Comhairle Contae Chiarraí

Kerry County Council



Waste Licence Ref No. W0001-04

Annual Environmental Report for North Kerry Landfill

Reporting Period:

January 2012 - December 2012

10.05.2013 v1

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2.0 Introduction and Reporting Period

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

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

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

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

The reporting period for this Annual Environmental Report is from January 1st 2012 to December 31st 2012.

3.0 Waste Activities carried out at the Facility

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

Licenced activities include;

- Class 2 Land treatment, including biodegradation of liquid or sludge discards in soils.
- Class 4 Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.
- Class 5 Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.
- Class 6 Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule.
- Class 7 Physico-chemical treatments not referred to elsewhere in this Schedule (including evaporation, drying and calcinations) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 10 of this Schedule.
- Class 11 Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
- Class 12 Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
- Class 13 Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.

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

Licenced activities include:

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

- Class 4 Recycling or reclamation of other inorganic materials.
- Class 10 The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
- Class 11 Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
- Class 13 Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

4.0 Quantity and composition of waste received, disposed and recovered

Waste tonnage disposed of at NKL during the reporting year 2012 increased by 54,461.88 tonnes on the previous year to 71,006.59 tonnes.

This is due mainly to a return of private waste contractors disposing of their collected waste at North Kerry Landfill for the reporting period.

Quantity of Waste disposed at facility

Since opening in May 1994 the total quantity of waste disposed of at the facility is 828,602 tonnes.

Appendix C shows a yearly break down of tonnage from 1994 – 2012.

BMW Percentage Composition of Waste disposed at facility

Total Qty MSW of which the BMW Condition Applies	Total Qty BMW	% BMW
71,006.59	44,689.45	62.94%

Appendix A shows the yearly breakdown of tonnage

Appendix B – shows %BMW entering the landfill site between 1^{st} January – 31^{st} December 2012 as submitted to the Agency.

5.0 Remaining Capacity and Projected Closure Date

Waste disposal/placement is currently being carried out in cell 18. It is estimated at current waste disposal trends that waste disposal/placement in cell 18 will cease in April 2013 after which cell 17 will be opened.

The remaining developed void capacity is 35,923 m³. This equates making allowance for cover requirements and compaction densities to approximately 32,000 tonnes.

Remaining undeveloped licensed capacity volume is 509,012 m³ which equates to approximately 450,000 tonnes.

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

6.0 Method of Deposition of Waste at North Kerry Landfill

Large vehicle access/private customers with large trailers.

The current arrangement for disposing of waste in cell 18 is carried out on a pre-built pre-planned tip head.

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

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

Customers accessing the site with small quantities of waste.

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

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

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

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

7.0 Summary Report on Emissions for the Reporting Period.

Emissions to Water.

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

Emissions to Air.

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

The Systems and operations include:

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

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

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

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

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

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

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

8.0 Resource and Energy Consumption.

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

<u>Diesel</u>

The diesel usage for the reporting period was 63,664 litres. This is an increase of 5,167 litres which is due to an increase in plant activity around the active cell because of the increase in tonnage.

Electricity

The total usage for 2012 was 106,350 kWh; This is a decrease in energy consumption of 41,500 kWh. The gas utilisation engine removed the use of the flare which is the reason for the large decrease in electricity consumption.

9.0 <u>Energy Efficiency and Audit Report Summary</u>

Electricity

The kW hour usage on site for 2012 is set out in the attached table.

Table 8.2, kWh usage 2012

From	То	Day kWh	Night kWh
31/12/2011	28/02/2012	17,200	9,300
28/02/2012	30/04/2012	10,400	6,450
30/04/2012	30/06/2012	8,250	5,050
30/06/2012	31/08/2012	8,750	4,550
31/08/2012	31/10/2012	9,550	5,100
31/10/2012	31/12/2012	14,150	7,600
		68,300	38,050

10.0 Proposed Development of the Facility and timescale of the Development

The following projects are proposed for construction at North Kerry Landfill over 2013.

