Comhairle Contae Chiarraí

Kerry County Council

Waste Licence Ref No. W0001-04

Annual Environmental Report for North Kerry Landfill

Reporting Period:

January 2014 – December 2014

1.0 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 accepted solid waste for disposal and 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 2014 to December 31st 2014.

The acceptance of waste for landfilling and for recycling ceased on site on the 11th July 2014. Both the landfill site and the civic amenity site are now closed to all customers.

Kerry County Council is now looking at alternative options for North Kerry Landfill and the Agency will be advised and consulted on the same as this progresses.

2.0 Waste Activities carried out at the Facility

Waste disposal activities carried out at North Kerry Landfill were in accordance with Part 1 of Waste Licence W0001-04.

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 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.

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.

3.0 Quantity and composition of waste received, disposed and recovered

The amount of waste landfilled at North Kerry Landfill reduced from 55,276.682 tonnes in 2013 to 4,521.40 tonnes in 2014.

The dramatic decrease in waste landfilled at the site was due to the available built capacity on site being exhausted by July 2014, a decision was made by Kerry County Council in September 2013 not to progress with the development of further cells at the landfill site.

Kerry County Council is now looking at alternative options for the site.

Quantity of Waste disposed at facility

Since opening in May 1994 the total quantity of waste disposed of at the facility was 888,400 tonnes.

Appendix B shows a yearly break down of tonnage from 1994 – 2014.

BMW Percentage Composition of Waste disposed at facility

Year	Period	Total Qty MSW of which the BMW Condition Applies	Total Qty BMW	% BMW
2010	Q3 – Q4	9,461.84	5,834.46	61.66
2011	Q1 – Q4	16,315.41	10,301.91	63.14
2012	Q1 – Q4	71,006.59	44,689.45	62.94
2013	Q1 – Q4	55,117.72	30,668.49	55.64
2014	Q1 – Q4	4,741.01	2,628.35	55.44

Please note that submitted figures for 2013 and 2014 were incorrect below shows the discrepancies in both.

Appendix A shows the yearly breakdown of tonnage and %BMW entering the landfill site between 1st January – 31st December 2014 as submitted to the Agency.

Year	BMW Returns	Total Waste Landfilled	Total BMW (biological municipal waste)	% BMW
2013	Reported	55,117.72	30668.49	55.64%
	Actual	55,276.68	29,749.68	53.52%
2014	Reported	4,741.01	2,628.35	55.44%
	Actual	4,521.4	2,476.83	54.78%

4.0 Remaining Capacity and Closure Date

The North Kerry Landfill and civic amenity site ceased operation on the 11th July 2014.

Remaining undeveloped licensed volume is 509,012 m^3 which could be utilised in the future.

5.0 Method of Deposition of Waste at North Kerry Landfill - 2014

Large vehicle access/private customers with large trailers.

The arrangement for disposing of waste in cell 17 was carried out on a pre-built pre-planned tip head.

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

Customers accessing the site with small quantities of waste.

Members of the public did not access the landfill tip head instead these were directed to the public skip area to place their waste into a series of trailers. These trailers were removed from the public skip area 2 to 3 times a date and at close of business daily and tipped at the tip head for placement/compaction.

Appendix C outlines the categories of waste landfilled and sent off site for recovery.

The civic amenity ceased operation on the 11th July 2014. The area contained a number of receptacles into which members of the public deposited specific waste types free of charge for recovery/recycling/disposal. In addition to the concrete slab area there was a shed for the housing of WEEE and household hazardous waste. The civic amenity area included an area for the deposition of green waste. With the introduction of BMW target in July 2010, all green waste collected on site was removed to the Bord na Mona licenced site at Kilberry Co Kildare for further processing and reuse.

6.0 Summary Report on Emissions for the Reporting Period.

Emissions to Water.

A full report prepared by the Environmental Laboratory of KCC is not included in this document and will be forwarded separately. Kerry County Council's lab is currently working towards ISO accreditation and as a result the senior executive chemist time has been taken up with this process and has not closed out 2014 to date. However, verified lab results are provided in Appendix D.

Emissions to Air.

Gas management practices at North Kerry Landfill is an interlinked system of 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
- Connection of new gas wells in phase 8 and permanent capping which will be completed in Q1 2015.
- Odour patrol
- 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 monthly basis for the presence of a suite of indicator gases that would signal the possible migration of LFG.

Perimeter Gas Wells No. 6 through to 6d continues to show methane and CO2 concentrations above the allowable limits. These are historically problematic wells. 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 nuisance at the location of gas wells 6 through to 6d or any evidence of vegetation die back.

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 by B9 to ensure maximum production.

Gas Balancing records, Flare and Engine Stack Monitoring and Dust Monitoring data are included in are Appendices: E,F,G, H.

7.0 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 (1st January to 31st December 2014) was 18,848 litres.

Electricity
The total usage for 2014 was 132,325 kWh. This is an increase in energy consumption of 13,675 kWh. This is due to an increase in the use of pumps in the active cells during 2014 and usage of the gas flare from January to September 2014.

8.0 Energy Efficiency and Audit Report Summary

Electricity

The kW hour usage on site for 2014 is set out in the attached table.

Table 8.2, kWh usage 2014

From	To	Day kWh	Night kWh
31/12/2013	28/02/2014	17,250	17,400
28/02/2014	30/04/2014	11,650	16,050
30/04/2014	30/06/2014	9,900	11,850
30/06/2014	31/08/2014	7,650	10,700
31/08/2014	31/10/2014	7,000	8,900
31/10/2014	31/12/2014	9,625	4,350
		63,075	**69,250**

9.0 Proposed Development of the Facility and timescale of the Development

The following projects are proposed at North Kerry Landfill over 2015.

Permanent Capping of Cell 17

Permanent capping of Cell 17 completed with the gas wells within the cell connected to the gas network in the first quarter of 2015.

10.0 Volume of leachate produced and volume transported off site.

Over the reporting period 61,164 m^3 of leachate was produced on site.

The total quantity of leachate produced on site since the landfill site opened in May 1994 to the end of the reporting period is 851,625 m^3.

There is a small ICW constructed on Cell 13 and 14 as a pilot project but all leachate treated is re-circulated into cell 13/14 and tankered off site.

Table 10.1, Leachate volumes tankered off –site, 2014.

Month	2010	2011	2012	2013	2014
January	4,230.94	5,255.90	11,271.74	9,991.34	14,069.56
February	5,666.38	5,395.38	6,780.04	10,926.18	11,161.2
March	3,324.86	3,768.72	2,502.62	2,412.84	6,039.42
April	4,080.68	3,845.78	3,623.48	5,506.44	3,269.7
May	1,711.48	2,805.70	3,724.42	5,322.99	3,479.30
June	1,236.44	3,735.13	4,351.31	3,488.05	2,358.17
July	4,304.64	3,698.12	7,551.38	2,313.66	1,317.42
August	2,208.06	2,751.70	6,072.90	4,572.32	3,043.37
September	4,902.34	3,655.51	4,576.09	2,028.98	1,229.30
October	2,393.60	3,956.40	5775.56	5,791.80	3,748.06
November	6,719.70	4,905.12	6997.38	9,154.71	6,346.25
December	1,663.61	6,335.12	5836.08	6,320.70	5,102.68
Total	**42,442.73**	**50,108.58**	**69,063.00**	**67,830.01**	**61,164.43**

11.0 Report on Development Works Undertaken during the Reporting Period

The permanent capping of Cells 18 and 19 and their connection to the landfill gas network was completed in June 2014.

12.0 Report on Restoration of Completed Cells and Phases

All constructed cells 1 – 19 are now fully capped with gas extraction system.

Estimated Annual and Cumulative quantities of landfill gas emitted from the

The GasSim Model gas curve estimates in 2014 the total gas production is 375m3/hr.

	hrs	rate m3/hr	total m3	% Methane	Total	
Theoretical	8760	375	3285000	0.467333333	1535190	methane m3

The actual sum of methane flared and utilised in the engine is 842,807kg/yr for 2014.

		hrs	rate m3/hr	total m3	methane %	methane m3		
Flare	Jan	736	330	242880	0.46	111724.8		
	Feb	660	340	224400	0.43	96492		
	Mar	738	310	228780	0.48	109814.4		
	Apr	700	335	234500	0.45	105525		
	May	739	320	236480	0.47	111145.6		
	Jun	692	350	242200	0.42	101724		
	Jul	730	335	244550	0.44	107602		
	Aug	734	340	249560	0.46	114797.6		
	Sep	680	334	227120	0.44	99932.8		
	Oct	155	340	52700	0.51	26877		
	Nov	691	210	145110	0.49	71103.9		
	Dec	722	190	137180	0.53	72705.4		
Engine	Oct	744	150	111600	0.51	56916		
	Nov	718	155	111290	0.49	54532.1		
	Dec	714	145	103530	0.43	44517.9		
		10153		2791880	0.467333333	1285410.5	@98% efficiency	1259702

	Methane	Density	Total	
Theoretical	1535190	0.66	1013225	kg
Actual	1259702	0.66	831403.5	kg
			181.8219	tonnes unexplained

These figures were used in the estimation of landfill gas generation over the reporting period and submitted as part of the Landfill Gas Survey 2014 (Appendix I) and the PRTR 2014 (Appendix J).


Total: Total Bulk LFG Produced
ile Cell Gas Plot
Total LFG
Gas Generated (m3/hr)
Year
Percentiles
95% Less Than
90% Less Than
75% Less Than
50% Less Than
25% Less Than
10% Less Than
5% Less Than
5% Less Than
10% Less Than
25% Less Than
50% Less Than
75% Less Than
90% Less Than
95% Less Than

13.0 Estimated Annual and Cumulative quantities of Indirect Emissions to Groundwater

None to report.

14.0 Annual Water Balance Calculation and Interpretation

The predicted Water Mass Balance calculation shows predicted leachate production for 2014.

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

Year	Active Phase	Active Area	Active Area infiltration	Restored Phase No.	Liquid Waste	Restored Area	Restored Area Infiltration	Total Water	Absorptive Capacity	Leachate Produced	Actual Leachate	Difference
		A (m2)	R(A) m3		LW (m3)	RCA (m2)	IRCA (m3)		aW (m3)	Lo (m3)	m3	
2002	5	11800	19918.4	1,2,3	0	22050	2840.04	25,885.70	1770.8075	49,771.34	34218.23	-15,553.11
2003	6	16100	20946.1	1,2,3,4	0	25450	2547.545	25,924.07	879.11758	51,436.60	30721.59	-20,715.01
2004	6	19500	32416.8	1,2,3,4	0	27550	3306	35,722.80	840.95323	37,947.25	45130.4	7,183.15
2005	6,7	16200	27596.7	1,2,3,4,5	0	29600	4004.88	31,601.58	602.53935	34,155.79	54784.59	20,628.80
2006	7	28800	27596.7	1,2,3,4,5	0	29600	4025.6	31,622.30	1050.4414	33,361.86	60922.61	27,560.75
2007	7	14400	24036.48	1,2,3,4,5,6	0	53340	6769.913	30,806.39	1391.4589	33,307.30	55436.15	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	32400	62763.98	1,2,3,4,5,6	0	53,340.00	8295.223	71,059.21	695.7195	73,862.60	73,727.85	-134.75
2010	8	32400	43957.08	1,2,3,4,5,7	0	63,340.00	4736.819	48,693.90	367.269	50,009.27	42,442.00	-7,567.27
2011	8	32400	45398.88	1,2,3,4,5,7	0	63,340.00	1280.861	46,679.74	289.54993	46,845.19	50,108.58	3,263.39
2012	8,9	33616.67	61630.45	1,2,3,4,5,7,8	0	95740	11620.16	73,250.60	1242.6153	72,462.98	69063.01	-3399.975
2013	9	38323.335	53334.59	1,2,3,4,5,7,8	0	95740	9650.592	62,985.18	967.33	62,472.84	67830.1	5357.2577
2014	9	19161.667	34261.06	1,2,3,4,5,7,8	0	134063	13961.32	48,222.38	79.1245	48,598.25	58879.27	10281.018

Actual leachate does not include leachate from civic amenity site area.

15.0 Report on the Progress towards Achievement of Environmental Objectives contained in previous AER 2013

Target Area	*Objective*	*Works Carried Out*	*Results*
Odour Management *Reduction in Fugitive Gas Emissions*	Reduction in number of off site odours experienced	Regular patrol of gas collection infrastructure to ensure that there is no blockages on the lines. Permanent capping of cells 18 and 19. Gas extraction from cells 18 and 19.	Odour Complaints reduced from 5 in 2013 to 1 in 2014.
Surface Water Emissions	Keep Surface Water Emissions within agreed limits	Proper management of leachate on site. Regular inspection of surface water drains Regular inspection of bunded area for integrity on site	No ammonia levels exceeded in surface water lagoons.
Ground Water Emissions	Keep Ground Water Emissions to within agreed limits	Proper management of leachate levels on site. Extension of pipework and clearance of vegetation around borehole 5 in Dec.14	Licence limit exceeded in Borehole No. 5.
Leachate Management	Reduction in the quantity of leachate produced on site	Final capping of cells 17 and 18 commenced in November 2014 and was completed in March 2015.	Decrease in leachate produced on site during reporting period.
Dust	Keep dust deposit limits within allowable level.	Regular spray of site roads with water at time of dry and windy weather. Since landfill closure in July 2014 there has a reduction in traffic through site which contributed to dust.	No licenced limits exceeded
Vermin	Keep vermin population on site to a minimum	Regular baiting of bait boxes through out the site	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 nuisances 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	No fly nuisance during reporting period.
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		Increase in electricity consumption on site due to landfill gas flare in operation.
Reduction of BMW entering the landfill site	Reduce the percentage of biological municipal waste entering the landfill site to 40%.	Provide organic bin for cold callers to the site and have such material removed 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	2015	2016	2017	2018
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 Permanent capping of Cell 17. o Permanent gas extraction from Cell 17.	FM	Ongoing Q1 Q1	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	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	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing
Leachate Management	Reduction in the quantity of leachate produced on site	o Permanent capping of phase 8. o ICW trial	FM FM	Q1 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
Litter	No litter visible	o Regular litter picking patrols on site to pick up any windblown litter.	FM	Ongoing	Ongoing	Ongoing	Ongoing

Target Area	Objective	Actions to be progressed and methods	By	2015	2016	2017	2018
Energy Resources	Reduce the quantity of diesel and electricity used on site.	o Less use of plant/better management of electricity	FM	Ongoing			
Leachate Management	Develop Integrate Constructive Wetland and capping of Phase 8	• Operate & Monitor ICW • Capping of Phase 8	 FM	Ongoing Q1			

FM – Facility Manager

20.0 Summary of Procedures Developed by the Licensee during the reporting period

No additional procedure were developed by the Licensee during the reporting period.

21.0 Tank, Pipeline and Bund Testing and Inspection Report

Integrity testing was completed on leachate lagoons 1 and 2 in 2013.

22.0 Environmental Incidents and Complaints

Environmental Incidents

The incidents reported to the agency refer to exceedances experienced in perimeter gas wells 6 to 6d and the temporary exceedence above one meter in the leachate level of Waste Cell 13.

It is noted that there was no odour nuisances in the perimeter gas well exceedences or no vegetative die back and so it is thought that the readings in gas well 6 to 6d refer to a sump effect in a rock fill embankment that is at a finished construction height above the original ground level.

Complaints

There was one odour complaint received for the reporting period (2014).
There were 10 in 2013.

Table 18.1: Breakdown of complaints received over last four years

Issue	2011	2012	2013	2014
Odour	1	16	5	1
Illegal Dumping	6	3	1	0
Rubbish on Main Road	2	1	1	0
Uncovered/unsecure loads being admitted into landfill site	0	9	0	0
Flies	5	5	0	0
Site Infrastructure	6	3	3	0
Speeding Leachate Trucks	0	0	0	0
Noise from Leachate Lorries at Treatment Plant	1	0	0	0
Windblown litter	0	0	0	0
Total Number of Complaints	21	37	10	1

24.0 Report on Financial Provision

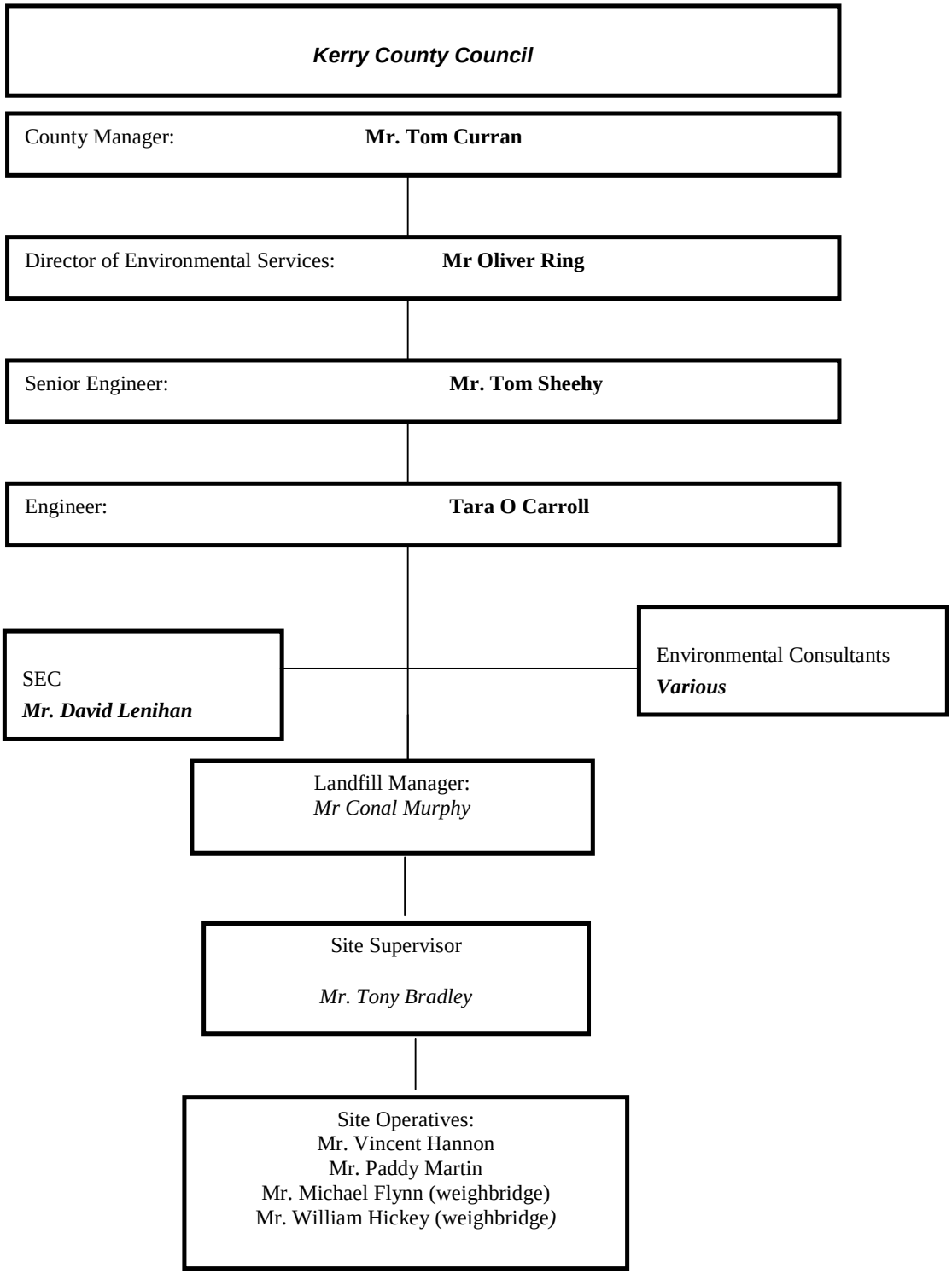
Kerry County Council has a Landfill Aftercare and Development Fund.

The CRAMP report as submitted to the agency requires the Kerry County Council 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 which details the financial standing of the facility.

25.0 Management and Staffing Structure at the Facility 2014



26.0 Programme of Public Information

The following files are available for inspection on site by members of the public.
The site has been closed since 11th July 2014.

- AER of previous reporting year.
- 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

In the 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 procedures in relation to fire or accidents on site and other environmental information.

27.0 Training of Staff 2014

	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					
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 Cost of Landfill / 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 €60,199.16 (Consumer Index Link) to the Community Fund, which was used on various projects in the area.

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

Table 22.2, Financial outlay 2014

Waste Operations Costs 2014:

Waste Operations 2014	Total Charge Euro
Wages	69,430.52
Salaries	42,775.53
ER PRSI	14,649.20
Overtime	18,367.09
Sick Pay	484.18
Annual Leave	10,404.22
Bank Holiday Leave	3,152.37
Eating on site allowance	1,044.81
Other Allowances	7.47
Minor Contracts- Trade Services & other works	265,492.71
Transfer to Fixed Assets/Capitalisation-Assets	7,254.40
Transfer to/from Cap/Rev (Exp)	62,480.76
Non-Capital Equip Purchase - Fire Services	44.01
Non-Capital Equip Purchase - Other	424.19
Hire (Ext) - Plant/Transport/Machinery & Equipment	13,933.85
Repairs & Maint - Plant	12,153.53
Repairs & Maint - Other Equip	465.40
Transfers from Machinery Yard	7,730.50
Other Vehicle Expenses	736.86
Materials	5,827.98
Issues from Stores	2,707.17
Insurance	4,595.36
Staff Travelling & Subsistence Expenses	1,733.62
Communication Expenses	648.05
Courier	472.21
Training	1,723.28
Consultancy/Professional Fees and Expenses	3,986.01
Advertising	239.32
Printing & Office Consumables	1,615.48
Statutory Contributions to Other Bodies	11,182.00
Rates & Other LA Charges	148.20
Cleaning	4,716.00
Energy	24,834.84
Refunds	20.00
Total	595,481.12

Recycling Costs 2014:

Recycling Costs 2014	Total Charge Euro
Wages	21,608.54
Salaries	10,693.81
ER PRSI	4,368.73
Overtime	8,102.70
Sick Pay	718.46
Annual Leave	1,273.21
Bank Holiday Leave	621.26
Travel/Subsistence	345.49
Eating on site allowance	323.00
Other Allowances	44.82
Minor Contracts- Trade Services & other works	23,665.53
Repairs & Maint - Plant	298.89
Issues from Stores	450.13
Insurance	0.99
Staff Travelling & Subsistence Expenses	433.21
Communication Expenses	60.74
Training	548.77
Advertising	239.32
Statutory Contributions to Other Bodies	11,181.50
Rates & Other LA Charges	0.00
Energy	10,634.70
Miscellaneous Expenses	0.00
Refunds	22.50
Total	95,636.30

29.0 Noise and Dust Monitoring Results

Table 23.1, Rainfall data 2013 / 2014

	2013			2014		
	Rainfall (mm)	TRUE Evaporation (mm)	Effective Rainfall (mm)	Rainfall (mm)	TRUE Evaporation (mm)	Effective Rainfall (mm)
Jan	210.7	-0.08	210.78	307.7	56.7	251
Feb	92.9	18.26	74.64	309.6	60.8	248.8
Mar	46.4	-31.52	77.92	145.5	51.8	93.7
Apr	135.2	38.92	97	93.8	68.5	25.3
May	119.7	55.6	64.1	120.5	71.8	48.7
Jun	120.7	81.94	38.76	59.3	104.8	-45.5
Jul	89.5	118.48	-28.98	84.7	79	5.7
Aug	110.4	51.84	58.56	72.7	80.1	-7.4
Sep	107.4	31.8	75.6	28	65.2	-37.2
Oct	209.6	13.68	195.92	205.6	47.8	157.8
Nov	149.2	4.86	144.34	212.1	30.7	181.4
Dec	250.7	-5.92	256.62	149.2	30.1	119.1
Total	*1642.4*	*377.86*	*1265.26*	*1788.7*	*747.3*	*1041.4*

Noise Monitoring 2014

Southern Scientific were commissioned by Kerry County Council to undertake a noise survey at North Kerry Landfill on the 19/6/14 and 23/6/14.

No limits were exceeded and the results are set out below.

Table 23.2, Noise monitoring data

19/6/14 (morning)

Location	Laeq 30min dB	Laf10 30min	Laf90 30min
N1	40.2	42.6	30.0
N2	40.9	41.9	30.7
N3	43.9	46.35	38.6
E1	45.0	39.9	27.4
E2	55.6	45.3	30.1
E3	52.0	48.5	30.9

19/6/14 (evening)

Location	Laeq 30min dB	Laf10 30min	Laf90 30min
N1	31.3	31.6	24.4
N2	30.8	31.3	24.5
N3	38.3	40.5	29.5
E1	36.0	36.5	27.3
E2	53.0	48.6	35.5
E3	52.9	51.4	38.4

23/6/14

Location	Laeq 30min dB	Laf10 30min	Laf90 30min
N1	31.3	31.6	24.4
N2	30.8	31.3	24.5
N3	38.3	40.5	29.5
E1	36.0	36.5	27.3
E2	56.9	51.1	29.1
E3	52.3	51.0	28.9

Dust Monitoring 2014

Southern Scientific was commissioned by Kerry County Council to carry out dust deposition monitoring at four locations at North Kerry Landfill in 2014.
No limits were exceeded and the results are set out below.

Table 23.3, Dust Monitoring Results

03/06/14 to 01/07/14	Total particulates, mg/m^2/d	84	141	44	41
	Inorganic particulates, mg/m^2/d	37	35	10	17
07/08/14 to 04/09/14	Total particulates, mg/m2/d	39	55	34	19
	Inorganic particulates,mg/m2/d	15	10	10	10
04/09/14 to 06/10/14	Total particulates, mg/m2/d	61	210	127	40
	Inorganic particulates, mg/m2/d	30	116	10	24

30.0 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
4,521.40	2,506.66	55.44%

Year	BMW Returns	Total Waste Landfilled	Total BMW (biological municipal waste)	% BMW
2013	Reported	55,117.72	30668.49	55.64%
	Actual	55,276.68	29,749.68	53.52%
2014	Reported	4,741.01	2,628.35	55.44%
	Actual	4,521.4	2,476.83	54.78%

Appendix A shows the yearly breakdown of tonnage and %BMW entering the landfill site between 1st January – 31st December 2014 as submitted to the Agency.

Appendix A: % BMW Report 2014 and 2013

Biodegradable Municipal Waste Reporting
Landfill Submission Report

Waste licence number: W0001-04 North Kerry Landfill Site

Report created on: 10/10/2014 13:43

Submission details

Year: 2014 Quarter: 3

Reporting period: July - September

Reference number: R-W0001-2014-3

Site details

License number: W0001-04

Parent company name: Kerry County Council

Facility name: North Kerry Landfill Site

Facility address: Muingnaminnane, Tralee, ,

Contact details of person who made the return

Contact name: Conal Murphy Contact position: Executive Engineer

Email address: cmurphy@kerrycoco.ie Telephone number: 066 7183651

Mobile number: 087 4187103 Fax number:

BMW details

Summary for Q3 2014

Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
2-bin residual commercial waste	5.78	EPA Approved factor	0.75	4.34		75.09
Other	21.76	Site Specific factor	0.63	13.71	Dingle CA	63.01
Other	52.4	Site Specific factor	0.64	33.54	Milltown TS	64.01
Other	39.6	Site Specific factor	0.61	24.16	Coolcashlagh TS	61.01
Other	39.14	Site Specific factor	0.66	25.83	Kenmare TS	65.99
Other	15.26	Site Specific factor	0.64	9.77	Caherciveen TS	64.02
Residual MSW from civic amenity facility	57.58	EPA Approved factor	0.63	36.28		63.01
Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	43.57	EPA Approved factor	0.65	28.32		65.00
	275.09			175.95		63.96

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	34.88	EPA Approved factor	0.75	26.16		75.00
Q1	Other	85.80	Site Specific factor	0.63	54.05	Dingle CA	63.00
Q1	Other	330.70	Site Specific factor	0.64	211.65	Milltown TS	64.00
Q1	Other	558.80	Site Specific factor	0.65	363.22	Coolcashlagh TS	65.00

Q1	Other	190.68	Site Specific factor	0.65	123.94	Kenmare TS	65.00
Q1	Other	123.20	Site Specific factor	0.64	78.85	Caherciveen TS	64.00
Q1	Other	201.34	Site Specific factor	0.55	110.74	KWD Recycling	55.00
Q1	Other	625.74	Site Specific factor	0.00	0.00	Greenstar Ltd.	0.00
Q1	Residual MSW from civic amenity facility	172.52	EPA Approved factor	0.63	108.69		63.00
Q1	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	339.18	EPA Approved factor	0.65	220.47		65.00
Q2	2-bin residual commercial waste	23.16	EPA Approved factor	0.75	17.37		75.00
Q2	Other	123.71	Site Specific factor	0.63	77.94	Dingle CA	63.00
Q2	Other	379.20	Site Specific factor	0.64	242.69	Milltown TS	64.00
Q2	Other	364.16	Site Specific factor	0.65	236.70	Coolcashlagh TS	65.00
Q2	Other	208.90	Site Specific factor	0.65	135.78	Kenmare TS	65.00
Q2	Other	139.38	Site Specific factor	0.64	89.20	Caherciveen TS	64.00
Q2	Other	16.08	Site Specific factor	0.55	8.84	KWD Recycling	54.98
Q2	Residual MSW from civic amenity facility	182.14	EPA Approved factor	0.63	114.75		63.00
Q2	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	355.93	EPA Approved factor	0.65	231.35		65.00
Q2	Other	10.42	Site Specific factor	0.00	0.00	Graveyard Waste	0.00
Q3	2-bin residual commercial waste	5.78	EPA Approved factor	0.75	4.34		75.09
Q3	Other	21.76	Site Specific factor	0.63	13.71	Dingle CA	63.01
Q3	Other	52.40	Site Specific factor	0.64	33.54	Milltown TS	64.01
Q3	Other	39.60	Site Specific factor	0.61	24.16	Coolcashlagh TS	61.01
Q3	Other	39.14	Site Specific factor	0.66	25.83	Kenmare TS	65.99
Q3	Other	15.26	Site Specific factor	0.64	9.77	Caherciveen TS	64.02
Q3	Residual MSW from civic amenity facility	57.58	EPA Approved factor	0.63	36.28		63.01
Q3	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	43.57	EPA Approved factor	0.65	28.32		65.00
		4741.01			2628.34		55.44

These figures are as reported by the licensee to the Agency and have not been validated by the EPA

Revised BMW Return Data 2014:

North Kerry Landfill

Source	Tonnes	Waste type	BMW %	Total Bmw	Total Waste
A\C Holder & Public Commerical (Commercial)	44.44	2-bin commercial	0.75	33.330	44.44
KCC Levied Waste	18.92	2-bin commercial	0.75	14.190	18.92
		2-bin commercial		***47.520***	***63.36***
Graveyard	10.42	Other	0	0	10.42
		Other		***0***	***10.42***
Dingle CA	231.68	Other	63.19%	146.3870759	231.68
Milltown TS	764.4	other	64.16%	490.4046	764.4
Coolcashlagh TS	963.80	Other	63.93%	616.1402	963.8
Kenmare TS	440.66	Other	65.54%	288.809	440.66
Caherciveen TS	272.66	Other	63.77%	173.875	272.66
KWD Recycling	201.34	Other	55.00%	110.737	201.34
Higgins Waste	5.58	Other	0.00%	0	5.58
Dillon Waste	10.5	Other	56.00%	5.88	10.5
CLO CLOR	625.74	Other	0.00%	0	625.74
Public weigh (Car Household)	229.46	Residual MSW civic amenity	0.63	144.5598	229.46
Public Tickets (Skip)	182.78	Residual MSW civic amenity	0.63	115.1514	182.78
		Residual MSW civic amenity facility		***259.7112***	***412.24***
KCC Road Sweeper, Road\Street Cleaning	28.56	Untreated cleansing waste	0.65	18.564	28.56
TTC Road Sweeper, Road\Street Cleaning	442.3	Untreated cleansing waste	0.65	287.495	442.3
KCC Clean Up flytipping	19.32	Untreated cleansing waste	0.65	12.558	19.32
Clean Up flytipping	25.56	Untreated cleansing waste	0.65	16.614	25.56
Scartaglin	3.28	Untreated cleansing waste	0.65	2.132	3.28
		Untreated cleansing waste		***337.363***	***519.02***
Total	***4521.4***			**2476.827**	**4521.400**
Percentage %BMW				0	**54.78%**

Biodegradable Municipal Waste Reporting
Landfill Submission Report

Waste licence number: W0001-04 North Kerry Landfill Site

Report created on: 13/01/2014 11:58

Submission details

Year: 2013 Quarter: 4

Reporting period: October - December

Reference number: R-W0001-2013-4

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: Conal Murphy Contact position: Landfill Manager

Email address: cmurphy@kerrycoco.ie Telephone number: 0667183735

Mobile number: 0874187103 Fax number: 0667129195

BMW details

Summary for Q4 2013

Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
2-bin residual commercial waste	32.3	EPA Approved factor	0.75	24.22		74.98
Other	83.04	Site Specific factor	0.63	52.32	Dingle CA	63.01
Other	322.56	Site Specific factor	0.64	206.44	Milltown TS	64.00
Other	589.44	Site Specific factor	0.65	383.14	Coolcashlagh TS	65.00
Other	183.9	Site Specific factor	0.66	121.37	Kenmare TS	66.00
Other	117.66	Site Specific factor	0.64	75.30	Caherciveen TS	64.00
Other	1329.16	Site Specific factor	0.55	731.04	KWD	55.00
Other	2069.68	Site Specific factor	0	0.00	Greenstar Ltd.	0
Other	100.88	Site Specific factor	0.5	50.44	Wards	50
Other	115.38	Site Specific factor	0.56	64.61	Dillons	56.00
Residual MSW from civic amenity facility	181.34	EPA Approved factor	0.63	114.24		63.00
Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	259	EPA Approved factor	0.65	168.35		65
	5384.34			1991.47		36.99

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	68.50	EPA Approved factor	0.75	51.38		75.01
Q1	Other	79.68	Site Specific factor	0.63	50.20	dingle CA	63.00
Q1	Other	307.70	Site Specific factor	0.64	196.93	milltown ts	64.00
Q1	Other	613.14	Site Specific factor	0.58	355.62	coolcasigh TS	58.00
Q1	Other	189.02	Site Specific factor	0.66	124.75	Kenmare Ts	66.00
Q1	Other	98.32	Site Specific factor	0.63	61.94	Caherciveen TS	63.00
Q1	Other	4702.56	Site Specific factor	0.55	2586.41	KWD recycling	55.00
Q1	Other	5118.18	Site Specific factor	0.55	2815.00	Greenstar	55.00
Q1	Other	161.48	Site Specific factor	0.50	80.74	Wards	50.00
Q1	Other	178.44	Site Specific factor	0.58	103.50	SWB	58.00
Q1	Other	3614.56	Site Specific factor	0.75	2710.92	Country Clean	75.00
Q1	Other	3834.90	Site Specific factor	0.56	2147.54	Dillon Waste	56.00
Q1	Residual MSW from civic amenity facility	148.32	EPA Approved factor	0.63	93.44		63.00
Q1	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	336.68	EPA Approved factor	0.65	218.84		65.00
Q2	2-bin residual commercial waste	140.50	EPA Approved factor	0.75	105.38		75.00
Q2	Other	69.56	Site Specific factor	0.63	43.82	dingle CA	63.00
Q2	Other	351.86	Site Specific factor	0.64	225.19	milltown ts	64.00
Q2	Other	590.00	Site Specific factor	0.58	342.20	coolcashlagh TS	58.00
Q2	Other	208.16	Site Specific factor	0.66	137.39	Kenmare TS	66.00
Q2	Other	132.88	Site Specific factor	0.64	85.04	Caherciveen TS	64.00
Q2	Other	7130.74	Site Specific factor	0.55	3921.91	KWD recycling	55.00
Q2	Other	5545.60	Site Specific factor	0.63	3493.73	Greenstar	63.00
Q2	Other	215.38	Site Specific factor	0.50	107.69	Wards	50.00
Q2	Other	2889.40	Site Specific factor	0.53	1531.38	Country Clean	53.00
Q2	Other	2402.04	Site Specific factor	0.56	1345.14	Dillons	56.00
Q2	Residual MSW from civic amenity facility	182.54	EPA Approved factor	0.63	115.00		63.00
Q2	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	636.52	EPA Approved factor	0.65	413.74		65.00
Q3	2-bin residual commercial waste	24.58	EPA Approved factor	0.75	18.44		75.02
Q3	Untreated 1-bin household waste	105.00	EPA Approved factor	0.65	68.25		65.00
Q3	Other	114.64	Site Specific factor	0.63	72.22	Dingle Ca	63.00
Q3	Other	394.84	Site Specific factor	0.64	252.70	Milltown TS	64.00
Q3	Other	628.02	Site Specific factor	0.58	364.25	Coolcalagh TS	58.00
Q3	Other	235.72	Site Specific factor	0.66	155.58	Kenmare TS	66.00
Q3	Other	4735.20	Site Specific factor	0.55	2604.36	KWD	55.00
Q3	Other	1630.64	Site Specific factor	0.50	815.32	Greenstar	50.00
Q3	Other	224.18	Site Specific factor	0.50	112.09	Wards	50.00
Q3	Other	813.18	Site Specific factor	0.56	455.38	Dillons	56.00
Q3	Residual MSW from civic amenity facility	190.80	EPA Approved factor	0.63	120.20		63.00
Q3	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	266.78	EPA Approved factor	0.65	173.41		65.00
Q3	Bio-stabilised residual waste	423.14	EPA Approved factor	0.00	0.00		0.00
Q4	2-bin residual commercial waste	32.30	EPA Approved factor	0.75	24.22		74.98
Q4	Other	83.04	Site Specific factor	0.63	52.32	Dingle CA	63.01
Q4	Other	322.56	Site Specific factor	0.64	206.44	Milltown TS	64.00
Q4	Other	589.44	Site Specific factor	0.65	383.14	Coolcashlagh TS	65.00
Q4	Other	183.90	Site Specific factor	0.66	121.37	Kenmare TS	66.00
Q4	Other	117.66	Site Specific factor	0.64	75.30	Caherciveen TS	64.00
Q4	Other	1329.16	Site Specific factor	0.55	731.04	KWD	55.00
Q4	Other	2069.68	Site Specific factor	0.00	0.00	Greenstar Ltd.	0.00
Q4	Other	100.88	Site Specific factor	0.50	50.44	Wards	50.00
Q4	Other	115.38	Site Specific factor	0.56	64.61	Dillons	56.00
Q4	Residual MSW from civic amenity facility	181.34	EPA Approved factor	0.63	114.24		63.00
Q4	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	259.00	EPA Approved factor	0.65	168.35		65.00
		55117.72			30668.49		55.64

These figures are as reported by the licensee to the Agency and have not been validated by the EPA

Revised BMW Return Data 2013:

North Kerry Landfill

Source	Tonnes	Waste type	BMW %	Total Bmw	Total Waste
A\C Holder & Public Commerical (Commercial)	284.7	2-bin commercial	0.75	213.525	284.7
KCC Levied Waste	86.08	2-bin commercial	0.75	64.560	86.08
		2-bin commercial		***278.085***	***370.78***
Graveyard	2.86	Other	0	0	2.86
		Other		***0***	***2.86***
Dingle CA	346.92	Other	63.15%	219.0790266	346.92
Milltown TS	1376.96	other	64.14%	883.178	1376.96
Coolcashlagh TS	2420.60	Other	64.98%	1572.8396	2420.6
Kenmare TS	816.8	Other	65.80%	537.452	816.8
Caherciveen TS	504.18	Other	63.78%	321.5634	504.18
KWD Recycling	17897.66	Other	55.00%	9843.713	17897.66
South West Bins	178.44	Other	58.00%	103.4952	178.44
Dillon Waste	7165.5	Other	56.00%	4012.68	7165.5
CLO CLOR	2492.82	Other	0.00%	0	2492.82
Greenstar	12296.42	Other	55.00%	6763.031	12296.42
Wards	701.92	Other	50.00%	350.96	701.92
Country Clean	6504.02	Other	53.00%	3447.1306	6504.02
Public weigh (Car Household)	394.56	Residual MSW civic amenity	0.63	248.5728	394.56
Public Tickets (Skip)	308.44	Residual MSW civic amenity	0.63	194.3172	308.44
		Residual MSW civic amenity facility		***442.89***	***703***
KCC Road Sweeper, Road\Street Cleaning	87.9	Untreated cleansing waste	0.65	57.135	87.9
TTC Road Sweeper, Road\Street Cleaning	806.64	Untreated cleansing waste	0.65	524.316	806.64
KCC Clean Up flytipping	202.62	Untreated cleansing waste	0.65	131.703	202.62
Greenstar Road Sweeping	392.1	Untreated cleansing waste	0.65	254.865	392.1
Scartaglin	8.54	Untreated cleansing waste	0.65	5.551	8.54
		Untreated cleansing waste		***973.57***	***1497.8***
Total	***55276.68***			**29749.667**	**55276.680**
Percentage %BMW				0	**53.82%**

Appendix B: Historic Data

North Kerry Landfill Leachate Tankered Off Site		
	Waste Tonnes	**Leachate m3**
1994	16,902	1,494.00
1995	23,505	6,475.00
1996	23,722	8,496.37
1997	25,581.88	12,175.49
1998	33,529.67	20,318.09
1999	57,872.71	22,822.95
2000	60,473.65	36,780.71
2001	63,945.91	18,953.85
2002	62,821.52	34,218.23
2003	50,235.29	30,721.59
2004	48,054.47	45,130.40
2005	34,430.82	54,784.59
2006	60,025.22	60,922.61
2007	56,794.24	55,436.15
2008	62,412.96	78,558.53
2009	39,755.40	73,727.85
2010	20,986.80	42,442.73
2011	16,545.71	50,108.58
2012	71,006.59	69,063.01
2013	55,276.68	67,830.01
2014	4,521.40	61,164.43
Total	**888400.08**	**851625.44**

Appendix C: Waste Categorisation as Landfilled Jan – 11th July 2014 North Kerry Landfill.

