EPA Approved factor	0.75	262.71		75.00
Q2	2-bin residual household waste	1111.74	EPA Approved factor	0.63	700.40		63.00
Q2	3-bin residual commercial waste	24.88	EPA Approved factor	0.68	16.92		68.02
Q2	3-bin residual household waste	99.26	EPA Approved factor	0.47	46.65		47.00
Q2	Other	0.88	Site Specific factor	0.00	0.00	Graveyard waste	0.00
Q2	Other	47.50	Site Specific factor	0.63	29.92	Dingle CA	62.99
Q2	Other	613.50	Site Specific factor	0.65	398.78	Milltown TS	65.00
Q2	Other	872.62	Site Specific factor	0.60	523.57	Coolcaslagh TS	60.00
Q2	Other	307.54	Site Specific factor	0.66	202.98	Kenmare TS	66.00
Q2	Other	238.12	Site Specific factor	0.64	152.40	Caherciveen TS	64.00
Q2	Residual MSW from civic amenity facility	209.96	EPA Approved factor	0.63	132.27		63.00
Q2	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	286.86	EPA Approved factor	0.65	186.46		65.00
Q3	2-bin residual commercial waste	186.01	EPA Approved factor	0.75	139.51		75.00
Q3	2-bin residual household waste	1313.87	EPA Approved factor	0.63	827.74		63.00
Q3	3-bin residual commercial waste	12.80	EPA Approved factor	0.68	8.70		67.98
Q3	3-bin residual household waste	115.18	EPA Approved factor	0.47	54.14		47.00
Q3	Other	1.64	Site Specific factor	0.00	0.00	Graveyard Waste	0.00
Q3	Other	73.22	Site Specific factor	0.63	46.13	Dingle Civic Amenity	63.00
Q3	Other	692.42	Site Specific factor	0.64	443.15	Miltown Transfer Station	64.00
Q3	Other	848.28	Site Specific factor	0.59	500.49	Coolcaslagh Transfer Station	59.00
Q3	Other	319.60	Site Specific factor	0.67	214.13	Kenmare Transfer Station	67.00
Q3	Other	339.34	Site Specific factor	0.65	220.57	Caherciveen Transfer Station	65.00
Q3	Residual MSW from civic amenity facility	192.38	EPA Approved factor	0.63	121.20		63.00
Q3	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	345.26	EPA Approved factor	0.65	224.42		65.00
Q4	2-bin residual commercial waste	229.81	EPA Approved factor	0.75	172.36		75.00
Q4	2-bin residual household waste	687.81	EPA Approved factor	0.63	433.32		63.00
Q4	3-bin residual commercial waste	8.09	EPA Approved factor	0.68	5.50		68.00
Q4	3-bin residual household waste	72.79	EPA Approved factor	0.47	34.21		47.00
Q4	Residual MSW from civic amenity facility	173.56	EPA Approved factor	0.63	109.34		63.00
Q4	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	255.98	EPA Approved factor	0.65	166.39		65.00
Q4	Other	54.84	Site Specific factor	0.63	34.55	Dingle Civic Amenity Site	63.00
Q4	Other	467.18	Site Specific factor	0.64	299.00	Milltown transfer station	64.00
Q4	Other	716.96	Site Specific factor	0.60	430.18	Coolcaslgh Transfer Station	60.00
Q4	Other	214.86	Site Specific factor	0.66	141.81	Kenmare Transfer Station	66.00
Q4	Other	173.68	Site Specific factor	0.65	112.89	Caherciveen Transfer Station	65.00

Q4	Other	21.10	Site Specific factor	0.54	11.39	KWD Recycling Ltd	53.98
		16315.41			10301.91		63.14

Appendix D: Historic Data

	Waste Tonnes	Leachate m3	tonnes/m3
1994	16,902	1,494.00	11.31325301
1995	23,505	6,475.00	3.63011583
1996	23,722	8,496.37	2.792015884
1997	25,581.88	12,175.49	2.101096547
1998	33,529.67	20,318.09	1.650237301
1999	57,872.71	22,822.95	2.535724348
2000	60,473.65	36,780.71	1.644167554
2001	63,945.91	18,953.85	3.373768918
2002	62,821.52	34,218.23	1.835907936
2003	50,235.29	30,721.59	1.635178713
2004	48,054.47	45,130.40	1.064791582
2005	34,430.82	54,784.59	0.628476365
2006	60,025.22	60,922.61	0.985270001
2007	56,794.24	55,436.15	1.024498274
2008	62,412.96	78,558.53	0.794477188
2009	39,755.40	73,727.85	0.539218219
2010	20,986.80	42,442.73	0.494473353
2011	16,545.71	50,108.58	0.330197144
Total	**741,050**	**561,016**	

Appendix E: Waste Recycling and Recovery

Recycling Waste collected at NKL in 2011

Material type	Suggested EWC codes	Notes	Name of destination facility(ies), or collector(s) if directly exported (please provide licence/permit number)	January	February	March	April	May	June	July	August	September	October	November	December	Total Household waste (tonnes)
Organic waste (food and garden)																0.00
garden	*20 02 01*		*W0001-03*		15.24		23.48	16.02	118.60	0	75.66	83.76	18.74			351.50
Mixed dry recyclables	20 03 01		Kerry County Council Refuse and Recycling Service collect and transport to Dillons Waste WP	3.18	1.66	2.3	1.38	1.48	2.02	1.68	1.96	1.54		1.38	1.26	19.84
Cardboard, newspaper and other paper																0.00
cardboard packaging	*15 01 01*		*Dillon Waste The Kerries, Tralee WCP - LK-007/07d*				16.22			12.3					12.68	41.20
newspaper and magazines	*20 01 01*		*Dillon Waste, The Kerries, Tralee WCP -LK-007/07d*	6.8	4.56	6.4	4.46	4.12	7.04	5	5.32	5.94	4.34	4.36	5.08	63.42
Glass																0.00
glass packaging	*15 01 07*		Glassco Recycling	5.68	2.31	2.56	1.45	3.28	1.32	2.96	3.28		2.9	1.68	3.14	30.56
Metals																0.00
aluminium cans (packaging)	*15 01 04*		Glassco Recycling	0.18	0.09	0.14	0.09	0.08	0.14	0.1	0.2		0.1	0.2	0.1	1.42
steel cans (packaging)	*15 01 04*		Glassco Recycling	0.44	0.2	0.2	0.12	0.18	0.16	0.18	0.26		0.24	0.24	0.24	2.46
other metals (non-packaging)	*20 01 40*		Hegarty Metals, Dock road, Limerick WCP-LK-027/02b	5.3	5.92	11.6	5.66	10.2	4.86	9.8	5.4	4.6	2.04	4.5		69.88
Plastic (Bottles)																0.00
plastic packaging	*15 01 02*		Dillon Waste, The Kerries, Tralee Wp	1.82	1.24	1.04	1.3	1.28	1.44	1.46	1.4	1.6	1.3	1.5	2.12	17.50
Textiles																0.00
textiles, non-packaging	20 01 11		Cookstown Recyclers	1.06	0.74	0.9	0.9	0.42	1.18	0.56	0.84	1.94			1.18	9.72
Waste Electrical and Electronic Equipment																0.00
SDA TVs Monitors	20 01 35		Ratcliffe/EWM WCP-DC-08-1130-01 WFP-DS-09-0012-01	4.34	8.5	7.92	6.66	5.86	7.82	2.76	14.94	4.06	11.48	6.38	12.82	93.54
LHA - Large Houshold Appliances	20 01 23 20 01 36		KMK Metals Recycling	6.9	0	4.72	5.2	5.96	3.94			0.1				26.82

NKL - Hazardous Waste 2011

Material type	Suggested EWC codes		Name of destination facility(ies), or collector(s) if directly exported	January	February	March	April	May	June	July	August	September	October	November	December	Total Household waste
(If you must depart from this list, please provide details on a separate sheet)	(overwrite as appropriate)	Notes	(please provide licence/permit number)													(tonnes)
Batteries		*Portable batteries weigh <2kg, are sealed, are not exclusively designed to propel an electrical vehicle, and are not intended to be used for automotive starter, lighting or ignition power.*														0
lead acid batteries and accumulators	16 06 01*	portable	n/a													0
		non-portable (automotive and industrial)	ENVA Ireland WCP-LK-052/06d, Campine Belgium MLVA/05-		1.500	1.3	0	1.2		0.55				0.79		5.340
Ni-Cd batteries and accumulators	16 06 02*	portable	ENVA Ireland WCP-LK-052/06d, Accurec Germany											0.14		0
Other (e.g. alkaline) batteries and accumulators	16 06 04	portable	n/a													0
		non-portable (automotive and industrial)	n/a													0
Waste mineral oils	13 02 05	*lubrication, vehicle, machine, etc.*	ENVA Ireland WCP/LK/052/06d	0	0.475	1.034	0	0.86		0.8			1.4			4.57
Oil filters (vehicles)	13 08 99		ENVA Ireland WCP/LK/052/06d	0	0	0.14	0	0.14				0.14	0.08			0.50
Oil containers (mineral oil) - plastic + metal	13 08 99		ENVA Ireland WCP/LK/052/06d		0.12	0.08	0	0.12		0.76		0.42	0.14	0.18	0.1	1.92
Waste cooking or vegetable oils	20 01 25		Fryrite	0	0	0.4	0	0								0.40
Waste paint and varnish (including containers)	20 01 27		ENVA Ireland WCP/LK/052/06d	0	0	0.2	0	0.09		0.51		0.285	0.045	0.16		1.29
aersols	14 06 01		ENVA Ireland WCP/LK/052/06d		0.075	0.05	0	0.05		0.075		0.15	0.06	0.065	0.06	0.59
Leachate NKL	19 07 03			5255.9	5395.38	3768.72	3845.78	2805.7	3735.13	3698.13	2751.7	3655.51	3956.4	4950.12	6335.12	50,153.59
Gas Cylinders	16 05 04			0	0	0	0.2	0				0.34				0.54
Fluorscent Tubes	20 01 21								0.08						0.24	0.32