Table 1: North Kerry Landfill Residual Waste - Tonnage Period 01/01/14 to 11/07/2014

Residual Waste to which Levy Applies

Month	Coolcaslagh: KTC Refuse	Coolcaslagh: Weighed Waste Less KTC	Coolcaslagh: Total Waste	Milltown: Weighed Waste Less KTC	Milltown: Total Waste Levied	Caherciveen: Weighed Waste	Caherciveen: Total Waste	Kenmare: Weighed Waste	Kenmare: Total Waste	Dingle: Weighed Waste	Dingle: Total Waste	Totals of Transferred Levied Waste: Total TS Levied Waste	Public Levied Waste: Public Household Commercial C&D & Ferryard Waste	Public Skip (Tickets): Public Skip/
January 2014	120.3	50.18	61.2	62.9	56.44	22.36	24.14	27.26	37.04	6.02	29.54	490.40	29.66	32.82
January 2013	94.04	62.02	55	56.18	33.84	23.84	9.86	32.8	29.53	7.74	21.42	426.07	26.98	24.18
February 2014	77.78	44.84	40.42	52.58	29.72	20.76	7.88	28.94	25.44	6.88	14.42	340.64	25.84	28.38
February 2013	72.64	56.70	19.00	56.76	50.64	19.50	13.12	22.06	32.6	7.08	13.94	384.24	25.8	21.06
March 2014	0	57.56	47.46	56.12	45.64	20.46	14.32	32.42	38.36	6.34	11.96	332.84	34.88	23.84
March 2013	92.10	60.46	48.74	54.72	36.80	22.48	0.36	25.02	41.96	6.44	18.06	407.16	28.80	21.48
April 2014	0	49.02	60.46	69.84	47.20	30.52	8.80	34.66	33.24	10.68	27.28	389.18	31.84	23.88
April 2013	96.66	57.28	46.72	56.52	41.94	21.56	23.48	28.54	18.28	5.28	14.46	400.69	28.04	18.78
May 2014	0.00	49.42	46.33	65.02	55.33	22.94	21.10	32.76	28.30	11.82	22.20	354.28	34.36	27.96
May 2013	72.44	65.34	46.4	63.02	57.86	23.84	11.38	42.22	38.6	5.64	20.16	449.10	58.88	24.98
June 2014	0	62.2	66.16	58	46.88	25.58	16.46	38.7	40.62	10.32	27.10	390.64	39.12	28.28
June 2013	68.44	56.22	32.02	66.2	34.64	26.62	13.62	34.2	37.62	6.66	6.98	383.62	29.12	22.74
1-11 July 2014	0	17.48	19.22	24.64	25.76	0	10.62	18.6	22.06	3.24	17.76	157.57	33.74	23.84
July 2013	80.12	60.70	49.46	64.62	52.98	5.02	35.66	43.98	37.98	6.54	27.54	467.12	39.92	27.36
August 2014														
August 2013														
September 2014														
September 2013														
October 2014														
October 2013														
November 2014														
November 2013														
December 2014														
December 2013														
Total Tonnage 2014	198.08	330.75	342.38	390.90	306.67	142.62	101.14	208.36	222.86	59.31	150.23	2485.40	229.46	182.75
Total Tonnage 2013	564.44	410.75	298.34	410.02	308.70	142.66	109.36	228.02	236.87	48.06	122.90	2097.89	237.54	160.60
Total Levied Waste 2014	871.13			697.08		243.76		431.22		235.54				
Total Non Levied Waste 2014	92.87			66.75		28.80		9.34		22.14				
Total Residual Waste 2014	963.90			764.4		272.96		440.56		231.80				
Grand Total	2673.23													

Month	Account Holders: Cahir Bakery	Account Holders: Ballbees	Account Holders: Higgins Galley Waste	Account Holders: Others Galley Waste	Account Holders: Large Commercial Account Holders 2014/2013 Excluding KWD, Higgins & Others Non Galley Waste	Account Holders: Total of Waste Account Holders	KCC Levied Waste: KCC Area Offices Levied Waste	KCC Levied Waste: KCC Water Services Levied Waste	KCC Levied Waste: KCC Housing Levied Waste	KCC Levied Waste: KCC Corporate Offices Levied Waste	KCC Levied Waste: KCC Fire Station Levied Waste	KCC Levied Waste: KCC Machinery Yard Levied Waste	KCC Levied Waste: Totals of KCC Levied Waste	Town Council's Levied Waste: TTC Levied Waste	Town Council's Levied Waste: LTC Levied Waste	Town Council's Levied Waste: KTC Refuse Collection	Totals of Levied Waste: Total Direct to NKL	Totals of Levied Waste: Total Levied Waste
January 2014	2.18	0.4	5.2	0	201.34	209.12	2.56	0	0	0	0	0	2.56	0	0.8	0	274.70	774.20
January 2013	1.1	0.74	3.66	0	7004.562	7010.062	0	0.18	0	0	0	7.44	7.62	0	0.72	0	7069.562	7495.632
February 2014	1.22	0.78	0.00	2.56	0.00	4.56	0	0	0	0	0	0.86	0.86	0	2.62	0	55.22	408.86
February 2013	2.18	0.44	1.42	0	4515.86	4519.9	0	0	0	0	0	0	0.00	0	0	0	4986.76	4931.02
March 2014	2.02	0.4	2.98	2.18	0.00	7.58	7.84	0.00	0.5	-	0.00	0.00	8.34	0.00	0.00	0.00	74.74	407.28
March 2013	3.4	0.84	1.16	4.06	8130.72	8140.18	0.00	0.10	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	8190.56	8597.72
April 2014	1.82	1.08	0	3.24	5.50	11.42	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.84	438.02
April 2013	4.22	0.42	2.7	0.00	7346.5	7385.84	0.36	0.34	0	0	0	0	0.70	0.00	0.76	0	7404.12	7804.80
May 2014	1.76	0.88	3.46	0.00	10.50	16.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.92	433.17
May 2013	4.4	1.02	2.76	1.8	6511.64	6521.82	0.32	49.38	0.54	0	0	0	50.22	0	0	0	6866.70	7104.80
June 2014	1.48	0.6	2.3	3.12	0.00	7.5	0.00	0.00	3.28	0.00	0.00	0.00	3.28	0.00	0.00	0.00	73.16	465.80
June 2013	2.76	0.76	4.34	3.06	4371.46	4382.38	0.34	12.86	0	0	0	0	13.20	0	0.94	0	4448.38	4832.00
1-11 July 2014	0.96	0.26	1.22	2.66	0.00	5.1	0.00	0.00	0.00	0.68	0.00	0.00	0.68	0.00	0.00	0.00	63.36	220.93
July 2013	1.04	0.42	4.38	1.96	2122.1	2129.9	1.78	3.32	0	0	0	0	5.10	0	0	0	2202.28	2669.40
August 2014																		
August 2013																		
September 2014																		
September 2013																		
October 2014																		
October 2013																		
November 2014																		
November 2013																		
December 2014																		
December 2013																		
Total Tonnage 2014	11.14	4.30	15.16	13.76	217.42	261.56	10.40	0.00	3.78	0.68	0.00	0.86	15.72	0.00	3.22	0.00	695.82	3166.42
Total Tonnage 2013	18.10	4.64	20.42	10.83	39004.84	39069.85	2.30	66.18	0.54	0.00	0.00	7.44	76.94	0.00	2.42	0.00	39837.35	41635.37
Total Non Levied Waste 2014	695.82																	
Grand Total	1865.22																	

Month	Non Levied Waste Direct to NKL: KCC Roadsweeping/ Road Cleaning	TTC Road Sweeping/ Street Cleaning	LTC Rd Sweeping/Street Cleaning	Graveyard Waste	TTC Clean Ups /Flytips	LTC Clean Ups /Flytips	KCC Clean Ups/ Flytips Charged	Clean Ups/Flytips - Non Charged	Forestry Fly Tipping	Residual Landfill Cover including CLO & CLOR 2013 Roadsweeping Greenstar collected by Limerick City Council	Total Non Levied at NKL	Non Levied Waste from TS: Transfer Station Road sweeping/ Graveyard Waste/ Flytipping/ Clean ups	Grand Totals
January 2014	8.44	71.06	0	0	0	0	0.00	1.1	1.88	825.74	898.3	45.16	1918.72
January 2013	6.86	57.02	0	0	0	0	0.56	1.26	0.58	0.00	68.28	31.07	7594.982
February 2014	10.44	63.24	0	0	0	0	0.00	5.76	1.3	0.00	77.78	28.14	914.76
February 2013	28.46	85.48	0	0	0	0	0.00	0.66	0.42	0.00	115.02	26.98	5073.02
March 2014	0.44	73.84	0	0.00	0.00	0.00	0.00	5.06	0	0.00	79.34	34.12	520.84
March 2013	9.02	60.80	0.00	0.00	1.16	0.00	0.00	2.04	0.24	80.12	153.38	32.34	8783.44
April 2014	1.76	65.36	0	0	0	0	0.00	8.42	0	0.00	76.64	36.1	548.88
April 2013	0.82	77.8	0	0	4.12	0	0.00	3.04	1.2	79.20	166.38	37.7	8008.88
May 2014	0.62	78.72	0.00	10.42	0.00	0.00	0.00	2.86	0.00	0.00	92.62	33.05	558.84
May 2013	0	67.38	0	0	17.02	22.88	63.50	3	1.84	103.98	279.60	36.62	7423.02
June 2014	14.54	61.40	0.00	0.00	0.00	0.00	16.10	1.56	0.00	0.00	98.16	32.08	594.04
June 2013	0	53.64	0	1.18	0	0	53.18	1	0.26	81.28	190.54	42.74	5065.28
1-11 July 2014	0.32	31.62	0.00	0.00	0.00	0.00	0.14	0.48	0.00	0.00	32.56	11.15	264.64
July 2013	13.78	54.06	0	1.68	0	0	22.00	1.26	0.6	56.16	150.54	47.64	2876.58
August 2014													
August 2013													
September 2014													
September 2013													
October 2014													
October 2013													
November 2014													
November 2013													
December 2014													
December 2013													
Total Tonnage 2014	35.96	442.30	0.00	10.42	0.00	0.00	16.22	25.36	3.28	825.74	1168.10	218.06	4621.40
Total Tonnage 2013	61.04	456.25	0.00	2.86	22.30	22.88	139.24	12.26	5.14	410.74	1132.74	257.08	42828.202
Total Non Levied Waste 2014	1158.10												
Grand Total											4621.400		

Note: North Kerry Landfill closed on 11.7.14

Household Bagged Waste from Public for Landfilling and Household waste for Recycling Recovery Removed from North Kerry Landfill Site in 2014

Material type	Suggested EWC codes	Jan	Feb	Mar	Apr	May	June	July	August	September	October	November	December	Total
Mixed residual waste - Public Skip	20 03 01	32.82	25.36	23.94	23.58	27.96	25.28	23.84						182.78
Organic waste (food and garden)														0.00
food (compost waste Milltown TS)	*20 01 08*													0.00
garden	*20 02 01*			9.30						20.70				30.00
Mixed dry recyclables (Ecosence Bags)	20 03 01	1.26	2.42	1.00	2.02	1.34	1.68	1.36						11.08
Cardboard, newspaper and other paper														0.00
cardboard packaging	*15 01 01*	0.00	0.00	0.00	16.76	0.00	0.00	9.40						26.16
cardboard non-packaging	*20 01 01*													0.00
paper packaging	*15 01 01*													0.00
paper non-packaging	*20 01 01*													0.00
newspaper and magazines	*20 01 01*	5.50	4.10	4.74	4.54	3.70	6.28	3.94						32.80
Glass														0.00
glass packaging (bottles)	*15 01 07*	2.8330	2.8250	0.0000	2.4340	2.5580	2.6280	1.734						15.0120
glass non-packaging (flat glass)	*20 01 02*													0.0000
Metals														0.0000
aluminium cans (packaging)	*15 01 04*	0.0750	0.0770	0.0000	0.1330	0.1130	0.1140	0.070						0.5820
steel cans (packaging)	*15 01 04*	0.2380	0.2480	0.0000	0.3660	0.4000	0.4120	0.202						1.8660
other metals (scrap metals)	*20 01 40*	15.46	5.18	4.50	5.74	5.22	3.72	7.06		3.02				49.90
Packaging containing residues of or contaminated by dangerous substances	*15 01 10*							1.00						1.00
Plastic														0.00
plastic packaging (bottles)	*15 01 02*	2.84	2.82	2.52	2.24	2.20	3.40	1.86						17.88
plastic non-packaging	*20 01 39*													0.00
polystyrene														0.00
Composite packaging (e.g. tetrapaks)	*15 01 05*													0.00
Textiles														0.00
textiles, packaging	15 01 09													0.00
textiles, non-packaging (clothes)	20 01 11	0.80	0.72	0.00	0.00	0.86	0.58	1.40						4.36
Wood														0.00
wood packaging	15 01 03													0.00
wood non-packaging	20 01 38													0.00
mixed, uncontaminated wood packaging and non-packaging (collected at An Daingean)	15 01 03; 20 01 38													0.00
wood, treated, hazardous	20 01 37*													0.00
Batteries														0.00
lead acid batteries and accumulators (Car Batteries)	16 06 01*							1.425						1.43
Ni-Cd batteries and accumulators	16 06 02*	0.00	0.52	0.00	0.00	0.00	0.00	0.6880	0.00	0.00	0.00	0.00	0.00	1.208
Other (e.g. alkaline) batteries and accumulators (Small Batteries)	16 06 04													0.00
														0.00
Household Hazardous Waste														0.00
Waste mineral oils (Engine Oil)	13 02 08	1.056					0.98	0.98						3.012
Oil filters (vehicles)	16 01 07				0.12			0.12						0.24
Oil containers (mineral oil) - plastic + metal	15 01 01				0.10			0.09						0.19
Waste cooking or vegetable oils	20 01 25													0.00
Waste paint and varnish (including containers)	08 01 11													0.00
Gas Cylinders	16 05 04													
Aerosols	16 05 04				0.12			0.06						0.18
WEEE collected by compliance schemes														
CRT	20 01 36	5.262	2.378	3.055	2.433	3.920	1.060	5.369	0.000	1.373	0.000	0.000	0.000	24.850
SDA - Small Domestic Appliances	20 01 36	5.643	2.364	2.127	2.881	3.253	0.807	5.208	0.000	1.680	0.000	0.000	1.120	25.083
LDA - Large Domestic Appliances	20 01 36	2.296	0.000	3.956	0.000	2.036	0.000	6.376	0.000	0.000	0.000	0.000	0.000	14.664
Cold	20 01 36	1.749	0.000	2.372	0.000	1.363	0.000	2.790	0.000	0.000	0.000	0.000	0.000	8.274
														0.00
														0.00
														0.00
Tyres	16 01 03													0.00
Plasterboard (gypsum-based construction materials)	17 08 02													0.00
Bulky waste (provide summary below of waste types)	20 03 07													0.00
Household hazardous waste (medicines, pesticides etc.)														0.00
KCC Dry Recyclable Collection (KCC Trucks Into TS)	20 03 01													0.00
Leachate NKL	19 07 03	14,069.56	11,161.20	6,039.42	3,269.70	3,479.30	2,358.17	1,317.42	3,043.37	1,229.30	3,748.06	6,346.25	5,102.68	61164.43
Flourscent Tubes	20 01 11	0.188			0.026			0.0880						0.3020
<other categories not included above>	<enter EWC code>													0.00

Appendix D: Summary of results and Interpretation of Environmental Monitoring

Ground Water Results – North Kerry Landfill 2014

Ground Water Results – Borehole No2:

Archived	Category	Project	Location	Location Ea	Location No	Sample Template	Sample Da	Comments	mg/l	pH units	µS/cm	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l	Hazen	T.U.'s	mg/l
								Parameter	Ammonium	pH	Conductivit	Chloride	Dissolved (	Temperatu	Appearanc	Odour	Total Orgar	Colour	Turbidity	Hardness
									NH4	Physchem	Physchem	Cl	O2	Physchem		Physchem	C	Hz	SiO2	CaCO3
								Max.	Varies	Varies	Varies	Varies	Varies	--	--	--	--	Varies	4	--
								Target	--	--	--	--	--	--	--	--	--	--	--	--
								Min.	--	Varies	--	--	Varies	--	--	--	--	--	--	--
Yes	Landfill	North Kerry Landfill	Groundwater :Borehole No 2	94814	117306	EPA:North kerry:Groundwater Quarterly	23-Apr-14		< 0.02	5.8	178	44.6	5.5	10.9	Clear	N/D	< 1	< 5	2.69	34

Product	Project	SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Colour	Turbidity	Odour	Temperature	pH	Conductivity	Total Hardness	TOC	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolved Oxygen	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
					Min. Value					6.0					0.0																														
					Max Value					9.0					0.0																														
					Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	MGCACO3 L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3 L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
GRD_WATER	North Kerry Landfill	NORTH_KERRY_LANDFILL_BH2	North_Kerry_Landfill Groundwater :Borehole No 2	27-Aug-14		668	14.80	Normal	11.0	5.8	199	40.0	0.5		<0.02		48.2				4.1		Clear																						
			North_Kerry_Landfill Groundwater :Borehole No 2	02-Dec-14		112	24.90		9.4	6.0	168	35.0	1.8	<0.20	0.03	0.02	38.9	1.6	150	0.97	6.9	24	clear	0.072081579	<0.5	0.006	0.008	8.0	<0.7	<0.8	0.017	17	412	300.5	13	412	0.8	3.6	300.5	21.7	1.7	3.4	0.3	<0.8	13

Ground Water Results – Borehole No3:

Archived	Category	Project	Location	Location Ea	Location No	Sample Template	Sample Da	Comments	mg/l	pH units	µS/cm	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l	Hazen	T.U.'s	mg/l
								Parameter	Ammonium	pH	Conductivit	Chloride	Dissolved (	Temperatu	Appearanc	Odour	Total Orgar	Colour	Turbidity	Hardness
									NH4	Physchem	Physchem	Cl	O2	Physchem		Physchem	C	Hz	SiO2	CaCO3
								Max.	Varies	Varies	Varies	Varies	Varies	--	--	--	--	Varies	4	--
								Target	--	--	--	--	--	--	--	--	--	--	--	--
								Min.	--	Varies	--	--	Varies	--	--	--	--	--	--	--
Yes	Landfill	North Kerry Landfill	Groundwater :Borehole No 3	94808	117005	EPA:North kerry:Groundwater Quarterly	23-Apr-14		< 0.02	7	350	22.1	7.6	11.9	Cloudy	N/D	1.4	51	***4.76***	161

SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Colour	Turbidity	Odour	Temperature	pH	Conductivity	Total Hardness	TOC	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolved Oxygen	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Min. Value					6.0																																				
			Max Value					9.0																																				
			Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	MGCACO3 L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3 L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_BH3	North_Kerry_Landfill Groundwater :Borehole No 3	27-Aug-14		9	1.09	Normal	15.3	7.0	396	180.0	1.3		0.02		18.6				2.6		Cloudy																						
	North_Kerry_Landfill Groundwater :Borehole No 3	02-Dec-14		178	21.30		8.0	6.9	367	171.0	5.0	<0.20	0.02	0.02	23.4	7.9	242	<0.12	6.0	168	clear	0.058686333	<0.5	0.017	0.023	44.1	<0.7	<0.8	0.022	22	218	2088.0	13	218	1.9	18.1	2088.0	23.5	1.9	1.8	0.0	<0.8	13

Ground Water Results – Borehole No4:

SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Colour	Turbidity	Odour	Temperature	pH	Conductivity	Total Hardness	TOC	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolved Oxygen	Alkalinity	Visual Inspection
				Reported Name																		
				Min. Value					6.0													
				Max Value					9.0													
				Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	MGCACO3L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3L	NONE
NORTH_KERRY_LANDFILL_BH4	North_Kerry_Landfill Groundwater :Borehole No 4	27-Aug-14	130_NKL_GRD_QUART		26	3.82	Normal	10.8	6.2	184	67.0	0.7		0.02		17.7				4.1		Clear
	North_Kerry_Landfill Groundwater :Borehole No 4	02-Dec-14	130_NKL_GRD_ANNUAL		62	8.80	Normal	8.7	6.1	183	63.0	1.2	<0.20	0.02	0.01	19.9	< 1	123	<0.12	3.7	70	Clear

SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
				Reported Name																						
				Min. Value																						
				Max Value																						
				Units	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_BH4	North_Kerry_Landfill Groundwater :Borehole No 4	27-Aug-14	130_NKL_GRD_QUART																							
	North_Kerry_Landfill Groundwater :Borehole No 4	02-Dec-14	130_NKL_GRD_ANNUAL		0.039972127	<0.5	0.006	0.001	9.9	<0.7	<0.8	0.006	6	78	61.9	6	78	0.9	9.1	61.9	13.3	1.7	1.1	0.2	<0.8	6

Ground Water Results – Borehole No5:

Archived	Category	Project	Project Ref	Location	Location Reference	Location Ea	Location N	District	River Basin	Hydrometri	Catchment	Sample Te	Sample Re	Sample Da	Sample Tin	Sample Me	Sampled B	Reason
Yes	Landfill	North Kerry		Groundwater :Borehole No 5		94917.5	117152.7	All Districts				EPA:North	2014/1606	23-Apr-14	15:00	Grab	Andrew Sc	Compliance

Comments	mg/l	pH units	µS/cm	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l	Hazen	T.U.'s	mg/l
Parameter	Ammonium	pH	Conductivit	Chloride	Dissolved (	Temperatu	Appearanc	Odour	Total Orgar	Colour	Turbidity	Hardness
	NH4	Physchem	Physchem	Cl	O2	Physchem		Physchem	C	Hz	SiO2	CaCO3
Max.	Varies	Varies	Varies	Varies	Varies	--	--	--	--	Varies	4	--
Target	--	--	--	--	--	--	--	--	--	--	--	--
Min.	--	Varies	--	--	Varies	--	--	--	--	--	--	--
	0.09	6.1	181	31.5	2.9	9.8	Iron Oxide	Metallic	49.7	1580	***818***	43

SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Turbidity	Odour	Temperature	pH	Conductivity	Total Hardness	TOC	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolved Oxygen	Alkalinity	Visual Inspection
				Reported Name																	
				Min. Value				6.0													
				Max Value				9.0													
				Units	NTU	NONE	DEG_C	PH	USCM	MGCACO3L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3L	NONE
NORTH_KERRY_LANDFILL_BH5	North_Kerry_Landfill Groundwater :Borehole No 5	27-Aug-14	130_NKL_GRD_QUART		133.00	Metallic	12.9	6.1	227	41.0	7.7		0.98		26.6				1.6		Iron Oxide
	North_Kerry_Landfill Groundwater :Borehole No 5	02-Dec-14	130_NKL_GRD_ANNUAL		684.00		10.1	6.0	202	34.0	26.7	<0.20	0.77	0.18	28.6	4.9	690	<0.12	4.1	70	brownish

SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
				Reported Name																						
				Min. Value																						
				Max Value																						
				Units	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_BH5	North_Kerry_Landfill Groundwater :Borehole No 5	27-Aug-14	130_NKL_GRD_QUART																							
	North_Kerry_Landfill Groundwater :Borehole No 5	02-Dec-14	130_NKL_GRD_ANNUAL		0.025743373	11.5	0.004	0.024	8.3	<0.7	3.6	0.026	26	58603	552.3	20	58603	0.9	1.8	552.3	16.3	2.6	7.4	0.2	2.9	20

Ground Water Results – Borehole No6:

Project	Location	Sample Template	Sample Date	Comments	mg/l	pH units	µS/cm	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l	Hazen	T.U.'s	mg/l
				Parameter	Ammonium	pH	Conductivit	Chloride	Dissolved C	Temperatu	Appearanc	Odour	Total Orgar	Colour	Turbidity	Hardness
					NH4	Physchem	Physchem	Cl	O2	Physchem		Physchem	C	Hz	SiO2	CaCO3
				Max.	Varies	Varies	Varies	Varies	Varies	--	--	--	--	Varies	4	--
				Target	--	--	--	--	--	--	--	--	--	--	--	--
				Min.	--	Varies	--	--	Varies	--	--	--	--	--	--	--
North Kerry Landfill	Groundwater :GW6 E3	EPA:North kerry:Groundwater Quarterly	23-Apr-14		< 0.02	5.8	145	20.9	1.8	10	Clear	N/D	< 1	35	***11.7***	41

Project	SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Colour	Turbidity	Odour	Tempera ture	pH	Conducti vity	Total Hardness	TOC	Fluoride	Ammonia	Phosphor us (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolve d Oxygen	Alkalinity	Visual Inspectio n	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolve d Cu	Dissolve d Fe	Dissolve d Mn	Dissolve d Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
					Reported Name																																								
					Min. Value					6.0																																				
					Max Value					9.0																																				
					Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	MGCACO3 L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3 L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
	NORTH_KERRY_LANDFILL_BH6	North_Kerry_Landfill Groundwater :Borehole No 6	27-Aug-14	130_NKL_GRD_QUART		49	14.20	Normal	14.3	5.9	144	39.0	0.9		<0.02		21.0				2.7		Clear																							
		North_Kerry_Landfill Groundwater :Borehole No 6	02-Dec-14	130_NKL_GRD_ANNUAL		227	43.70	Normal	9.9	5.9	154	49.0	4.7	<0.20	0.02	0.02	23.0	3.1	157	0.23	3.8	40	Clear	0.044521304	<0.5	0.007	0.006	6.1	<0.7	<0.8	0.015	15	1153	629.1	27	1153	1.0	6.6	629.1	15.5	5.8	4.7	1.5	<0.8	27

Ground Water Results – Borehole No GWML E1:

Archived	Category	Project	Project Ref	Location	Location Reference	Location Ea	Location No	District	River Basin	Hydrometri	Catchment	Sample Te	Sample Re	Sample Da	Sample Tin	Sample Me	Sampled By	Reason	Comments	mg/l	pH units	µS/cm	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l	Hazen	T.U.'s	mg/l
																			Parameter	Ammonium	pH	Conductivit	Chloride	Dissolved C	Temperatu	Appearanc	Odour	Total Orgar	Colour	Turbidity	Hardness
																				NH4	Physchem	Physchem	Cl	O2	Physchem		Physchem	C	Hz	SiO2	CaCO3
																			Max.	Varies	Varies	Varies	Varies	Varies	--	--	--	--	Varies	4	--
																			Target	--	--	--	--	--	--	--	--	--	--	--	--
																			Min.	--	Varies	--	--	Varies	--	--	--	--	--	--	--
Yes	Landfill	North Kerry		Groundwater :GWML E1	old bore hole no 1	94697	117360	All Districts			EPA:North	2014/1602	23-Apr-14	12:21	Grab	Andrew Sc	Compliance		< 0.02	6.5	294	51.6	2.2	10.3	Brown	Earthy	17	2490	***2210***	82

SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Colour	Turbidity	Odour	Tempera ture	pH	Conducti vity	Total Hardness	TOC	Fluoride	Ammonia	Phosphor us (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolve d Oxygen	Alkalinity	Visual Inspectio n	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolve d Cu	Dissolve d Fe	Dissolve d Mn	Dissolve d Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
				Reported Name																																									
				Min. Value					6.0																																					
				Max Value					9.0																																					
				Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	MGCACO3 L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3 L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_GWML_E1	North_Kerry_Landfill Groundwater :GWML E1	27-Aug-14	130_NKL_GRD_QUART		434	439.00	Normal	12.3	6.3	276	84.0	2.4		<0.02		40.7				1.8		Brown Colour/Cloudy																								
	North_Kerry_Landfill Groundwater :GWML E1	02-Dec-14	130_NKL_GRD_ANNUAL		3740	5.42	Normal	10.6	6.4	225	77.0	6.8	<0.20	<0.02	0.56	28.9	9.5	1991	1.66	2.6	62	Brown Colour/Sediment	0.126568601	0.9	0.013	0.011	23.4	<0.7	1.2	0.013	13	704	458.8	7	704	2.0	3.3	458.8	20.1	1.6	6.2	0.3	5.7	7

Ground Water Results – Denis O'Mahony Groundwater Well external to site:

Project	Location	Location Ea	Location No	Sample Template	Comments	mg/l	pH units	µS/cm	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l	Hazen	T.U.'s	mg/l
					Parameter	Ammonium	pH	Conductivit	Chloride	Dissolved O	Temperatu	Appearanc	Odour	Total Orga	Colour	Turbidity	Hardness
						NH4	Physchem	Physchem	Cl	O2	Physchem		Physchem	C	Hz	SiO2	CaCO3
					Max.	Varies	Varies	Varies	Varies	Varies	--	--	--	--	Varies	4	--
					Target	--	--	--	--	--	--	--	--	--	--	--	--
					Min.	--	Varies	--	--	Varies	--	--	--	--	--	--	--
North Kerry Landfill	Groundwater :Dennis O'Mahony	97390.7	118348.7	EPA:North kerry:Groundwater Quarterly		< 0.02	5.7	110	17.9	2.4	11.1	Cloudy	N/D	5.6	175	***19.8***	29

SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Colour	Turbidity	Odour	Temperature	pH	Conductivity	Total Hardness	TOC	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolved Oxygen	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Reported Name																																								
			Min. Value					6.0																																			
			Max Value					9.0																																			
			Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	MGCACO3L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_OMAHONY	North_Kerry_Landfill Groundwater :Dennis O'Mahony	27-Aug-14		5	0.53	Normal	14.3	5.6	172	50.0	0.7		<0.02		26.8				2.4		Clear																						
	North_Kerry_Landfill Groundwater :Dennis O'Mahony	02-Dec-14		79	5.12	Normal	7.9	5.8	106	34.0	5.0	<0.20	0.03	0.01	14.1	1.3	77	<0.12	2.4	30	Clear	0.038723914	0.8	0.005	0.005	26.6	<0.7	<0.8	0.063	63	979	421.5	45	979	0.3	3.1	421.5	9.4	1.3	3.2	0.0	2.2	45

Ground Water Results – Gerry Sugrue Groundwater Well external to site:

Project	Location	Location Re	Location Ea	Location No	Sample Template	Sample Date	Comments	mg/l	pH units	µS/cm	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l	Hazen	T.U.'s	mg/l
							Parameter	Ammonium	pH	Conductivit	Chloride	Dissolved O	Temperatu	Appearanc	Odour	Total Orga	Colour	Turbidity	Hardness
								NH4	Physchem	Physchem	Cl	O2	Physchem		Physchem	C	Hz	SiO2	CaCO3
							Max.	Varies	Varies	Varies	Varies	Varies	--	--	--	--	Varies	4	--
							Target	--	--	--	--	--	--	--	--	--	--	--	--
							Min.	--	Varies	--	--	Varies	--	--	--	--	--	--	--
North Kerry Landfill	Groundwater :Gerry Sugrue	93037.8	116489.5	EPA:North kerry:Groundwater Quarterly		23-Apr-14		< 0.02	5.5	174	26.7	3.4	13.4	Clear	N/D	< 1	< 5	0.19	61

SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Colour	Turbidity	Odour	Temperature	pH	Conductivity	Total Hardness	TOC	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolved Oxygen	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
				Reported Name																																								
				Min. Value					6.0																																				
				Max Value					9.0																																				
				Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	MGCACO3L	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGL	MGLN	MGL	MGCACO3L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_SUGRUE	North_Kerry_Landfill Groundwater :Gerry Sugrue	27-Aug-14	130_NKL_GRD_QUART		71	4.82	Normal	16.8	5.6	109	38.0	3.5		0.03		15.0				5.7		Clear																						
	North_Kerry_Landfill Groundwater :Gerry Sugrue	27-Aug-14	130_NKL_GRD_QUART		4	0.48	Normal	16.8	5.8	204	76.0	0.8		<0.02						5.7		Clear																						
	North_Kerry_Landfill Groundwater :Gerry Sugrue	02-Dec-14	130_NKL_GRD_ANNUAL		6	0.99		7.8	5.5	170	56.0	0.9	<0.20	0.02	<0.005	28.6	5.8	102	3.02	2.6	25	clear	0.034497003	<0.5	0.009	0.009	7.6	<0.7	<0.8	0.158	158	197	93.1	191	197	0.8	7.8	93.1	13.5	8.5	7.2	0.1	<0.8	191
	North_Kerry_Landfill Groundwater :Gerry Sugrue	02-Dec-14	130_NKL_GRD_ANNUAL		5	1.03		7.8	5.5	168	50.0	0.8	<0.20	0.02	<0.005	28.8	5.8	107	2.88	2.5	26	clear	0.034179554	<0.5	0.009	0.009	7.8	<0.7	<0.8	0.178	178	<2	89.9	250	<2	0.8	8.0	89.9	13.6	9.5	6.9	0.2	<0.8	250

Leachate Lab Results – North Kerry Landfill 2014

Leachate Detection Manhole - LD1

Project	Location	Location Reference	Location E	Location N	Sample Template	Sample Date	Comments	Degrees C	Descriptive	Descriptive
							Parameter	Temperatu	Appearanc	Odour
								Physchem		Physchem
							Max.	--	--	--
							Target	--	--	--
							Min.	--	--	--
North Kerry Landfill	Leachate: LD-1	detection manhole 1	94909	117268	EPA:North kerry: Leachate Quarterly	25-Mar-14		6.8	cloudy	leachate smell

Product	Project	SAMPLING POINT	Sampling Point	Sampled Date	Sample Type	Test List	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Suspended Solids	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
							Reported Name																																	
							Min. Value			6.0																														
							Max Value			9.0																														
							Units	NONE	DEG_C	PH	USCM	BOD	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGLN	MGL	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
LEACHATE	North Kerry Landfill	NORTH_KERRY_LANDFILL_LD1	North_Kerry_Landfill Leachate: LD-1	27-Aug-14	LANDFILL	130_NKL_LEC_QUART		Leachate	15.1												Slight Brown Colour																		
			North_Kerry_Landfill Leachate: LD-1	02-Dec-14	LANDFILL	130_NKL_LEC_ANNUAL			10.4	6.4	375	48	150	<0.20	10.73	0.08	31.0	4.8	<0.12	766	dirty brown	0.033789446	30.8	0.033	0.111	42.7	<0.7	5.5	0.022	83600	8.4	4.8	2295.7	18.0	19.5	4.2	0.2	4.2	35

Leachate Detection Manhole – LD2

Project	Location	Location Reference	Sample Template	Sample Da	Comments	Degrees C	Descriptive	Descriptive
					Parameter	Temperatu	Appearanc	Odour
						Physchem		Physchem
					Max.	--	--	--
					Target	--	--	--
					Min.	--	--	--
North Kerry Landfill	Leachate: LD-2	detection manhole 2	EPA:North kerry: Leachate Quarterly	25-Mar-14		6.4	clear	n/d

SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Suspended Solids	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Reported Name																																
			Min. Value			6.0																													
			Max Value			9.0																													
			Units	NONE	DEG_C	PH	USCM	BOD	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGLN	MGL	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_LD2	North_Kerry_Landfill Leachate: LD-2	27-Aug-14		Normal	15.3												Clear																			
	North_Kerry_Landfill Leachate: LD-2	02-Dec-14			11.0	7.4	529	16	16	<0.20	2.68	0.01	30.1	6.7	4.34	8	clear	0.044907244	<0.5	0.039	0.024	67.6	<0.7	<0.8	0.008	385	11.3	4.2	888.3	21.3	<1.0	<1.0	0.1	<0.8	3

Leachate Detection Manhole – LD3

Project	Location	Location Reference	Sample Template	Sample Da	Comments	Degrees C	Descriptive	Descriptive
					Parameter	Temperatu	Appearanc	Odour
						Physchem		Physchem
					Max.	--	--	--
					Target	--	--	--
					Min.	--	--	--
North Kerry Landfill	Leachate: LD-3	det mH Lagoon	EPA:North kerry: Leachate Quarterly	25-Mar-14		6.9	clear	n/d

SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Colour	Turbidity	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Suspended Solids	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Reported Name																																		
			Min. Value					6.0																													
			Max Value					9.0																													
			Units	HAZEN	NTU	NONE	DEG_C	PH	USCM	BOD	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGLN	MGL	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_LD3	North_Kerry_Landfill Leachate: LD-3	27-Aug-14				Normal	14.9												Clear																		
	North_Kerry_Landfill Leachate: LD-3	02-Dec-14					8.6	7.7	1011	<1.0	27	<0.20	<0.02	0.06	85.9	40.5	64.30	8	clear	0.046823031	0.6	0.153	0.033	90.6	<0.7	<0.8	0.008	38	25.2	8.3	74.6	67.6	2.2	<1.0	0.3	<0.8	3

Leachate Lagoons – Leachate Lagoon 1 LL1

Project	Location	Location Reference	Sample Template	Sample Da	Comments	Degrees C	Descriptive	Descriptive
					Parameter	Temperatu	Appearance	Odour
						Physchem		Physchem
					Max.	--	--	--
					Target	--	--	--
					Min.	--	--	--
North Kerry Landfill	Leachate: LL 1	leachate lagoon 1	EPA:North kerry: Leachate Quarterly	25-Mar-14		8.9	dark brown	strong leachate odour

SAMPLING POINT	Sampling Point	Sampled Date	Sampled Time	Parameter / Reported Name / Min. Value / Max Value / Units	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Suspended Solids	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
					NONE	DEG_C	PH	USCM	BOD	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGLN	MGL	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
							6.0																												
							9.0																												
NORTH_KERRY_LANDFILL_LL1	North_Kerry_Landfill Leachate: LL 1	27-Aug-14	11:40		Leachate	16.4												Brown Colour																	
	North_Kerry_Landfill Leachate: LL 1	02-Dec-14	14:55			9.4	7.2	2580	Sample Overdiluted	230	<0.20	165.00	0.43	218.8	57.8	0.27	52	brownish	0.030116884	9.9	0.528	0.082	81.6	<0.7	18.1	0.010	13940	109.5	25.9	3800.8	202.6	16.9	2.9	1.2	0.8	19

Leachate Lagoons – Leachate Lagoon 2 LL2

Project	Location	Location Reference	Sample Da	Comments	Degrees C	Descriptive	Descriptive
				Parameter	Temperatu	Appearance	Odour
					Physchem		Physchem
				Max.	--	--	--
				Target	--	--	--
				Min.	--	--	--
North Kerry Landfill	Leachate: LL 2	leachate lagoon 2	25-Mar-14		9.2	dark brown	strong leachate

Product	Sampling Point	Sampled Date	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Suspended Solids	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Reported Name																																
			Min. Value			6.0																													
			Max Value			9.0																													
			Units	NONE	DEG_C	PH	USCM	BOD	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGLN	MGL	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
	North_Kerry_Landfill Leachate: LL 2	27-Aug-14		Leachate	16.1												Black Colour																		
	North_Kerry_Landfill Leachate: LL 2	02-Dec-14			5.8	8.0	3040	58	583	<0.20	232.00	1.29	337.9	5.5	<0.12	400	dirty blackish/green ish	0.0288932 8	5.1	0.672	0.079	60.9	<0.7	27.2	0.018	13819	142.9	27.6	1610.6	287.9	30.1	4.2	0.4	1.2	32

Leachate Lagoons – Leachate Lagoon 3 LL3

Project	Location	Location Reference	Sample Template	Sample Da	Comments	Degrees C	no./100mls	no./100mls	Descriptive	Descriptive
					Parameter	Temperatu	Faecal coli	Total Colifo	Appearance	Odour
						Physchem	FC marine			Physchem
					Max.	--	--	--	--	--
					Target	--	--	--	--	--
					Min.	--	--	--	--	--
North Kerry Landfill	Leachate: L	compost lagoon	EPA:North kerry: Leachate Quarterly	25-Mar-14		9.4			slightly cloudy	n/d

Sampling Point	Sampled Date	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Fluoride	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Suspended Solids	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
		Reported Name																																
		Min. Value																																
		Max Value																																
		Units	NONE	DEG_C	PH	USCM	BOD	MGL	MGL_F	MGLN	MGL	MGL	MGL	MGLN	MGL	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
North_Kerry_Landfill Leachate: LL 3	27-Aug-14		Musty	15.9												Slightly Brown Colour																		
North_Kerry_Landfill Leachate: LL 3	02-Dec-14			6.0	8.0	136	2.1	<10	<0.20	0.09	0.03	5.6	< 1	<0.12	16	clear	65.52629551	0.6	0.006	0.007	24.1	<0.7	<0.8	0.008	366	4.1	1.0	35.8	4.8	<1.0	1.6	0.2	<0.8	13

Surface Water Lab Results – North Kerry Landfill 2014

Surface Water Results – SW1 off site Adjacent to Muingnaminnane Road South East of North Kerry Landfill

Project	Location	Sample Template	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive
				Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearanc	Odour
					NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem
				Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--
				Target	--	--	--	--	--	--	--	--	--	--	--
				Min.	--	Varies	--	--	--	--	Varies	--	--	--	--
North Kerry Landfill	Surface water: SW-1	EPA: North kerry: Surface Water monthly	28-Jan-14									< 1	5.6	Clear	N/D
North Kerry Landfill	Surface water: SW-1	EPA: North kerry: Surface Water monthly	27-Feb-14									< 1	6.1	Clear	N/D
North Kerry Landfill	Surface water: SW-1	EPA:North kerry: Surface water Quarterly	25-Mar-14		< 0.02	5.8	1.6	107	< 10	30.8	11.1	3	6.7	slight colour	n/d
North Kerry Landfill	Surface water: SW-1	EPA: North kerry: Surface Water monthly	23-Apr-14									2	11.5	Clear	N/D
North Kerry Landfill	Surface water: SW-1	Quality Assurance sample : Landfill Surface water	23-Apr-14							27.2		< 1	11.5	Clear	N/D
North Kerry Landfill	Surface water: SW-1	EPA: North kerry: Surface Water monthly	15-May-14									2	13.3	Clear	N/D
North Kerry Landfill	Surface water: SW-1	EPA: North kerry: Surface Water monthly	30-Jun-14								9	< 1	15	ight Sedime	N/D

Sampling Point	Sampled Date	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Dissolved Oxygen	Suspended Solids	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
		Reported Name																																				
		Min. Value			6.0																																	
		Max Value			9.0																																	
		Units	NONE	DEG_C	PH	USCM	BOD	MGL	MGLN	MGL	MGL	MGL	MGLN	MGL	MGL	MGCACO3 1	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
North_Kerry_Landfill Surface water: SW-1	29-Jul-14			15.4											1		Slight Brown Colour																						
North_Kerry_Landfill Surface water: SW-1	27-Aug-14		Normal	14.7	7.0	109	<1.0	47	0.02		20.2			9.1	6		Some Sediment																						
North_Kerry_Landfill Surface water: SW-1	23-Oct-14		Normal	10.6											4		Slight Brown Colour																						
North_Kerry_Landfill Surface water: SW-1	27-Nov-14			6.5											1		Slight Brown Colour																						
North_Kerry_Landfill Surface water: SW-1	02-Dec-14		Normal	6.8	6.6	78	1.3	78	0.03	0.01	17.7	< 1	<0.12	10.3	2	11	Brown Colour	0.049097643	<0.5	0.005	0.002	4.7	<0.7	<0.8	0.012	12	1265	71.2	4	1265	0.3	1.6	71.2	10.2	1.1	4.0	0.1	<0.8	4

Surface Water Results – SW2 North Kerry Landfill

Project	Location	Sample Template	Sample Date	Comments	Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearance	Odour	null sample reason
						NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem	
					Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--	--
					Target	--	--	--	--	--	--	--	--	--	--	--	--
					Min.	--	Varies	--	--	--	--	Varies	--	--	--	--	--
North Kerry Landfill	Surface water: SW-2	EPA: North kerry: Surface Water monthly	28-Jan-14										1	5.7	Clear	N/D	
North Kerry Landfill	Surface water: SW-2	EPA: North kerry: Surface Water monthly	27-Feb-14										< 1	6.6	Clear	N/D	
North Kerry Landfill	Surface water: SW-2	EPA:North kerry: Surface water Quarterly	25-Mar-14			0.02	***4.2***	1.2	141	47	33.6	10.9	1.5	6.9	slight colour	n/d	
North Kerry Landfill	Surface water: SW-2	null sample reason	23-Apr-14	No Flow													No Flow
North Kerry Landfill	Surface water: SW-2	EPA: North kerry: Surface Water monthly	15-May-14										2	11.4	Brown Colour	N/D	
North Kerry Landfill	Surface water: SW-2	null sample reason	30-Jun-14	No Sample - Location dry													Location Dry

Project	SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Dissolved Oxygen	Suspended Solids	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
				Reported Name																																				
				Min. Value			6.0				0.0																													
				Max Value			9.0				0.0																													
				Units	*NONE*	*DEG_C*	*PH*	*USCM*	*BOD*	*MGL*	*MGLN*	*MGL*	*MGL*	*MGL*	*MGLN*	*MGL*	*MGL*	*MGCACO3L*	*NONE*	*UGL*	*UGL*	*MGL*	*MGL*	*MGL*	*UGL*	*UGL*	*MGL*	*UGL*	*UGL*	*UGL*	*UGL*	*UGL*	*MGL*	*MGL*	*UGL*	*MGL*	*UGL*	*UGL*	*UGL*	*UGL*	*UGL*
	NORTH_KERRY_LANDFILL_SW2	North_Kerry_Landfill Surface water: SW-2	23-Oct-14		Normal	10.9											2		Brown Colour																					
		North_Kerry_Landfill Surface water: SW-2	27-Nov-14			7.0											1		Dark Brown Colour																					
		North_Kerry_Landfill Surface water: SW-2	27-Nov-14			7.0											<1		Dark Brown Colour																					
		North_Kerry_Landfill Surface water: SW-2	02-Dec-14		Normal	7.1	4.8	92	1.4	166	0.03	0.49	20.8	18.9	0.24	10.4	10	10	Brown Colour	0.032013557	<0.5	0.009	0.003	17.8	<0.7	<0.8	0.005	5	396	19.5	5	396	1.4	1.7	19.5	13.5	<1.0	1.6	0.0	<0.8	5

Surface Water Results – SW3 North Kerry Landfill

Project	Location	Sample Template	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive
				Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved (	Suspended	Temperatu	Appearance
					NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem	
				Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--
				Target	--	--	--	--	--	--	--	--	--	--
				Min.	--	Varies	--	--	--	--	Varies	--	--	--
North Kerry Landfill	Surface water: SW-3	EPA: North kerry: Surface Water monthly	28-Jan-14									< 1	5.7	Clear
North Kerry Landfill	Surface water: SW-3	EPA: North kerry: Surface Water monthly	27-Feb-14									2	6.5	Clear
North Kerry Landfill	Surface water: SW-3	EPA:North kerry: Surface water Quarterly	25-Mar-14		0.02	6.3	2	108	30	28.3	11.3	3.5	6.4	slight colour
North Kerry Landfill	Surface water: SW-3	EPA: North kerry: Surface Water monthly	23-Apr-14									6	11.7	Slightly Coloured
North Kerry Landfill	Surface water: SW-3	EPA: North kerry: Surface Water monthly	15-May-14									3	13.6	Brown Colour
North Kerry Landfill	Surface water: SW-3	EPA: North kerry: Surface Water monthly	30-Jun-14								9.1	6	17.3	Brown Colour

Sampling Point	Sampled Date	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Dissolved Oxygen	Suspended Solids	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
		Min. Value			6.0																																	
		Max Value			9.0																																	
		Units	NONE	DEG_C	PH	USCM	BOD	MGL	MGLN	MGL	MGL	MGL	MGLN	MGL	MGL	MGCACO3L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
North_Kerry_Landfill Surface water: SW-3	29-Jul-14			15.8										4		Brown Colour																						
North_Kerry_Landfill Surface water: SW-3	27-Aug-14		Normal	15.0	7.0	114	1.7	84	0.02		20.1			9.3	4		Slightly Brown Colour																						
North_Kerry_Landfill Surface water: SW-3	23-Oct-14		Normal	10.9										2		Slight Brown Colour																						
North_Kerry_Landfill Surface water: SW-3	02-Dec-14		Normal	6.6	6.6	82	1.5	67	0.03	0.02	16.3	< 1	<0.12	10.9	16	11	Brown Colour/Sediment	0.061862988	0.5	0.007	0.005	4.0	<0.7	<0.8	0.011	11	1842	531.6	11	1842	0.9	2.2	531.6	10.9	<1.0	4.1	0.1	<0.8	11

Surface Water Results – SWML 2 Outlet to Western Lagoon North Kerry Landfill

Project	Location	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive
			Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearance	Odour
				NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem
			Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--
			Target	--	--	--	--	--	--	--	--	--	--	--
			Min.	--	Varies	--	--	--	--	Varies	--	--	--	--
North Kerry Landfill	Surface water: SWML-2(Western Lagoon outlet)	28-Jan-14	Taken from Lagoon	0.03							12	5.2	Cloudy	N/D
North Kerry Landfill	Surface water: SWML-2(Western Lagoon outlet)	27-Feb-14		0.02							18	6.7	Cloudy	N/D
North Kerry Landfill	Surface water: SWML-2(Western Lagoon outlet)	27-Feb-14		0.02							11	6.7	Cloudy	N/D
North Kerry Landfill	Surface water: SWML-2(Western Lagoon outlet)	25-Mar-14		< 0.02	7.5	1.1	206	< 10	24.4	11	4.5	7.9	clear	n/d
North Kerry Landfill	Surface water: SWML-2(Western Lagoon outlet)	23-Apr-14	Taken From Lagoon	< 0.02							8	13.8	Slightly Cloudy	N/D
North Kerry Landfill	Surface water: SWML-2(Western Lagoon outlet)	15-May-14	Not Flowing	0.02							4	14.5	Clear	N/D
North Kerry Landfill	Surface water: SWML-2(Western Lagoon outlet)	30-Jun-14		< 0.02						10.5	4.8	20	Clear	N/D

SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Odour	Temperature	PH	Conductivity	B.O.D.	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	Total Solids	TON	Dissolved Oxygen	Dissolved Oxygen	Suspended Solids	Total Nitrogen	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Reported Name																																									
			Min. Value			6.0					0.0						80.0																											
			Max Value			9.0					0.0						120.0																											
			Units	NONE	DEG_C	PH	USCM	BOD	BOD	MGL	MGLN	MGL	MGL	MGL	MGL	MGLN	PERCENT SA	MGL	MGL	MGLN	MGCACO3 L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_SWML2	North_Kerry_Landfill Surface water: SWML-2(Western Lagoon outlet)	29-Jul-14			19.6						0.02								<1			Clear																					
	North_Kerry_Landfill Surface water: SWML-2(Western Lagoon outlet)	29-Jul-14			19.6						<0.02								2			Clear																					
	North_Kerry_Landfill Surface water: SWML-2(Western Lagoon outlet)	27-Aug-14		Normal	16.2	8.0	234		1.4	32	0.03		9.3					9.0	3			Clear																					
	North_Kerry_Landfill Surface water: SWML-2(Western Lagoon outlet)	23-Oct-14		Normal	11.7						<0.02								2			Clear																					
	North_Kerry_Landfill Surface water: SWML-2(Western Lagoon outlet)	27-Nov-14			6.0						0.04								2			Clear																					
	North_Kerry_Landfill Surface water: SWML-2(Western Lagoon outlet)	02-Dec-14			5.8	8.1	80	1.0		10	<0.02	0.01	10.4	< 1		<0.12		11.0	6		99	clear	0.065909619	<0.5	0.006	0.005	38.9	<0.7	<0.8	0.010	10	131	23.9	<3	131	1.2	2.2	23.9	8.1	<1.0	<1.0	0.2	<0.8	<3

Surface Water Results – SWML 3 Inlet to Western Lagoon North Kerry Landfill

Location	Sample Template	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive	Descriptive
			Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearanc	Odour	null sample reason
				NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem	
			Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--	--
			Target	--	--	--	--	--	--	--	--	--	--	--	--
			Min.	--	Varies	--	--	--	--	Varies	--	--	--	--	--
	Surface water: SWML-3	EPA: North kerry: Surface Water monthly	28-Jan-14								< 1	5.1	Clear	N/D	
	Surface water: SWML-3	EPA: North kerry: Surface Water monthly	27-Feb-14								2	6.5	Clear	N/D	
	Surface water: SWML-3	EPA:North kerry: Surface water Quarterly	25-Mar-14	< 0.02	7.5	1.1	217	< 10	23.8	10.3	< 1	8	clear	n/d	
	Surface water: SWML-3	null sample reason	23-Apr-14	No Flow											No Flow
	Surface water: SWML-3	null sample reason	15-May-14	No Sample											No Sample
	Surface water: SWML-3	null sample reason	30-Jun-14	No Sample											Location Dry

SAMPLING POINT	Sampling Point	Sampled Date	Parameter	Odour	Temperature	PH	Conductivity	B.O.D.	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Dissolved Oxygen	Suspended Solids	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Reported Name																																						
			Min. Value			6.0																																			
			Max Value			9.0																																			
			Units	NONE	DEG_C	PH	USCM	BOD	BOD	MGL	MGLN	MGL	MGL	MGL	MGLN	MGL	MGL	MGCACO3L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_SW3	North_Kerry_Landfill Surface water: SW-3	29-Jul-14			15.8												4		Brown Colour																					
	North_Kerry_Landfill Surface water: SW-3	27-Aug-14		Normal	15.0	7.0	114		1.7	84	0.02		20.1			9.3	4		Slightly Brown Colour																					
	North_Kerry_Landfill Surface water: SW-3	23-Oct-14		Normal	10.9												2		Slight Brown Colour																					
	North_Kerry_Landfill Surface water: SW-3	02-Dec-14		Normal	6.6	6.6	82	1.5		67	0.03	0.02	16.3	< 1	<0.12	10.9	16	11	Brown Colour/Sediment	0.061862988	0.5	0.007	0.005	4.0	<0.7	<0.8	0.011	11	1842	531.6	11	1842	0.9	2.2	531.6	10.9	<1.0	4.1	0.1	<0.8	11

Surface Water Results – SWML-4 Upstream of Western Lagoon North Kerry Landfill

Project	Location	Sample Template	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive	Descriptive
				Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearanc	Odour	null sample reason
					NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem	
				Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--	--
				Target	--	--	--	--	--	--	--	--	--	--	--	--
				Min.	--	Varies	--	--	--	--	Varies	--	--	--	--	--
North Kerry Landfill	Surface water: SWML-4	EPA: North kerry: Surface Water monthly	28-Jan-14									< 1	5.2	Clear	N/D	
North Kerry Landfill	Surface water: SWML-4	EPA: North kerry: Surface Water monthly	27-Feb-14									2	6.5	Clear	N/D	
North Kerry Landfill	Surface water: SWML-4	EPA:North kerry: Surface water Quarterly	25-Mar-14		< 0.02	6.9	< 1	224	< 10	24.6	8.8	< 1	9.4	clear	n/d	
North Kerry Landfill	Surface water: SWML-4	null sample reason	23-Apr-14	No Flow												No Flow
North Kerry Landfill	Surface water: SWML-4	EPA: North kerry: Surface Water monthly	15-May-14	Not Flowing								< 1	11	Clear	N/D	
North Kerry Landfill	Surface water: SWML-4	null sample reason	30-Jun-14	No Sample												Location Dry

Surface Water Results – SWML-5 Upstream of SWML -4 flow to Western Lagoon North Kerry Landfill

Project	Location	Sample Template	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive	Descriptive
				Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearanc	Odour	null sample reason
					NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem	
				Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--	--
				Target	--	--	--	--	--	--	--	--	--	--	--	--
				Min.	--	Varies	--	--	--	--	Varies	--	--	--	--	--
North Kerry Landfill	Surface water: SWML-5	EPA: North kerry: Surface Water monthly	28-Jan-14									< 1	5.2	Clear	N/D	
North Kerry Landfill	Surface water: SWML-5	EPA: North kerry: Surface Water monthly	27-Feb-14									2	6.6	Clear	N/D	
North Kerry Landfill	Surface water: SWML-5	EPA:North kerry: Surface water Quarterly	25-Mar-14		< 0.02	7.7	< 1	231	< 10	20.6	10.8	1	8.2	clear	n/d	
North Kerry Landfill	Surface water: SWML-5	null sample reason	23-Apr-14	No Flow												No Flow
North Kerry Landfill	Surface water: SWML-5	EPA: North kerry: Surface Water monthly	15-May-14	Not Flowing								< 1	15	Clear	N/D	
North Kerry Landfill	Surface water: SWML-5	null sample reason	30-Jun-14													Location Dry

SAMPLING POINT	Sampling Point	Sampled Date	Comments	Parameter / Units	Odour *NONE*	Temperature *DEG_C*	Suspended Solids *MGL*	Visual Inspection *NONE*	Hg *UGL*
NORTH_KERRY_LANDFILL_SWML5	North_Kerry_Landfill Surface water: SWML-5	23-Oct-14	Not Flowing		Normal	10.8	<1	Clear	
	North_Kerry_Landfill Surface water: SWML-5	27-Nov-14				5.5	<1	Clear, Slow flow	

Surface Water Results – SWML-10 Outfall of Eastern Surface Water Lagoon

Project	Location	Sample Template	Sample Date	Comments	Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearance	Odour
						mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive
						NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem
					Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--
					Target	--	--	--	--	--	--	--	--	--	--	--
					Min.	--	Varies	--	--	--	--	Varies	--	--	--	--
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	EPA: North kerry: Surface Water monthly	28-Jan-14	Taken from Lagoon		0.28							8	5.4	Clear	N/D
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	Quality Assurance sample : Landfill Surface water	28-Jan-14			0.22							10	5.4	Clear	N/D
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	General Landfill: Surface water	31-Jan-14	Sample A		0.08										
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	General Landfill: Surface water	31-Jan-14	Sample B		0.08										
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	EPA: North kerry: Surface Water monthly	27-Feb-14										20	6	Cloudy	N/D
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	EPA:North kerry: Surface water Quarterly	25-Mar-14			0.02	7.4	1.1	199	< 10	25.4	10.8	15	8.2	cloudy	n/d
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	EPA: North kerry: Surface Water monthly	23-Apr-14	Taken From Lagoon									12	14.4	Cloudy	N/D
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	EPA: North kerry: Surface Water monthly	15-May-14			0.21							9	11.2	Slightly Cloudy	N/D
North Kerry Landfill	Surface water: SWML-10(Eastern Lagoon outlet)	EPA: North kerry: Surface Water monthly	30-Jun-14			0.05						8.6	4	18.8	Clear	N/D

Sampling Point	Sampled Date	Parameter	Odour	Temperature	PH	Conductivity	B.O.D.	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Dissolved Oxygen	Suspended Solids	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
		Min. Value			6.0					0.0																													
		Max Value			9.0					0.0																													
		Units	NONE	DEG_C	PH	USCM	BOD	BOD	MGL	MGLN	MGL	MGL	MGL	MGLN	MGL	MGL	MGCACO3L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
North_Kerry_Landfill Surface water: SWML-10(Eastern Lagoon outlet)	29-Jul-14			19.2						0.07						9		Clear																					
North_Kerry_Landfill Surface water: SWML-10(Eastern Lagoon outlet)	27-Aug-14		Normal	15.9	7.9	280		1.2	49	0.04		16.5			8.9	6		Clear																					
North_Kerry_Landfill Surface water: SWML-10(Eastern Lagoon outlet)	23-Oct-14		Normal	11.2						0.08						5		Clear																					
North_Kerry_Landfill Surface water: SWML-10(Eastern Lagoon outlet)	23-Oct-14		Normal	11.2												3		Clear																					
North_Kerry_Landfill Surface water: SWML-10(Eastern Lagoon outlet)	27-Nov-14			6.0						0.04						2		Clear																					
North_Kerry_Landfill Surface water: SWML-10(Eastern Lagoon outlet)	02-Dec-14			6.8	7.6	234	1.6		29	0.13	0.01	13.2	4.8	0.73	10.5	22	105	sl. coloured/sl. cloudy	0.0815698 94	0.5	0.007	0.005	40.1	<0.7	<0.8	0.012	12	969	202.5	5	969	1.4	3.4	202.5	11.5	1.0	2.0	0.1	<0.8	5
North_Kerry_Landfill Surface water: SWML-10(Eastern Lagoon outlet)	02-Dec-14			6.8	7.5	235	1.1		31	0.12	0.01	13.7	4.7	0.26	10.4	19	104	sl. coloured	0.0551353 27	<0.5	0.006	0.004	33.6	<0.7	<0.8	0.007	7	639	121.3	<3	639	1.1	2.8	121.3	9.7	<1.0	<1.0	0.1	<0.8	<3

Surface Water Results – SWML-11 Downstream from Outfall of Eastern Surface Water Lagoon

Project	Location	Sample Template	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive	Descriptive
				Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearanc	Odour	null sample reason
					NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem	
				Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--	--
				Target	--	--	--	--	--	--	--	--	--	--	--	--
				Min.	--	Varies	--	--	--	--	Varies	--	--	--	--	--
North Kerry Landfill	Surface water: SWML-11	EPA: North kerry: Surface Water monthly	28-Jan-14									10	5.4	Clear	N/D	
North Kerry Landfill	Surface water: SWML-11	EPA:North kerry: Surface water Quarterly	25-Mar-14		< 0.02	7.5	1.2	202	< 10	25.8	11	12.5	8	cloudy	n/d	
North Kerry Landfill	Surface water: SWML-11	null sample reason	23-Apr-14	No Flow												No Flow
North Kerry Landfill	Surface water: SWML-11	null sample reason	15-May-14	No Sample												No Sample
North Kerry Landfill	Surface water: SWML-11	null sample reason	30-Jun-14													Location Dry

SAMPLING POINT	Sampling Point	Sampled Date	Test List	Parameter	Temperature	pH	Conductivity	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Dissolved Oxygen	Suspended Solids	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
				Units	DEG_C	PH	USCM	BOD	MGL	MGLN	MGL	MGL	MGL	MGLN	MGL	MGL	MGCACO3 L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_SWML11	North_Kerry_ Landfill Surface water: SWML-11	27-Nov-14	130_NKL_SURF_MONTH		7.0											2		Clear																					
	North_Kerry_ Landfill Surface water: SWML-11	02-Dec-14	130_NKL_SURF_ANNUAL		6.7	7.5	233	1.7	45	0.09	0.02	13.6	4.6	0.25	10.4	66	105	sl. coloured/sl. cloudy	0.061445467	0.5	0.006	0.004	35.6	<0.7	<0.8	0.009	9	812	169.4	3	812	1.3	3.0	169.4	10.4	38.3	<1.0	0.1	<0.8	3

Surface Water Results – SWML-E1 Outfall of Northern Surface Water Lagoon

Project	Location	Sample Template	Sample Date	Comments	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	mg/l	Degrees C	Descriptive	Descriptive	mg/l
				Parameter	Ammonium	pH	BOD (5day	Conductivit	Chemical C	Chloride	Dissolved C	Suspended	Temperatu	Appearance	Odour	Total Organ
					NH4	Physchem	O2	Physchem	O2	Cl	O2	Physchem	Physchem		Physchem	C
				Max.	Varies	Varies	--	Varies	--	Varies	Varies	--	--	--	--	--
				Target	--	--	--	--	--	--	--	--	--	--	--	--
				Min.	--	Varies	--	--	--	--	Varies	--	--	--	--	--
North Kerry Landfill	Surface water: SWML-E1(Northern Lagoon)	EPA: North kerry: Surface Water monthly	28-Jan-14		0.05							13	5.6	Clear	N/D	
North Kerry Landfill	Surface water: SWML-E1(Northern Lagoon)	EPA: North kerry: Surface Water monthly	27-Feb-14		0.02							217	6.7	Slight sediment	N/D	
North Kerry Landfill	Surface water: SWML-E1(Northern Lagoon)	EPA:North kerry: Surface water Quarterly	25-Mar-14		0.02	7.6	1.2	248	< 10	32.3	10.8	148	7.7	cloudy/sediment	n/d	
North Kerry Landfill	Surface water: SWML-E1(Northern Lagoon)	EPA:North kerry: Surface water Quarterly	25-Mar-14		0.03	7.8	1.2	247	< 10	32.4	10.8	197	8.1	cloudy/sediment	n/d	1.1
North Kerry Landfill	Surface water: SWML-E1(Northern Lagoon)	EPA: North kerry: Surface Water monthly	23-Apr-14		0.06							8	13	Clear	N/D	
North Kerry Landfill	Surface water: SWML-E1(Northern Lagoon)	EPA: North kerry: Surface Water monthly	15-May-14		< 0.02							41	17.8	Cloudy	N/D	
North Kerry Landfill	Surface water: SWML-E1(Northern Lagoon)	EPA: North kerry: Surface Water monthly	30-Jun-14		0.07						8.7	11.6	18.7	Cloudy	N/D	

SAMPLING POINT	Sampled Date	Test List	Parameter	Odour	Temperature	pH	Conductivity	B.O.D.	B.O.D.	C.O.D.	Ammonia	Phosphorus (MRP)	Chloride	Sulphate	TON	Dissolved Oxygen	Suspended Solids	Alkalinity	Visual Inspection	Hg	As	B	Ba	Ca	Cd	Cr	Cu	Dissolved Cu	Dissolved Fe	Dissolved Mn	Dissolved Zn	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Se	Zn
			Units	NONE	DEG_C	PH	USCM	BOD	BOD	MGL	MGLN	MGL	MGL	MGL	MGLN	MGL	MGL	MGCACO3L	NONE	UGL	UGL	MGL	MGL	MGL	UGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL	MGL	MGL	UGL	MGL	UGL	UGL	UGL	UGL	UGL
NORTH_KERRY_LANDFILL_E1	16-Sep-14	130_NKL_SURF_QUART			12.6	7.8	142				<0.02					9.2	12		satisfactory																					
NORTH_KERRY_LANDFILL_SWMLE1	29-Jul-14	130_NKL_SURF_MONTH			18.4						0.04						4		Clear																					
	27-Aug-14	130_NKL_SURF_QUART		Normal	16.3	8.6	204		2.0	33	0.02		16.6			10.4	8		Clear																					
	23-Oct-14	130_NKL_SURF_MONTH		Normal	11.2						<0.02						12		Clear																					
	27-Nov-14	130_NKL_SURF_MONTH			6.5												8		Clear																					
	02-Dec-14	130_NKL_SURF_ANNUAL		Normal	7.5	7.8	189	1.1		11	0.02	0.01	12.9	4.6	0.46	10.4	13	76	Clear	0.042742775	<0.5	0.005	0.005	30.1	<0.7	<0.8	0.011	11	198	159.7	3	198	1.2	2.6	159.7	10.5	<1.0	2.2	0.2	<0.8	3

Appendix E: Engine Stack Monitoring Testing

Report Title	Air Emissions Compliance Monitoring Emissions Report
Company address	Air Scientific Ltd., 32 DeGranville Court, Dublin road, Trim, Co. Meath
Stack Emissions Testing Report Commissioned by	B9 Power
Facility Name	North Kerry Landfill Site, Muingnaminnane, Tralee, Co. Kerry
Contact Person	Ruth Baker
EPA Licence Number	W0001-04
Licence Holder	North Kerry Landfill, E1
Stack Reference Number	E1
Dates of the Monitoring Campaign	23/01/2015
Job Reference Number	NOKETL1230115 / 2015020
Report Written By	Dr. John Casey
Report Approved by	Dr. Brian Sheridan
Stack Testing Team	Dr. John Casey
Report Date	20/02/2015
Report Type	Test Report Compliance Monitoring
Version	1
Signature of Approver	Brian Sheridan Technical Manager

Contents

1. Executive Summary

I. Monitoring Objectives

Overall Aim of the monitoring Campaign

The aim of the monitoring campaign was to demonstrate compliance with a set of emission limit values as specified in the site licence.

Special Requirements

There were no special requirements.