Appendix F: Summary of results and Interpretation of Environmental Monitoring

ANNUAL ENVIRONMENT REPORT
Physio-chemical and Biological Monitoring of North Kerry Landfill 2011
Prepared by:
David Lenihan
Senior Executive Chemist **02 April 2012**

INTRODUCTION

As Part of requirements under EPA Licence for North Kerry landfill this laboratory produces a report on a six monthly basis as well as an annual detailed report. This report can thus be interpreted as *Laboratory contribution to* ***Annual Environment report*****.**

Enclosed are:

- Annual results in spreadsheet format for Leachate, Surface Water and Groundwater as required per monitoring provisions as of licence requirements for 2011. ***(note that due to borehole sample pump failure in latter part of 2011 we were forced to wait until to jan 2012 for annual groundwater samples (these are included here as part of our 2011 requirements))***
- Interpretation of results pertaining to three matrices of concern i.e. Groundwater, Surface water and Leachate
- results from ELS contract laboratory pertaining to individual List 1 and List 2 organics which were analysed for in Jan 2012 at three groundwater locations ***App3***
- trend graphs for Total organic Carbon results and associated conductivity measurements for each of boreholes
- ***Appendix 1*** detailing sample locations and associated grid references used in report
- ***Table 1*** outlines trigger values for strategic parameters analysed in groundwater
- ***Appendix 2*** details list of List 1,2 Organics monitored and their associated Limits of detection (LODs)
- ***Appendix 3*** Biological assessment of surface water impact sites conducted by KCC Scientific staff

All except for analysis of ***Total cyanide, list 1*** and ***List 2 organic substances***, was conducted at KCC laboratory.
Analysis on these Parameters (italics *and asterix*) was farmed out to ***ELS laboratories*** Mahon Industrial Estate, Cork.
A summary of Environmental requirements has been prepared by Tobin Consulting engineers. This is the document we are using. In the case of surface waters and leachate samples, the final round of results for 2010 was taken on the 30th Nov. In the case of groundwater, because of failure of borehole sampling pump, the final round of samples was taken on Jan 18, 2012. Results are also included for monthly analysis of groundwater as required by provisions of old licence
In 2010 a total of ***166***samples were sampled by KCC Laboratory personnel
Altogether ***1495*** tests were analysed to satisfy requirements of licence monitoring.

Of these ***1470*** tests were analysed in KCC laboratory
25tests were analysed by *ELS laboratories*. The latter included Cyanide and List1 / 2 organics as required on an annual basis for three groundwater locations It must however be stressed that each test for SVOCs or VOCs comprises analysis for 153 specific compounds

The monitoring locations monitored are as per requirements of new licence.
APP1 outlines locations and associated northing's and easting's
Trigger limits

Trigger limits are required to be set for certain parameters in groundwater and submitted to EPA. Perhaps the best such limits to use are groundwater threshold values as set out in groundwater regulations 2009. Other standards used, correspond to drinking water regulatory standards. However where drinking water limits cannot be adhered to because of natural conditions (non anthropogenic effects) i.e. Ph the trigger value would have to be more flexible. The trigger values for Boreholes 1 to 4 are as highlighted in Table 1. Borehole 5 appears to be monitoring an aquifer which contains a lot of decaying organic matter more than likely from natural sources. Therefore trigger value for ammonia may be too strict.

Table I Parametric Trigger values for Groundwater

Parameter	units	Trigger value (max)	Trigger value(min)
Ammonium	mg/L	0.225	
Nitrite	mg/L	0.38	
Total Oxidised Nitrogen	mg/L (NO_3)	37.5	
Conductivity	Us/cm	800	
Ph	Ph units	10	4.5
Dissolved Oxygen	mg/L O2		1.0
Chloride	mg/L	200	
Flouride	ug/L	1000	
Sodium	mg/L	150	
Potassium	mg/L	10	
Boron	mg/L	0.75	
Copper	mg/L	1.5	
Cadmium	ug/L	3.75	
Chromium	ug/L	37.5	
Arsenic	ug/L	7.5	
Lead	ug/L	10	
Nickel	ug/L	15	
Mercury	ug/L	0.75	
Total Cyanide	ug/L	37.5	
VOCs			
Benzene	ug/L	0.75	
1,2 dichloroethane	ug/L	2.25	
Tetra chloroethene and Trichloroethene	ug/L	7.5	
Toluene	ug/L	5	
Phenols	mg/L	0.05	
SVOCs			
Atrazine	ug/L	0.075	
Simazine	ug/L	0.075	
Poly aromatic Hydrocarbons[1]	ug/L	0.075	
Pesticides[2,3]	ug/L	0.375	

[1] ***PAHs neasured should include at least benzo(b)Fluoranthene, benzo(k Fluoranthene, benzo(ghi)perylene,indeno(123-cd)pyrene Fluoranthene detection***
[2] ***the trigger value applies to each individual pesticide measured.***
[3]***Pesticides include organic insecticides, Organic herbicides, Organic nematocides, organic acaricides, organic algicides, organic rodenticides, organic slimicides, related products (inter alia, growth regulators***

List 1 and List 2 Organics

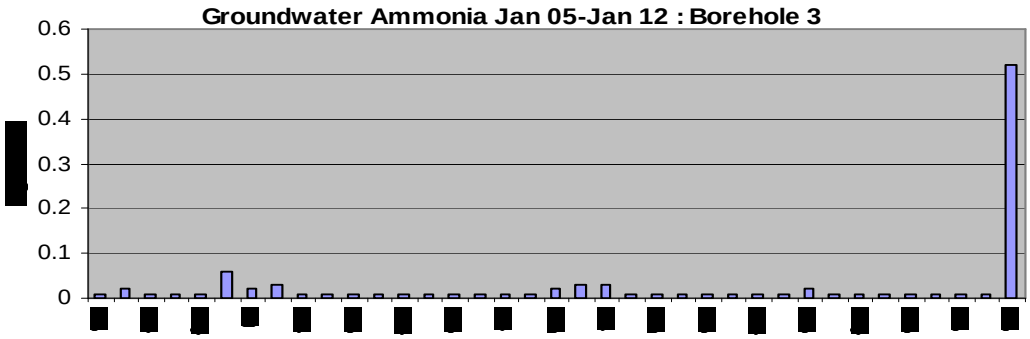
Under the provisions of monitoring requirements we are required to monitor List 1 and List 2 organic compounds in three groundwater locations on an annual basis. These locations have to be agreed with EPA. In this report we report on three groundwater locations which were monitored for these compounds i.e. ***Borehole 1***, ***4*** and ***5***
The compounds analysed comprised of two types Volatile Organic compounds ***(VOCs)*** and Semi Volatile organic compounds ***(SVOCs)*** . VOCs comprise of organic compounds with boiling points close to or less than that of Water i.e. ***Petroleum products*** and common solvents –up to 83 compounds were screened for using Purge and Trap GC MS.
Semi Volatile compounds comprise of higher boiling point organics and comprise of classes of compounds such as ***pesticides, herbicides, PCBs (****polychlorinated Biphenyls****)*** and ***PAHs(****Poly aromatic Hydrocarbons)* .Up to 63 different compounds in this category were screened for. A list of these compounds, together with limits of detection is given in ***Appendix 2***
Of the 83 VOCs analysed only two were detected above their respective Limits of detection in each of the three wells i.e. Borehole 1, 4 and 5
Chloroform was found in range ***1.1 to 2.4 ug/L*** and ***Acetone*** was found at levels in range 4.9 to 11.6 ug/L These levels are miniscule and are not of significance
No SVOCs were detected in any of samples .