Target Parameters

Total Particulate Matter (TPM)
Carbon Monoxide (CO)
Oxides of Nitrogen (NOx) as NO_2
Sulphur Dioxide (SO_2)
Stack Gas Temperature
Volume ($m^3.h^{-1}$)

Emission Limit Values

Emission Limit Values / Mass Emissions Limit Values	$mg.m^{-3}$	$kg.h^{-1}$
TPM	130	-
CO	-	-
NOx as NO_2	500	-
SO_2	-	-
Stack Gas Temperature	-	-
Volume ($m^3.h^{-1}$)	3,000	-

Reference Conditions

Reference Conditions	Value
Oxygen Reference %	5
Temperature °C	273.15
Total Pressure kPa	101.3
Moisture %	Yes

Executive Summary

Overall Results

	Concentration					Mass Emission	
Parameter	**Units**	**Result**	**MU +/-**	**Limit**	**Compliant**	**Units**	**Result**
Total Particulate Matter (TPM)	$mg.m^{-3}$	1.78	0.54	130	Yes	$kg.h^{-1}$	0.001
Carbon Monoxide (CO)	$mg.m^{-3}$	1556.51	101.46	-	Yes	$kg.h^{-1}$	1.095
Oxides of Nitrogen (NOx) as NO_2	$mg.m^{-3}$	488.89	39.31	500	Yes	$kg.h^{-1}$	0.344
Sulphur Dioxide (SO_2)	$mg.m^{-3}$	509.01	33.75	-	Yes	$kg.h^{-1}$	0.358
Oxygen (%)	% v/v	8.88	0.15	-	N/A	-	-
Stack Gas Temperature	K	718.15	-	-	N/A	-	-
Stack Gas Velocity	$m.s^{-1}$	24.22	-	-	N/A	-	-
Volumetric Flow Rate	$m^3.h^{-1}$	932	-	-	N/A	-	-
Volumetric Flow Rate (Ref.)	$m^3.h^{-1}$	703	-	3,000	Yes	-	-

Accreditation details

Air Scientific Limited	INAB319T
External Analytical Laboratory	UKAS1549
Other	-

Executive Summary

Monitoring Dates & Times

Parameter	Run	Location ID	Sampling Dates	Sampling Time On	Sampling Time Off	Duration (mins.)
Total Particulate Matter (TPM)	Run 1	E1	23/01/2015	10:40:00	11:10:00	00:30:00
	Run 2					
	Run 3					
Carbon Monoxide (CO)	Run 1	E1	23/01/2014	09:55:00	10:34:00	00:39:00
	Run 2					
	Run 3					
Oxides of Nitrogen (NOx) as NO_2	Run 1	E1	23/01/2014	09:55:00	10:34:00	00:39:00
	Run 2					
	Run 3					
Sulphur Dioxide (SO_2)	Run 1	E1	23/01/2015	9:55:00	10:34:00	00:39:00
	Run 2					
	Run 3					
Oxygen (%)	Run 1	E1	23/01/2014	09:55:00	10:34:00	00:39:00

Executive Summary

Process details

Parameter	
Process status	Normal
Capacity (per/hour) (if applicable)	N/a
Continuous or Batch Process	Continuous
Feedstock	LFG
Abatement System	No
Abatement Systems Running Status	N/A
Fuel	LFG
Plume Appearance	Yes
Other information	None

Executive Summary

Monitoring, Equipment & Analytical Methods

	Monitoring				Analysis	
Parameter	**Standard**	**Technical Procedure**	**Accredited Testing**	**Testing Lab**	**Analytical Technique**	**Analysis Lab**
Total Particulate Matter (TPM)	EN13284-1:2002	SOP 2000	Yes	AirSci	Gravimetric	SAL
Carbon Monoxide (CO)	EN15058:2006	SOP 2004	Yes	AirSci	NCIR By Horiba PG-250	AirSci
Oxides of Nitrogen (NOx)	EN14792:2006	SOP 2002	Yes	AirSci	Chemiluminescence	AirSci
Sulphur Dioxide (SO2)	TGN 21	SOP 2012	Yes	AirSci	NDIR Absorption	AirSci
Oxygen (%)	EN14789:2005	SOP 2008	Yes	AirSci	Paramagnetic	AirSci
Stack Gas Temperature	EN16911:2013	SOP 2005	Yes	AirSci	Thermocouple	AirSci
Stack Gas Velocity	EN16911:2013	SOP 2005	Yes	AirSci	Pitot tubes	AirSci

List of Equipment

ID	Item of Equipment	Manufacturer	Serial No.
ASLTM12EQ517	Testo 400 Gas Pressure Vacumn and Flow	Testo	00828828/305
ASLTM12EQ520	Buhler Sample Gas Cooler	Buhler Technologies	100063602044367-001
ASLTM13EQ501	Stanley 8m Measuring Tape	Stanley	33-726
ASLTM13EQ502	6" Vernier Caliper	MEDID	N/A
ASLTM13EQ504	Horiba PG2500 Portable Flue Gas Analzer	Horiba	41432840053
ASLTM13EQ505	S TYPE PITOT TUBE	Tecora	1347
ASLTM13EQ508	3 metre industrial heated sample line (Temp controller box 1 & 2)	Neptech	ML-2
ASLTM14EQ512	GemRed Electronic Level 0 to 180 Degrees	GemRed	8088
ASLTM14EQ513	ISO Stack Sampling Machine and associated equipment	TCR Tecora	070205976 & 049039P

Sampling Deviations

Parameter	Deviation
Standard ID	EN16911 - in accordance with MID6911-1
Standard ID	-
Standard ID	-
Standard ID	-

Reference Documents

Risk Assessment (RA)	SOP1011
Site Review (SR)	SOP1015
Site Specific Protocol (SSP)	SOP1015

Executive Summary

Suitability of sampling location

General Information	Value
Permanent/Temporary	Temporary
Inside/ Outside	Outside

Platform Details		
Irish EPA Technical Guidance Note AG1 / BS EN 15259 Platform Requirements	**Value**	**Comment**
Sufficient Working area to manipulate probe and measuring instruments	Yes	-
Platform has 2 handrails (approx. 0.5m & 1.0 m high)	Yes	-
Platform has vertical base boards (approx. 0.25 m high)	Yes	-
Platform has chains / self closing gates at top of ladders	Yes	-
There are no obstructions present which hamper insertion of sampling equipment	No	-
Safe Access Available	Yes	-
Easy Access Available	Yes	-

Sampling Location / Platform Improvement Recommendations
None

BSEN 15259 Homogeneity Test Requirements
1: There is no requirement to perform a BSEN15259 Homogenity Test on this stack
E.g. Select Option **1: There is no requirement to perform a BSEN15259 Homogenity Test on this stack** **2: Test results were obtained from previous Homogeneity test carried out by ASL** **3: Test results were obtained from previous Homogeneity test carried out by Alternative contractor** **4: Other: Enter Description**

Stack diagram

APPENDICES

II. *Appendix I Monitoring Personnel & Equipment*

Stack Emissions Monitoring Personnel

Team Leader	**Name**	John Casey
	Qualifications	PhD. (Eng.), MSc. (Agr.), B. Agr. Sc.
	System approval	Air Scientific Limited Approved
		-

III. *Appendix II Stack Details & flow characteristics*

Preliminary stack survey calculations

General Stack Details		
Stack details	**Units**	**Value**
Date of survey		23/01/2015
Time of survey		09:40
Type		Circular
Stack Diameter / Depth, D	m	0.20
Stack Width, W	m	-
Average Stack Gas Temp., Ta	C	445
Average Static Pressure, P static	kPa	0.12
Average Barometric Pressure, Pb	kPa	100.1
Type of Pitot		S
Are Water Droplets Present ?		No
Average Pitot Tube Calibration Coeff, Cp		0.84
Negative flow		No
Highly homogeneous flow stream/gas velocity		Yes

Sample Port Size	mm	100
Initial Pitot Leak Check	Pa	350
Final Pitot Leak Check	Pa	350
Orientation of Duct		Vertical
Pitot Tube Cp		0.998
Number of Lines Available		2
Number of Lines Used		2

Sampling Line A						
Point	**Distance to duct (m)**	**Pa**	**Temp °C**	**Velocity (m/s)**	**Oxygen (%)**	**Angle of Swirl**
1	0.01	-	-	-	-	-
2	0.05	199	-	24.0	-	<15
3	0.15	205	-	24.4	-	<15
4	0.19	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
Average	-	202.00	-	24.22	-	<15
Min	-	199	-	24.04	-	<15
Max	-	205	-	24.40	-	<15

Sampling Line B						
Point	**Distance to duct (m)**	**Pa**	**Temp °C**	**Velocity (m/s)**	**Oxygen (%)**	**Angle of Swirl**
1	0.01	-	-	-	-	-
2	0.05	203	-	24.3	-	<15
3	0.15	195	-	23.8	-	<15
4	0.19	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
Average	-	199.00	-	24.04	-	<15
Min	-	195	-	23.80	-	<15
Max	-	203	-	24.28	-	<15

Component	Conc. ppm	Conc. Dry % v/v	Conc. Wet % v/v	Molar Mass
Carbon Dioxide CO_2	-	9.1	-	44.01
Oxygen O_2	-	8.9	-	32
Nitrogen N_2	-	82	-	28.1
Moisture (H_2O)	-	-	9.6	18.02

Reference Conditions	Units	Numbers
Temperature	°C	273.15
Total Pressure	kPa	101.3
Moisture	%	-
Oxygen (Dry)	%	5

Stack Gas Composition & Molecular Weights								
Component	**Molar Mass M**	**Density Kg/m^3 p**	**Conc. Dry % v/v**	**Dry Volume Fraction r**	**Dry Conc. kg/m^3 pi**	**Conc. wet % v/v**	**Wet Volume Fraction r**	**Wet Conc.kg/m^3 pi**
Carbon Dioxide CO_2	44.01	1.96	9.1	0.091	0.18	8.23	0.08	0.16
Oxygen O_2	32	1.43	8.9	0.089	0.13	8.05	0.08	0.11
Nitrogen N_2	28.1	1.25	82	0.82	1.03	74.13	0.74	0.93
Moisture (H_2O)	18.02	0.80	-	-	-	9.6	0.10	0.08
	-	-	-	-	-	-	-	-
where p=M/22.41	-	-	-	-	-	-	-	-
pi = r x p	-	-	-	-	-	-	-	-

Calculation of Stack Gas Densities		
Determinand	**Units**	**Result**
Dry Density (STP), P STD	$kg.m^{-3}$	1.334
Wet Density (STP), P STW	$kg.m^{-3}$	1.288
Dry Density (Actual), P Actual	$kg.m^{-3}$	0.501
Average wet Density (Actual), P ActualW	$kg.m^{-3}$	0.484
Where		
P STD = sum of component concentrations, kg/m3 (excluding water vapour)	-	-
P STW = (P STD + pi of H2O) / (1 + (pi of H2O / 0.8036))	-	-
P actual = P STD x (T STP / (P STP)) x (Pa / Ta)	-	-
P actual W (at each sampling point) = P STW x (Ts / Ps) x (Pa / Ta)	-	-

Sampling Plane Validation Criteria	Value	Units	Requirement	Compliance	Method
Lowest Differential Pressure	199	Pa	>5 Pa	Yes	EN16911:2013
Lowest Gas Velocity	24.04	m/s	-	N/A	-
Highest Gas Velocity	24.40	m/s	-	N/A	-
Ratio of Above	1.01	:1	<3:1	Yes	EN16911:2013
Mean Velocity	24.22	m/s	-	N/A	-
Angle of flow with regard to duct axis	<15	degrees	< 15	Yes	EN16911:2013
No local negative flow	No	-	-	Yes	-
Homogeneous flow stream/gas velocity	Yes	-	-	Yes	-

Calculation of stack Gas Velocity, V	
Velocity at Traverse Point, V = Kcp * Sqroot ((2 * DP) / Density)	-
Where	
Kpt = Pitot tube calibration coefficient	0.84
Compressibility correction factor, assumed at a constant 0.998	0.998

Gas Volumetric Flowrate	Units	Result
Gas Volumetric Flow Rate (Actual)	$m^3.h^{-1}$	2740
Gas Volumetric Flow Rate (STP, Wet)	$m^3.h^{-1}$	1031
Gas Volumetric Flowrate (STP, Dry)	$m^3.h^{-1}$	932
Gas Volumetric Flowrate REF to Oxygen	$m^3.h^{-1}$	703

IV. Appendix III Individual parameter sampling details and results

Total Particulate Matter : Sampling details and results

Run 1			**Time On**	10:40:00	-
Stack ID	E1	-	**Time Off**	11:10:00	-
Filter ID	304	-	**Uncertainty Data**	-	-
Start Dry Gas Meter	-	Nm3	**Temperature at Pump**	12	Deg C
Finish Dry Gas Meter	-	Nm3	**Pressure at Pump**	100.1	kPa
Average Stack Temperature	445	degrees	**Air Volume at Pump**	0.4512	m^3
Moisture Content	9.60	%	**Humidity at Pumps**	0.1	%
Stack Flow Rate STP, Dry	932	m^3h^{-1}	**Filter Weight**	0.28	mg
Volume of Air Sampled	0.4301	$m^{3\ (VgN)}$	**Front End Weight**	0.3	mg
Balance Calibration	**Weight**				
300.0	-	g	-	-	-
500.0	-	g	-	-	-
1000.0	-	g	-	-	-
Inpinger Weights	**Initial**	**Final**	**Difference**		
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-
4	-	-	-	-	-
Volume of Air Sampled	-	Nm3	0	-	-
Moisture Content (EN 14790)	-	%	-	-	-
Leak Check Results	**Result**	-	**% Leak**		
Before Blank	0.1	l/min	0.6	-	-
After Blank	0.1	l/min	0.6	-	-
Before Sample 1	0.1	l/min	0.6	-	-
After Sample 1	0.1	l/min	0.6	-	-
Average Flow Rate	16	l/min	0.6	-	-
Standard Maximum	0.32	l/min	2%	-	-
Back Pressure	-	bar	-	-	-
Leak check acceptable	Yes	-	Yes/No	-	-
Water droplets present	No	-	Yes/No	-	-
Standard Criteria to be Met	**Result**	**Standard Requirement**			
Angle of Flow	3	<15 Degrees			
Negative Flow in the Stack	None	None			
Pitot Pressure Difference	19	>5Pa			
Ratio of Flow Measurement	1.48	<3:1			
Pitot Tube Leak Check	**Result**				
Positive Pressure	Pass	-			
Negative Pressure	Pass	-			

Number of Ports	1	2			
Straight length before sample point	> 5	> 5 Hydraulic Diameters			
Straight length after sample point	> 5	> 5 Hydraulic Diameters			
Sample Calculations	-	-			
Blank (Filter and Front Wash Combined)	0.35	mg			
Sample 1 (Filter and Front Combined)	0.58	mg			
Volume of Air Sampled	0.43	m^3			
Blank Result	0.81	$mg.m^{-3}$			
Sample Result	1.35	$mg.m^{-3}$			
Emission Limit Value	130	$mg.m^{-3}$			
Blank as Percentage of ELV	0.6	%	**Standard Requirement**	**<10% ELV**	-
Isokinetic Criterion Compliance					
Isokinetic Variation	%	0.7	-	-	-
Allowable IsoKinetic Range	%	95-115	-	-	-
Iso Kineticity Acceptable	-	Yes	-	-	-

Total Particulates Quality Assurance

Stack ID	E1	-
Parameter	**Units**	**Run 1**
Sampling Times	-	10:40:00
Sampling dates	-	23/01/2015
Sampling Device	-	Iso Stack Basic
Volume Sampled (REF.)	m3	0.4301
Filter ID Number	-	304
Probe rinse ID	-	304W
Total Filter Mass	mg	0.3
Probe Rinse Solids Mass	mg	0.3
Total Mass Collected	mg	0.58
General information		
Standard	ISEN13284-1	**Run 1**
Technical Procedure	-	2000
Probe Material	-	Titanium
Filter Housing	-	Titanium
Positioning of Filter	-	In-stack
Filter Size and Material	-	47
Number of Sampling lines used	-	2
Number of Sampling Points used	-	8

Carbon Monoxide Quality Assurance

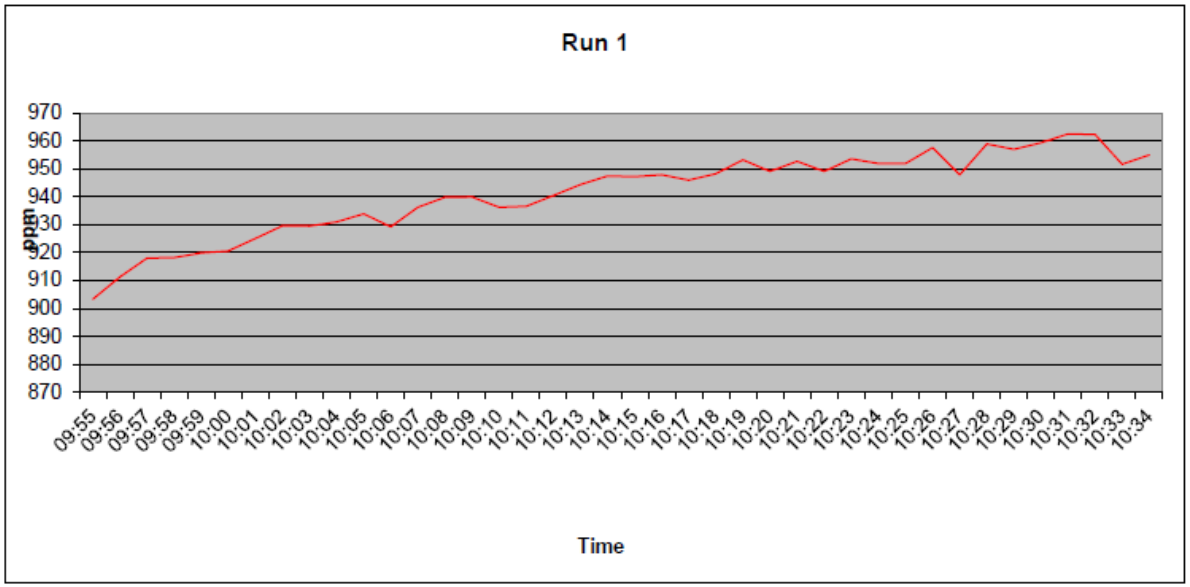
Sampling Details		
Stack ID	E1	-
	Units	**Run 1**
Parameter		
Sampling Times	-	09:55
Sampling Dates	-	23/01/2015
Instrument Range	ppm	1000
Span Gas Value	ppm	598
Acceptable Gas Range	-	Yes
Quality Assurance	**Units**	**Run 1**
Conditioning Unit Temperature	C	2
Average Temperature	< C	2
Allowable Temperature	-	4
Temperature Acceptable	-	Yes
Pump flow rate	l/min.	0.4
Zero Drift	Units	**Run 1**
Zero Down Sampling Line (Pre)	ppm	0.4
Zero Down Sampling Line (Post)	ppm	0.9
Zero drift	ppm	0.5
Allowable Zero Drift	ppm	12
Zero Drift Acceptable	-	Yes
Span Drift	Units	**Run 1**
Span Down Sampling Line (Pre)	ppm	600
Span Down Sampling Line (Post)	ppm	603
Span Drift	ppm	3
Allowable Span Drift	ppm	12
Span Drift Acceptable (Y/N)	-	Yes
Leak Check		
Span Gas Conc.	ppm	598
Recorded Conc. down Line	ppm	600
Leak check acceptable (< 2%)	(Y/N)	Yes
Test Conditions	**Units**	**Run 1**
Run Ambient Temperature Range	C	8

Carbon Monoxide Results & Sampling details

Parameter	Units	Run 1
Concentration	$mg.m^{-3}$	1176.63
Uncertainty	$mg.m^{-3}$	101.46
Mass Emission	kg.h	1.09

General Sampling Information	
Parameter	**Value**
Standard	EN15058
Technical Procedure	SOP2004
Probe material	SS
Filtration Type/Size	PTFE
Heated Head Filter Used	Yes
Heated Line Temperature	190
Span Gas Reference Number	ASLTM14ING522
Span Gas Expiry Date	Jan-17
Span Gas Start Pressure (bar)	60
Gas Cylinder Concentration (ppm)	598
Span Gas Uncertainty (%)	<2
Zero Gas Type	Nitrogen
Number of Sampling Lines Used	1
Number of Sampling Points Used	1
Sample Point I.D's	E1
Reference Conditions	
Temperature (K)	273.15
Pressure (kPa)	101.3
Gas (Wet or Dry)	Dry
Oxygen	5

Carbon Monoxide Trend



Carbon Monoxide Measurement Uncertainty

	Units	Run 1
Measured Quantities		
Certified Range of Analyser	ppm	1.36 to 1000
Operational Range of Analyser	ppm	1000
Measured Reading	ppm	941.30
Measured Quantities	Units	Run 1
Nonlinearity	%	0.9
Temperature Dependent Zero drift	%	0.14
Temperature Dependent Span drift	%	-0.12
Cross-sensitivity	%	0.08
Leak	%	0
Calibration Gas Uncertainty	%	<2
Parameter	Units	Run 1
Combined uncertainty	$mg.m^{-3}$	15.11
Expanded uncertainty	$mg.m^{-3}$	30.22
Uncertainty corrected to std conds.	$mg.m^{-3}$	101.46
Expanded uncertainty expressed with a level of confidence of 95%	% of ELV	--
Expanded uncertainty expressed with a level of confidence of 95%	$mg.m^{-3}$	101.46
Expanded uncertainty expressed with a level of confidence of 95%	% of value	8.62
Requirement in standard is for uncertainty to be < 10% at ELV at standard conditions		

Oxides of Nitrogen Quality Assurance

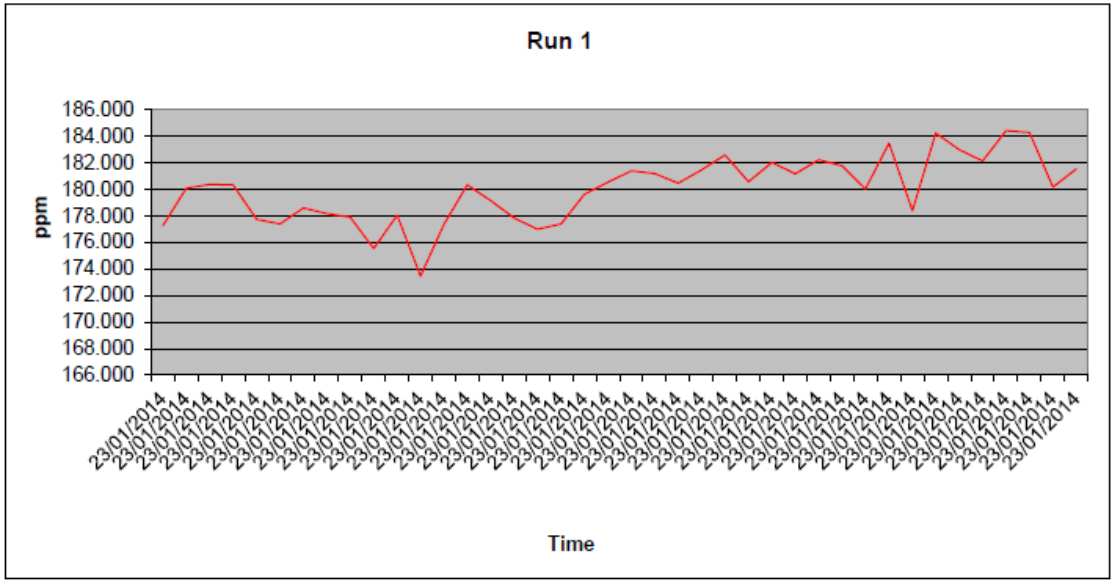
Sampling Details		
Stack ID	E1	-
	Units	**Run 1**
Parameter		
Sampling Times	-	09:55
Sampling Dates	-	23/01/2015
Instrument Range	ppm	250
Span Gas Value	ppm	158
Acceptable Gas Range	-	Yes
Quality Assurance	**Units**	**Run 1**
Conditioning Unit Temperature	C	2
Average Temperature	< C	2
Allowable Temperature	-	4
Temperature Acceptable	-	Yes
Pump flow rate	l/min.	0.4
Zero Drift	Units	**Run 1**
Zero Down Sampling Line (Pre)	ppm	0.3
Zero Down Sampling Line (Post)	ppm	0.9
Zero drift	ppm	0.6
Allowable Zero Drift	ppm	3.166
Zero Drift Acceptable	-	Yes
Span Drift	Units	**Run 1**
Span Down Sampling Line (Pre)	ppm	158.3
Span Down Sampling Line (Post)	ppm	158.9
Span Drift	ppm	0.6
Allowable Span Drift	ppm	3.166
Span Drift Acceptable (Y/N)	-	Yes
Leak Check		
Span Gas Conc.	ppm	158
Recorded Conc. down Line	ppm	158.3
Leak check acceptable (< 2%)	(Y/N)	Yes
Test Conditions	**Units**	**Run 1**
Run Ambient Temperature Range	C	8
NOx Converter Efficiency	%	95.7

Oxides of Nitrogen Results & Sampling details

Parameter	Units	Run 1
Concentration	$mg.m^{-3}$	369.57
Uncertainty	$mg.m^{-3}$	39.31
Mass Emission	$kg.h^{-1}$	0.34

General Sampling Information	
Parameter	**Value**
Standard	EN14792
Technical Procedure	SOP2002
Probe material	SS
Filtration Type/Size	PTFE
Heated Head Filter Used	Yes
Heated Line Temperature	190
Date & Result of last converter check	95.7 04/12/2014
Span Gas Reference Number	ASLTM15ING511
Span Gas Expiry Date	Nov-15
Span Gas Start Pressure (bar)	50
Gas Cylinder Concentration (ppm)	158
Span Gas Uncertainty (%)	<2
Zero Gas Type	Nitrogen
Number of Sampling Lines Used	1
Number of Sampling Points Used	1
Sample Point I.D's	E1
Reference Conditions	
Temperature (K)	273.15
Pressure (kPa)	101.3
Gas (Wet or Dry)	Dry
Oxygen	5

Oxides of Nitrogen Trend



Oxides of Nitrogen Measurement Uncertainty

Measured Quantities	**Units**	**Run 1**
Nonlinearity	%	1.4
Temperature Dependent Zero drift	%	-0.04
Temperature Dependent Span drift	%	-0.25
Cross-sensitivity	%	0.5
Leak	%	0
Calibration Gas Uncertainty	%	<2
Mass Flow Controllers (Dilution) Uncertainty	%	<1
NOx Converter Efficiency	%	95.5
Parameter	**Units**	**Run 1**
Combined uncertainty	$mg.m^{-3}$	10.25
Expanded uncertainty	$mg.m^{-3}$	20.50
Uncertainty corrected to std conds.	$mg.m^{-3}$	39.31
Expanded uncertainty expressed with a level of confidence of 95%	% of ELV	7.86
Expanded uncertainty expressed with a level of confidence of 95%	$mg.m^{-3}$	39.31
Expanded uncertainty expressed with a level of confidence of 95%	% of value	10.64
Requirement in standard is for uncertainty to be < 10% at ELV at standard conditions		

Sulphur Dioxide Quality Assurance

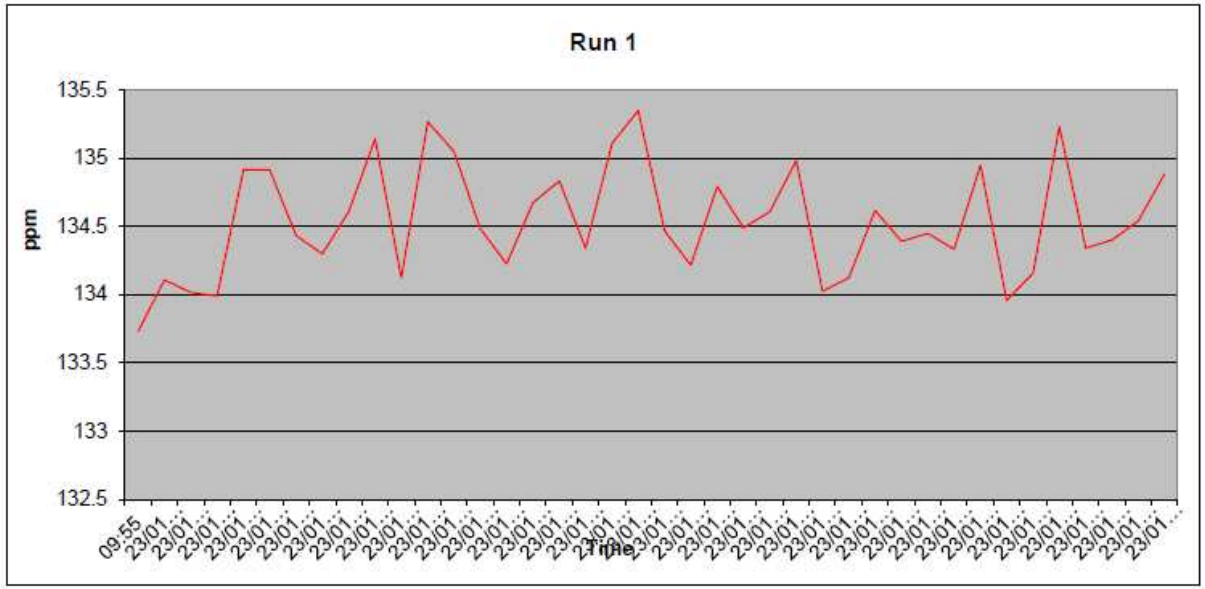
Sampling Details		
Stack ID	E1	-
	Units	**Run 1**
Parameter		
Sampling Times	-	09:55
Sampling Dates	-	23/01/2015
Instrument Range	ppm	500
Span Gas Value	ppm	404
Acceptable Gas Range	-	Yes
	-	-
Quality Assurance	**Units**	**Run 1**
Conditioning Unit Temperature	C	2
Average Temperature	< C	2
Allowable Temperature	-	4
Temperature Acceptable	-	Yes
Pump flow rate	l/min.	0.4
	-	-
Zero Drift	Units	**Run 1**
Zero Down Sampling Line (Pre)	ppm	1.1
Zero Down Sampling Line (Post)	ppm	3.1
Zero drift	ppm	3
Allowable Zero Drift	ppm	20.3
Zero Drift Acceptable	-	Yes
	-	-
Span Drift	Units	**Run 1**
Span Down Sampling Line (Pre)	ppm	406
Span Down Sampling Line (Post)	ppm	409
Span Drift	ppm	3
Allowable Span Drift	ppm	20.3
Span Drift Acceptable (Y/N)	-	Yes
	-	-
Leak Check		
Span Gas Conc.	ppm	404
Recorded Conc. down Line	ppm	406
Leak check acceptable (< 2%)	(Y/N)	Yes
	-	-
Test Conditions	**Units**	**Run 1**
Run Ambient Temperature Range	C	8

Sulphur Dioxide Results & Sampling details

Parameter	Units	Run 1
Concentration	$mg.m^{-3}$	384.78
Uncertainty	$mg.m^{-3}$	33.75
Mass Emission	kg.h	0.36

General Sampling Information	
Parameter	**Value**
Standard	TGN 21
Technical Procedure	2012
Probe material	SS
Filtration Type/Size	PTFE
Heated Head Filter Used	Yes
Heated Line Temperature	190
Date & Result of last converter check	-
Span Gas Reference Number	ASLTM14ING506
Span Gas Expiry Date	Jan-16
Span Gas Start Pressure (bar)	20
Gas Cylinder Concentration (ppm)	404
Span Gas Uncertainty (%)	<2
Zero Gas Type	N
Number of Sampling Lines Used	1
Number of Sampling Points Used	1
Sample Point I.D's	E1
Reference Conditions	
Temperature (K)	273.15
Pressure (kPa)	101.3
Gas (Wet or Dry)	Dry
Oxygen	5

Sulphur Dioxide Trend



Sulphur Dioxide Measurement Uncertainty

	Units	Run 1
Measured Quantities		
Certified Range of Analyser	ppm	2.14 to 1000
Operational Range of Analyser	ppm	500
Measured Reading	ppm	134.54
Measured Quantities	**Units**	**Run 1**
Nonlinearity	%	0.8
Temperature Dependent Zero drift	%	0.8
Temperature Dependent Span drift	%	2
Cross-sensitivity	%	1.5
Leak	%	0
Calibration Gas Uncertainty	%	<2 %
Parameter	**Units**	**Run 1**
Combined uncertainty	$mg.m^{-3}$	5.46
Expanded uncertainty	$mg.m^{-3}$	10.92
Uncertainty corrected to std conds.	$mg.m^{-3}$	33.75
Expanded uncertainty expressed with a level of confidence of 95%	% of ELV	--
Expanded uncertainty expressed with a level of confidence of 95%	$mg.m^{-3}$	33.75
Expanded uncertainty expressed with a level of confidence of 95%	% of value	8.77
Requirement in standard is for uncertainty to be < 10% at ELV at standard conditions		

Appendix F: Flare Stack Monitoring Results

Report Title	Air Emissions Compliance Monitoring Emissions Report
Company address	Air Scientific Ltd., 32 DeGranville Court, Dublin road, Trim, Co. Meath
Stack Emissions Testing Report Commissioned by	B9 Power
Facility Name	North Kerry Landfill Site, Muingnaminnane, Tralee, Co. Kerry
Contact Person	Ruth Baker
EPA Licence Number	W0001-04
Licence Holder	North Kerry Landfill, F1
Stack Reference Number	F1
Dates of the Monitoring Campaign	23/01/2015
Job Reference Number	NOKETL1230115 / 2015020
Report Written By	Dr. John Casey
Report Approved by	Dr. Brian Sheridan
Stack Testing Team	Dr. John Casey
Report Date	20/02/2015
Report Type	Test Report Compliance Monitoring
Version	1
Signature of Approver	Brian Sheridan Technical Manager

Contents

1. Executive Summary

I. Monitoring Objectives

Overall Aim of the monitoring Campaign

The aim of the monitoring campaign was to demonstrate compliance with a set of emission limit values as specified in the site licence.

Special Requirements

There were no special requirements.