Heavy Metals
As we possess and use *ICP-MS instrument we monitored many more locations for heavy metals than were strictly required i.e. 11 surface water,6 Leachate, and 8 groundwater locations
**Inductively coupled Plasma Mass spectrometer*

INTERPRETATION OF RESULTS

Groundwater:
In the latter period of 2011 it was not possible to conduct detailed monitoring as required by license due to problems with existing borehole pump. A replacement pump was hired at start of 2012 and samples were taken from all concerned boreholes on 18th Jan. However analysis indicates elevated results in all boreholes. A level of ***8.55*** mg/l for Ammonia was detected in Borehole 4 where all concentrations prior to this were lower than detection limit (0.02) . High TOC levels were detected in all wells reflecting high colour and presence of sediment detected.
Elevated levels of Lead, Nickel Iron and Manganese were detected also in Boreholes- levels of Nickel and Lead may be due to leaching of well casings
Further investigation therefore points to inadequate pumping out of wells prior to sampling. The replacement pump appears to have been inadequate to provide adequate purging of wells i.e. 3 times volume of borehole.
One of boreholes however i.e. Borehole No 3 does not require purging prior to monitoring as this well is used as source of water for canteen and is thus actively used. Curiously in this case both ammonia (see Fig 1) and TOC levels were abnormally high which suggests that there may be some actual contamination of this well.
It is clear that further investigative monitoring is required. Accordingly this laboratory will conduct within next month i.e. April 2012 an intensive survey of all wells
. ***See Fig 1.***

Fig 1



Examination of earlier results for 2011 confirms results from earlier years i.e. Surface water appears to be intruding into at least two out of five wells as evident from levels of Total organic carbon i.e. Borehole 5 and 6 . *See trend graphs for Total Organic Carbon (with associated conductivity) for each Borehole (encl)*

Boreholes , ***3 4*** and ***5*** were tested for list 1 , 2 organics. Outside of traces of acetone and chloroform No organics of significance were found here.

Surface water:

Occasional excesses of suspended solids are noted at on site impact stations i.e. at new surface water lagoon (***SWMLE1***) in Feb. However in general, based on enclosed results, minimal impact was noted. Biological monitoring is at present been conducted.
At present as part of operational monitoring instruments for automated monitoring of Ammonia in lagoons is been sourced. In the interim grab samples for this parameter are been taken from lagoons and analyzed in laboratory *(appropriate preservative has been added prior to sampling to sample bottles*). This analysis is reported separately which accompanies this report.

Results from monitoring over last 10 years indicates that most significant threat or impact from Landfill activities in surrounding waters is suspended solids
Samples were obtained "in site monitoring" from Stations ***SWML 1,2.3,4,5,10,11 and new lagoon SWMLE1***.
While overall there was a noticeable decrease in suspended solids in receiving waters at W1 during 2011 relative to earlier years- there was a spike observed in August probably corresponding to heavy rainfall prior to sampling. . *See Fig 4 Suspended solids @ W1 2009/2011.*

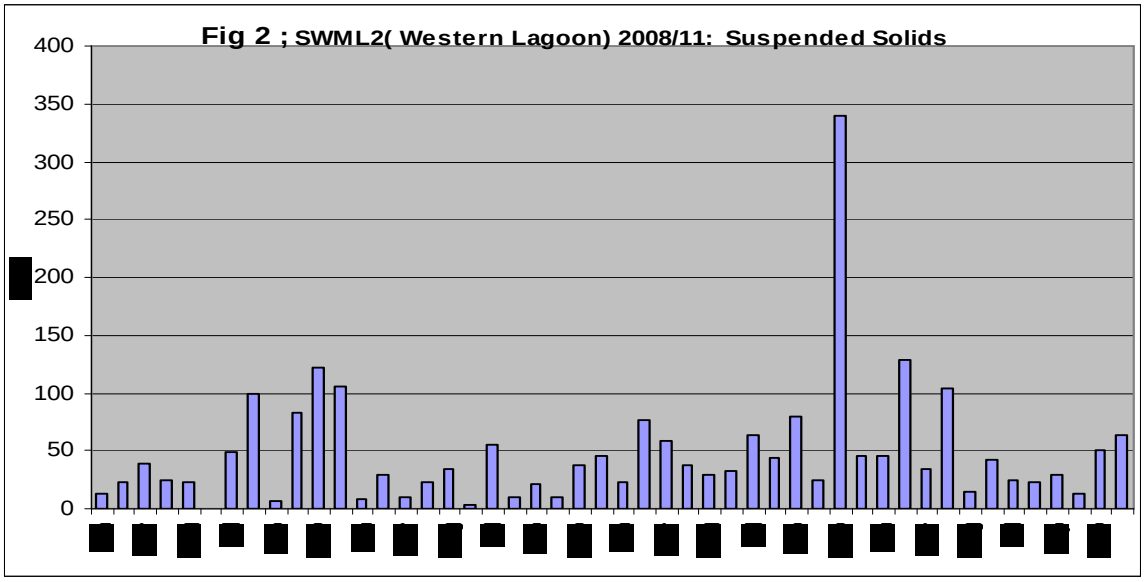


Fig 2 ; SWML2(Western Lagoon) 2008/11: Suspended Solids
400
350
300
250
200
150
100
50
0

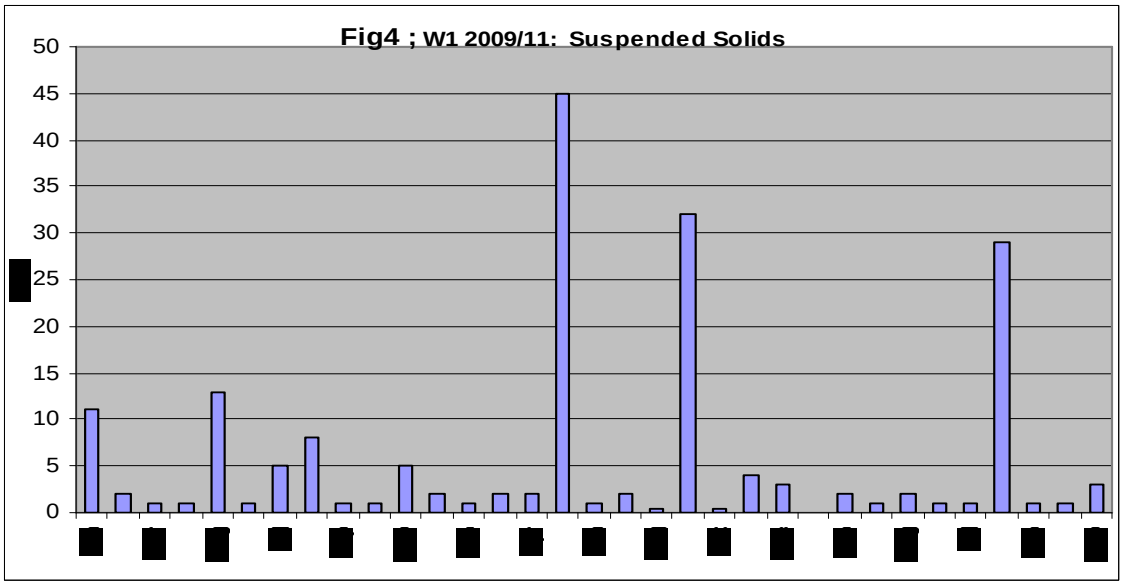


Fig4 ; W1 2009/11: Suspended Solids
50
45
40
35
30
25
20
15
10
5
0

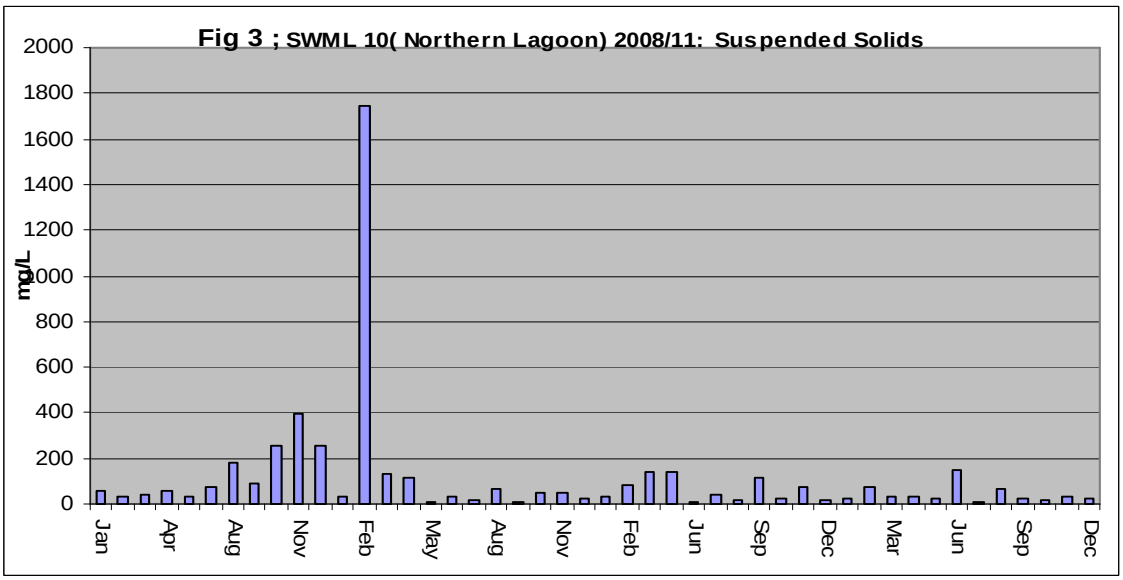
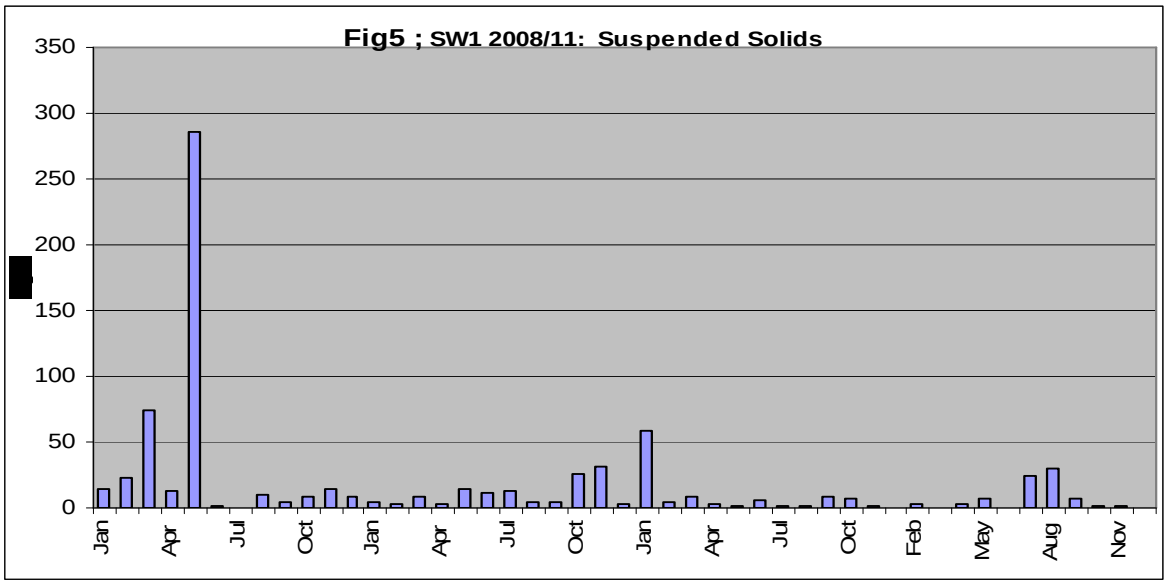


Fig 3 ; SWML 10(Northern Lagoon) 2008/11: Suspended Solids
2000
1800
1600
1400
1200
1000
800
600
400
200
0
mg/L
Jan
Apr
Aug
Nov
Feb
May
Aug
Nov
Feb
Jun
Sep
Dec
Mar
Jun
Sep
Dec

There was also much less significant impact from Suspended Solids on off site SW1 *See Fig 5Suspended solids @ sW1 2008/2011*



High suspended solids in river waters may impair fish spawning grounds particularly in winter and spring. Occasional pulses of suspended matter entering these sites are more than likely the main contributory factor for unsatisfactory biological quality at this site.
Ecological assessment of ***W1*** In 2011 denotes a Q3 value (moderate pollution), which still reflects some impact See ***App 4: Biological assessment of North Kerry Landfill impact sites 2011***. This reflects earlier assessments both small stream risk assessments and Q investigations conducted since 2007. However when comparison is made between SSSRS studies done in 2009 /2010 and Q assessment in 2011 a deterioration in sensitive invertebrate species was noted. This deterioration may have been due to problems experienced in late 2010
However Biological assessment at station on Lee about 3 km downstream (O'Brennans bridge) and at ivy bridge on Glashroeg stream indicates a stream of good quality i.e. Q =4

Because of importance and significance of Suspended solids monitoring of both W1 and SW1 are at a much higher frequency for this parameter than license obligations

Impact of Ammonia levels on receiving waters
In 2010 some impact was noted form landfill on receiving waters gauged by Ammonia levels at Location W1 (see 2010 AER). However during course of 2011 no such impact was observed .

Leachate results

Leachate was detected in all detection manholes monitored i.e. ***LD1***, ***LD2*** and ***LD3.***

Conclusion

- ***Increases in significant parameters of pollution significance were noted in groundwater sites. However this may have been due to inadequate pumping out of wells prior to sampling***
- ***Evidence of siltation was evident in sites W1and SW1 (headwaters of Lee and Smeralagh)***
- ***Biological assessment in 2011 denoted moderate pollution (Q=3) at principal Surface water impact site W1 – some deterioration was noted compared to previous year***
- ***Evidence of leachate was detected in all three leachate detection manholes***

References:

1. Summary of Environmental Monitoring requirements For- Kerry Co Council Landfill, Muingnaminnane, Tralee, Co Kerry -Waste Licence Ref No: 1-3: Tobin Consulting Engineers
2. Biological Invertebrate Monitoring of Surface Waters 2011; Laboratory KCC

Appendix1: Details Sampling points referred to in report

Location	comments	old or alternative name	Location Easting	Location Northing
Groundwater				
specified groundwater monitoring pts				
Groundwater - BH-1			94697	117360
Groundwater - BH-2			94814	117306
Groundwater - BH-3			94808	117005
Groundwater - BH-4			95430	117040
Groundwater - BH-5			94917.5	117152.7
Groundwater - BH-6			94843	117658
Private boreholes adjacent to landfill				
borehole: Dennis O Mahony	not specified in new licence		97390.7	118348.7
borehole: Gerry Sugrue	not specified in new licence		93037.8	116489.5
Leachate				
Detection manholes				
LD-1		leachate detection manhole 1	94909	117268
LD-2		leachate detection manhole 2	94894	117298
LD-3		leachate detection manhole from lagoon	94905	117264
Lagoon sampling pts				
LL-1		Leachate in lagoon 1	94904	117237
LL-2		leachate in Lagoon 2	94927	117166
LL-3		lagoon containing run off from compost	94979	117414
Ancillary pts				
Puraflo Treatment Inlet	not specified in new licence			
Puraflo Treatment Outlet	not specified in new licence		94867.2	117332
Wheelwash	Not specified in new licence			
Surface water				
Off site sampling pts				
Surface Water sampling point: W1	not specified in new licence	biological station	94493.3	117107.5
Surface water sampling point: E2	Not specified in new licence	O'Learys farm	95870.6	116575.6

Surface water sampling point: W2	Not specified in new licence		94493.3	117159.9
SW-1		previously E1	95471	117077
SW-2			95143.6	117969.4
SW-3			94853	118263
On site sampling pts				
SWML-1		previously 1	94948.3	117376.4
SWML-2	Western Lagoon	previously 2	94837.9	117263.7
SWML-3			94866	117221
SWML-4		previously 4	94883.9	117092.6
SWML-5			94911	117027
SWML-10	Eastern lagoon		95092	117470
SWML-11		previously 11	95067	117520
SWML-E1	New surface water lagoon		94592	117510

APPENDIX 2 ; LIST 1, 2 Organics

SVOCs: (Semi Volatile base Neutrals) Std Method 6410 B Liquid-Liquid Extraction GC/MS.

Parameter	***limit of detection***	***units***
1.3 - Dichlorobenzene	1	ug/l
1.4 - Dichlorobenzene	1	ug/l
Hexachloroethane	1	ug/l
bis(2-Chloroethyl) ether	1	ug/l
1,2-Dichlorobenzene	1	ug/l
bis(2-Chloroisopropyl) ether	1	ug/l
N-Nitrosodi-n-propylamine	1	ug/l
Nitrobenzene	1	ug/l
Hexachlorobutadiene	1	ug/l
1,2,4-Trichlorobenzene	1	ug/l
Isophorone	1	ug/l
Naphthalene	1	ug/l
bis(2-Chlororthoxy) methane	1	ug/l
Hexachlorocyclopentadiene	1	ug/l
2-Chloronaphthalene	1	ug/l
Acenaphthylene	1	ug/l
Acenaphthene	1	ug/l
Dimethyl phthalate	1	ug/l
2,6-Dinitrotoluene	1	ug/l
Fluorene	1	ug/l
4-Chlorophenyl phenyl ether	1	ug/l
2,4-Dinitrotoluene	1	ug/l
Diethyl phthalate	1	ug/l
N-Nitrosodiphenylamine	1	ug/l
Hexachlorobenzene	1	ug/l
a-BHC	1	ug/l
4-Bromophenyl phenyl ether	1	ug/l
y-BHC	1	ug/l
Phenanthrene	1	ug/l
Anthracene	1	ug/l
B-BHC	1	ug/l
Heptachlor	1	ug/l
d-BHC	1	ug/l
Aldrin	1	ug/l
Dibutyl phthalate	1	ug/l
Heptachlor epoxide	1	ug/l
Endosulfan I	1	ug/l
Fluoranthene	1	ug/l
Dieldrin	1	ug/l
4,4'-DDE	1	ug/l
Pyrene	1	ug/l
Endrin	1	ug/l

VOCs : Std Method 6210 D-Purge and Trap Capillary Column GCMS.Screening per USEPA 524.2 list.