Target Parameters

Carbon Monoxide (CO)
Oxides of Nitrogen (NOx) as NO_2
Total Volatile Organic Carbon (TOC)
Sulphur Dioxide (SO_2)
Stack Gas Temperature
Volume ($m^3.h^{-1}$)

Emission Limit Values

Emission Limit Values / Mass Emissions Limit Values	$mg.m^{-3}$	$kg.h^{-1}$
CO	-	-
NOx as NO_2	150	-
TOC	10	-
SO_2	-	-
Stack Gas Temperature	-	-
Volume ($m^3.h^{-1}$)	3,000	-

Reference Conditions

Reference Conditions	Value
Oxygen Reference %	3
Temperature °C	273.15
Total Pressure kPa	101.3
Moisture %	Yes

Executive Summary

Overall Results

	Concentration					Mass Emission	
Parameter	**Units**	**Result**	**MU +/-**	**Limit**	**Compliant**	**Units**	**Result**
Carbon Monoxide (CO)	$mg.m^{-3}$	8.56	2.72	-	N/A	$kg.h^{-1}$	-
Oxides of Nitrogen (NOx) as NO_2	$mg.m^{-3}$	93.73	7.50	150	Yes	$kg.h^{-1}$	-
Total Volatile Organic Carbon (VOC)	$mgC.m^{-3}$	3.64	0.60	10	Yes	$kg.h^{-1}$	-
Sulphur Dioxide (SO_2)	$mg.m^{-3}$	81.52	6.75	-	N/A	$kg.h^{-1}$	-
Oxygen (%)	% v/v	7.76	0.15	-	N/A	-	-
Stack Gas Temperature	K	1293.15	-	-	N/A	-	-

Accreditation details

Air Scientific Limited	INAB319T
External Analytical Laboratory	-
Other	-

Executive Summary

Monitoring Dates & Times

Parameter	Run	Location ID	Sampling Dates	Sampling Time On	Sampling Time Off	Duration (mins.)
Carbon Monoxide (CO)	Run 1	F1	23/01/2014	12:24:00	12:53:00	00:30:00
	Run 2					
	Run 3					
Oxides of Nitrogen (NOx) as NO_2	Run 1	F1	23/01/2014	12:24:00	12:53:00	00:30:00
	Run 2					
	Run 3					
Total Volatile Organic Carbon (VOC)	Run 1	F1	23/01/2014	12:25:31	12:54:31	00:30:00
	Run 2					
	Run 3					
Sulphur Dioxide (SO_2)	Run 1	F1	23/01/2015	12:24:00	12:53:00	00:30:00
	Run 2					
	Run 3					
Oxygen (%)	Run 1	F1	23/01/2014	12:24:00	12:53:00	00:30:00

Process details

Parameter	
Process status	Normal
Capacity (per/hour) (if applicable)	N/a
Continuous or Batch Process	Continuous
Feedstock	LFG
Abatement System	No
Abatement Systems Running Status	N/A
Fuel	LFG
Plume Appearance	Yes
Other information	None

Executive Summary

Monitoring, Equipment & Analytical Methods

	Monitoring				Analysis	
Parameter	**Standard**	**Technical Procedure**	**Accredited Testing**	**Testing Lab**	**Analytical Technique**	**Analysis Lab**
Carbon Monoxide (CO)	EN15058:2006	SOP 2004	Yes	AirSci	NCIR By Horiba PG-250	AirSci
Oxides of Nitrogen (NOx)	EN14792:2006	SOP 2002	Yes	AirSci	Chemiluminescence	AirSci
Total Volatile Organic Carbon (TOC)	EN12619:2013	SOP 2009	Yes	AirSci	Flame Ionisation Detection	AirSci
Sulphur Dioxide (SO2)	TGN 21	SOP 2012	Yes	AirSci	NDIR Absorption	AirSci
Oxygen (%)	EN14789:2005	SOP 2008	Yes	AirSci	Paramagnetic	AirSci
Stack Gas Temperature	EN16911:2013	SOP 2005	Yes	AirSci	Thermocouple	AirSci
Stack Gas Velocity	EN16911:2013	SOP 2005	Yes	AirSci	Pitot tubes	AirSci

List of Equipment

ID	Item of Equipment	Manufacturer	Serial No.
ASLTM12EQ511	3010 MiniFID	Signal Instruments	17852
ASLTM12EQ518	5 metre heated line 342 470 (Only used with 3010)	Signal Instruments	16838
ASLTM12EQ520	Buhler Sample Gas Cooler	Buhler Technologies	100063602044367-001
ASLTM13EQ504	Horiba PG2500 Portable Flue Gas Analzer	Horiba	41432840053
ASLTM13EQ508	3 metre industrial heated sample line (Temp controller box 1 & 2)	Neptech	ML-2

Sampling Deviations

Parameter	Deviation
Standard ID	Flow measurement not possible
Standard ID	EN12916 Uncertainty >10% ELV
Standard ID	-
Standard ID	-

Reference Documents

Risk Assessment (RA)	SOP1011
Site Review (SR)	SOP1015
Site Specific Protocol (SSP)	SOP1015

Executive Summary

Suitability of sampling location

General Information	Value
Permanent/Temporary	Temporary
Inside/ Outside	Outside

Platform Details		
Irish EPA Technical Guidance Note AG1 / BS EN 15259 Platform Requirements	**Value**	**Comment**
Sufficient Working area to manipulate probe and measuring instruments	Yes	-
Platform has 2 handrails (approx. 0.5m & 1.0 m high)	Yes	-
Platform has vertical base boards (approx. 0.25 m high)	Yes	-
Platform has chains / self closing gates at top of ladders	Yes	-
There are no obstructions present which hamper insertion of sampling equipment	No	-
Safe Access Available	Yes	-
Easy Access Available	Yes	-

Sampling Location / Platform Improvement Recommendations
None

BSEN 15259 Homogeneity Test Requirements
1: There is no requirement to perform a BSEN15259 Homogenity Test on this stack
E.g. Select Option **1: There is no requirement to perform a BSEN15259 Homogenity Test on this stack** **2: Test results were obtained from previous Homogeneity test carried out by ASL** **3: Test results were obtained from previous Homogeneity test carried out by Alternative contractor** **4: Other: Enter Description**

Stack diagram

APPENDICES

II. *Appendix I Monitoring Personnel & Equipment*

Stack Emissions Monitoring Personnel

Team Leader	**Name**	John Casey
	Qualifications	PhD. (Eng.), MSc. (Agr.), B. Agr. Sc.
	System approval	Air Scientific Limited Approved
		-

III. Appendix II Stack Details & flow characteristics

Preliminary stack survey calculations

General Stack Details		
Stack details	**Units**	**Value**
Date of survey		23/01/2015
Time of survey		11:50
Type		Circular
Stack Diameter / Depth, D	m	-
Stack Width, W	m	-
Average Stack Gas Temp., Ta	C	1020
Average Static Pressure, P static	kPa	-
Average Barometric Pressure, Pb	kPa	-
Type of Pitot		-
Are Water Droplets Present ?		-
Average Pitot Tube Calibration Coeff, Cp		-
Negative flow		-
Highly homogeneous flow stream/gas velocity		Yes

Sample Port Size	mm	25
Initial Pitot Leak Check	Pa	-
Final Pitot Leak Check	Pa	-
Orientation of Duct		Vertical
Pitot Tube Cp		0.998
Number of Lines Available		1
Number of Lines Used		1

Sampling Line A						
Point	**Distance to duct (m)**	**Pa**	**Temp °C**	**Velocity (m/s)**	**Oxygen (%)**	**Angle of Swirl**
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
Average	-	-	-	-	-	-
Min	-	-	-	-	-	-
Max	-	-	-	-	-	-

Sampling Line B						
Point	**Distance to duct (m)**	**Pa**	**Temp °C**	**Velocity (m/s)**	**Oxygen (%)**	**Angle of Swirl**
1	-	-	-	-	-	-
2	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
Average	-	-	-	-	-	-
Min	-	-	-	-	-	-
Max	-	-	-	-	-	-

Component	Conc. ppm	Conc. Dry % v/v	Conc. Wet % v/v	Molar Mass
Carbon Dioxide CO_2	-	10.16	-	44.01
Oxygen O_2	-	7.13	-	32
Nitrogen N_2	-	82.71	-	28.1
Moisture (H_2O)	-	-	9.8	18.02

Reference Conditions	Units	Numbers
Temperature	°C	273.15
Total Pressure	kPa	101.3
Moisture	%	-
Oxygen (Dry)	%	3

Stack Gas Composition & Molecular Weights								
Component	Molar Mass M	Density Kg/m^3 p	Conc. Dry % v/v	Dry Volume Fraction r	Dry Conc. kg/m^3 pi	Conc. wet % v/v	Wet Volume Fraction r	Wet Conc.kg/m^3 pi
Carbon Dioxide CO_2	44.01	1.96	10.16	0.1016	0.20	9.16	0.09	0.18
Oxygen O_2	32	1.43	7.13	0.0713	0.10	6.43	0.06	0.09
Nitrogen N_2	28.1	1.25	82.71	0.8271	1.04	74.60	0.75	0.94
Moisture (H_2O)	18.02	0.80	-	-	-	9.8	0.10	0.08
	-	-	-	-	-	-	-	-
where p=M/22.41	-	-	-	-	-	-	-	-
pi = r x p	-	-	-	-	-	-	-	-

Calculation of Stack Gas Densities		
Determinand	**Units**	**Result**
Dry Density (STP), P STD	$kg.m^{-3}$	1.338
Wet Density (STP), P STW	$kg.m^{-3}$	1.291
Dry Density (Actual), P Actual	$kg.m^{-3}$	-
Average wet Density (Actual), P ActualW	$kg.m^{-3}$	-
Where		
P STD = sum of component concentrations, kg/m3 (excluding water vapour)	-	-
P STW = (P STD + pi of H2O) / (1 + (pi of H2O / 0.8036))	-	-
P actual = P STD x (T STP / (P STP)) x (Pa / Ta)	-	-
P actual W (at each sampling point) = P STW x (Ts / Ps) x (Pa / Ta)	-	-

Sampling Plane Validation Criteria	Value	Units	Requirement	Compliance	Method
Lowest Differential Pressure	-	Pa	>5 Pa	N/A	EN16911:2013
Lowest Gas Velocity	-	m/s	-	N/A	-
Highest Gas Velocity	-	m/s	-	N/A	-
Ratio of Above	-	:1	<3:1	N/A	EN16911:2013
Mean Velocity	-	m/s	-	N/A	-
Angle of flow with regard to duct axis	-	degrees	< 15	N/A	EN16911:2013
No local negative flow	-	-	-	N/A	-
Homogeneous flow stream/gas velocity	-	-	-	N/A	-

Calculation of stack Gas Velocity, V	
Velocity at Traverse Point, V = Kcp * Sqroot ((2 * DP) / Density)	-
Where	
Kpt = Pitot tube calibration coefficient	-
Compressibility correction factor, assumed at a constant 0.998	0.998

Gas Volumetric Flowrate	Units	Result
Gas Volumetric Flow Rate (Actual)	$m^3.h^{-1}$	-
Gas Volumetric Flow Rate (STP, Wet)	$m^3.h^{-1}$	-
Gas Volumetric Flowrate (STP, Dry)	$m^3.h^{-1}$	-
Gas Volumetric Flowrate REF to Oxygen	$m^3.h^{-1}$	-

IV. Appendix III Individual parameter sampling details and results

Carbon Monoxide Quality Assurance

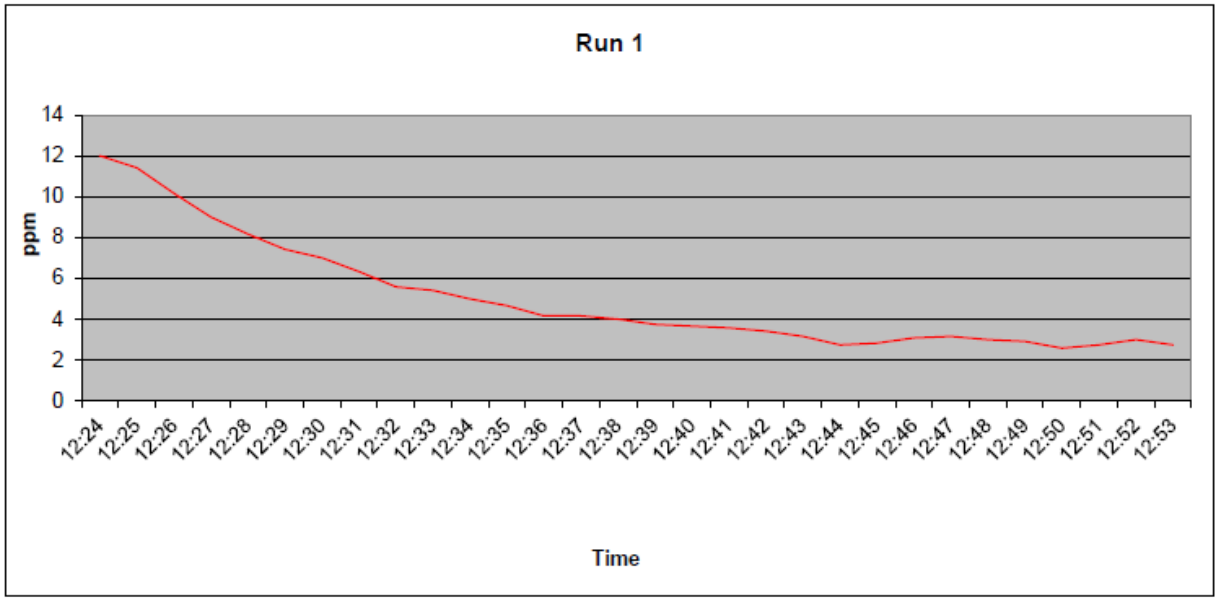
Sampling Details		
Stack ID	F1	-
	Units	**Run 1**
Parameter		
Sampling Times	-	12:23
Sampling Dates	-	23/01/2015
Instrument Range	ppm	200
Span Gas Value	ppm	151
Acceptable Gas Range	-	Yes
Quality Assurance	**Units**	**Run 1**
Conditioning Unit Temperature	C	2
Average Temperature	< C	2
Allowable Temperature	-	4
Temperature Acceptable	-	Yes
Pump flow rate	l/min.	0.4
Zero Drift	Units	**Run 1**
Zero Down Sampling Line (Pre)	ppm	0.3
Zero Down Sampling Line (Post)	ppm	0.6
Zero drift	ppm	0.3
Allowable Zero Drift	ppm	3.02
Zero Drift Acceptable	-	Yes
Span Drift	Units	**Run 1**
Span Down Sampling Line (Pre)	ppm	151
Span Down Sampling Line (Post)	ppm	151.3
Span Drift	ppm	0.3
Allowable Span Drift	ppm	3.02
Span Drift Acceptable (Y/N)	-	Yes
Leak Check		
Span Gas Conc.	ppm	151
Recorded Conc. down Line	ppm	151
Leak check acceptable (< 2%)	(Y/N)	Yes
Test Conditions	**Units**	**Run 1**
Run Ambient Temperature Range	C	8

Carbon Monoxide Results & Sampling details

Parameter	Units	Run 1
Concentration	$mg.m^{-3}$	6.29
Uncertainty	$mg.m^{-3}$	2.72
Mass Emission	kg.h	-

General Sampling Information	
Parameter	**Value**
Standard	EN15058
Technical Procedure	SOP2004
Probe material	SS
Filtration Type/Size	PTFE
Heated Head Filter Used	Yes
Heated Line Temperature	190
Span Gas Reference Number	ASLTM15ING509
Span Gas Expiry Date	Nov-17
Span Gas Start Pressure (bar)	50
Gas Cylinder Concentration (ppm)	151
Span Gas Uncertainty (%)	<2
Zero Gas Type	Nitrogen
Number of Sampling Lines Used	1
Number of Sampling Points Used	1
Sample Point I.D's	F1
Reference Conditions	
Temperature (K)	273.15
Pressure (kPa)	101.3
Gas (Wet or Dry)	Dry
Oxygen	3

Carbon Monoxide Trend



Carbon Monoxide Measurement Uncertainty

	Units	Run 1
Measured Quantities		
Certified Range of Analyser	ppm	1.36 to 1000
Operational Range of Analyser	ppm	200
Measured Reading	ppm	5.03
Measured Quantities	Units	Run 1
Nonlinearity	%	0.9
Temperature Dependent Zero drift	%	0.14
Temperature Dependent Span drift	%	-0.12
Cross-sensitivity	%	0.08
Leak	%	0
Calibration Gas Uncertainty	%	<2
Parameter	Units	Run 1
Combined uncertainty	$mg.m^{-3}$	0.98
Expanded uncertainty	$mg.m^{-3}$	1.95
Uncertainty corrected to std conds.	$mg.m^{-3}$	2.72
Expanded uncertainty expressed with a level of confidence of 95%	% of ELV	--
Expanded uncertainty expressed with a level of confidence of 95%	$mg.m^{-3}$	2.72
Expanded uncertainty expressed with a level of confidence of 95%	% of value	43.21
Requirement in standard is for uncertainty to be < 10% at ELV at standard conditions		

Oxides of Nitrogen Quality Assurance

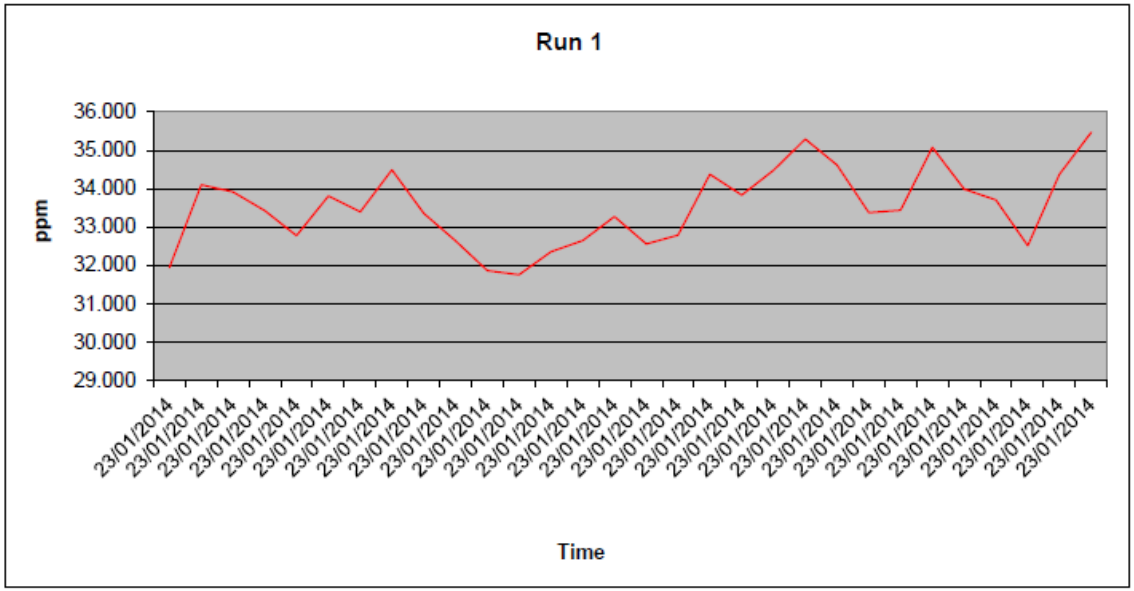
Sampling Details		
Stack ID	F1	-
	Units	**Run 1**
Parameter		
Sampling Times	-	12:23
Sampling Dates	-	23/01/2015
Instrument Range	ppm	250
Span Gas Value	ppm	158
Acceptable Gas Range	-	Yes
Quality Assurance	**Units**	**Run 1**
Conditioning Unit Temperature	C	2
Average Temperature	< C	2
Allowable Temperature	-	4
Temperature Acceptable	-	Yes
Pump flow rate	l/min.	0.4
Zero Drift	Units	**Run 1**
Zero Down Sampling Line (Pre)	ppm	0.1
Zero Down Sampling Line (Post)	ppm	0.6
Zero drift	ppm	0.5
Allowable Zero Drift	ppm	3.16
Zero Drift Acceptable	-	Yes
Span Drift	Units	**Run 1**
Span Down Sampling Line (Pre)	ppm	158.4
Span Down Sampling Line (Post)	ppm	158.9
Span Drift	ppm	0.5
Allowable Span Drift	ppm	3.16
Span Drift Acceptable (Y/N)	-	Yes
Leak Check		
Span Gas Conc.	ppm	158
Recorded Conc. down Line	ppm	158.4
Leak check acceptable (< 2%)	(Y/N)	Yes
Test Conditions	**Units**	**Run 1**
Run Ambient Temperature Range	C	8
NOx Converter Efficiency	%	95.7

Oxides of Nitrogen Results & Sampling details

Parameter	Units	Run 1
Concentration	$mg.m^{-3}$	68.82
Uncertainty	$mg.m^{-3}$	7.50
Mass Emission	$kg.h^{-1}$	-

General Sampling Information	
Parameter	**Value**
Standard	EN14792
Technical Procedure	SOP2002
Probe material	SS
Filtration Type/Size	PTFE
Heated Head Filter Used	Yes
Heated Line Temperature	190
Date & Result of last converter check	95.7 04/12/2014
Span Gas Reference Number	ASLTM15ING511
Span Gas Expiry Date	Nov-15
Span Gas Start Pressure (bar)	50
Gas Cylinder Concentration (ppm)	158
Span Gas Uncertainty (%)	<2
Zero Gas Type	Nitrogen
Number of Sampling Lines Used	1
Number of Sampling Points Used	1
Sample Point I.D's	F1
Reference Conditions	
Temperature (K)	273.15
Pressure (kPa)	101.3
Gas (Wet or Dry)	Dry
Oxygen	3

Oxides of Nitrogen Trend



Oxides of Nitrogen Measurement Uncertainty

Measured Quantities	**Units**	**Run 1**
Nonlinearity	%	1.4
Temperature Dependent Zero drift	%	-0.04
Temperature Dependent Span drift	%	-0.25
Cross-sensitivity	%	0.5
Leak	%	0
Calibration Gas Uncertainty	%	<2
Mass Flow Controllers (Dilution) Uncertainty	%	<1
NOx Converter Efficiency	%	95.5
Parameter	**Units**	**Run 1**
Combined uncertainty	$mg.m^{-3}$	2.05
Expanded uncertainty	$mg.m^{-3}$	4.10
Uncertainty corrected to std conds.	$mg.m^{-3}$	7.50
Expanded uncertainty expressed with a level of confidence of 95%	% of ELV	5.00
Expanded uncertainty expressed with a level of confidence of 95%	$mg.m^{-3}$	7.50
Expanded uncertainty expressed with a level of confidence of 95%	% of value	10.89
Requirement in standard is for uncertainty to be < 10% at ELV at standard conditions		

Total Volatile Organic Carbon Quality Assurance

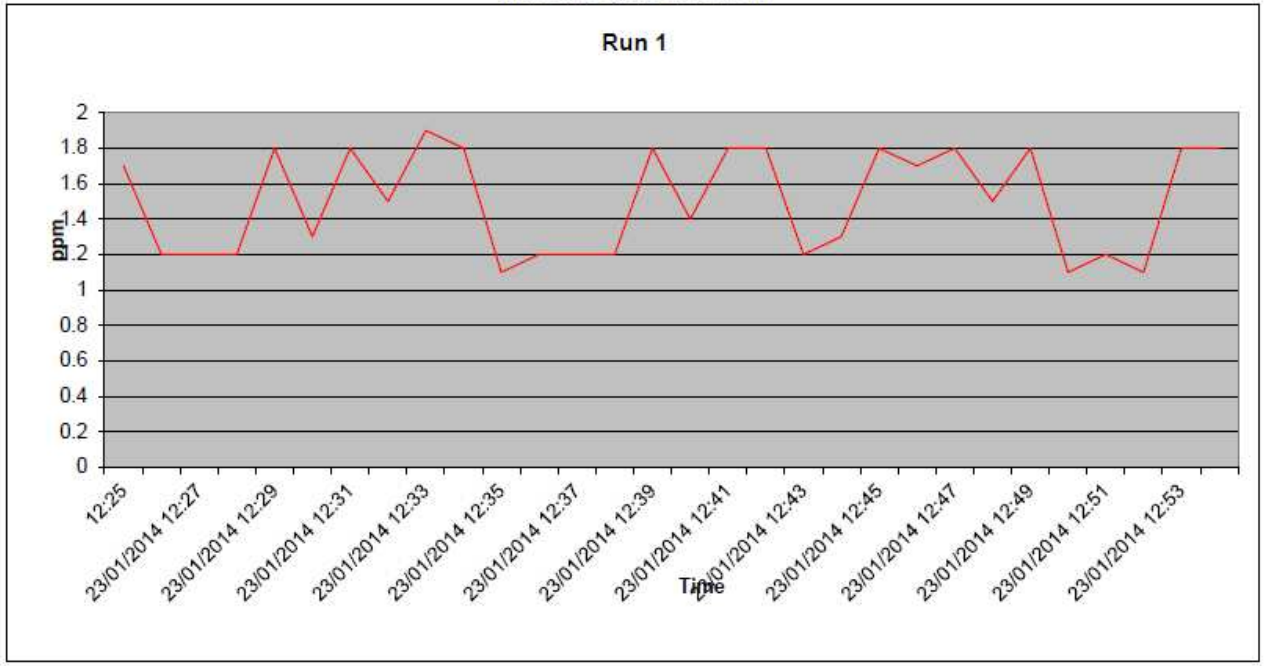
Sampling Details		
Stack ID	F1	-
	Units	**Run 1**
Parameter		
Sampling Times	-	12:25
Sampling Dates	-	25/03/2014
Instrument Range	ppm	100
Span Gas Value	ppm	78
Acceptable Gas Range	-	Yes
Quality Assurance	**Units**	**Run 1**
Oven Temperature	C	190
Average Temperature	< C	-
Temperature Acceptable	-	Yes
Sample line temperature	C	190
Zero Drift	Units	**Run 1**
Zero Down Sampling Line (Pre)	ppm	0.1
Zero Down Sampling Line (Post)	ppm	0.4
Zero drift	ppm	0.3
Allowable Zero Drift	ppm	1.56
Zero Drift Acceptable	-	Yes
Span Drift	Units	**Run 1**
Span Down Sampling Line (Pre)	ppm	78
Span Down Sampling Line (Post)	ppm	78.3
Span Drift	ppm	0.3
Allowable Span Drift	ppm	1.56
Span Drift Acceptable (Y/N)	-	Yes
Leak Check		
Span Gas Conc.	ppm	78
Recorded Conc. down Line	ppm	78
Leak check acceptable (< 2%)	(Y/N)	Yes

Total Volatile Organic Carbon Results and Sampling Details

Parameter	Units	Run 1
Concentration	$mgC.m^{-3}$	2.67
Uncertainty	$mgC.m^{-3}$	0.30
Mass Emission	$kg.h^{-1}$	-

General Sampling Information	
Parameter	**Value**
Standard	EN12619
Technical Procedure	SOP2009
Probe material	SS
Filtration Type/Size	PTFE
Heated Head Filter Used	Yes
Heated Line Temperature	190
Span Gas Reference Number	ASLTM15ING515
Span Gas Expiry Date	01/11/2017
Span Gas Start Pressure (bar)	50
Gas Cylinder Concentration (ppm)	78
Span Gas Uncertainty (%)	<2
Zero Gas Type	Ambient
Number of Sampling Lines Used	1
Number of Sampling Points Used	1
Sample Point I.D's	F1
Reference Conditions	-
Temperature (K)	273.15
Pressure (kPa)	101.3
Gas (Wet or Dry)	Dry
Oxygen	3

Total Volatile Organic Carbon Trend



Total Volatile Organic Carbon Measurement Uncertainty

	Units	Run 1
Measured Quantities		
Certified Range of Analyser	ppm	0.5 to 1000
Operational Range of Analyser	ppm	100
Measured Reading	ppm	1.50
Measured Quantities	Units	**Run 1**
Nonlinearity	%	0.068
Temperature Dependent Zero drift	%	0.3
Temperature Dependent Span drift	%	0.3
Cross-sensitivity	%	-
Leak	%	<2
Calibration Gas uncertainty	%	<2
Parameter	Units	**Run 1**
Combined uncertainty	$mg.m^{-3}$	2.67
Expanded uncertainty	$mg.m^{-3}$	0.30
Expanded uncertainty expressed with a level of confidence of 95%	% of ELV	11.14
Expanded uncertainty expressed with a level of confidence of 95%	% of value	22.28
Expanded uncertainty expressed with a level of confidence of 95%	$mg.m^{-3}$	0.60
Requirement in standard is for uncertainty to be < 10% at ELV at standard conditions		

Sulphur Dioxide Quality Assurance

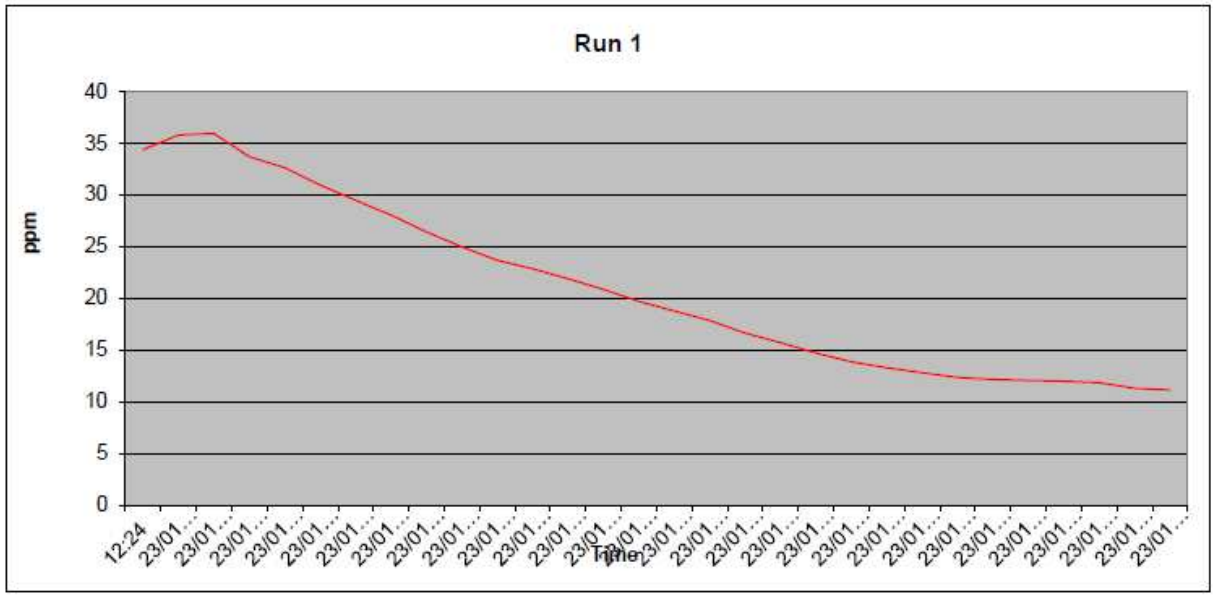
Sampling Details		
Stack ID	F1	-
	Units	**Run 1**
Parameter		
Sampling Times	-	12:24
Sampling Dates	-	23/01/2015
Instrument Range	ppm	500
Span Gas Value	ppm	404
Acceptable Gas Range	-	Yes
	-	-
Quality Assurance	**Units**	**Run 1**
Conditioning Unit Temperature	C	2
Average Temperature	< C	2
Allowable Temperature	-	4
Temperature Acceptable	-	Yes
Pump flow rate	l/min.	0.4
	-	-
Zero Drift	Units	**Run 1**
Zero Down Sampling Line (Pre)	ppm	0.5
Zero Down Sampling Line (Post)	ppm	3.8
Zero drift	ppm	3.3
Allowable Zero Drift	ppm	20.25
Zero Drift Acceptable	-	Yes
	-	-
Span Drift	Units	**Run 1**
Span Down Sampling Line (Pre)	ppm	405
Span Down Sampling Line (Post)	ppm	409
Span Drift	ppm	4
Allowable Span Drift	ppm	20.25
Span Drift Acceptable (Y/N)	-	Yes
	-	-
Leak Check		
Span Gas Conc.	ppm	404
Recorded Conc. down Line	ppm	405
Leak check acceptable (< 2%)	(Y/N)	Yes
	-	-
Test Conditions	**Units**	**Run 1**
Run Ambient Temperature Range	C	8

Sulphur Dioxide Results & Sampling details

Parameter	Units	Run 1
Concentration	$mg.m^{-3}$	59.86
Uncertainty	$mg.m^{-3}$	6.75
Mass Emission	kg.h	-

General Sampling Information	
Parameter	**Value**
Standard	TGN 21
Technical Procedure	2012
Probe material	SS
Filtration Type/Size	PTFE
Heated Head Filter Used	Yes
Heated Line Temperature	190
Date & Result of last converter check	-
Span Gas Reference Number	ASLTM14ING506
Span Gas Expiry Date	Jan-16
Span Gas Start Pressure (bar)	20
Gas Cylinder Concentration (ppm)	404
Span Gas Uncertainty (%)	<2
Zero Gas Type	N
Number of Sampling Lines Used	1
Number of Sampling Points Used	1
Sample Point I.D's	F1
Reference Conditions	
Temperature (K)	273.15
Pressure (kPa)	101.3
Gas (Wet or Dry)	Dry
Oxygen	3

Sulphur Dioxide Trend



Sulphur Dioxide Measurement Uncertainty

	Units	Run 1
Measured Quantities		
Certified Range of Analyser	ppm	2.14 to 1000
Operational Range of Analyser	ppm	500
Measured Reading	ppm	20.93
Measured Quantities	Units	Run 1
Nonlinearity	%	0.8
Temperature Dependent Zero drift	%	0.8
Temperature Dependent Span drift	%	2
Cross-sensitivity	%	1.5
Leak	%	0
Calibration Gas Uncertainty	%	<2 %
Parameter	Units	Run 1
Combined uncertainty	$mg.m^{-3}$	1.84
Expanded uncertainty	$mg.m^{-3}$	3.68
Uncertainty corrected to std conds.	$mg.m^{-3}$	6.75
Expanded uncertainty expressed with a level of confidence of 95%	% of ELV	--
Expanded uncertainty expressed with a level of confidence of 95%	$mg.m^{-3}$	6.75
Expanded uncertainty expressed with a level of confidence of 95%	% of value	11.28
Requirement in standard is for uncertainty to be < 10% at ELV at standard conditions		

Emission Testing Location Points

Gas Flare

GF1 location for emission testing in accordance with the waste licence and AG1/AG2 requirements.

Gas Engine

GF2 location for emission testing in accordance with the waste licence and AG1/AG2 requirements.

Appendix G: Monthly Balancing Records – Gas field

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **21/01/2014**
Weather: **Dry & sunny intervals 967mb**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	63.9	23.4	2.9	9.8	0	-5.7	5	
	1.4	67	25.6	1.7	5.7	0	-5.7	4	
Cells 2	2.1	21.2	18.2	5.4	55.2	1	9.4	3	
	2.2	0.1	0.2	20.7	79	0	9.4	2	
	2.3	11.1	16.4	4.8	67.7	0	7.8	2	
Cells 3	3.2	22.5	20.5	4.9	52.1	0	3.9	2	
	3.3								
	3.4	7.5	15	8	69.5	0	2.7	2	
Cells 4	4.2	39.8	27.1	1.8	31.3	0	-20	50	
	4.3	69.1	35.3	1.1	1	1	-9.1	3	
	4.4	12.2	19.3	1.7	66.8	0	6.7	2	
Cells 5	5.1	63	30.5	2.4	4.1	5	-5.7	5	
	5.2	44.3	23.5	0.4	31.8	1	-9.4	2	
	5.3	39.1	20.1	8.3	32.5	0	-9.4	2	
	5.4	54.6	30.4	0.7	14.3	1	-7.7	2	
Cells 6	6.1	44.6	28.1	0.8	26.5	1	-9.3	1	
	6.2	44.5	24.5	5.9	25.1	3	-0.6	2	
	6.3	70.4	22.4	2.5	4.7	0	-2.4	1	
	6.4	0.2	3	17.4	79.4	1	9.3	0	
Cells 7	7.1	21.9	3.6	15.3	59.2	0	-2.7	3	
	7.2	0.1	0.1	21.2	78.6	0	9.3	0	
	7.3	11.9	5.1	17.6	65.4	0	6.4	3	
	7.4	0.1	1.1	20	78.8	0	5	0	
	7.5								
Cells 8	8.1	50.1	32.2	1.1	16.6	0	-0.6	20	
	8.2	0.2	1.7	20.1	78	0	-0.7	2	
	8.3	48.2	30.4	1.1	20.3	0	-9.2	3	
	8.4	0	0.1	21.2	78.6	0	0	0	
Cells 9	9.1	88.4	11	2.3	0	1	0	2	
	9.2	45.4	29	0.8	24.8	0	-19.2	20	
	9.3	1.1	0.3	20.9	77.7	0	-20.7	5	
	9.4	27.9	12.7	14.1	45.3	0	-21	25	
	9.6	0.2	0.1	21	78.7	0	0	0	
Cells 10	10.2	38	18.8	8	34.8	1	-9.7	10	
	10.3	67.3	33	1.7	0	1	-20.9	25	
	10.4	71.8	33.1	1.4	0	0	-21.1	25	
	10.5	75.3	29.6	0.2	0	0	-15.3	10	
	10.6	77	26.3	1.1	0	0	-20.7	20	
Cells 11	1	70.9	33.7	1.5	0	1	0.4	3	

	2	11.1	6	16.5	66.4	4	-1.8	10	
	3	40.3	27.3	1.3	31.1	0	-20.6	20	
Cells 12	**1**	0.4	0.3	20.4	78.9	0	0	0	
	2	0.2	0.2	21.2	78.4	0	0	0	
	3	44.8	29.5	1.4	24.3	0	-11.3	50	
	4	71.1	33.6	0.9	0	1	0.3	3	
Cells 13	**1**	11.5	4.5	18.3	65.7	0	-23.3	20	
	2	74.6	29.2	0.3	0	1	-23.5	40	
	3	69.3	27.8	1.9	1	1	-24.7	50	
	4	70.3	28.9	1.5	0	1	-24	40	
	5	73.5	28.6	2	0	1	-23.6	50	
	6	69.9	29	1.2	0	1	-24.7	50	
Cells 14	**1**	24.4	13.7	14	47.9	0	-17.9	60	
	2	54.6	32.1	3.1	10.2	2	-25.4	30	
	3	71.7	31.1	1.8	0	1	-13.9	20	
	4	62.3	36.5	1.4	0	1	-22.5	30	
	5	9.1	4.2	18.8	67.9	0	-22.2	10	
	6	40.2	24	7.9	27.9	1	-24.2	60	
Cells 15/16	**1**	64	39	0.5	0		-30	40	
	2	51	38	0.9	11.1		-34	40	
	3	40	26	4.9	29.1		-36	40	
	4	65	38	1.2	0		-34	40	
	5	64	36	0.9	0		-37	40	
	6	58	37	1.9	3.1		-33	40	
	7	57	34	0.8	8.2		-35	40	
	8	65	36	1.2	0		-34	40	
	9	60	34	0.7	0		-38	40	
	10	65	33	0.2	0		-33	40	
	11	57	34	2.4	6.6		-34	40	
	12	66	36	0.9	0		-37	40	
Flare		**44**	**25**	**2.4**	**28.6**		**-40**		

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **21/02/2014**
Weather: Cloudy with showers 967mb

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	59.9	21.9	4.9	13.3	0	-3.8	5%	
	1.4	67.8	25.3	2	4.9	0	-3.2	5%	
Cells 2	2.1	31.2	26.4	0.3	42.1	0	0.5	0	
	2.2	42.1	23.4	5.3	30.1	0	-1.7	3%	
	2.3	38.7	26.4	1.5	33.4	0	0.3	2%	
Cells 3	3.2								
	3.3								
	3.4	34.9	22.4	2.3	40.4	0	-5.4	8%	
Cells 4	4.2	57.8	34.1	1.1	7	0	-6.5	20%	
	4.3	65.4	32.1	0.2	2.3	0	-0.7	2%	
	4.4	29	27.7	1.2	42.1	0	-2.2	3%	
Cells 5	5.1	69.3	31.2	1.9	0	5	-3.4	3%	
	5.2	37.8	23.5	2.8	35.9	1	0.2	5%	
	5.3	26.7	13.8	13	46.5	0	0.3	3%	
	5.4	66.2	31.2	0.9	1.7	1	-1	8%	
Cells 6	6.1	7.3	8.4	15.8	68.5	0	0.1	2%	
	6.2	37.1	21.1	9.3	32.5	1	-8.5	8%	
	6.3	52.1	11.1	7	29.8	0	-21.9	5%	
	6.4	0.1	3	17.3	79.2	1	0.2	0%	
Cells 7	7.1	12.6	1.9	17.3	68.2	0	-6.6	2%	
	7.2	0	0.1	21	78.9	0	0.3	0%	
	7.3	4.9	2.7	19.6	72.8	0	-2.2	2%	
	7.4	0	1.2	20	78.8	0	-18.6	2%	
	7.5								
Cells 8	8.1	61.6	34.1	1.3	3	0	-8.6	5%	
	8.2	53	28.2	1.2	17.6	0	-20	100%	
	8.3	25.1	22.8	6.5	45.6	0	0.2	5%	
	8.4	0	0.1	21	78.9	0	0.2	0%	
Cells 9	9.1	4.2	0.5	3.2	92.1	2	0	0%	
	9.2	0.2	0.2	21	78.6	0	0	0%	
	9.3	1.3	0.5	20.9	77.3	0	-22.6	5%	
	9.4	51.2	13.6	6.6	28.6	1	-23.1	20%	
	9.6	0.1	0.1	21	78.8	0	0.1	0%	
Cells 10	10.2	81.1	22.2	2	0	0	-12.1	20%	
	10.3	76.8	17.6	2.1	3.5	0	-22.7	25%	
	10.4	0.2	0.1	20.8	78.9	0	0	0%	
	10.5	79.9	25.1	1.7	0	0	-16.8	30%	
	10.6	79.1	22.2	0.9	0	0	-22.5	20%	
Cells 11	1	71.7	33.8	0.6	0	2	0.4	0%	
	2	11.2	6.1	16.3	66.4	4	-7.1	5%	
	3	54.5	28.7	1.7	15.1	0	-19	10%	