Parameter	***limit of detection***	***units***
Dichlorodifluoromethane	10	ug/l
Chloromethane	0.5	ug/l
Ethyl Chloride/Chloroethane	0.5	ug/l
Vinyl Chloride/Chloroethene *(0.5ppb)	0.5	ug/l
Vinyl Chloride/Chloroethene * (25ppb)	0.5	ug/l
Bromomethane	0.5	ug/l
Trichloromonofluoromethane	0.5	ug/l
Ethyl Ether/Diethyl Ether	0.5	ug/l
11 Dichloroethene	0.5	ug/l
Acetone	2	ug/l
Iodomethane/Methyl Iodide	0.5	ug/l
Carbon Disulphide	0.5	ug/l
Allyl Chloride	0.5	ug/l
Methylene Chloride/DCM	5	ug/l
2-Propenenitrile/Acrylonitrile	2	ug/l
Chloroacetonitrile	0.5	ug/l
Nitrobenzene	0.5	ug/l
Propanenitrile	10	ug/l
Hexachlorobutadiene	0.5	ug/l
Trans-1,2 Dichloroethene	0.5	ug/l
MtBE	0.5	ug/l
11 Dichloroethane	0.5	ug/l
22 Dichloropropane	0.5	ug/l
cis-12 Dichloroethene	0.5	ug/l
2-Butanone	5	ug/l
Methyl Acrylate	5	ug/l
Bromochloromethane	0.5	ug/l
Methacrylonitrile	5	ug/l
Tetrahydrofuran	5	ug/l
Chloroform*	1	ug/l
111 Trichloroethane	0.5	ug/l
1-Chlorobutane	0.5	ug/l
Carbon Tetrachloride	0.5	ug/l
11 Dichloropropene	0.5	ug/l
Benzene	0.1	ug/l
12 Dichloroethane)	0.1	ug/l
Trichloroethylene/ Trichloroethene	0.1	ug/l
12 Dichloropropane	0.5	ug/l
Dibromomethane	0.5	ug/l
Methyl Methacrylate	0.5	ug/l
Bromodichloromethane*	2	ug/l
13 Dichloropropene,cis	2	ug/l

APPENDIX 2 ; LIST 1, 2 Organics

SVOCs: (Semi Volatile base Neutrals) Std Method 6410 B Liquid-Liquid Extraction GC/MS.

Parameter	***limit of detection***	***units***
Endosulfan II	1	ug/l
4,4'-DDD	1	ug/l
Benzidine	1	ug/l
4,4'-DDT	1	ug/l
Endosulfan sulfate	1	ug/l
Endrin aldehyde	1	ug/l
Butyl benzyl phthalate	1	ug/l
bis(2-Ethylhexyl) phthalate	1	ug/l
Chrysene	1	ug/l
Benzo(a)anthracene	1	ug/l
3,3'-Dichlorobenzidine	1	ug/l
Di-n-octyl phthalate	1	ug/l
Benzo(b)fluoranthene	1	ug/l
Benzo(k)fluoranthene	1	ug/l
Benzo(a)pyrene	1	ug/l
Indeno(1,2,3-cd)pyrene	1	ug/l
Dibenzo(a,h)anthracene	1	ug/l
Benzo(ghi)perylene	1	ug/l
N-Nitrosodimethylamine	1	ug/l
Chlordane	1	ug/l
Toxapene	1	ug/l
PCB 1016	1	ug/l
PCB 1221	1	ug/l
PCB 1232	1	ug/l
PCB 1242	1	ug/l
PCB 1248	1	ug/l
PCB 1254	1	ug/l
PCB 1260	1	ug/l

VOCs : Std Method 6210 D-Purge and Trap Capillary Column GCMS.Screening per USEPA 524.2 list.

Parameter	***limit of detection***	***units***
MIBK/4 Methyl 2 Pentanone	2	ug/l
Toluene	0.5	ug/l
13 Dichloropropene,trans	2	ug/l
Ethyl Methacrylate	2	ug/l
112 Trichloroethane	0.5	ug/l
Tetrachloroethylene/ Tetrachloroethene*	0.1	ug/l
Tetrachloroethylene/ Tetrachloroethene*	0.1	ug/l
13 Dichloropropane	0.5	ug/l
2-Hexanone	1	ug/l
Dibromochloromethane *	1	ug/l
12 Dibromoethane	0.5	ug/l
Chlorobenzene	0.5	ug/l
1112 Tetrachloroethane	2	ug/l
Ethyl Benzene	0.5	ug/l
m & p Xylene	0.5	ug/l
o Xylene	0.5	ug/l
Styrene	2	ug/l
Bromoform *	1	ug/l
Isopropyl Benzene	0.5	ug/l
Bromobenzene	0.5	ug/l
1122 Tetrachloroethane	0.5	ug/l
123 Trichloropropane	2	ug/l
Trans 14 Dichloro 2 Butene, tran	2	ug/l
Propyl Benzene	0.5	ug/l
2-Chlorotoluene	0.5	ug/l
4 Chlorotoluene	0.5	ug/l
135 Trimethylbenzene	0.5	ug/l
Tert Butyl Benzene	0.5	ug/l
124 Trimethylbenzene	0.5	ug/l
Sec Butyl Benzene	0.5	ug/l
13 Dichlorobenzene	0.5	ug/l
P Isopropyltoluene	0.5	ug/l
14 Dichlorobenzene	0.5	ug/l
12 Dichlorobenzene	0.5	ug/l
N Butyl Benzene	0.5	ug/l
Hexachloroethane	5	ug/l
12 Dibromo 3 Chloropropane	2	ug/l
124 Trichlorobenzene	0.5	ug/l
Napththalene	2	ug/l
123 Trichlorobenzene	0.5	ug/l
Toluene	0.5	ug/l
13 Dichloropropene,trans	2	ug/l
Ethyl Methacrylate	2	ug/l
112 Trichloroethane	0.5	ug/l
Tetrachloroethylene/ Tetrachloroethene*	0.1	ug/l

APPENDIX 3

Subject: Biological Assessment of impact sites of North Kerry landfill.

Authors: Caroline Markey, Claire McCaffrey and Iona McGloin KCC Laboratory.
Date of report: 12/04/2012

Introduction:

Under the EPA license granted to North Kerry Landfill at Muingnaminnane, surface waters draining the landfill are continually monitored. Condition 9.9 of the license requires biological assessment to be carried out annually at specific sites.

W1 biological station is one of these sites and has been monitored regularly over the lifetime of the landfill. The W1 stream drains the western side of the landfill. It is a very small stream just downstream of the landfill. The terrain is very steep, the stream is very narrow and the water flows over a series of small falls. Location of the site is shown on Map (appendix 1).

This report details the biological assessment carried out on W1 site 2nd august 2011 , assessment of river station on Lee approximately 3 Km downstream i.e. ***O'Brennans bridge(16th of June 2011)*** and assessment on Glashroeg stream At Ivy bridge which may be impacted on northern side of landfill (2nd of aug 2011)
For comparison purposes the report also refers to earlier Biological assessments both Q and SSRS(Small streams risk score) conducted on W1.

Methodology:

The basic principle of the biological assessments is that aquatic insects and other invertebrates living in rivers and streams have varying sensitivities to pollution and therefore, can be used as monitors of water quality.

Biological Q rating system:
The samples were classified using the Biological Quality Rating System for Rivers (Q Rating System) as outlined by the Environmental Protection Agency (EPA). The Biological Quality Rating System for Rivers (Q ratings) goes from Q1 to Q5 where a Q5 denotes a pristine river and Q1 indicates serious pollution.
From the point of view of the Water frame work directive all rivers and streams must be at least at Good status i.e. Q4. No high status river stations are allowed to deteriorate. There are different classifications for depositing and eroding substrates. The Q system is aimed particularly at larger streams and rivers and is carried out between May and September. Three-minute kick samples are carried out at each station accompanied by stone examinations and weed sweeps.

Table 1 : Q inveterbrate status rating vs Water Framework Directive(WFD) Quality status

Biotic Index	Water Quality	WFD Quality Status
Q5	pristine	High
Q4-5	Very good	
Q4	Good	Good
Q3-4	Slightly Polluted	Moderate
Q3	Moderately Polluted	Poor

Q2-3	Moderate to Poor	
Q2	Poor	
Q1-2	Poor to bad	
Q1	Bad	

The Small Streams Risk Score (SSRS) is a biological risk assessment system for detecting potential sources of pollution in rivers and is usually carried out on first and second order streams from October to April. It was developed by the Environmental Protection Agency (EPA) in association with Western River Basin District (WRBD). The SSRS is of particular value in detecting hard to find diffuse sources of pollution within catchments. The basic principle of the SSRS is that aquatic insects and other invertebrates living in streams have varying sensitivities to pollution and therefore, can be used as continuous monitors of water quality.

It involves a two minute kick sample, weed sweeps (where applicable) and stone examinations. Results are entered into the SSRS classification system and the risk category is assessed by comparing the final SSRS score with the following score thresholds:

SSRS Scores: >8 Probably not at risk
6.5-8 Probably at risk
<6.5 At risk

Results and Discussion: (*refer also to appendix 2 for Q value field sheets for three sites monitored in 2011)*

Table 2: Results of physiochemical and biological monitoring of W1

		Q value index	SSRS score	Ammonium	Molybdate Reactive	Total Oxidised nitrogen	pH	D.O.	D.O.(as %Sat)	Temperature	Conductivity	Colour	BOD (5day)	Suspended solids
		Q value	SSRS score	as N	Phosphorous (MRP)	Nitrogen as N		O2			at 20degC	Hz	O2	
				--	--					--	--	--	--	--
Sample Ref	Sample Date			mg/l	mg/l	mg/l N	pH units	mg/l	% O2	Degrees C	µS/cm	Hazen	mg/l	mg/l
2006/5619	14/11/2006		5.6	***<0.02***		4.31		10.6	96	9.7	144			16
2009/1954	08-Apr-09		6.4	***<0.015***	< 0.005		6.6	11.5	97	6.5	87	***156***		< 1
2010/1330	30-Mar-10		8	***<0.015***	0.007	0.8	6.8	11.4	93	5.4	58	242	1.1	
2011/3450	02-Aug-11	***3***		< 0.01	< 0.005	0.25	6.8	***9.8***	95.1	12.5	127	101		1.09

Both SSRS and Q rating biological assessment were carried out at this station depending on the time of year it was monitored. As can be seen from the results table physio-chemical analysis to date indicates low nutrient levels and high dissolved oxygen levels. There was a problem with high levels of silt at this site prior to the installation of surface water settling ponds at the landfill. Suspended solid results were quite high in 2006 but have improved a lot since.