Cells 12	**1**	0.1	0.2	20.7	79	0	0.1	0%	
	2	0.1	0.2	21	78.7	0	0.1	0%	
	3	55.1	33	0.9	11	1	-11.2	50%	
	4								
Cells 13	**1**	70.2	28.7	2.7	0	1	-23.2	20%	
	2	72.5	29.4	0.9	0	2	-27.2	20%	
	3	73.4	30	0.6	0	2	-23	40%	
	4	74.7	30.3	1	0	2	-23.2	40%	
	5	74.8	29.7	0.2	0	2	-22.9	40%	
	6	73	31.8	0.3	0	2	-22.9	50%	
Cells 14	**1**	19.5	11.1	16.4	53	0	-17.6	10%	
	2	56.3	33.2	2.8	7.7	2	-22	30%	
	3	70.3	28.8	2.5	0	2	-22.8	30%	
	4	67.6	39	1	0	1	-22.1	30%	
	5	8.5	3.9	18.8	68.8	0	-21.5	10%	
	6	34.9	21.2	10.5	33.4	0	-22.9	60%	
Cells 15/16	**1**	62	36	0.2	1.2		-33	40%	
	2	49	37	0.8	13.7		-35	40%	
	3	41	26	4.4	25.9		-32	40%	
	4	61	36	1.8	1		-37	40%	
	5	65	37	0.5	0.6		-36	40%	
	6	56	35	1.4	4.8		-33	40%	
	7	55	33	0.7	12.7		-35	40%	
	8	62	35	1.5	1.6		-36	40%	
	9	58	35	0.7	0		-35	40%	
	10	61	34	0.7	0		-32	40%	
	11	55	35	2.6	9.7		-36	40%	
	12	66	34	0.9	1.5		-34	40%	
Flare		41	24	2.9	30.6		-43		

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **04/04/2014**
Weather: Dry & Cloudy 970mb

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	15	5.5	16	62	0	-3	3%	
	1.4	70	25	1	0.9	3	-3	5%	
Cells 2	2.1	16	16	6.8	61	0	0	0	
	2.2	13	13	9	65	0	-2	5	
	2.3	14	18	2.8	65	0	0	0	
Cells 3	3.2	27	21	3	48	0	-3	5%	
	3.3	28	21	3	47	0	-3	2%	
	3.4	12	15	5	67	0	-4	1%	
Cells 4	4.2	25	21	2	50	0	0	2%	
	4.3	56	29	3	12	2	-1	2%	
	4.4	14	17	5	63	0	-3	50%	
Cells 5	5.1	72	30	0.6	0	3	-3	5%	
	5.2	0.1	5	17	77	0	0	0%	
	5.3	26	13	12	48	0	0	0%	
	5.4	70	30	0.4	0	1	-0.5	2%	
Cells 6	6.1	25	21	3	49	0	0	2%	
	6.2	65	34	0.8	0	2	-5	5%	
	6.3	68	21	3	7	0	-5	5%	
	6.4	0.1	2.9	17	79	0	0	0%	
Cells 7	7.1	44	16	8	32	0	0	5%	
	7.2	40	21	8	30	0	-3	2%	
	7.3	5	4	18	72	0	-3	2%	
	7.4	17	4	13	64	0	0	2%	
Cells 8	8.1	48	30	1.3	19		-5	5%	
	8.2	27	25	0.3	47	0	-5	20%	
	8.3	30	26	2.6	42		0	5%	
	8.4	0.1	0.1	20	79		0	0%	
Cells 9	9.1	64	18	0.2	0	3	0	0%	
	9.2	54	31	1.6	13	1	-18	30%	
	9.3	22	8	14	55	0	-18	50%	
	9.4	26	10	13	51	0	-18	20%	
	9.6	0	0	21	78	0	0	0%	
Cells 10	10.2	18	10	13	59	0	-2	5%	
	10.3	66	35	2	0	1	0	30%	
	10.4	67	30	0.5	2.1	1	-18	5%	
	10.5	76	27	0.4	0	1	-12	30%	
	10.6	76	23	0.7	0	1	-18	40%	
Cells 11	1	72	31	1.4	0	1	0	5%	

	2	11	6	16	66	5	0	0%	
	3	28	24	2.3	47	0	-21	0%	
Cells 12	**1**	0	0	21	79	0	0	0%	
	2	0	0	21	78	1	0	0%	
	3	31	26	0.5	43	1	-10	20%	
	4	72	32	0.4	0	1	0	0%	
Cells 13	**1**	18	6	16	60	0	-20	5%	
	2	62	25	0.5	13	1	-21	40%	
	3	54	25	0.2	22	1	-22	40%	
	4	38	22	2.6	38	1	-22	40%	
	5	40	24	0.9	36	0	-21	50%	
	6	57	25	0.9	17	1	-21	50%	
Cells 14	**1**	20	11	14	56	0	-1	5%	
	2	49	28	3.5	19	2	-23	40%	
	3	75	27	0.4	0	2	-23	100%	
	4	61	35	1.1	3.6	2	-20	20%	
	5	10	4	18	67	0	-20	5%	
	6	46	26	6	22	1	-24	30%	
Cells 15/16	**1**	64	38	0.7	0	70	-23	40%	
	2	60	39	0.8	0	16	-22	40%	
	3	55	34	2.6	9.8	11	-16	40%	
	4	64	35	0.3	0	26	-16	40%	
	5	65	35	0.1	0	32	-18	40%	
	6	65	34	0	0.6	68	-13	40%	
	7	64	36	0.4	0	41	-22	40%	
	8	56	33	2.5	5.9	86	-22	40%	
	9	63	34	1	0	911	-22	40%	
	10	21	10	14	54	24	-22	40%	
	11	70	33	0.2	0	18	-22	40%	
	12	62	35	0.6	0	12	-28	40%	
Flare		41	27.8	2.7			-18		

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **06/05/2014**
Weather: Sunny Intervals 970mb

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	56.1	20.5	4.7	18.7	1	-1.9	10%	
	1.4	71.9	26.2	1.3	0.6	1	-1.9	5%	
Cells 2	2.1	42	27.3	0.8	29.9	1	2	5%	
	2.2	30	19.2	3.7	65	0	-2	0%	
	2.3	38.8	23.7	0.9	36.6	0	0	5%	
Cells 3	3.2	44.9	26.2	1.7	27.2	1	-0.7	3%	
	3.3	28	21	3	47	0	-3	2%	
	3.4	30.9	22.4	1	45.7	0	-2.3	5%	
Cells 4	4.2	40.9	29.6	1.4	28.1	0	-3	5%	
	4.3	66.8	29.3	1.4	2.5	2	1.7	3%	
	4.4	19.3	20.1	5.2	55.4	0	-0.8	1%	
Cells 5	5.1	73	31.7	0.3	0	3	-1.9	5%	
	5.2	46.4	22.6	0.6	30.4	2	2	5%	
	5.3	32.7	18.2	9.1	40	0	2	5%	
	5.4	71.6	30.7	0.2	0	2	1.1	5%	
Cells 6	6.1	52.3	28.8	0.9	18	1	1.9	5%	
	6.2	50.9	28.1	4.8	16.2	2	-2.7	5%	
	6.3	72.2	21	2.1	4.7	1	-6.7	10%	
	6.4	0.1	2.8	17.4	79.7	2	1.9	0%	
Cells 7	7.1	53.8	19.4	5.4	21.4	1	2	0%	
	7.2	37.1	20.7	9	33.2	1	-0.3	1%	
	7.3	0.8	3.3	19.4	76.5	0	1.9	0%	
	7.4	0.1	3.2	18.1	78.6	1	1.9	0%	
Cells 8	8.1	65.2	33.8	1.1	0	0	-2.6	5%	
	8.2	33.4	17.7	2.5	46.4	0	1.8	5%	
	8.3	30	26	2.6	42		0	5%	
	8.4	0.1	0.1	20.6	79.2	0	2	0%	
Cells 9	9.1	64	16.5	1.2	0	0	2.8	0%	
	9.2	67.2	30.6	0.8	1.4	0	-19.1	30%	
	9.3	0.7	0.2	20.8	78.3	0	-19.6	0%	
	9.4	18.9	6.4	15.8	58.9	0	-19.4	20%	
	9.6	0.6	0.2	20.7	78.5	0	1.8	0%	
Cells 10	10.2	35.2	14.6	9.7	40.5	0	0.8	10%	
	10.3	65.2	32.8	2.1	0	1	-19.1	40%	
	10.4	72	30.2	0.4	0	1	-19.5	50%	
	10.5	72.1	31.9	0.3	0	1	-12.7	40%	
	10.6	71.2	27.8	0.4	0.6	1	-19.3	50%	

Cells 11	**1**	72.4	31.7	0.2	0	2	2.1	5%	
	2	11.1	5.7	15.9	67.3	4	15	0%	
	3	48.7	26.3	1.2	23.8	0	-20.7	5%	
Cells 12	**1**	0.1	0.1	20.7	79.1	1	1.9	0%	
	2	0.3	0.4	20.7	78.6	1	1.6	0%	
	3	55.3	32.1	0.5	12.2	1	-5	20%	
	4	1.1	0.6	19.9	78.4	0	1.6	0%	
Cells 13	**1**	20.6	6.7	15.1	57.6	1	-21.3	2%	
	2	72.6	26.4	0.4	0.6	1	-22.1	50%	
	3	73.6	25.8	0.4	0.2	1	-22.1	50%	
	4	61	24.5	1.4	13.1	1	-22.3	50%	
	5	62.9	27.6	0.2	9.3	1	-22.1	50%	
	6	68.2	26.3	1.2	4.3	1	-22.2	50%	
Cells 14	**1**	15.4	8.7	15.5	60.4	1	-4.9	2%	
	2	41.7	26	5.3	27	3	-20.6	20%	
	3	43.8	25.3	6.3	24.6	2	-22.4	10%	
	4	62.1	35.8	0.9	1.2	1	-19.8	20%	
	5	9.6	3.8	18.4	68.2	1	-17.7	5%	
	6	43.4	24.8	6.7	25	1	-22.4	10%	
Cells 15/16	**1**	59	37	0.8	3.2		-20	40%	
	2	60	36	1	3		-22	40%	
	3	53	35	2.4	9.6		-15	40%	
	4	62	34	0.4	3.6		-19	40%	
	5	60	35	0.8	4.2		-16	40%	
	6	63	34	0	3		-17	40%	
	7	62	36	0.8	1.2		-19	40%	
	8	55	35	2.3	7.7		-21	40%	
	9	63	35	1	1		-21	40%	
	10	21	10	14	54		-18	40%	
	11	62	33	0.6	4.4		-21	40%	
	12	58	35	0.9	6.1		-25	40%	
Flare		46	29	2.1			-30		

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **05/06/2014**
Weather: **Dry & sunny intervals 9** **1002**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	56	24	3	17	1	-2.2	10	
	1.4	66	28	1	3	1	-2	5	
Cells 2	2.1	44	29	0.6	26	2	-1	5	
	2.2	32	21	3.2	44	0	0	0	
	2.3	41	25	0.9	32	0	-1	5	
Cells 3	3.2	46	28	2	24	2	-1	3	
	3.3								
	3.4	34	25	0.7	40	1	-2	2	
Cells 4	4.2	43	30	1.1	26	0	-3	5	
	4.3	64	31	1.1	1	1	-1	1	
	4.4	22	18	4	56	0	-2	1	
Cells 5	5.1	62	34	0.3	0	3	-2.6	5	
	5.2	44	23.5	1.2	31	2	-1.1	5	
	5.3	35	21	6.5	38	0	2	5	
	5.4	66	33	0.9	0	2	-1	5	
Cells 6	6.1	50	30	0.6	19	2	-1	5	
	6.2	49	29	3.1	18	2	-2	5	
	6.3	68	24	1.6	16	2	0	0	
	6.4	0.8	4	17.4	81	1	0	0	
Cells 7	7.1	50	29	3.6	17	0	-2.7	5	
	7.2	40	25	4.2	30	1	-1	1	
	7.3	1	4	18	77	0	0	0	
	7.4	0.3	4.2	18	77	2	0	0	
	7.5								
Cells 8	8.1	63	35	0.9	0	3	-4	5	
	8.2	35	21	0.6	42	0	-1	5	
	8.3	48.2	30.4	1.1	20.3	0	-9.2	3	
	8.4	60	35	1.2	0	2	0	0	
Cells 9	9.1	82	17	0.9	0	1	0	0	
	9.2	64	32	1	3	0	-18	30	
	9.3	1.1	0.3	19	79	0	-19	0	
	9.4	21	11	14.1	54	0	-21	20	
	9.6	0.2	0.4	20	79	0	0	0	
Cells 10	10.2	40	21	6	48	0	-1	10	
	10.3	62	34	1.6	0	1	-19	40	
	10.4	68	33	0.4	0	2	-20	50	
	10.5	61	34	0.2	0	2	-15.3	40	
	10.6	61	32	0.9	0	0	-18	50	
Cells 11	1	66	32	0.1	0	2	0	5	
	2	15	8	14	63	4	0	0	
	3	49	28	1	22	1	-20.6	5	

Cells 12	**1**	0.4	0.3	20.4	78.9	0	0	0	
	2	0.2	0.2	21.2	78.4	0	0	0	
	3	54	33	1.4	11	0	-5	20	
	4	2	2	17	79	2	0	0	
Cells 13	**1**	31	14	7	48	0	-23.3	2	
	2	65	30	0.6	0	1	-21	50	
	3	61	26	0.3	0	0	-22	50	
	4	58	31	0.6	0	1	-22	50	
	5	64	30	0.6	0	2	-24	50	
	6	63	27	0.1	0	1	-25	50	
Cells 14	**1**	25	16	7	52	4	-6	4	
	2	45	28	3.1	23	2	-22	100	
	3	46	29	3.2	21	3	-24	10	
	4	61	36	1	0	1	-19	20	
	5	14	7	14	65	1	-3	3	
	6	45	27	3.6	24	2	-22	10	
Cells 15/16	**1**	62	37	0.8	1	2	-25	40	
	2	49	36	0.9	14	1	-27	40	
	3	42	27	3.9	29.1	0	-22	40	
	4	63	38	0.8	0	2	-26	40	
	5	59	34.5	1.2	0	1	-22	40	
	6	55	35	1.6	8	0	-25	40	
	7	53	34	0.8	11	2	-23	40	
	8	65	28	0.7	6	0	-24	40	
	9	62	38	0.7	0	1	-22	40	
	10	59	35	0.2	3	3	-25	40	
	11	56	33	1.9	6.6	0	-22	40	
	12	62	36	0.9	0	0	-24	40	
Flare		**44**	**25**	**2.4**	**28.6**		**-40**		

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **17/06/2014**
Weather: **Dry & sunny intervals 9** **1001**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	50	16	4	31	1	-3	5%	
	1.4	44	19	3.5	32	1	-3	5%	
Cells 2	2.1	22	19	0.7	58	0	0	0%	
	2.2	0.9	4	15	80	0	0	0%	
	2.3	19	18	1.6	61	1	-2	5%	
Cells 3	3.2	29	18	3	48	1	-1	3%	
	3.3								
	3.4	11	17	4	67	1	-2	2%	
Cells 4	4.2								
	4.3	68	28	0.9	2.9	4	-1	1%	
	4.4	15	17	3	64	0	-2	2%	
Cells 5	5.1	70	30	0.6	0	2	-3	3%	
	5.2	39	22	0.2	38	1	0	0%	
	5.3	30	14	3	51	1	0	0%	
	5.4	72	28	0.2	0	1	0	0%	
Cells 6	6.1	46	25	0.7	28	1	-1	1%	
	6.2	70	31	0.3	0	2	-3	5%	
	6.3	83	18	0.2	0	1	0	0%	
	6.4	0.2	2.3	17	80	2	0	0%	
Cells 7	7.1	34	13	9	42	1	0	0%	
	7.2	26	13	12	48	1	-1	1%	
	7.3	33	14	4	49	0	0	0%	
	7.4	14	6.5	11	68	1	0	0%	
	7.5								
Cells 8	8.1								
	8.2								
	8.3	59	31	0.5	10	2	-1	1%	
	8.4	0	0	20	79	2	0	0%	
Cells 9	9.1	82	18	0.2	0	1	-1	2%	
	9.2								
	9.3	40	6.8	2.7	50	1	-1	2%	
	9.4	69	22	0.9	8	1	-15	10%	
	9.6								
Cells 10	10.2	15	9	10	66	1	-1	1%	
	10.3	54	27	3	15	2	-15	10%	
	10.4	58	26	0.5	15	2	-15	10%	
	10.5	69	31	0.4	0	1	-10	5%	
	10.6	0.5	0.2	19	79	1	0	0%	
Cells 11	1	72	29	0.3	0	1	0	0%	

	2	11.1	5.2	15.6	68	1	0	0%	
	3	36	23	0.8	40	1	-15	10%	
Cells 12	**1**								
	2	0.3	0.5	19	78	3	0	0%	
	3	71	29	0.5	0	1	0	0%	
	4	37	24	0.3	37	11	-3	17%	
Cells 13	**1**	45	24	3	28	2	-16	20%	
	2	66	23	0.5	9.9	1	-16	50%	
	3	58	32	0.3	18	1	-17	50%	
	4	63	22	1.1	14	2	-16	20%	
	5	47	24	0.3	30	1	-17	40%	
	6	51	25	2.4	21	1	-17	40%	
Cells 14	**1**	18	9	14	58	1	-4	5%	
	2	49	27	2.8	21	2	-17	40%	
	3	41	20	7.1	31	1	-17	40%	
	4	61	33	0.8	5	2	-15	30%	
	5	9	4	17	68	1	0	0%	
	6	56	34	1	9	2	-15	40%	
Cells 15/16	**1**	62	37	0.9	1	4	-19	40%	
	2	59	36	0.3	4	1	-18	40%	
	3	53	33	2.6	12	2	-19	40%	
	4	58	35	1	6	2	-17	40%	
	5	62	37	0.9	1	1	-19	40%	
	6	60	35	1	4	5	-15	40%	
	7	59	37	0.7	3	2	-19	40%	
	8	51	32	2.8	14	1	-18	40%	
	9	58	38	2	2	2	-17	40%	
	10	25	13	9	53	1	-18	40%	
	11	61	38	0.7	1	1	-20	40%	
	12	60	37	0.4	2.6	1	-20	40%	
Flare		**42**	**27**	**3.6**	**27.4**		**-45**		

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **30/07/2014**
Weather: **Heavy showers & Warm** **987mb**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	48	21	3.6	27.4	2	-4	5%	
	1.4	45	22	3.2	29.8	1	-4	5%	
Cells 2	2.1	32	21	0.6	53.6	2	0	0%	
	2.2	2	6	14	78	0	0	0%	
	2.3	26	21	1.4	51.6	1	-2	5%	
Cells 3	3.2	36	20	3	41	1	-1	3%	
	3.3								
	3.4	16	15	4	65	1	-4	5%	
Cells 4	4.2								
	4.3	64	31	0.9	4.1	1	-3	1%	
	4.4	26	20	2.6	51.4	0	-3	2%	
Cells 5	5.1	65	32	0.4	2.6	1	-4	3%	
	5.2	42	24	0.5	33.5	2	0	0%	
	5.3	36	22	2.5	39.5	1	0	0%	
	5.4	64	29	0.6	6.4	1	0	0%	
Cells 6	6.1	47	27	0.4	25.6	1	-2	1%	
	6.2	65	34	0.5	0.5	3	-4	5%	
	6.3	72	26	0.2	1.8	2	0	0%	
	6.4	1	4.2	16	78.8	3	0	0%	
Cells 7	7.1	41	20	6	33	2	0	0%	
	7.2	31	18	8	43	1	-1	1%	
	7.3	35	16	3.6	45.5	0	0	0%	
	7.4	22	11	8	59	1	0	0%	
	7.5								
Cells 8	8.1								
	8.2								
	8.3	58	32	0.5	9.5	3	-1	2%	
	8.4	0	2	18	80	1	-2	2%	
Cells 9	9.1	65	30	1	4	1	-2	2%	
	9.2								
	9.3	39	15	0.2	45.8	2	-2	2%	
	9.4	63	26	1	10	1	-17	10%	
	9.6								
Cells 10	10.2	18	11	8	63	2	-1	1%	
	10.3	52	29	2.5	16.5	1	-15	12%	
	10.4	54	29	0.5	16.5	3	-17	10%	
	10.5	66	33	0.7	0.6	1	-12	5%	
	10.6	3	4	17	76	2	0	0%	

Cells 11	**1**	64	34	0.6	1.4	2	0	0%	
	2	12	8	14	66	1	0	0%	
	3	42	26	0.7	31.3	8	-4	20%	
Cells 12	**1**	0	0	18.6	81.4	1	0	0%	
	2	0.3	0.5	17	82.2	4	0	0%	
	3	68	28	0.5	3.5	2	0	0%	
	4	42	25	0.1	32.9	9	-6	20%	
Cells 13	**1**	47	24	2.7	26.3	1	-18	20%	
	2	64	27	0.2	8.8	2	-17	50%	
	3	54	34	0.4	11.6	1	-18	50%	
	4	61	26	0.9	12.1	1	-19	40%	
	5	48	25	0.6	26.4	2	-18	50%	
	6	52	27	1.9	19.4	1	-19	40%	
Cells 14	**1**	24	12	10	54	1	-6	5%	
	2	51	29	2.1	17.9	3	-19	40%	
	3	44	24	5.2	26.3	1	-20	40%	
	4	58	34	0.6	7.4	1	-17	30%	
	5	12	10	15	63	2	0	0%	
	6	54	35	0.8	10.2	1	-15	40%	
Cells 15/16	**1**	60	34	0.6	5.4	2	-21	40%	
	2	54	35	0.3	10.7	2	-20	40%	
	3	54	34	1.9	10.1	1	-22	40%	
	4	56	36	0.9	7.1	2	-21	40%	
	5	60	35	0.6	4.4	1	-20	40%	
	6	62	36	0.8	1.2	4	-19	40%	
	7	56	35	1	8	2	-21	40%	
	8	49	33	2.1	15.9	1	-20	40%	
	9	56	36	1.8	6.2	2	-22	40%	
	10	31	17	6.5	45.5	1	-21	40%	
	11	59	36	1.1	3.9	2	-23	40%	
	12	61	38	0.6	0.4	1	-20	40%	
Flare		**43.2**	**26.4**	**2.8**			**-45**		

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **26/08/2014**
Weather: **Sunny Intervals** **991mb**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	55	19	5	20	1	-2	5%	
	1.4	66	23	2	8	1	-2	2%	
Cells 2	2.1	35	26	0.2	39	2	0	1%	
	2.2	19	17	7	56	0	0	0%	
	2.3	30	24	0.9	45	1	-2	5%	
Cells 3	3.2	45	26	2	27	2	-1	5%	
	3.3								
	3.4	27	26	2	27	2	-1	2%	
Cells 4	4.2								
	4.3	72	30	0.2	0	5	-0.3	2%	
	4.4	33	25	1.3	41	2	-2	5%	
Cells 5	5.1	70	33	0.9	0	5	-2	5%	
	5.2	30	23	0.4	47	2	0	1%	
	5.3	34	24	2	40	1	0	3%	
	5.4	66	32	1.3	0	3	-1	3%	
Cells 6	6.1	50	26	1	22	3	-1	5%	
	6.2	71	33	0.9	0	4	-2	5%	
	6.3	82	22	0.4	0	2	0	0%	
	6.4	2	5	18	75	4	0	0%	
Cells 7	7.1	23	11	13	53	1	0	0%	
	7.2	41	23	7	28	1	-1	1%	
	7.3	5	2	20	73	1	0	0%	
	7.4	70	32	0.4	0	2	0	0%	
	7.5								
Cells 8	8.1	68	34	1	0	1	-2	5%	
	8.2	47	28	0.8	24	1	-12	5%	
	8.3	0.3	0.2	20	79	2	0	0%	
	8.4	69	35	0.2	0	2	0	0%	
Cells 9	9.1	79	24	0.6	0	1	0	0%	
	9.2	65	30	1	4	2	-8	30%	
	9.3	79	23	0.1	0	1	0	0%	
	9.4	59	27	1	12	0	-8	20%	
	9.6	0.7	0.1	21	78	2	0	0%	
Cells 10	10.2	52	21	1	26	3	0	0%	
	10.3	67	34	1	0	0	-8	30%	
	10.4								
	10.5	71	33	0.4	0	2	-7	30%	
	10.6	68	29	0.4	2	4	-8	30%	
Cells 11	1	71	32	0.8	0	2	0	0%	

	2	11.8	6	16	66	7	-0.9	1%	
	3	47	28	0.6	24	2	-12	5%	
Cells 12	**1**	0.3	0.4	20	79	1	0	0%	
	2	0.6	0.9	19	78	2	0	0%	
	3	71	32	0.8	0	2	0	0%	
	4	45	28	0.1	28	2	-2	5%	
Cells 13	**1**	56	26	3	15	4	-12	5%	
	2	69	29	0.2	1.7	3	-12	40%	
	3	56	24	0.1	20	0	-12	40%	
	4	69	26	0.4	4	4	-12	40%	
	5	46	24	0.9	29	1	-12	40%	
	6	65	31	1.3	3	2	-12	50%	
Cells 14	**1**	42	24	5	28	3	-1	2%	
	2	49	26	4	20	2	-12	40%	
	3	71	26	0.3	0	6	-12	60%	
	4	62	35	0.4	2	4	-9	30%	
	5	20	9	15	55	0	-8	2%	
	6	65	32	2	0	1	-12	5%	
Cells 15/16	**1**	60	36	0.6	0	9	-17	40%	
	2	58	37	0.8	0	4	-15	40%	
	3	52	34	1	13	3	-17	40%	
	4	62	35	0.4	2.6	6	-15	40%	
	5	64	35	0.3	0.7	3	-18	40%	
	6	65	35	0	0	4	-17	40%	
	7	61	34	2	3	3	-17	40%	
	8	51	35	2	12	2	-15	40%	
	9	60	34	1	0	40	-17	40%	
	10	28	12	13	47	12	-14	40%	
	11	59	36	0.6	4.4	11	-17	40%	
	12	61	35	0.6	0	6	-16	40%	
Flare		46	31	2.3	21.7	4	-32	15%	

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **29/09/2014**
Weather: **Dry, warm** **1002mb**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	53	26	3	18	1	-2	2%	
	1.4	63	27	1.1	0	1	-1	5%	
Cells 2	2.1	57	28	0.6	14	1	-3	2%	
	2.2	54	25	1.7	20	0	-2	2%	
	2.3	45	27	1.4	27	1	-2	2%	
Cells 3	3.2	61	31	0.9	6	1	-2	2%	
	3.3								
	3.4	58	30	0.5	11	1	-4	5%	
Cells 4	4.2	66	34	0.7	0	2	-2	20%	
	4.3	61	31	0.6	0	4	-3	2%	
	4.4	46	28	5	20	1	-3	2%	
Cells 5	5.1	62	36	0.8	0	5	-3	2%	
	5.2	50	25	1.5	25	2	-3	2%	
	5.3	46	26	2.8	25	1	-4	2%	
	5.4	62	35	0.7	0	2	-4	2%	
Cells 6	6.1	57	28	1.1	14	1	-3	2%	
	6.2	60	34	0.5	0	2	-4	2%	
	6.3	62	25	1.6	0	2	0	0%	
	6.4	0.1	2.8	19	78	1	0	0%	
Cells 7	7.1	6.8	3.7	18	71	1	0	0%	
	7.2	0	0.1	20	79	2	0	0%	
	7.3	3.5	5.3	19	70	1	0	0%	
	7.4	45	18	3.8	33	1	-2	2%	
	7.5								
Cells 8	8.1	64	36	1	0	1	-1	1%	
	8.2	59	31	1	8.6	2	-6	80%	
	8.3	62	37	1	0	2	-4	2%	
	8.4	0	0	20	78	1	0	0%	
Cells 9	9.1	62	33	0.4	0	1	0	0%	
	9.2	60	32	1	3	2	-8	30%	
	9.3	61	34	1	0	1	0	0%	
	9.4	56	31	1	12	0	-8	20%	
	9.6	0.7	0.1	21	77	1	0	0%	
Cells 10	10.2	50	30	1	19	4	0	0%	
	10.3	0.1	0.5	21	78	3	0	0%	
	10.4	72	33	0.1	0	2	-10	20%	
	10.5	66	34	0.4	0	3	-8	30%	
	10.6	65	31	0.3	0	1	-8	30%	
Cells 11	1	64	35	0.9	0	2	-6	5%	

	2	11	6.3	15	66	4	0	0%	
	3	65	33	1.2	0.6	2	-4	5%	
Cells 12	**1**	8	4	16	71	3	0	0%	
	2	0	0.3	21	78	2	0	0%	
	3	64	35	1.5	0	2	-2	1%	
	4	59	31	0.3	9.8	2	-10	40%	
Cells 13	**1**	61	34	1.6	0	3	-4	2%	
	2	64	31	0.8	0	2	-12	40%	
	3	61	30	0.6	0	3	-14	40%	
	4	64	34	1	0	3	-10	40%	
	5	62	31	1	0	2	-11	40%	
	6	60	30	1.5	0	2	-12	40%	
Cells 14	**1**	28	18	10	43	2	-12	3%	
	2	54	32	2.5	48	2	-12	40%	
	3	22	13	16	49	1	-2	2%	
	4	60	36	0.4	0	2	-8	40%	
	5	20	12	10	48	1	0	0%	
	6	61	36	1	3	1	-12	40%	
Cells 15/16	**1**	66	35	0.8	0	1	-46	40%	
	2	15	9	16	58	1	-47	40%	
	3	61	36	0.2	0	2	-45	40%	
	4	62	34	1.2	0	2	-16	40%	
	5	1	3	21	75	1	-2	40%	
	6	52	30	3	15	2	-46	40%	
	7	64	33	0	0	2	-16	40%	
	8	61	31	1	8	1	-40	40%	
	9	63	34	1	0	2	-46	40%	
	10	62	36	0.5	0	3	-46	40%	
	11	61	33	0.2	0	2	-41	40%	
	12	62	34	0	0	1	-45	40%	
Cells 18	**1**	60	36	0.4	0	2	-46	5%	
	2	56	39	1	2.9	4	-47	5%	
	3	61	38	0	0	2	-44	5%	
	4	60	36	1	3	1	-39	5%	
	5	58	38	0.9	0	3	-40	5%	
									Engine on line 29/09/14
									Wells on Cell 18
									connected
Flare		51	31	2.5	21.7	14	-40	100%	

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **24/10/2014**
Weather: **Rain** **972mb**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	53	24	3	19	1	-10	2%	
	1.4	68	26	1	5	1	-4	5%	
Cells 2	2.1	23	21	2	53	1	-6	5%	
	2.2	1	2	19	78	1	-4	2%	
	2.3	25	22	2	51	1	-3	2%	
Cells 3	3.2	47	27	0.8	25	2	-10	20%	
	3.3								
	3.4	25	22	2	50	1	-12	30%	
Cells 4	4.2	51	31	1	16	1	-30	60%	
	4.3	43	27	0.4	29	3	-8	2%	
	4.4	48	26	2.3	24	2	-10	5%	
Cells 5	5.1	35	29	0.2	35	5	-6	5%	
	5.2	24	18	0.9	57	2	-5	5%	
	5.3	36	34	0.3	0	2	0	0%	
	5.4	71	22	0.4	41	3	-2	2%	
Cells 6	6.1	36	27	1.1	23	2	-6	5%	
	6.2	49	28	1.1	20	2	-8	6%	
	6.3	36	16	1	46	1	0	0%	
	6.4	0.1	3	18	78	2	0	0%	
Cells 7	7.1	23	8	15	54	1	0	0%	
	7.2	0	2	20	77	2	0	0%	
	7.3	0	3	20	75	1	0	0%	
	7.4	53	24	0.5	23	1	-6	2%	
	7.5								
Cells 8	8.1	64	34	0.8	1	1	-12	20%	
	8.2	43	28	1	27	1	-10	20%	
	8.3	59	33	0.2	7.6	2	-2	1%	
	8.4	0	1	21	77	0	0	0%	
Cells 9	9.1	24	10	12	53	2	0	0%	
	9.2	64	31	0.3	4	1	-22	30%	
	9.3	82	7	7	3	0	0	0%	
	9.4	66	14	3	16	1	-25	20%	
	9.6	0.7	2	21	77	1	0	0%	
Cells 10	10.2	1	3	19	76	1	0	0%	
	10.3	58	32	1	8	6	-26	20%	
	10.4	46	24	2	28	3	-21	40%	
	10.5	61	32	0	7	2	-24	30%	
	10.6	42	21	0.5	36	1	-28	40%	

Cells 11	**1**	74	31	0.9	0	1	-14	10%	
	2	11	6	16	67	4	0	0%	
	3	51	32	1	16	1	-12	5%	
Cells 12	**1**	0	3	19	77	4	-1	1%	
	2	0	3	20	77	1	-1	1%	
	3	53	30	2.8	13	2	-12	20%	
	4	31	20	1.9	47	54	-10	20%	
Cells 13	**1**	54	23	2	21	1	-40	40%	
	2	53	24	3	18	1	-41	40%	
	3	73	30	0.2	0	1	-41	50%	
	4	39	19	7	34	1	-40	70%	
	5	22	18	2	50	1	-38	50%	
	6	55	31	1	13	1	-42	60%	
Cells 14	**1**	7	5	19	68	1	0	0%	
	2	22	13	12	52	1	-21	20%	
	3	72	29	1	0	3	-45	60%	
	4	49	29	2	17	2	-44	50%	
	5	10	6	18	66	1	0	0%	
	6	49	30	3	17	3	-10	2%	
Cells 15/16	**1**	69	35	1	0	2	-47	60%	
	2	18	8	16	56	1	-47	40%	
	3	66	38	1	0	2	-48	60%	
	4	69	35	0.2	0	4	-9	40%	
	5	70	35	0.2	0	1	-48	60%	
	6	49	28	3	19	4	-25	50%	
	7	45	27	4	23	24	-26	50%	
	8	67	37	0.2	0	3	-47	50%	
	9	65	31	1	2	14	-23	50%	
	10	58	33	2	6	3	-47	50%	
	11	70	34	0.4	0	2	-48	50%	
	12	71	33	0.2	0	3	-47	50%	
Cells 18	**1**	62	42	0.4	0	4	-26	20%	
	2	57	39	1.6	1	2	-24	20%	
	3	62	42	0.2	0	1	-21	20%	
	4	61	43	0.3	0	4	-26	20%	
	5	60	40	0.8	0	2	-22	20%	
									Engine on line 01/10/14
									Wells on Cell 18
									connected
Flare/Engine		45	28	2.1	24	6	-51	100%	

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** **GM09053**
Date: **27/11/2014**
Weather: **Dry** **972mb**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	58	26	2	19	1	-10	5%	
	1.4	69	25	1	5	1	-4	5%	
Cells 2	2.1	42	23	1	35	1	-4	5%	
	2.2	15	10	10	64	0	-6	2%	Check O2 Ingress
	2.3	28	20	1	52	1	-6	5%	
Cells 3	3.2	38	24	1	37	2	-4	5%	
	3.3								
	3.4	15	19	3	63	0	-8	30%	
Cells 4	4.2	36	26	1	36	1	-25	60%	
	4.3	46	28	0.6	26	2	-16	20%	
	4.4	39	24	0.9	36	0	-2	5%	
Cells 5	5.1	46	28	0.7	25	3	-6	2%	
	5.2	23	19	0.2	58	0	-4	5%	
	5.3	44	24	1.7	30	1	-7	5%	
	5.4	38	17	6	39	0	-8	5%	Check O2 ingress
Cells 6	6.1	56	26	0.3	17.4	1	-4	5%	
	6.2	48	25	0.4	28	0	-5	6%	
	6.3	33	21	1	46	1	0	0%	
	6.4	0.5	3.6	19	77	0	0	0%	Check O2 ingress
Cells 7	7.1	0.5	2.1	21	75	1	0	0%	Check O2 ingress
	7.2	0.5	2	20	77	2	0	0%	Check O2 ingress
	7.3	1.4	1.9	21	75	1	0	0%	Check O2 ingress
	7.4	35	21	1	43	1	-2	2%	
	7.5								
Cells 8	8.1	58	34	0.8	7	0	-10	20%	
	8.2	42	28	0.5	29	0	-16	20%	
	8.3	61	33	0.2	0	29	-8	5%	
	8.4	0.4	0.8	22	77	0	0	0%	Check O2 ingress
Cells 9	9.1	0.4	2.3	20	77	2	0	0%	Check O2 ingress
	9.2	46	29	0.2	26	0	-22	30%	
	9.3	71	8	0.1	3	0	0	0%	
	9.4	36	9	12	44	1	0	0%	
	9.6	0.7	3	20	75	0	0	0%	Check O2 ingress
Cells 10	10.2	5	4	19	72	0	0	0%	Check O2 ingress
	10.3	51	30	0.7	18	1	-40	40%	
	10.4	57	26	0.7	16	2	-36	30%	
	10.5	44	26	1	29	0	-31	40%	
	10.6	49	22	1	28	1	-29	40%	
Cells 11	1	42	29	0.4	29	2	-25	20%	
	2	11	6	15	67	6	0	0%	
	3	28	28	1.2	42	1	-12	5%	
Cells 12	1	0.4	1.9	21	76	2	-1	1%	Check O2 ingress
	2	1	1.3	21	76	1	-1	1%	Check O2 ingress
	3	52	27	0.6	21	4	-16	20%	
	4	36	21	1.1	42	1	-24	30%	
Cells 13	1	9	4	19	68	1	-48	40%	Check O2 ingress
	2	47	24	3	26	2	-44	50%	
	3	46	24	2	28	2	-51	50%	
	4	67	29	2	1	2	-46	70%	
	5	23	18	1	57	1	-49	50%	
	6	27	16	10	47	1	-46	60%	Check O2 ingress
Cells 14	1	27	25	10	37	2	-2	1%	Check O2 ingress
	2	20	11	15	54	1	-4	5%	Check O2 ingress
	3	71	29	1	0	3	-45	60%	
	4	44	26	3	26	4	-38	50%	
	5	35	17	11	37	2	-6	5%	Check O2 ingress
	6	48	27	3	19	4	-55	50%	