As this stream begins just below the landfill it is not possible to have an upstream control site.

This site was awarded an SSRS score of 5.6 in 2006 indicating the site was 'at risk'. It improved slightly obtaining a score of 6.4 in 2009 and 8.0 in 2010. Both these scores suggest the stream is 'probably at risk'. In 2011 a Q rating of 3 was obtained in august, indicating ***moderate pollution***. The low scores obtained are a result of the scarcity of group A invertebrates, which are comprised of most *Ephemeropteran* (mayflies) and *Plecopteran* (stoneflies) species. In 2006 while there were two Ephemeropteran species found they were in low numbers. There was an absence of Plecoptera and high numbers of GOLD (Gastropods (snails), Diptera (true flies) and Oligochaetes (worms)) all contributing to a low score. In 2009 and 2010 there was an absence of Ephemeroptera but two species of Plecoptera were identified. However in 2011 there was a total absence of Group A species showing a deterioration in water quality at this site compared to 2009 and 2010.

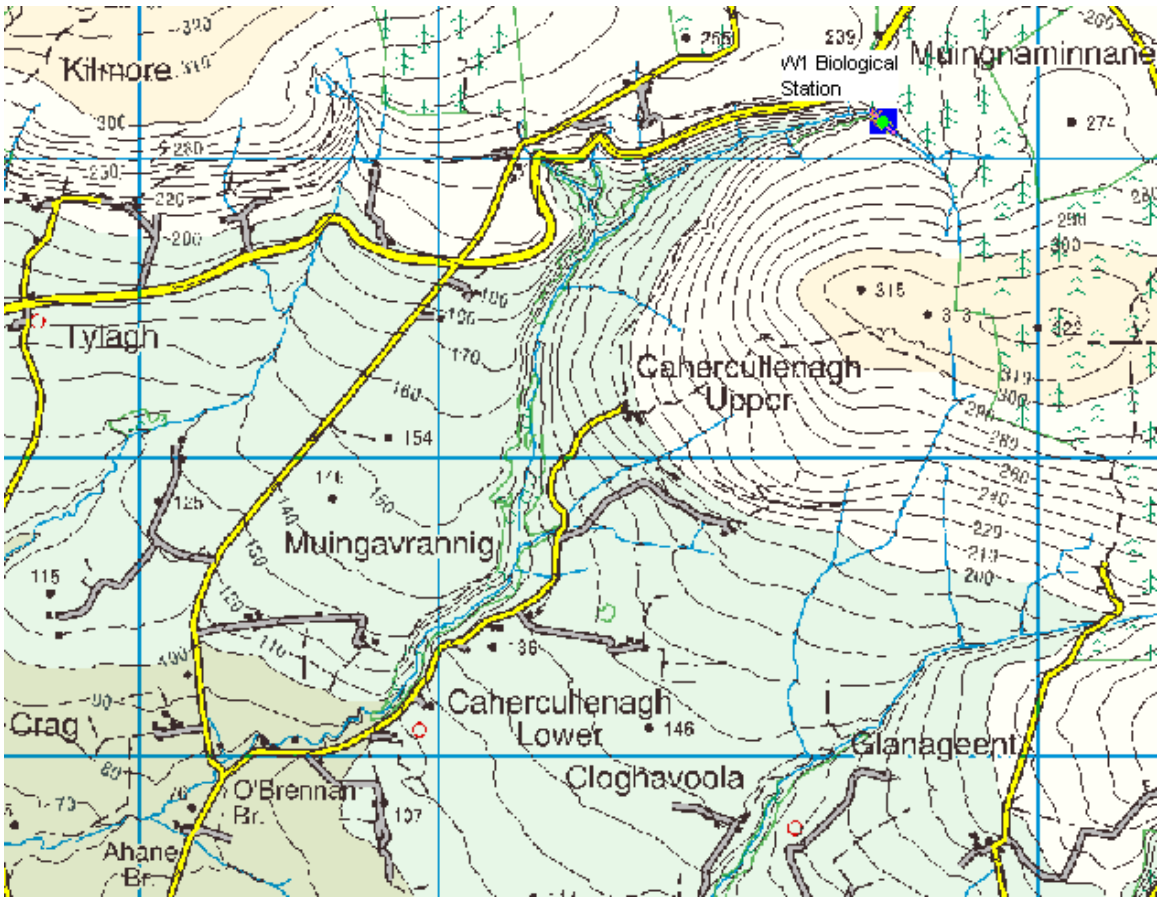
Two other sites were assessed for Q index i.e. ***River lee at O'Brennans bridge*** and ***Glashroeg at Ivy bridge***. Both these sites attained a score 4 which is equivalent to ***good*** status

Conclusion:

- Station W1 was assessed as having a Q value of 3 indicating moderate pollution status.
- The absence of Group A invertebrates in Q assessment in 2011 compared to SSRS studies in two preceding years denotes deterioration in status
- Assessment of River lee at O'Brennans bridge and of Glashroeg at Ivy bridge denotes good status

APPENDIX 1

Location Map



APPENDIX 2
Field sheets
Site 1: River lee at O'brennans bridge

River Code: **River.**	**Date:** **14/06/2011** **LEE**	**Time:** **11:20**	**Grid:** **92255 114959**
DO%	97.8	**Location:** Lee @ O'Brennan's Br	**Stream flow:** Riffle
DO mg/l	10.85		
Temp degC	10.4		
Conductivity			
pH		**Substratum Condition:**	
Bank width (m)	6		
Wet width (m)	5.5	Loose - no algae on stones	**Shading**: Low
Avg depth (m)	0.18	Cobbles 35% Gravel 40% Fine gravel 10% Silt 15%	**Cattle access:** No
Velocity: Moderate	**Colour:** None		**Litter:** Not obs
		Main land use u/s	**Photo:** Yes No. 100-011
Clarity: Clear	**Discharge:** Normal	Pasture & Housing	**Chemical Sample taken:** Yes Lab ref: 2011/2696

Macrophyte Type & Abundance:

Group	No. of Species	Abundance & Percentage		Abundance Category
A	2	85	15%	**Common**
B	5	85	15%	**Common**
C	10	374	66%	**Abundant / Dominant**
D	1	4	<1.0%	**Scarce/Few**
E	3	19	3.4%	**Present in Small Numbers**

Comments:

Q Rating: **4**

Analyst: CM CMcC

Field Sheet 2:
Site 2: River Lee at biological station W1 d/s of North Kerry landfill

River Code: **River.**	**Date:** **02/08/2011**	**Time:** **13:40**	**Grid:** **94524** **117087**
DO%	95.2	**Location:** R. Lee @ W1 Biological Station North Kerry Landfill Muingnaminane	**Stream flow:** Riffle/glide
DO mg/l	9.88		
Temp degC	12.5		
Conductivity			
pH		**Substratum Condition:** Boulder30% Cobble 35% Silt 15% Gravel 20%	**Shading**: H-M-L-N **Cattle access:** Y u/s-d/s or N **Litter:** NO-P-M-A
Bank width (m)	0.5		
Wet width (m)	0.5		
Avg depth (m)	0.12		
Velocity: Slow	**Colour:** Slight	**Main land use u/s** Bog Forestry Other - Landfill	**Photo:** Y -N No. 11
Clarity: Slightly Turbid	**Discharge:** Normal		**Chemical Sample taken:** Y-N 2011/3450

Macrophyte Type & Abundance:

Group	**No. of Species**	**Abundance & Percentage**	**Abundance Category**
A	0	0	**Absent**
B	2	9/196 4.6%	**Present in small nos**
C	9	184/196 94%	**Superabundant/Excessive**
D	0	0	**Absent**
E	1	3/196 1.5%	**Present in small nos**

Comments: unsuitable for Q assessment. Very overgrown to move along the stream

Q Rating: **3**

Analyst: CM , CMcC

Field Sheet 3:
Site 3: Glashoreag at Ivy Bridge

River Code: **River.**	**Date:** **02/08/2011**	**Time:** **11:50**	**Grid:** **97350 19663**
DO%	102	**Location:** R. Glashoreag at Ivy Bridge	**Stream flow:** Riffle
DO mg/l	10.4		
Temp degC	13.8		
Conductivity	n		
pH		**Substratum Condition:**	
Bank width (m)	5		
Wet width (m)	5	Slightly compacted	**Shading**: High
Avg depth (m)	0.18	Boulder30%	
Velocity: Moderate	**Colour:** Slight	Cobble 35% Gravel 35%	**Cattle access:** No **Litter:** Not obs
		Main land use u/s	**Photo:** Y No. 10
Clarity: Clear	**Discharge:** Normal	Bog Forestry Other - Landfill	**Chemical Sample taken:** yes 2011/3449

Macrophyte Type & Abundance:

Group	**No. of Species**	**Abundance & Percentage**	**Abundance Category**
A	2	29/260 11.2%	Common
B	2	16/260 5.4%	**Present in small nos**
C	11	211/260 83.5%	**Superabundant/Excessive**
D	0	0	**Absent**
E	1	1/260 <1%	**Scarce / Absent**

Comments:

Q Rating: **4**

Analyst: CM , CMcC

Appendix G: Filling Sequence

Comhairle Chontae Chiarraí
Kerry County Council

Waste Licence W0001-03

Filling Sequence and Gas Collection Plan
Phase 9

Cells 17/18/19

North Kerry Landfill

September 2009

Prepared By:

Environment Section
Kerry County Council

Roinn Comhshaoil
Comhairle Chontae Chiarraí

Introduction

This plan details the following:

- The proposed filling sequence for cells 17, 18 and 19;
- The liner/capping placement sequence for the filled cells (daily, weekly, intermediate and permanent);
- The progressive construction of a gas collection network from Phase 9 development.