Cells 15/16	**1**	68	35	0.3	0	4	-55	50%	
	2	22	12	14	52	5	-56	50%	Check O2 ingress
	3	68	38	0.4	0	3	-55	60%	
	4	66	35	0.6	0	4	-56	40%	
	5	68	34	0.2	0	4	-56	60%	
	6	39	24	3	34	3	-28	50%	
	7	43	24	5	31	14	-26	50%	
	8	53	31	2	12	3	-55	50%	
	9	48	31	2	12	14	-25	50%	
	10	62	34	2	2	15	-47	50%	
	11	64	33	0.3	0	4	-48	50%	
	12	61	35	1	0	2	-54	50%	
Cells 18	**1**	60	40	0.6	0	5	-31	20%	
	2	54	38	1.6	2	2	-32	20%	
	3	59	40	0.5	1	2	-29	20%	
	4	58	38	0.8	0	3	-33	20%	
	5	58	40	1.2	1	5	-30	20%	
									Engine on line 01/10/14
									Wells on Cell 18
									connected
Flare/Engine		44	27	2.4	26	6	-55	100%	

NORTH KERRY LANDFILL GAS EXTRACTION WELL MONITORING

Model **Serial No** GM09053
Date: 24/12/2014
Weather: Rain/Cold **0989mb**

Cell	Well	CH4 (%)	CO2 (%)	O2 (%)	Balance (%)	CO (ppm)	Static Pressure (mb)	Valve Pos (%)	Comments
Cells 1	1.3	55	22	3	20	5	-5	5%	
	1.4	66	24	1	9	0	-3	5%	
Cells 2	2.1	26	20	2.3	50	1	-6	5%	
	2.2	20	16	3	60	0	-6	2%	
	2.3	19	17	2	60	1	-4	2%	
Cells 3	3.2	47	23	0.5	30	0	-10	20%	
	3.3								
	3.4	31	20	2.3	46	0	-12	30%	
Cells 4	4.2	47	27	1.8	24	1	-20	80%	
	4.3	49	28	0.5	21	0	-18	20%	
	4.4	48	28	1.5	28	0	-7	5%	
Cells 5	5.1	51	29	0.7	18	7	-8	2%	
	5.2	46	29	0.3	30	1	-6	5%	
	5.3	43	23	3.8	30	0	-5	5%	
	5.4	47	26	0.5	26	2	-8	5%	
Cells 6	6.1	46	24	2.8	26	1	-8	2%	
	6.2	59	29	0.3	11	2	-4	2%	
	6.3	18	8	3.7	69	0	0	0%	
	6.4	0.7	7.2	6.9	85	0	0	0%	
Cells 7	7.1	0.6	2.8	18	78	0	0	0%	
	7.2	40	3.4	18	42	0	0	0%	
	7.3	0.7	2.3	21	76	1	0	0%	
	7.4	3.8	3.5	17	75	0	0	0%	
	7.5								
Cells 8	8.1	59	32	1.1	7.4	0	-5	20%	
	8.2	22	11	14	53	1	-27	10%	
	8.3	51	30	1.5	17	1	-12	5%	
	8.4	0.5	1.8	19	78	0	0	0%	
Cells 9	9.1	20	5	4	70	2	0	0%	
	9.2	63	29	0.3	6	0	-26	30%	
	9.3	22	5	3	70	0	0	0%	
	9.4	51	26	4	18	2	-8	15%	
	9.6	0.6	2	17	79	0	0	0%	
Cells 10	10.2	55	20	0.4	25	1	-10	5%	
	10.3	52	30	0.3	18	1	-28	40%	
	10.4	58	27	0.4	14	1	-25	20%	
	10.5	50	26	0.6	22	1	-21	5%	
	10.6	0.4	1.3	21	77	0	0	0%	

Cells 11	**1**	46	28	0.1	26	3	-18	20%	
	2	8	4	17	69	3	-2	5%	
	3	41	23	3	30	1	-8	5%	
Cells 12	**1**	61	30	0.5	7.9	3	-1	1%	
	2	32	23	0.4	44	2	-1	1%	
	3	48	30	0.7	21	2	-9	5%	
	4	48	26	1.4	24	1	-18	30%	
Cells 13	**1**	67	31	1.5	0	2	-24	20%	
	2	56	24	2.1	17	2	-19	60%	
	3	48	24	0.3	27	3	-21	60%	
	4	66	27	0.4	5	1	-19	70%	
	5	55	26	0.8	19	2	-21	60%	
	6	67	31	0.4	0	3	-16	60%	
Cells 14	**1**	20	11	13	54	2	-2	1%	
	2	32	18	9	40	1	-3	5%	
	3	74	28	0.7	0	0	-28	60%	
	4	56	28	2.7	18	3	-21	30%	
	5	31	21	12	42	1	-4	5%	
	6	54	30	3	13	3	-6	5%	
Cells 15/16	**1**	70	33	0.8	0	3	-31	60%	
	2	24	13	12	50	2	-30	60%	
	3	41	25	8	24	3	-31	60%	
	4	66	33	2	0	2	-30	60%	
	5	44	29	0.3	27	5	-31	60%	
	6	46	25	3.4	28	2	-21	60%	
	7	54	31	1.7	13	8	-17	60%	
	8	67	36	0.7	0	3	-31	60%	
	9	54	27	4	15	4	-29	60%	
	10	48	27	5	19	3	-29	60%	
	11	70	33	0.7	0	4	-30	60%	
	12	68	35	0.3	0	5	-30	60%	
Cells 18	**1**	58	38	1	3	3	-6	20%	
	2	52	36	1.6	10	2	-8	20%	
	3	57	35	0.5	7	2	-10	20%	
	4	54	35	1.8	9	3	-7	20%	
	5	59	40	0.5	1	3	-6	20%	
Flare/Engine	**Before**	46	28	2.4	21	4	-38	100%	
Flare/Engine	**After**	49	31	1.7	18	5	-33	100%	

Appendix H: Dust Monitoring

southern scientific services ltd.

OUR REF: RP **2014** | KERRY COUNTY COUNCIL - **NORTH KERRY LANDFILL** | **001** **PAGE 01 | 02**

ANALYSIS REPORT

CUSTOMER:	**KERRY COUNTY COUNCIL** | North Kerry Landfill |	**SAMPLE TYPE:**	**BERGERHOFF DEPOSIT GAUGE**
ADDRESS:	North Kerry Landfill, Tralee, County Kerry	**CONDITION OF SAMPLE ON RECEIPT:**	Satisfactory
		DATE SAMPLED:	03 June – 01 July 2014
REPORT TO:	**CONAL MURPHY**	**DATE RECEIVED:**	01 July 2014
SAMPLED BY:	**Danny O Leary** Southern Scientific Services Ltd	**DATE ANALYSED:**	14 – 23 July 2014
SAMPLING PT:	**North Kerry Landfill Boundaries**	**DATE REPORTED:**	24 July 2014
ORDER NO:	**400337804**	**WORK NO.:**	**30676 C | 14P-032 |**

TABLE OF RESULTS

METHOD:	**LAB REF:**	**YOUR REF:**	**TOTAL PARTICULATES mg/m²/day**	**INORGANIC PARTICULATES mg/m²/day**
SCP 039	C14-Jul 019	NKL D1	**84**	**37**
SCP 039	C14-Jul 020	NKL D2	**141**	**35**
SCP 039	C14-Jul 021	NKL D3	**44**	**10**
SCP 039	C14-Jul 022	NKL D4	**41**	**17**

Jennifer Keane

Jennifer Keane
Chemistry Laboratory Manager

- **The results relate only to the items tested.**
- **The analysis report shall not be reproduced except in full without written approval of the laboratory.**

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directors: K. Murphy, M. Murphy & C. Murphy
registered in ireland no 323196 | vat reg no IE 6343196 M

ANALYSIS REPORT

CUSTOMER:	**KERRY COUNTY COUNCIL** | North Kerry Landfill |	**SAMPLE TYPE:**	**BERGERHOFF DEPOSIT GAUGE**
ADDRESS:	North Kerry Landfill, Tralee, County Kerry	**CONDITION OF SAMPLE ON RECEIPT:**	Satisfactory
		DATE SAMPLED:	07 August – 04 September 2014
REPORT TO:	**CONAL MURPHY**	**DATE RECEIVED:**	04 September 2014
SAMPLED BY:	**Danny O Leary** Southern Scientific Services Ltd	**DATE ANALYSED:**	04 – 30 September 2014
SAMPLING PT:	**North Kerry Landfill Boundaries**	**DATE REPORTED:**	01 October 2014
ORDER NO:	**400337804**	**WORK NO.:**	**31301 C | 14P-032 |**

TABLE OF RESULTS

METHOD:	**LAB REF:**	**YOUR REF:**	**TOTAL PARTICULATES mg/m²/day**	**INORGANIC PARTICULATES mg/m²/day**
SCP 039	C14-Sep 525	NKL D1	**39**	**15**
SCP 039	C14-Sep 526	NKL D2	**55**	**<10**
SCP 039	C14-Sep 527	NKL D3	**34**	**<10**
SCP 039	C14-Sep 528	NKL D4	**19**	**<10**

Jennifer Keane

Jennifer Keane
Chemistry Laboratory Manager

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directors: K. Murphy, M. Murphy & C. Murphy
registered in ireland no 323196 | vat reg no IE 6343196 M

ANALYSIS REPORT

CUSTOMER:	**KERRY COUNTY COUNCIL** | North Kerry Landfill |	**SAMPLE TYPE:**	**BERGERHOFF DEPOSIT GAUGE**
ADDRESS:	North Kerry Landfill, Tralee, County Kerry	**CONDITION OF SAMPLE ON RECEIPT:**	Satisfactory
		DATE SAMPLED:	04 September – 06 October 2014
REPORT TO:	**CONAL MURPHY**	**DATE RECEIVED:**	06 October 2014
SAMPLED BY:	**Danny O Leary** Southern Scientific Services Ltd	**DATE ANALYSED:**	04 – 10 November 2014
SAMPLING PT:	**North Kerry Landfill Boundaries**	**DATE REPORTED:**	11 November 2014
ORDER NO:	**400337804**	**WORK NO.:**	**31411 C | 14P-032 |**

TABLE OF RESULTS

METHOD:	**LAB REF:**	**YOUR REF:**	**TOTAL PARTICULATES mg/m²/day**	**INORGANIC PARTICULATES mg/m²/day**
SCP 039	C14-Oct 200	NKL D1	**61**	**30**
SCP 039	C14-Oct 201	NKL D2	**210**	**116**
SCP 039	C14-Oct 202	NKL D3	**127**	**10**
SCP 039	C14-Oct 203	NKL D4	**40**	**24**

Jennifer Keane

Jennifer Keane
Chemistry Laboratory Manager

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Appendix I: Noise Monitoring 2014

southern scientific
services ltd

ENVIRONMENTAL NOISE SURVEY

NORTH KERRY LANDFILL

MUINGNAMINNANE

TRALEE

CO. KERRY

W0001-04

Requested By:	Conal Murphy Kerry County Council
Surveyed By:	Sinead Fagan M.A. Env. Res. Management
Reported By:	Sinead Fagan M.A. Env. Res. Management
Date Reported:	29th August 2014
Our Reference:	14P 042

Issue Date	Revision	Checked	Comment
29/08/14	00	P. Byrne (B.Sc; Ph.D) Cert. Env. Noise (IOA)	Final report

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Table of Contents

1. Introduction

Southern Scientific Services Ltd was commissioned by Kerry County Council to conduct a daytime environmental noise survey at North Kerry Landfill, Muingnaminnane, Tralee, Co. Kerry. The landfill is located approximately 9km north-west of Castleisland town in a rural setting. The site is bounded by a windfarm, bogland and forestry.

Six noise monitoring locations are listed in Schedule D.1 of the EPA Waste Licence (W0001-04) for the site. Schedule C.3 of the licence stipulates a daytime noise limit of 55dB(A) at noise sensitive locations, measured over a 30 minute period. EPA published the Guidance Note for Noise (NG4) in 2012 and this stipulates three noise surveys at each monitoring location for day-time assessments. Three noise surveys at each monitoring location were undertaken to fulfill and assess compliance with these licence conditions.

2. Site Location and Activities

The landfill is located at Muingnaminnane, Tralee, Co. Kerry. The facility closed for waste acceptance on Friday the 11th of July 2014. However, at the time of the survey, the facility was open to the public between 08:30 – 17:00 Monday - Friday and between 09:00 – 13:00 on Saturdays. Sources of noise within the site include machinery (some with reversing alarms), vehicle movements, loading and unloading activities, and recycling activities. The facility is closed at night-time.

3. Survey Details and Methodology

3.1 Survey Details

The noise surveys were undertaken on the 19th and 23rd of June 2014 to assess the noise levels at predetermined locations (N1, N2, N3, E1, E2, E3) provided by Kerry County Council. The monitoring locations are described in Table 1 and illustrated in Figure 1. A thirty minute monitoring period was employed for each survey conducted at each monitoring location.

Table 1: Noise Monitoring Locations

I.D.	Location	Surrounding ground features
N1	Site boundary at lagoon adjacent to public recycling area	Hardcore, lagoon, some earthen mounds
N2	Adjacent to Gas Detection Well No. 8	Hardcore, some earthen mounds
N3	On access road to forestry plantation	Hardcore, some earthen mounds
E1	Access road to windfarm	Rough grass & trees
E2	Junction of access road to windfarm and the public road	Conifer plantation
E3	At entrance to landfill	Roadway, conifer plantation

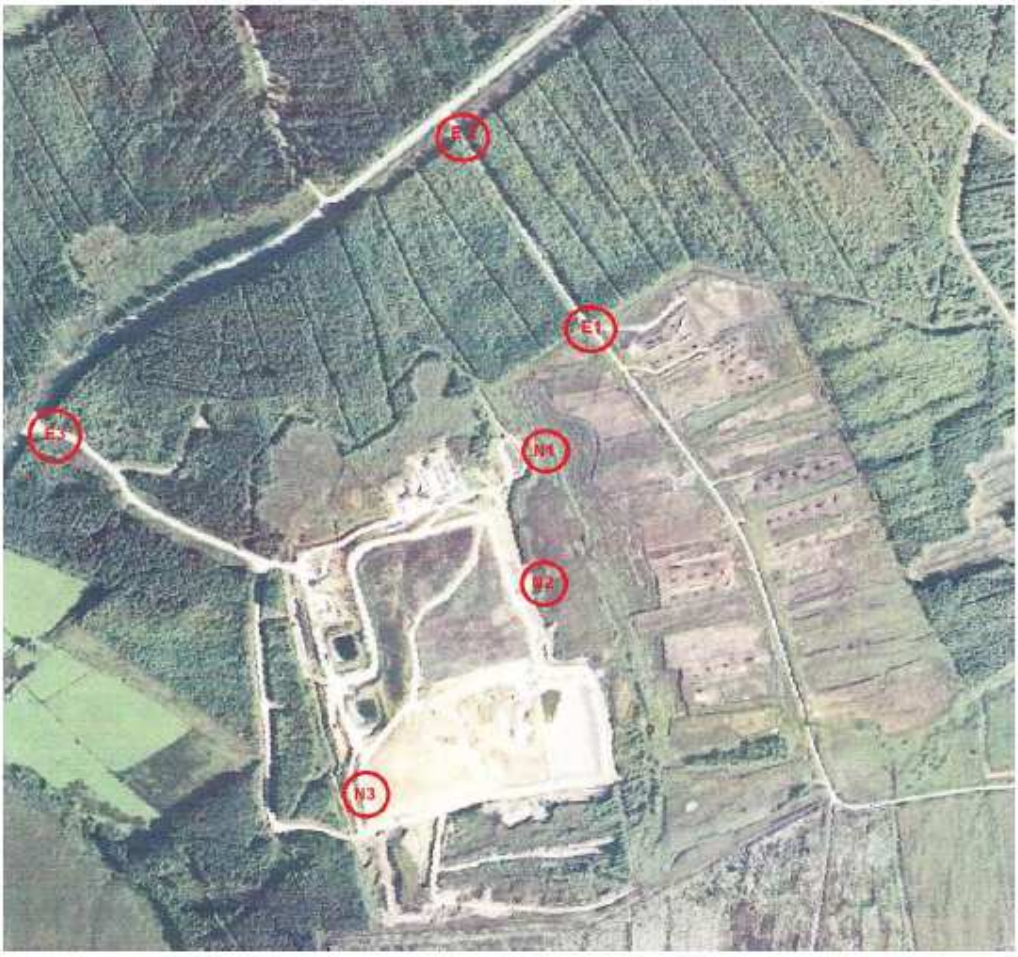

Figure 1: Map showing monitoring locations (refer to Table 1 for description)

3.2 Equipment

Instrument:	Brüel & Kjaer (Type 2250-L with Type 4950 microphone).
Instrument Serial No:	2654679
Microphone Serial No:	2652929
Instrument Last Calibrated:	24/10/2013

This instrument conforms to the following standards:

IEC 61672-1, Class 1
IEC 61260 1/3 Oct. Band Class 0
IEC 60651, Type 1
IEC 60804, Type 1

Sound Calibrator:	Brüel & Kjaer Type 4231
Sound Calibrator Serial No.:	3001116
Sound Calibrator Calibration Date:	24/10/2013
Utility Software:	BZ – 5298 Version 4.5

3.3 Monitoring Methodology

Noise monitoring was carried out in accordance with:

- International Standard ISO 1996 – Acoustics – Description, measurement and assessment of environmental noise
- Guidance Note for Noise (NG 4) – EPA, 2012

Briefly, these standards recommend calibration of instruments before and after the survey (this was undertaken on-site using the sound calibrator (94dBA) detailed above); measurement at least 3.5m from any reflecting structure (other than the ground) and 1.2m - 1.5m above ground level. The microphone was fitted with a windshield (Brüel & Kjaer Type UA-0237). Tonal analysis was undertaken following Annex D of ISO 1996 (Part 2), 2007. In this method, a prominent discrete tone is identified as present when the sound pressure level in the one-third-octave band of interest exceeds the sound pressure levels of both adjacent one-third-octave bands as follows:

1. 15 dB in the low frequency one-third-octave bands (25Hz – 125Hz)
2. 8dB in the middle frequency bands (160Hz – 400Hz)
3. 5dB in the high frequency bands (500Hz – 10, 000Hz)

3.4 Measurement Parameters/Terminology

A-weighted: The adjustment applied to sound level recordings to approximate the non-linear frequency response of the human ear. The A-weighting is denoted by the suffix A in the parameters listed below such as L_{Aeq}, L_{A10}.

Decibel (dB): The scale in which sound pressure level is expressed, which is based on a logarithmic scale.

Impulsive Noise: A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

Tonal Noise: Noise caused by the dominance of one or more frequencies which may result in increased noise nuisance.

Interval: The time period, t, over which noise monitoring is carried out.

$L_{Aeq\,t}$: The equivalent continuous sound level during a measurement interval, effectively representing the average A-weighted noise level.

L_{AF10}: The A-weighted sound level with Fast time weighting (F) which is exceeded for 10% of the measurement interval, usually used to quantify traffic noise.

L_{AF90}: The A-weighted sound level with Fast time weighting (F) which is exceeded for 90% of the measurement interval, usually used to quantify background noise.

1/3 Octave Band Analysis: Frequency Analysis of sound such that the frequency spectrum is subdivided into bands of one-third of an octave each. An octave is taken to be a frequency interval, the upper limit of which is twice the lower limit.

4. Results

4.1 Environmental Conditions on the 19th June 2014

Cloud Cover	Precipitation	Wind Direction	Av. wind speed @2m	Av. temperature
80%	0mm	North Easterly	Variable <0.5 – 3.7m/s	22ºC

4.2 Noise Survey Results on the 19th June 2014

I.D.	Start Time	$L_{Aeq\ (30\ mins)}$ dB	$L_{AF10\ (30\ mins)}$ dB	$L_{AF90\ (30\ mins)}$ dB
N1	11:29	40.2	42.6	30.0
Noise Sources: Internal site traffic and machinery, including reversing alarms were most audible at this location within site. Tractor removing trailer full of waste from public disposal area (2 tractors). Waste being deposited in the recycling area by members of the public (2 No. recyclers) (bottles most notable); associated vehicles entering and leaving this area; customers talking; car radio audible. Compressor in recycling area. Background noise included birdsong, bees and rustling vegetation, traffic faintly audible from main road, turbines from adjacent windfarm and water flow from lagoon. A metal sign at the lagoon was flapping in wind. Bird scarer device was audible (3 loud bangs) at regular intervals (approximately 8-minute intervals).				
N2	10:55	40.9	41.9	30.7
Noise Sources: Noise associated with turbines on adjacent windfarm was continuous in the background. Background noise included birdsong, bees and laughter from recycling area. Internal site traffic, one truck passed monitor. Very faint noise from plant machinery working at a distance. Traffic from external road east of site was also faintly audible. The bird scarer device was audible (3 loud bangs) at regular intervals (approximately 8-minute intervals).				
N3	10:17	43.9	46.3	38.6
Noise Sources: Noise associated with the adjacent windfarm turbines was continuous in the background. Machinery, including reversing alarms could be faintly heard operating at a distant location within site. Other background noise included birdsong, bees and rustling vegetation. External road traffic in the distance to the west of site could be barely heard. The bird scarer device was audible (3 loud bangs) at regular intervals (approximately 8-minute intervals).				
E1	08.30	45.0	39.9	27.4
Noise Sources:. The only noise emanating from the landfill was the bird scarer device (2 loud bangs) at regular intervals . Main road traffic was faintly audible. Local road traffic included 1 No. car and 1 No. van. Background noise included birdsong, bees, other rustling vegetation.				
E2	09:03	55.6	45.3	30.1
Noise Sources: Passing traffic on the public road included 4 No. cars, 3 No. vans and 1 No. jeep. Background noise included, bees, rustling vegetation and birdsong.				
E3	09.37	52.0	48.5	30.9
Noise Sources: Passing traffic on the public road included 7No. cars, 2No. trucks, 6No. vans. Traffic entering and exiting the landfill included 4No. vans and 1No. truck. Reversing alarms and plant machinery within the landfill could be heard on occasion. Background noise included wind-derived noise from adjacent forestry trees, other rustling vegetation, bees and birdsong. The bird scarer device was audible (2loud bangs) intermittently.				

4.3 Noise Survey Results on the 19th June 2014 continued

I.D.	Start Time	$L_{Aeq\ (30\ mins)}$ dB	$L_{AF10\ (30\ mins)}$ dB	$L_{AF90\ (30\ mins)}$ dB
N1	12.00	41.0	43.4	31.2
Noise Sources: Internal site traffic and machinery, including reversing alarms were most audible at this location within site. Tractor removing trailer full of waste from public disposal area (4 tractors). Waste being deposited in the recycling area by members of the public (3 No. recyclers) (bottles most notable); associated vehicles entering and leaving this area; customers talking; car radio audible. Background noise included birdsong, bees and rustling vegetation, traffic faintly audible from main road, turbines from adjacent windfarm and water flow from lagoon. A metal sign at the lagoon was flapping in wind. Bird scarer device was audible (3 loud bangs) at regular intervals (approximately 8-minute intervals).				
N2	12.35	41.1	41.0	31.9
Noise Sources: Noise associated with turbines on adjacent windfarm was the dominant noise at this location. Background noise included birdsong and bees. Very faint noise from plant machinery working at a distance. Traffic from external road east of site was also faintly audible. The bird scarer device was audible (2 loud bangs) at regular intervals.				
N3	13.13	45.6	48.5	38.7
Noise Sources: Noise associated with the adjacent windfarm turbines was the prevailing noise at this location. Machinery, including reversing alarms could be very faintly heard operating at a distant location within site. Other background noise included birdsong, bees and rustling vegetation. External road traffic could be barely heard in the distance to the west of site .The bird scarer device was audible (3 loud bangs) at regular intervals (approximately 8-minute intervals).				
E1	14.31	38.0	40.6	32.5
Noise Sources:. The only noise emanating from the landfill was the bird scarer device (1 loud bang) . Main road traffic was faintly audible. Background noise included birdsong, bees, turbines from adjacent windfarm and rustling vegetation in adjacent forestry.				
E2	15.05	53.0	48.6	35.5
Noise Sources: Passing traffic on the public road included 18 No. cars, 1 No. van, and 2 No. jeeps. Background noise included, bees, rustling vegetation and birdsong.				
E3	13.55	52.9	51.4	38.4
Noise Sources: Passing traffic on the public road included 5No. cars, 4No. jeeps, 4No. vans. Traffic entering and exiting the landfill included 1No. car, 1No. van and 1No. jeep. Reversing alarms and plant machinery within the landfill could be heard on occasion. Background noise included wind-derived noise from adjacent forestry trees, other rustling vegetation, bees and birdsong. The bird scarer device was audible (1 loud bang).				

4.4 Environmental Conditions on the 23rd June 2014

Cloud Cover	Precipitation	Wind Direction	Av. wind speed @2m	Av. temperature
83%	0mm	N to NE	Variable <0.5 – 3.5m/s	25°C

4.5 Noise Survey Results on the 23rd June 2014

I.D.	Start Time	$L_{Aeq\ (30\ mins)}$ dB	$L_{AF10\ (30\ mins)}$ dB	$L_{AF90\ (30\ mins)}$ dB
N1	13.14	31.3	31.6	24.4
Noise Sources: Waste being deposited in the recycling area by members of the public (3 No. recyclers) (bottles most notable); associated vehicles entering and leaving this area; customers talking; car radio audible. Helicopter passing overhead clearly audible. Background noise included birdsong, bees and rustling vegetation, traffic faintly audible from main road, turbines from adjacent windfarm and water flow from lagoon. Metal sign at lagoon was flapping in wind.				
N2	12.38	30.8	31.3	24.5
Noise Sources: Noise associated with turbines on adjacent windfarm was most audible in the background. Machinery, including reversing alarms could faintly be heard operating at a distant location within site. Internal site traffic could also be heard intermittently. Background noise included birdsong, bees and rustling vegetation.				
N3	13.54	38.3	40.5	29.5
Noise Sources: Noise associated with turbines on adjacent windfarm was clearly audible at this location. Machinery, including reversing alarms could only be slightly heard operating at a distant location within site. Internal site traffic was audible at this location. Tractor and tanker truck draining a lagoon could clearly be heard. Pump and engine running for 20 minutes of survey. Background noise included birdsong, bees and rustling vegetation.				
E1	10.45	36.0	36.5	27.3
Noise Sources Crickets, birdsong and bees formed the background noise at this location. Noise emanating from the landfill was very faint. It included reversing alarms, plant machinery. Main road traffic was faintly audible. Local road traffic included 1No. van.				
E2	11.19	56.9	51.1	29.1
Noise Sources: Passing traffic on the public road included 17No. cars, 2No. trucks, 2No. jeeps, 2No. tractors and 8No. vans. One car turned onto local road directly passing monitor. Background noise included, wind-derived noise from adjacent forestry trees, other rustling vegetation, bees and birdsong.				
E3	11.54	52.3	51.0	28.9
Noise Sources: Passing traffic on the public road included 8No. cars, 4No. vans,2 No. truck and 1No. motorbicycle. Traffic entering and exiting the landfill included 11No. cars, 2No. vans and 1No. jeep. 1 No. airplane passed over at 12.18. Reversing alarms and plant machinery within the landfill could be heard clearly during lulls in traffic. Background noise included wind-derived noise from adjacent forestry trees, other rustling vegetation, bees and birdsong.				

4.7 Summary of results

Station	Date	Start Time	L_{Aeq} (30mins)	L_{AF10}	L_{AF90}
N1	19.06.14	11:29	40.2	42.6	30.0
	19.06.14	12.00	41.0	43.4	31.2
	23.06.14	13.14	31.3	31.6	24.4
N2	19.06.14	10.55	40.9	41.9	30.7
	19.06.14	12.35	41.1	41.0	31.9
	23.06.14	12.38	30.8	31.3	24.5
N3	19.06.14	10.17	43.9	46.3	38.6
	19.06.14	13.13	45.6	48.5	38.7
	23.06.14	13.54	38.3	40.5	29.5
E1	19.06.14	08.30	45.0	39.9	27.4
	19.06.14	14.31	38.0	40.6	32.5
	23.06.14	10.45	36.0	36.5	27.3
E2	19.06.14	9:03	55.6	45.3	30.1
	19.06.14	15.05	53.0	48.6	35.5
	23.06.14	11.19	56.9	51.1	29.1
E3	19.06.14	9.37	52.0	48.5	30.9
	19.06.14	13.55	52.9	51.4	38.4
	23.06.14	11.54	52.3	51.0	28.9

5. Discussion & Conclusion

The L_{AF10} & L_{AF90} noise parameters along with the audible noise sources recorded during the survey assist in providing an understanding of the sources and nature of the noise in the area. The L_{A10} is the A-weighted sound level, which is exceeded for 10% of the measurement interval and is usually used to quantify traffic noise or other short duration/passing events. In contrast, the L_{A90} is the A-weighted sound level that is exceeded for 90% of the measurement interval and is usually used to quantify background noise. The L_{Aeq} is the equivalent continuous sound level during a measurement interval, effectively representing the average A-weighted noise level. The site waste licence specifies a day-time limit of 55dB (A) $L_{Aeq\ (30\ min)}$ at noise sensitive locations.

The noise levels measured were below 55dB (A) $L_{Aeq\ (30\ min)}$ at five of the six monitoring locations. All three on-site locations (N1-N3) were within the 55dB (A) $L_{Aeq\ (30\ min)}$ limit. The elevated noise levels measured at the roadside position (E2) was primarily attributed to traffic on the public road. Background noise is given by the L_{A90} and was recorded well below 55dB (A) at location E2. With the exception of the survey at 10:55am on the 19th June at location N2, the 1/3 Octave Frequency Spectra show that there was no prominent tonal noise present when assessed following the criteria in Annex D of ISO 1996 (Part 2), 2007. Tonal noise at 5kHz was identified at this monitoring location (N2) during one survey only but not during subsequent surveys. The source of tone was not identified. Having regard to the monitoring results obtained in these surveys, 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 noise sensitive receptors in the locality.