This plan outlines the methods that will be adopted and the gas control techniques adopted on site. These techniques are developed with the site specific circumstance taken into consideration.

This plan takes into account the Conditions of Waste Licence W0001/03 and best practice as detailed in the Landfill Gas Management Practice manuals and Best Available Technology available.

Filling Sequence

Cell 19 will initially be filled followed by cell 18 and cell 17.

The filing of Cell 19 will commence from the west via a constructed access ramp and work in a north to south direction until intercell berm 19/18 is met.

The first lift height will be in the regions of 3m. Once this initial area is filled the remaining area to the east will be sub-divided into sections to the intercell berm between Cell 19 / 20.

These will be progressively filled until a complete first lift has been placed within Cell 19.

The pattern will then be repeated and the height of the haul road adjusted to accommodate the filling area at any given time.

Within each section a particular area will be designated the active area. The active area will be kept to a minimum size as is practical taking account for the safe turning distance required for landfill plant.

Side slopes will be raised slightly above the level of the waste as filling progresses. This facilitates the pushing of waste against the inner face and the construction of a robust side slope.

Liner Placement

It is proposed that the sequence of permanent capping actions will be as follows:

- Incremental landfill to finished final profile
- Place intermediate capping material to all finished areas
- Place vertical wells
- Place woven polypropylene cover over sub soil intermediate cover as gas layer
- Connect vertical wells via temporary pipework
- Horizontal gas collection from the cell will still be active
- Once settlement has ceased place final LDPE capping
- Connect permanent vertical wells with permanent piping to manifold on trunk main.

The exact proposal with regard to the lining will be advised to the Agency for agreement in advance through a SEW.

Permanent capping will be LDPE liner with welded seams and welded to the HDPE liner within the anchor trench as appropriate.

Intermediate cover will be placed on all areas that have reached profile height. The intermediate cover will consist of site won low permeability soils spread in layers over the footprint and finished to final profile level.

Temporary Gas Extraction System

KCC have operated a successful horizontal gas extraction system in cells 15 and 16 while active. This has contributed significantly to the capture of gas from the active cell which was conveyed to and destroyed at the flare.

The gas network consist of layers of pipes work approximately 4m lifts within the waste.

For cells 19/18/17 a ring main will be used in the lowest lift. To mitigate gas escaping through the leachate drainage blanket and under any side slopes, an outer ring main will be placed as close as practical above the drainage blanket approximately 2m from the edge. Each edge of the manifold will be connected to the manifold to ensure maximum suction throughout the pipeline.

The inner pipes runs will be at a height of 2m above the leachate stone.

The pipes will be HDPE perforated pipework welded on site on the horizontal level and solid pipework from the connection to the manifold.

Condensate containment and removal is difficult when using a temporary manifold that is not located within the waste body.

The manifold will have a backfall and a solid pipe will be placed at the lowest end of the pipeline and will return down the side slope to return the condensate to the waste body.

The network will be constructed in progressive lifts following the depth of waste placed.

Each pipe will be controlled by a valve at the manifold. A sampling port on each pipe will facilitate balancing of the field with regard to gas capture. A check on O_2 ingress will be done to ensure that the draw in of air is kept to a minimum.

The horizontal system is intended to the be a sacrificial system which will be decommissioned once the permanent cap has been constructed and vertical wells are commissioned.

The treatment of the pipes work leading to the manifold before decommissioning will require cutback as far as practical and termination within the annulas of a vertical well to provide a pathway for any gas that will vent through the redundant pipework.

Permanent Gas Extraction

The permanent vertical wells will be constructed after the placement of the intermediate cover over the area that has been filled to profile height. Once constructed a polypropylene liner. The wells will be attached to a temporary manifold, once permanent capping is undertaken the wells will be connected to the permanent manifold.

A SEW will be lodged with the Agency setting out the engineering details for the proposal. The SEW will included all aspects of the permanent capping.

Gas Destruction

Currently all gas is conveyed to the permanent enclosed flare. The flare has a capacity of 500 m^3/hr.

Appendix H: PRTR 2011

Guidance to completing the PRTR workbook

AER Returns Workbook

REFERENCE YEAR	2011

1. FACILITY IDENTIFICATION

Parent Company Name	Kerry County Council
Facility Name	North Kerry Landfill Site
PRTR Identification Number	W0001
Licence Number	W0001-04

Waste or IPPC Classes of Activity

No.	class_name
3.5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and
3.11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage
3.2	Land treatment, including biodegradation of liquid or sludge discards in soils.
3.4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
3.6	Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are dispose
3.7	##
4.10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temp
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological tran
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.

Address 1	Muingnaminnane
Address 2	Tralee
Address 3	Co. Kerry
Address 4	
	Kerry
Country	Ireland
Coordinates of Location	-6.85099 54.1736
River Basin District	IEGBNISH
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Liz O Donnell
AER Returns Contact Email Address	lodonnel@kerrycoco.ie
AER Returns Contact Position	Administrative Officer
AER Returns Contact Telephone Number	0667162000
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	0667162001
Production Volume	
Production Volume Units	
Number of Installations	
Number of Operating Hours in Year	
Number of Employees	
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

4.1 RELEASES TO AIR Link to previous years emissions data | PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : W0001_2011- PRTR North Kerry Landfill revised 03.09.2012.xls | Return Year : 2011 | 11/10/2012 11:39

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs				
POLLUTANT		METHOD					QUANTITY		
			Method Used		Landfill				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	C	OTH	Total estimated generated minus total utilised on site	1925357.0	0.0	1925357.0	0.0	0.0
03	Carbon dioxide (CO2)	C	OTH	LandGem Model 3.02	21060.0	0.0	21060.0	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
					0.0	0.0	0.0	0.0

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

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

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used		landfill			
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
210	Dust	E	ESTIMATE		215.0	215.0	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: North Kerry Landfill Site

Please enter summary data on the quantities of methane flared and / or utilised	T (Total) kg/Year	M/C/E	Method Used: Method Code	Method Used: Designation or Description	Facility Total Capacity m3 per hour	
Total estimated methane generation (as per site model)	2314000.0	C	other	LandGem Model 3.02	N/A	
Methane flared	338955.0	M	Other	Landfill Gas Survey 2011	314.0	(Total Flaring Capacity)
Methane utilised in engine/s	49686.0	C	Other	Landfill Gas Survey 2011	115.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	1925357.0	C	Other	LandGem Model 3.02 minus Landfill Gas Survey	N/A	

4.2 RELEASES TO WATERS Link to previous years emissions data | PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : W0001_2011- PRTR North Kerry Landfill revised 03.09.2012.xls | Return Year : 2011 | 11/10/2012 11:40

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 this

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

4.3 RELEASES TO WASTEWATER OR SEWER Link to previous years emissions data | PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : W0001_2011- PRTR North Ker 11/10/2012 11:40

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			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 POLLUTANT EMISSIONS (as required in your Licence)

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			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

4.4 RELEASES TO LAND Link to previous years emissions data | PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : W0001_2011- PRTR North Kerry Landfill revised 03.09.2012.xls | Return Ye 11/10/2012 11:40

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND					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
					0.0	0.0	0.0

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

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

RELEASES TO LAND					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
					0.0	0.0	0.0

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

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE | PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : W0001_2011- PRTR North Kerry Landfill revised 03.09.2012.xls | Return Year : 2011 | 11/10/2012 11:41

Please enter all quantities on this sheet in Tonnes 8

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	50108.58	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Finucane Burke Haulage,WCP-CK-09-0691-01	Tralee Wastewater Treatment Plant,The Kerries,Tralee ,Co Kerry,Ireland		
Within the Country	20 03 01	No	19.84	mixed municipal waste	R3	M	Weighed	Offsite in Ireland	Kerry County Council Refuse Collection Service,N/a	Dillons Waste and Recycling,The Kerries,Tralee,Co Kerry,Ireland		
Within the Country	15 01 01	No	104.62	paper and cardboard packaging	R3	M	Weighed	Offsite in Ireland	Dillon Waste and Greenstar Sarsfield Court,WCP-LK-08-0077-04	Dillon Waste and Recycling The Kerries Tralee (91.94 tonnes),Greenstar Sarsfield Court Cork (12.68 tonnes),,,,Ireland		
Within the Country	**15 01 07**	**No**	30.56	glass packaging	R3	M	Weighed	Offsite in Ireland	Rehab Glassco Recycling,WCP - DC-08-1150-01	unit 4 Oberstown Business Park,Carragh Road,Nass,Co Kildare,ireland		
Within the Country	20 01 40	No	3.88	metals	R4	M	Weighed	Offsite in Ireland	Rehab Glassco Recycling,WCP - DC-08-1150-01	unit 4 Oberstown Business Park,Carragh Road,Nass,Co Kildare,ireland		
Within the Country	20 01 40	No	69.88	metals	R4	M	Weighed	Offsite in Ireland	Hegarty Metals,wcp-lk-027-02	Ballysimon Road,Limerick,,,,Ireland		
Within the Country	20 01 39	No	17.5	plastics	R3	M	Weighed	Offsite in Ireland	Dillon Waste and Recycling,WCP-LK-08-0077-04	Dillon Waste and Recycling,The Kerries,Tralee,Co Kerry,Ireland		
To Other Countries	20 01 11	No	9.72	textiles	R3	M	Weighed	Abroad	Cookstown Textile Recyclers,roc 1829 wmez 01/11	36 Maheralane Rd,Randalstown,Co Antrim,,,United Kingdom		
Within the Country	20 02 01	No	351.5	biodegradable waste	R3	M	Weighed	Offsite in Ireland	Bord Na Mona,W0198-01	Kilberry ,Co Kildare,,,,Ireland		
To Other Countries	16 06 01	Yes	5.34	lead batteries	R4	M	Weighed	Abroad	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA,WCP_LK_052/08d .ENVA,Campine,MLVA/05-173/gvda,Belgium,Belgium	ENVA,Campine,MLVA/05-173/gvda,Belgium,Belgium
To Other Countries	16 06 02	Yes	0.14	Ni-Cd batteries	R4	M	Weighed	Abroad	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA,WCP-LK_052/08d,Lindenscmidt,Accurec,Germany,,,Germany	Lindenscmidt,Accurec,Germany,,,Germany
To Other Countries	13 02 05	Yes	4.57	mineral-based non-chlorinated engine, gear and lubricating oils	R9	C	Volume Calculation	Abroad	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA,WCP-LK_052/08d,Lindenscmidt,Accurec,Germany,,,Germany	Lindenscmidt,Accurec,Germany,,,Germany
To Other Countries	13 08 99	Yes	0.5	wastes not otherwise specified	R9	C	Volume Calculation	Abroad	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA,WCP-LK_052/08d,Lindenscmidt,Accurec,Germany,,,Germany	Lindenscmidt,Accurec,Germany,,,Germany
To Other Countries	14 06 01	Yes	0.59	chlorofluorocarbons, HCFC, HFC	R7	C	Volume Calculation	Abroad	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA,WCP-LK_052/08d,Lindenscmidt,Accurec,Germany,,,Germany	Lindenscmidt,Accurec,Germany,,,Germany
To Other Countries	14 06 03	Yes	1.29	other solvents and solvent mixtures	R7	C	Volume Calculation	Abroad	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA,WCP-LK_052/08d,Lindenscmidt,Accurec,Germany,,,Germany	Lindenscmidt,Accurec,Germany,,,Germany
Within the Country	20 01 25	No	0.4	edible oil and fat	R9	M	Weighed	Offsite in Ireland	Buckley ECO Fuels,WCP-LK-95-07c	Killarney,Co Kerry,,,,Ireland		
To Other Countries	15 01 10	Yes	1.92	packaging containing residues of or contaminated by dangerous substances	R7	C	Volume Calculation	Abroad	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA,WCP-LK_052/08d,Lindenscmidt,Accurec,Germany,,,Germany	Lindenscmidt,Accurec,Germany,,,Germany

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

Appendix I: Landfill Gas Survey 2011

Environmental Protection Agency

A survey of landfill sites to determine the quantity of methane flared and or recovered in utilisation plants for 2011

Please choose from the drop down menu the license number for your site	W0004
Please choose from the drop down menu the name of the landfill site	North Kerry
Please enter the number of flares operational at your site in 2011	1
Please enter the number of engines operational at your site in 2011	1
Total methane flared	338,955 kg/year
Total methane utilised in engines	49,688 kg/year

Please note that the closing date for reciept of completed surveys is 31/03/2012

Introduction

The Office of Climate Licensing and Resource Use (OCLR) of the Environmental Protection Agency acts as the inventory agency in Ireland with responsibility for compiling and reporting national greenhouse gas inventories to the European Commission and the United Nations Framework Convention on Climate Change. In addition to meeting international commitments Ireland's national greenhouse gas inventory informs national agencies and Government departments as they face the challenge to curb emissions and meet Ireland's targets under the Kyoto Protocol. The national inventory also informs data suppliers, making them aware of the importance of their contributions to the inventory process and a means of identifying areas where input data may be improved.

It is on this basis that the Environmental Protection Agency is asking landfill operators to partake in this survey so that the most uptodate information on methane flaring and recovery in utilisation plants at landfills sites is used in calculating the contribution of the waste sector to national greenhouse gas emissions

The Environmental Protection Agency wishes to thank you for partaking in this survey. If you have any questions about the survey and how to complete it please view the "Help sheet" worksheet. If however, your query is not answered by viewing the "Help sheet" worksheet please contact:
LFGProject@epa.ie

Once completed please send the completed file as an attachment clearly stating the name and or license number of the landfill site (e.g. W000 Xanadu landfill_2011) to:
LFGProject@epa.ie

	to be filled in by licensee		calculated by spreadsheet	

Flare No. 1

Flare type ?	Other	**Biogas 500m3/hr modular ground gas flare**	
Is the flare an open or enclosed flare ?	Enclosed	**Rated flare capacity ?**	500 **m3/hr**
Month /year comissioned ?	Select / Select		
Month decomissioned if decomissioned in 2011 ?	November		
What is the function of the flare ?	Extraction from capped and uncapped ar	**Back up to Engine from November 2011**	

Monthly	Method M/C/E	Runtime days/month	Runtime hrs/day	Downtime hrs	Total runtime hrs/month	Average Inlet Pressure (mbg)	Average Flow Rate (m^3/hr)	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
January	C	31	24.0	155.0	589	-24	330	25.00	15.00	11.00	98.0	47,621	32,101
February	C	28	24.0	140.0	532	-50	330	25.00	15.00	11.00	98.0	43,012	28,232
March	C	31	24.0	155.0	589	-50	330	25.00	15.00	11.00	98.0	47,621	31,257
April	C	30	24.0	150.0	570	-50	330	25.00	15.00	11.00	98.0	46,085	30,249
May	C	30	24.0	150.0	570	-24	350	25.00	15.00	10.00	98.0	48,878	32,948
June	C	30	24.0	150.0	570	-25	350	22.00	14.00	11.00	98.0	43,012	28,965
July	C	31	24.0	155.0	589	-24	340	20.00	12.00	13.00	98.0	39,251	26,459
August	C	31	24.0	155.0	589	-80	220	43.00	28.00	6.00	98.0	54,605	34,725
September	C	31	24.0	75.0	669	-70	280	37.00	24.00	5.00	98.0	67,922	43,657
October	C	31	24.0	0.0	744	-85	280	39.00	26.00	2.00	98.0	79,620	50,362
November	E	0			0						98.0	0	0
December	E	0			0						98.0	0	0
Total					6,011							517,626	338,955

Please note: Only fill the "Yearly" table if data is not availabe or cannot be calculated nor estimated on a monthly basis

Yearly	Method M/C/E	Runtime days/year	Runtime hrs/day	Downtime hrs	Total runtime hrs/year	Average Inlet Pressure (mbg)	Average Flow Rate m^3/hr	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
2011					0						98.0	0	0

	to be filled in by licensee		calculated by spreadsheet

Engine No. 1

Engine type ?	Other	**Jenbacher J208 GS**
Month /year comissioned ?	November / 2011	
Month decomissioned if decomissioned in 2011 ?	Select	

Monthly	Method M/C/E	Runtime days/month	Runtime hrs/day	Downtime hrs	Total runtime hrs/month	Average Inlet Pressure (mbg)	Average Flow Rate (m^3/hr)	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
January					0						98.0	0	0
February					0						98.0	0	0
March					0						98.0	0	0
April					0						98.0	0	0
May					0						98.0	0	0
June					0						98.0	0	0
July					0						98.0	0	0
August					0						98.0	0	0
September					0						98.0	0	0
October					0						98.0	0	0
November	M	30	24	24	696	-60	120	50.00	35.00	2.80	98.0	40,925	26,583
December	M	31	24	33	711	-70	110	46.90	32.00	1.80	98.0	35,947	23,105
Total					1,407							76,872	49,688

Please note: Only fill the "Yearly" table if data is not availabe or cannot be calculated nor estimated on a monthly basis

Yearly	Method M/C/E	Runtime days/year	Runtime hrs/day	Downtime hrs	Total runtime hrs/year	Average Inlet Pressure (mbg)	Average Flow Rate m^3/hr	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
2011					0						98.0	0	0