Appendix 1

1/3 Octave Frequency Spectra

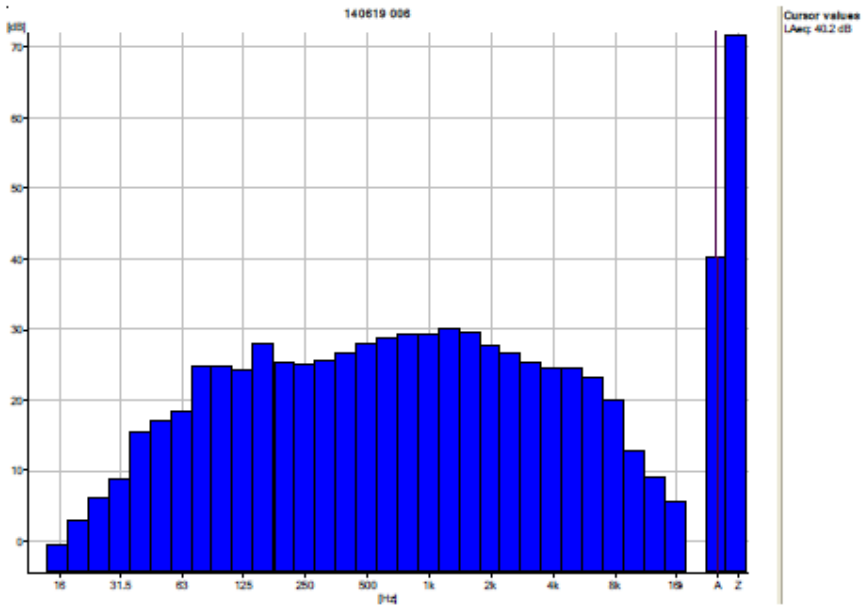

Figure A.1: 1/3 Octave Frequency Graph for N 1 on the 19th June 2014

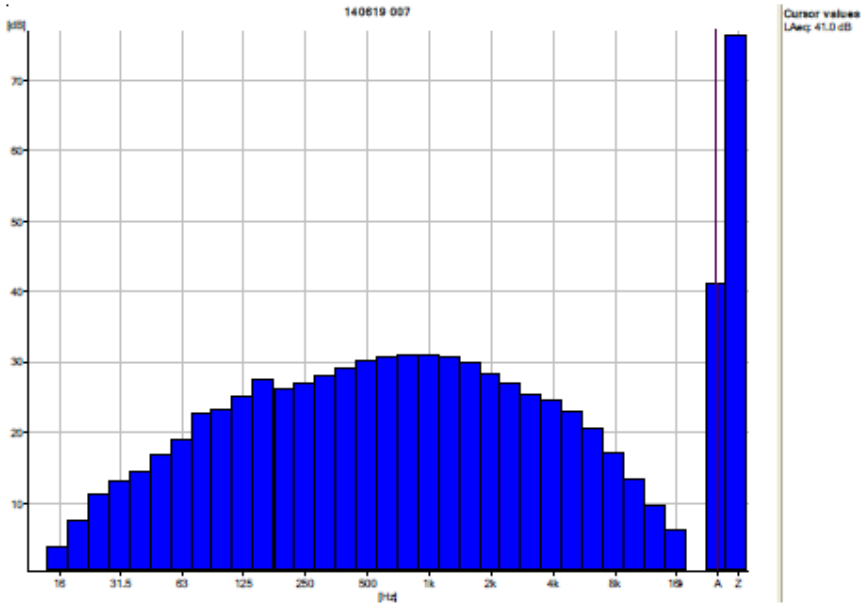

Figure A.2: 1/3 Octave Frequency Graph for N 1 on the 19th June 2014

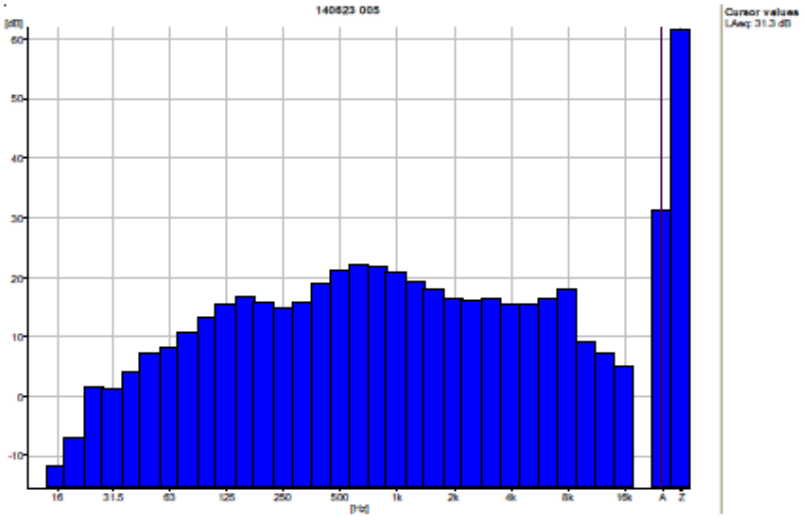

Figure A.3: 1/3 Octave Frequency Graph for N 1 on the 23rd June 2014

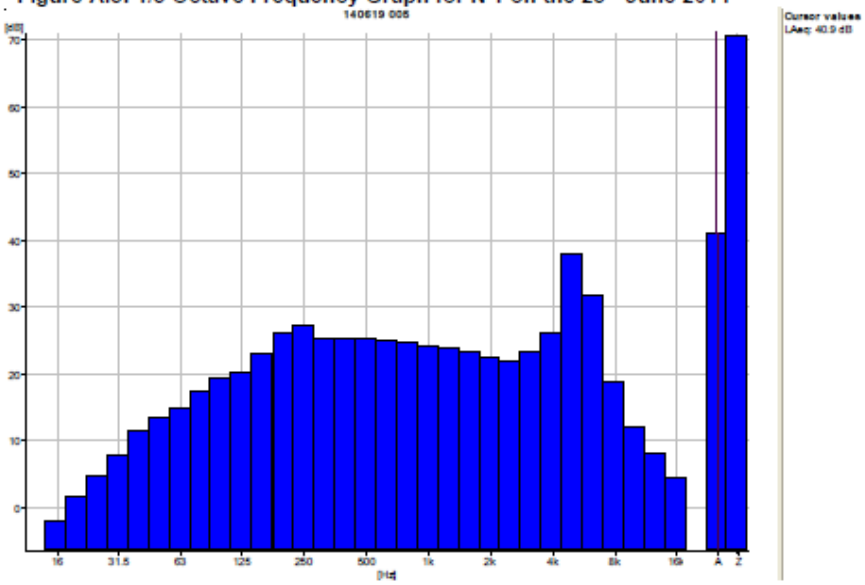

Figure A.4: 1/3 Octave Frequency Graph for N 2 on the 19th June 2014

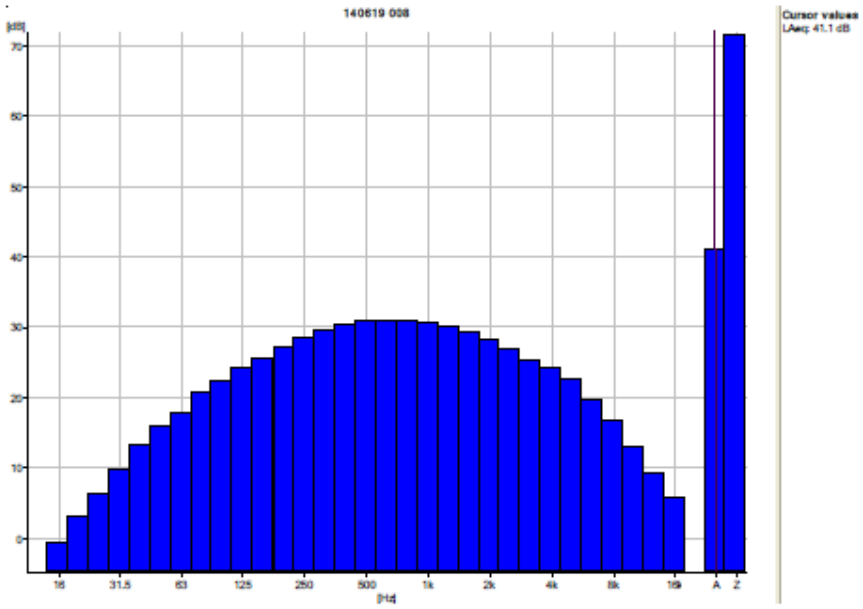

Figure A.5: 1/3 Octave Frequency Graph for N 2 on the 19th June 2014

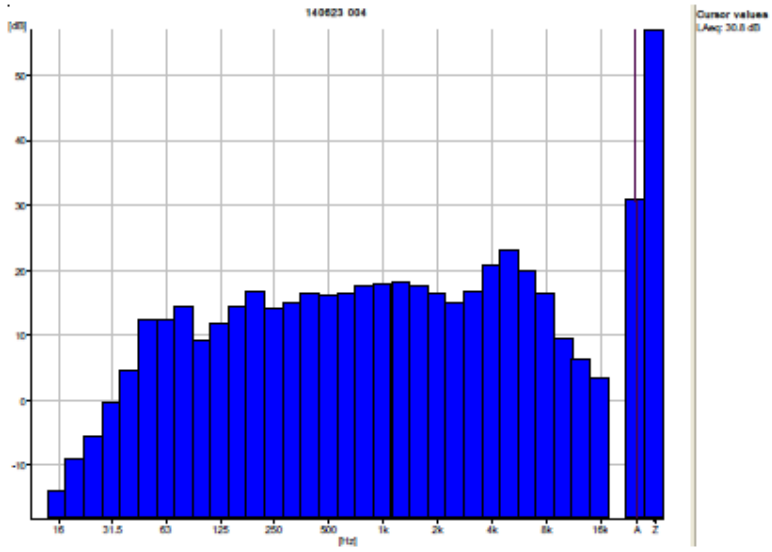

Figure A.6: 1/3 Octave Frequency Graph for N 2 on the 23rd June 2014

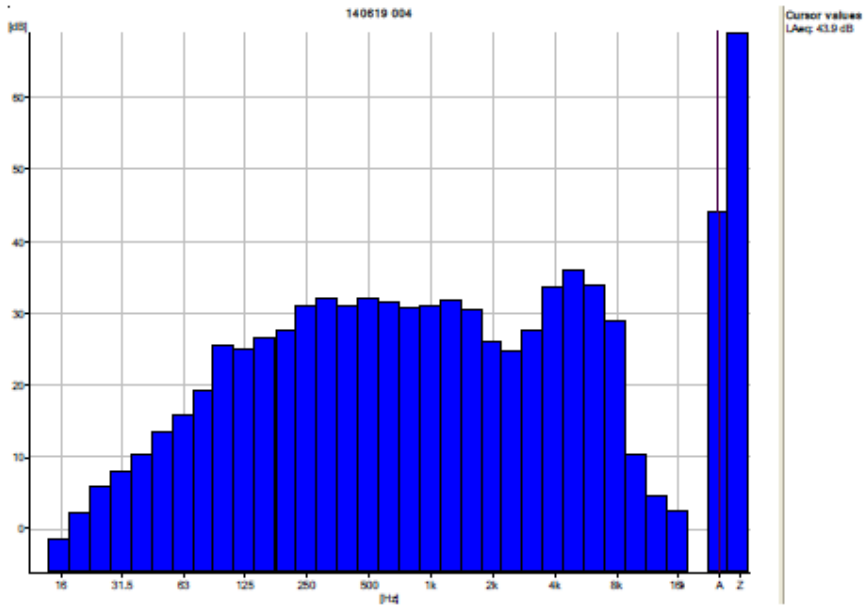

Figure A.7: 1/3 Octave Frequency Graph for N 3 on the 19th June 2014

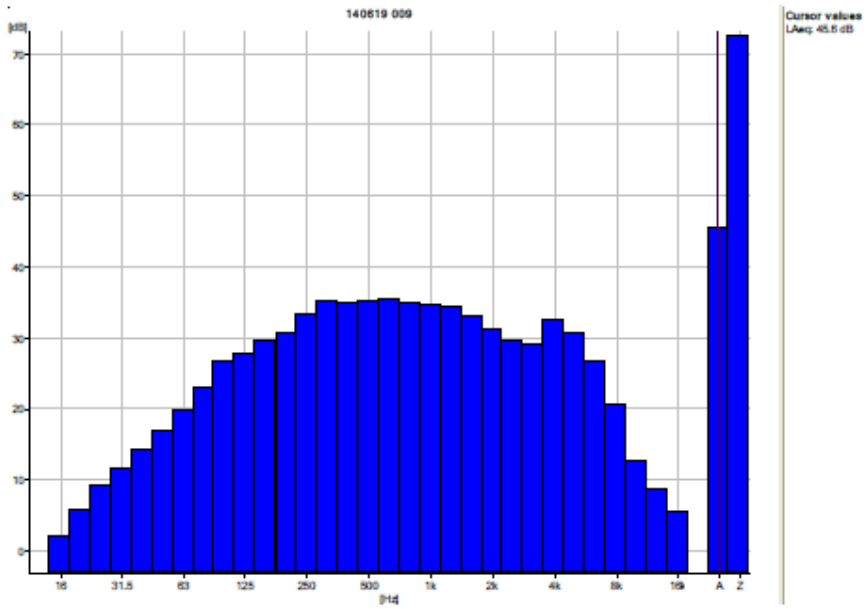

Figure A.8: 1/3 Octave Frequency Graph for N 3 on the 19th June 2014

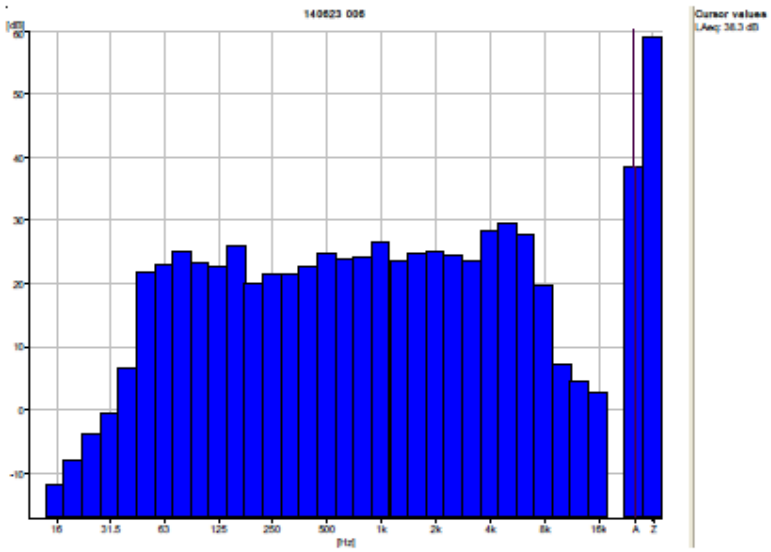

Figure A.9: 1/3 Octave Frequency Graph for N 3 on the 23rd June 2014

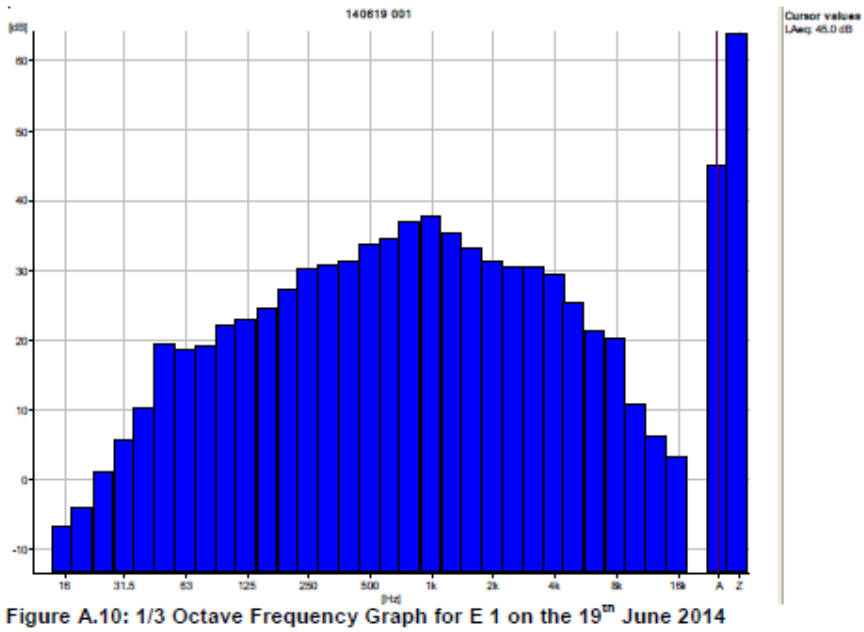

Figure A.10: 1/3 Octave Frequency Graph for E 1 on the 19th June 2014

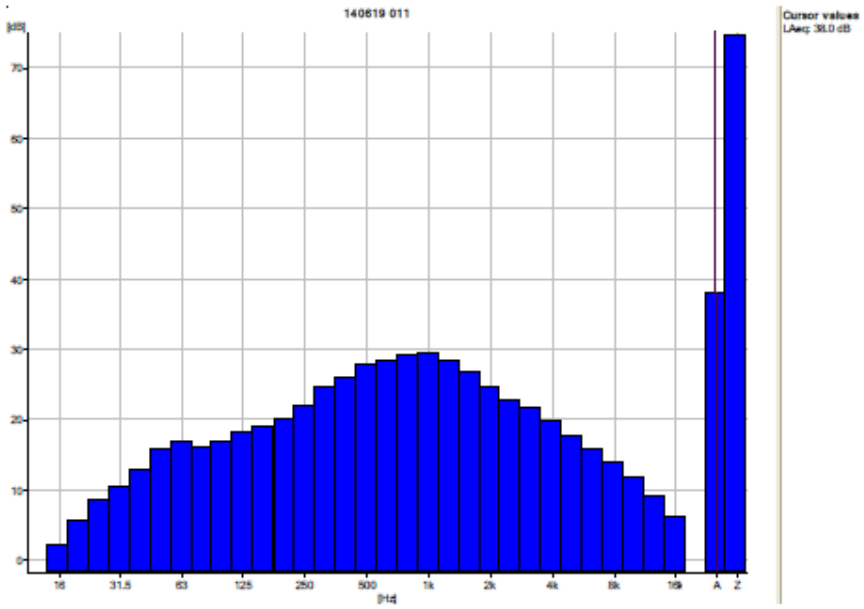

Figure A.11: 1/3 Octave Frequency Graph for E 1 on the 19th June 2014

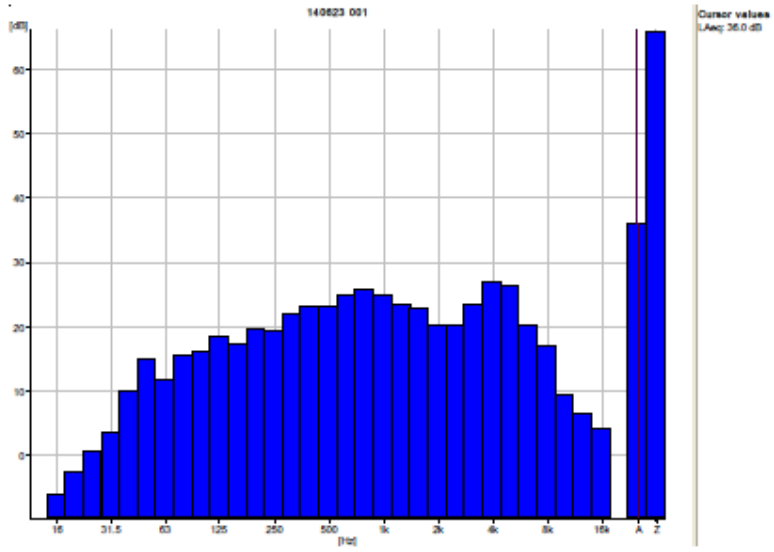

Figure A.12: 1/3 Octave Frequency Graph for E 1 on the 23rd June 2014

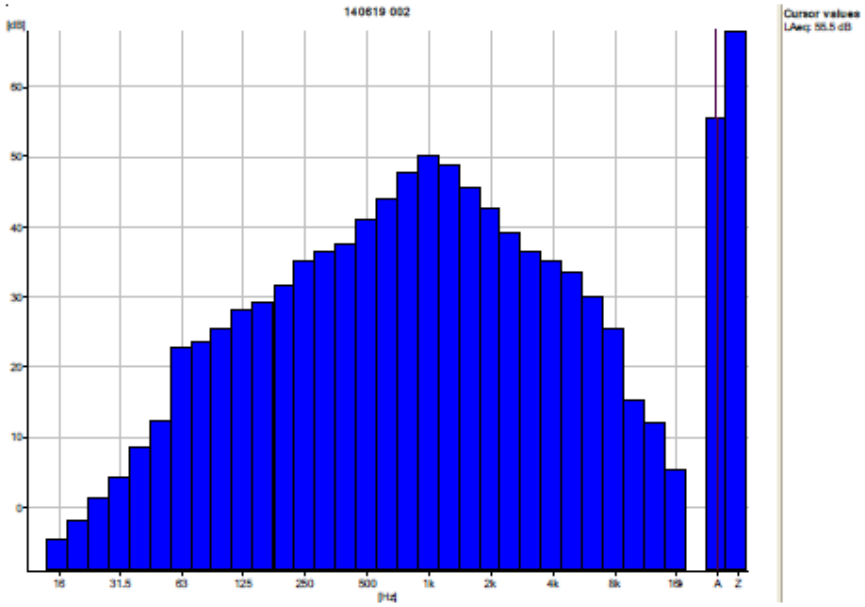

Figure A.13: 1/3 Octave Frequency Graph for E 2 on the 19th June 2014

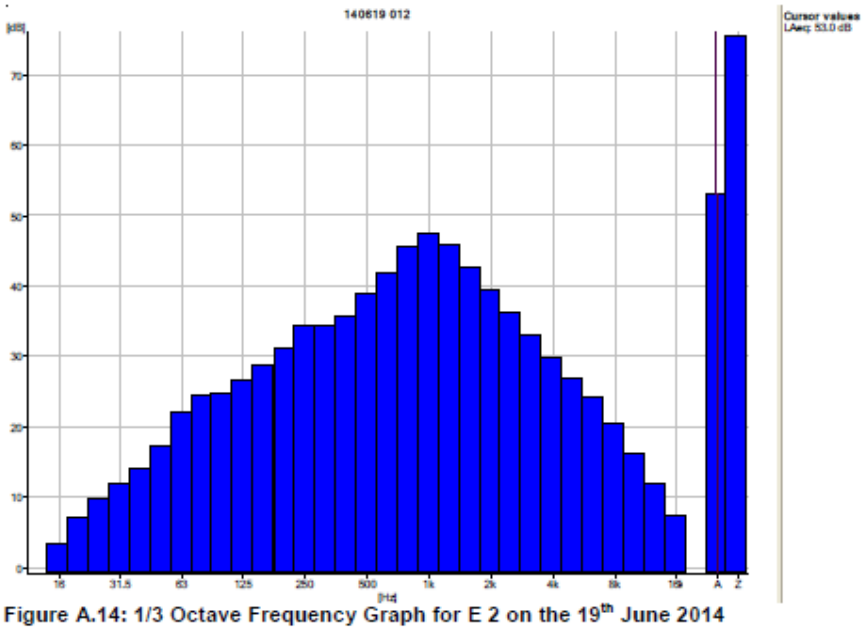

Figure A.14: 1/3 Octave Frequency Graph for E 2 on the 19th June 2014

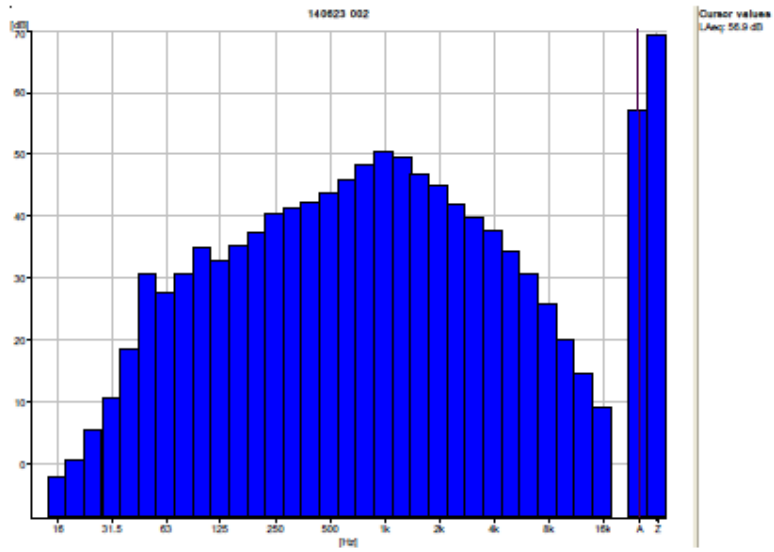

Figure A.15: 1/3 Octave Frequency Graph for E 2 on the 23rd June 2014

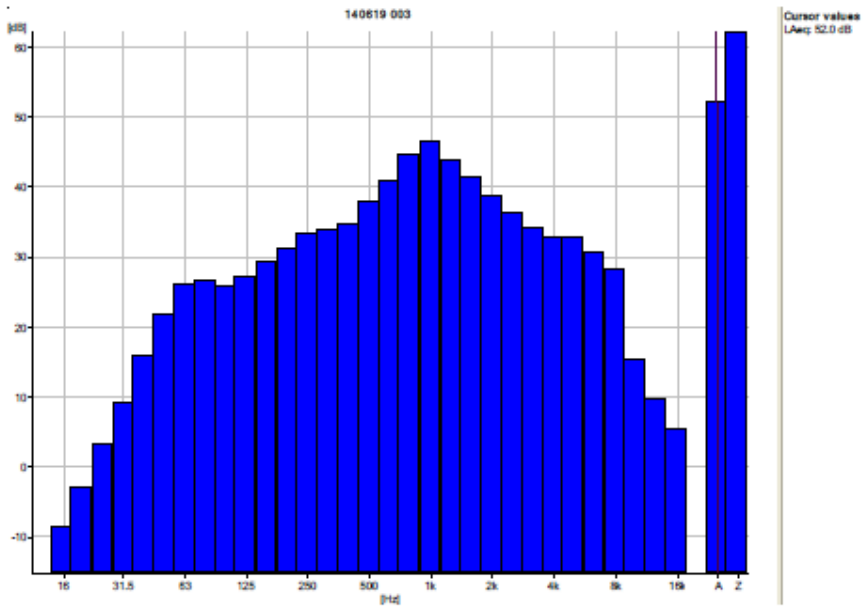

Figure A.16: 1/3 Octave Frequency Graph for E 3 on the 19th June 2014

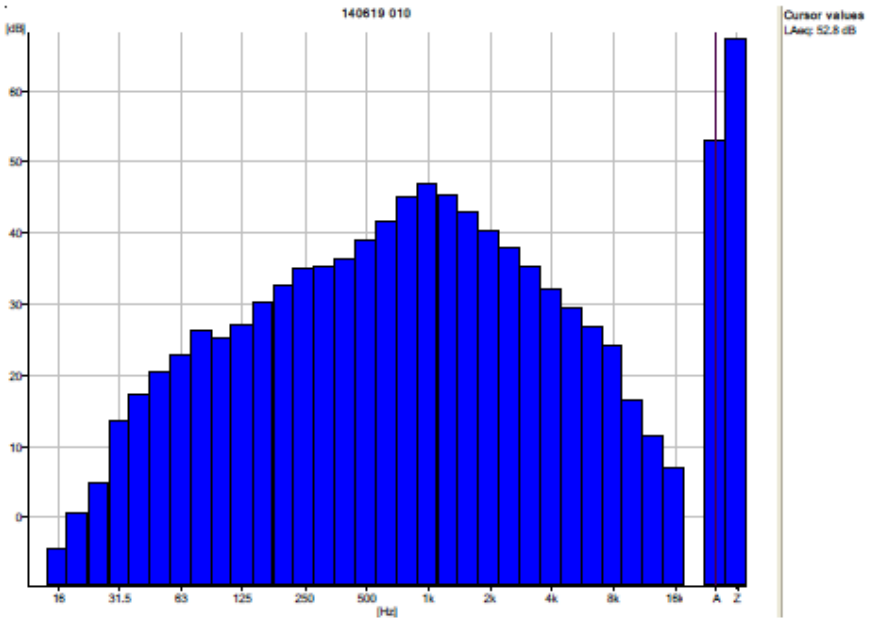

Figure A.17: 1/3 Octave Frequency Graph for E 3 on the 19th June 2014

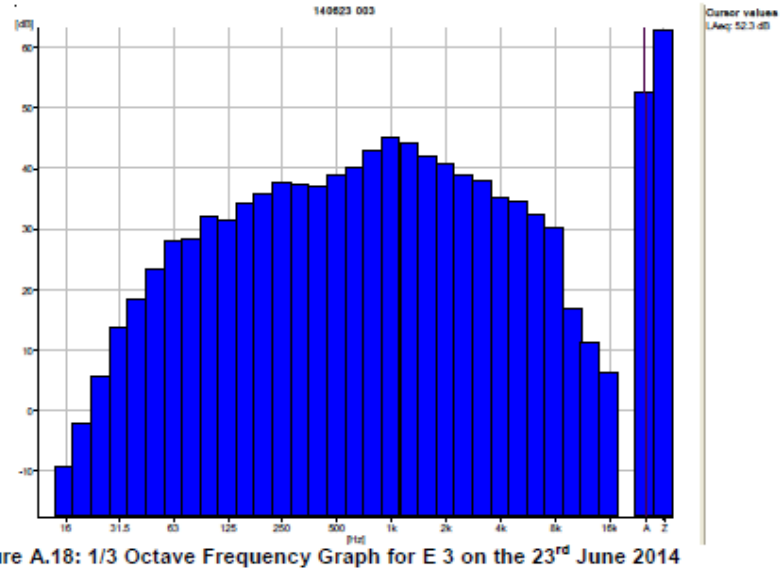

Figure A.18: 1/3 Octave Frequency Graph for E 3 on the 23rd June 2014

Appendix 2

Calibration Certificates

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

ilac-MRA DANAK

CERTIFICATE OF CALIBRATION

No: CDK1308419 Page 1 of 4

CALIBRATION OF

Calibrator:	Brüel & Kjær Type 4231	No: 3006120 Id: -
½ Inch adaptor:	Brüel & Kjær Type UC-0210	
Pattern Approval:	PTB-1.61-4057176	

CUSTOMER

Southern Scientific Services Ltd
Dunrine
Killarney
County Kerry, Ireland

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23 °C ± 3°C
Environment conditions: Pressure: 100.55 kPa. Humidity: 40 % RH. Temperature: 22.9 °C.

SPECIFICATIONS

The Calibrator Brüel & Kjær Type 4231 has been calibrated in accordance with the requirements as specified in IEC60942:2003 Annex B Class 1. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær acoustic calibrator calibration application software Type 7794 (version 2.4) by using procedure P_4231_D04.

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2013-10-24 Date of issue: 2013-10-24

Susanne Nygaard
Calibration Technician

Jonas Johannessen
Approved Signatory

Brüel & Kjær

The Calibration Laboratory
Skodsborgvej 307, DK-2850 Nærum, Denmark

ilac-MRA DANAK CAL Reg.nr. 327

CERTIFICATE OF CALIBRATION

No: CDK1308438 Page 1 of 10

CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2250 Light	No: 2654679	Id: -
Microphone:	Brüel & Kjær Type 4950	No: 2652929	
Preamplifier:	Brüel & Kjær Type ZC-0032	No: 10458	
Supplied Calibrator:	Brüel & Kjær Type 4231	No: 3006120	
Software version:	BZ7132 Version 2.4	Pattern Approval:	PENDING
Instruction manual:	BE1774-14		

CUSTOMER

Southern Scientific Services Ltd
Dunrine
Killarney
County Kerry, Ireland

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C

Environment conditions: *See actual values in **Environmental conditions** sections*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 Light has been calibrated in accordance with the requirements as specified in IEC61672-1:2002 class 1. Procedures from IEC 61672-3:2006 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 4.9 - DB: 4.90) by using procedure 2250-L-4950.

RESULTS

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2013-10-24

Steen Vodstrup Andersen
Calibration Technician

Date of issue: 2013-10-24

Jonas Johannessen
Approved Signatory

Appendix J: Landfill Gas Survey 2014

Environmental Protection Agency

A survey of landfill sites to determine the quantity of methane flared and or recovered in utilisation plants for 2014

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 2014	1
Please enter the number of engines operational at your site in 2014	1
Total methane flared	733,868 kg/year
Total methane utilised in engines	108,839 kg/year

Please note that the closing date for reciept of completed surveys is 31/03/2015

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_2014) to:
LFGProject@epa.ie

	to be filled in by licensee		calculated by spreadsheet	

Flare No. 1

Flare type ?	Other	**Biogas 500m3/hr Modular Ground Flare**	
Is the flare an open or enclosed flare ?	Enclosed	**Rated flare capacity ?**	500 **m3/hr**
Month /year comissioned ?	June 2000		
Month decomissioned if decomissioned in 2014 ?	Select		
What is the function of the flare ?	Back-up to engines	**If "other" enter flare function here**	

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	8.0	736	-40	330	46.00	28.00	2.70	98.0	109,490	72,613
February	C	28	24.0	12.0	660	-45	340	43.00	26.00	2.90	98.0	94,562	62,391
March	C	31	24.0	6.0	738	-38	310	48.00	29.00	2.10	98.0	107,618	71,518
April	C	30	24.0	20.0	700	-41	335	45.00	27.00	2.60	98.0	103,415	68,513
May	C	31	24.0	5.0	739	-40	320	47.00	28.00	2.20	98.0	108,923	72,237
June	C	30	24.0	28.0	692	-49	350	42.00	25.00	2.80	98.0	99,690	65,502
July	C	31	24.0	14.0	730	-42	335	44.00	26.00	2.70	98.0	105,450	69,790
August	C	31	24.0	10.0	734	-38	340	46.00	27.00	1.70	98.0	112,502	74,764
September	C	30	24.0	40.0	680	-41	334	44.00	25.00	2.10	98.0	97,934	64,882
October	C	31	5.0	0.0	155	-32	340	51.00	33.00	1.20	98.0	26,339	17,612
November	C	30	24.0	29.0	691	-38	210	49.00	34.00	1.40	98.0	69,682	46,307
December	C	31	24.0	22.0	722	-30	190	53.00	35.00	1.10	98.0	71,251	47,739
Total					7,977							1,106,856	733,868

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
2014					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 2014 ? 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	M	0			0						98.0	0	0
February	M	0			0						98.0	0	0
March	M	0			0						98.0	0	0
April	M	0			0						98.0	0	0
May	M	0			0						98.0	0	0
June	M	0			0						98.0	0	0
July	M	0			0						98.0	0	0
August	M	0			0						98.0	0	0
September	M	0			0						98.0	0	0
October	M	31	24	0	744	-32	150	51.00	33.00	1.20	98.0	55,778	37,295
November	M	30	24	2	718	-38	155	49.00	34.00	1.40	98.0	53,441	35,515
December	M	31	24	30	714	-30	145	53.00	35.00	1.10	98.0	53,773	36,029
Total					2,176							162,993	108,839

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
2014					0						98.0	0	0

Appendix K: PRTR Report 2014

| PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : Copy of PRTR 2014.xlsm | Return Year : 2014 |

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.18

REFERENCE YEAR	2014

1. FACILITY IDENTIFICATION

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

Classes of Activity

No.	class_name
-	Refer to PRTR class activities below

Address 1	Muingnaminnane
Address 2	Tralee
Address 3	
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	Conal Murphy
AER Returns Contact Email Address	cmurphy@kerrycoco.ie
AER Returns Contact Position	Site Engineer
AER Returns Contact Telephone Number	0667162000
AER Returns Contact Mobile Phone Number	0874187103
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	5
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. WASTE IMPORTED/ACCEPTED ONTO SITE Guidance on waste imported/accepted onto site

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

4.1 RELEASES TO AIR Link to previous years emissions data | PRTR# : W0001 | Facility Name : North Kerry Landfill Site | Filename : Copy of PRTR 2014.xlsm | Return Year : 2014 | 30/06/2015 17:06

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

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

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

SECTION B : REMAINING PRTR POLLUTANTS

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

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)	1111382.0	E	oth	gas sim	N/A	
Methane flared	733868.0	C	oth	calculated	500.0	(Total Flaring Capacity)
Methane utilised in engine/s	108839.0	C	oth	calculatedf	200.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	268675.0	E	oth	calculated	N/A	

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

Please enter all quantities on this sheet in Tonnes

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	20 03 01	No	182.78	mixed municipal waste	D1	M	Weighed	Offsite in Ireland	North Kerry Landfill,W0001	Kerry,,,,,,Ireland		
Within the Country	20 02 01	No	30.0	biodegradable waste	R3	M	Weighed	Offsite in Ireland	Bord Na Mona,W0198-01	Kilberry ,Co Kildare,,,,,Ireland		
Within the Country	15 01 06	No	11.08	mixed packaging	R3	M	Weighed	Offsite in Ireland	Killarney Waste Disposal,W0217-01	Aughacureen,Killarney,Co Kerry,,,Ireland		
Within the Country	15 01 01	No	16.76	paper and cardboard packaging	R3	M	Weighed	Offsite in Ireland	Greenstar ,WFP-CK-10-0047-02	Sarsfield Court Ind Estate,Glanmire,Cork,,,Ireland		
Within the Country	15 01 01	No	9.4	paper and cardboard packaging	R3	M	Weighed	Offsite in Ireland	Dillon Waste ,WCP-LK-08-0077-04	Dillon waste and recycling,The Kerries,Tralee,Co Kerry,Ireland		
Within the Country	20 01 01	No	32.8	paper and cardboard	R3	M	Weighed	Offsite in Ireland	Dillon Waste ,WCP-LK-08-0077-04	Dillon waste and recycling,The Kerries,Tralee,Co Kerry,Ireland		
Within the Country	15 01 07	No	15.012	glass packaging	R5	M	Weighed	Offsite in Ireland	Dillon Waste ,WCP-LK-08-0077-04	Dillon waste and recycling,The Kerries,Tralee,Co Kerry,Ireland		
Within the Country	15 01 04	No	2.448	metallic packaging	R4	M	Weighed	Offsite in Ireland	Dillon Waste ,WCP-LK-08-0077-04	Dillon waste and recycling,The Kerries,Tralee,Co Kerry,Ireland		
Within the Country	20 01 40	No	49.9	metals	R4	M	Weighed	Offsite in Ireland	United Meatis,WFP-LKC-10-00001-02	Ballysimon Road,Limerick,,,,Ireland		
Within the Country	15 01 10	Yes	1.19	packaging containing residues of or contaminated by dangerous substances	R1	M	Volume Calculation	Offsite in Ireland	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA IRELAND,W0184-01,ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland	ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland
Within the Country	15 01 02	No	17.88	plastic packaging	R3	M	Weighed	Offsite in Ireland	Dillon Waste ,WCP-LK-08-0077-04	Dillon waste and recycling,The Kerries,Tralee,Co Kerry,Ireland		
Within the Country	20 01 11	No	4.36	textiles	R3	M	Weighed	Offsite in Ireland	Textile Recycling Ltd,WPR-014/2	Belgard Road,Tallagh,Dublin 24,,,Ireland		
Within the Country	16 06 01	Yes	1.425	lead batteries	R4	M	Weighed	Offsite in Ireland	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA IRELAND,W0184-01,ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland	ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland
Within the Country	16 06 02	Yes	1.208	NI-Cd batteries	R4	M	Weighed	Offsite in Ireland	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA IRELAND,W0184-01,ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland	ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland
Within the Country	13 02 08	Yes	3.012	other engine, gear and lubricating oils	R1	M	Weighed	Offsite in Ireland	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA IRELAND,W0184-01,ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland	ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland
Within the Country	16 01 07	Yes	0.24	oil filters	R1	M	Weighed	Offsite in Ireland	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA IRELAND,W0184-01,ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland	ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland
Within the Country	16 05 04	Yes	0.18	gases in pressure containers (including halons) containing dangerous substances	R1	M	Weighed	Offsite in Ireland	ENVA Ireland,WCP-LK-052-08d	Clonminam Ind,Portlaoise ,Co Laois,,,Ireland	ENVA IRELAND,W0184-01,ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland	ENVA Ireland,Clonmainam,Portlaoise,Co Laois,Ireland
Within the Country	20 01 35	Yes	24.85	discarded electrical and electronic equipment other than those mentioned in 20 01 21 and and 20 01 23 containing hazardous components	R4	M	Weighed	Offsite in Ireland	Electrical Waste management,WFP-DS_11-004-04	The Recycling Village,WFP/MH/11/0005/01,Block 647,Jordanstown Drive,Greenogue Industrial Estate,Dublin,Ireland	Unit 21 Dunleek Business Pk,Commons ,Duleek,Co Meath,Ireland	Unit 21 Dunleek Business Pk,Commons ,Duleek,Co Meath,Ireland

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					
To Other Countries	20 01 35	Yes	25.083	discarded electrical and electronic equipment other than those mentioned in 20 01 21 and and 20 01 23 containing hazardous components	R4	M	Weighed	Abroad	Electrical Waste management,WFP-DS_11-004-04	Block 647,Jordanstown Drive,Greenogue Industrial Estate,Dublin,Ireland	European Metal Recycling Ltd,WML 101767,Alexander Dock 1,Bootle,Liverpool,L201Bx,United Kingdom	Alexander Dock 1,Bootle,Liverpool,L201Bx,United Kingdom
To Other Countries	**16 02 14**	**No**	14.664	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	R4	M	Weighed	Abroad	Electrical Waste management,WFP-DS_11-004-04	Block 647,Jordanstown Drive,Greenogue Industrial Estate,Dublin,Ireland		
To Other Countries	16 02 11	Yes	8.274	discarded equipment containing chlorofluorocarbons, HCFC, HFC	R4	M	Weighed	Abroad	Electrical Waste management,WFP-DS_11-004-04	Block 647,Jordanstown Drive,Greenogue Industrial Estate,Dublin,Ireland	European Metal Recycling Ltd,WML 101767,Alexander Dock 1,Bootle,Liverpool,L201Bx,United Kingdom	Alexander Dock 1,Bootle,Liverpool,L201Bx,United Kingdom
Within the Country	19 07 03	No	61164.43	landfill leachate other than those mentioned in 19 07 02	D8	M	Weighed	Offsite in Ireland	Tralee Wastewater Treatment Plant,W	The Kerries,Tralee,Co Kerry,,,Ireland		
To Other Countries	20 01 21	Yes	0.302	fluorescent tubes and other mercury-containing waste	R5	M	Weighed	Abroad	KMK Metals,W0113-01	Cappincur Industrial Est,Tullamore,Co Offaly,,,Ireland	Alba Service GmbH & Co,E56657020,Kanalstrasse 64,Rheine,48432,,,Germany	Kanalstrasse 64,Rheine,48432,,,Germany

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