Pilot Integrated Constructed Wetland Project

A pilot trial of a ICW will be built and commissioned in 2013. The focus of this project will be to determine if ICW can prove a sustainable long term solution to leachate management for the landfill site.

Intermediate Capping of cells 18 and 19

Cells 18 and 19 will be temporarily capped after both reach profile height. An SEW will be submitted to the agency for approval prior to any permanent capping work being commencing on site.

11.0 Volume of leachate produced and volume transported off site.

Over the reporting period 69,063 m³ 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 630,079 m³.

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

Month	2008	2009	2010	2011	2012
January	January 10,030.58		4,230.94	5,255.90	11,271.74
February	9,067.30	7,985.36	5,666.38	5,395.38	6,780.04
March	5,678.69	4,881.29	3,324.86	3,768.72	2,502.62
April	3,487.91	5,379.62	4,080.68	3,845.78	3,623.48
May	486.52	5,579.68	1,711.48	2,805.70	3,724.42
June	1,957.40	1,844.61	1,236.44	3,735.13	4,351.31
July	3,483.84	4,084.22	4,304.64	3,698.12	7,551.38
August	7,661.38	5,208.40	2,208.06	2,751.70	6,072.90
September	8,395.60	8,017.22	4,902.34	3,655.51	4,576.09
October	9,261.43	3,508.76	2,393.60	3,956.40	5775.56
November	11,123.44	11,213.14	6,719.70	4,905.12	6997.38
December	7,924.44	7,839.28	1,663.61	6,335.12	5836.08
Total	78,558.53	73,727.85	42,442.73	50,108.58	69,063.00

Table 10.1, Leachate volumes removed off -site, 2012.

Total Quantity of Leachate Removed from Site 2008 – 2012 (Trend Graph)



12.0 Report on Development Works Undertaken during the Reporting Period

Cells 15B and 16 were permanently capped in 2012.

13.0 Report on Restoration of Completed Cells and Phases

Cells 1 to 16 are now fully capped.

This is phase 1 to 8 (seventeen cells in total) for the site.

Cells 15B and 16 are fully capped.

The active phase is phase 9 which contains three cells (cells 17 -19).

The following page includes the design profile for Cell 17, 18 & 19.



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

The following table show the landfill input and expected/modelled gas outputs for the landfill site over the design period. These figures were used in the estimation of landfill gas generation over the reporting period and submitted as part of the Landfill Gas Survey 2012 (Appendix H) and the PRTR 2012 (Appendix G).

Voor	Waste Ace	cepted	Waste-I	n-Place
rear	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1994	16,902	18,592	0	0
1995	23,505	25,856	16,902	18,592
1996	23,722	26,094	40,407	44,448
1997	25,582	28,140	64,129	70,542
1998	33,530	36,883	89,711	98,682
1999	57,873	63,660	123,241	135,565
2000	60,474	66,521	181,113	199,225
2001	63,946	70,341	241,587	265,746
2002	62,822	69,104	305,533	336,086
2003	50,235	55,259	368,354	405,190
2004	48,054	52,860	418,590	460,449
2005	34,431	37,874	466,644	513,309
2006	60,025	66,028	501,075	551,182
2007	56,794	62,474	561,100	617,210
2008	62,413	68,654	617,894	679,684
2009	39,755	43,731	680,307	748,338
2010	20,987	23,086	720,063	792,069
2011	16,546	18,200	741,050	815,155
2012	71,007	78,107	757,595	833,355
2013	11,398	12,538	828,602	911,462
2014	0	0	840,000	924,000
2015	0	0	840,000	924,000
2016	0	0	840,000	924,000
2017	0	0	840,000	924,000
2018	0	0	840,000	924,000
2019	0	0	840,000	924,000
2020	0	0	840,000	924,000
2021	0	0	840,000	924,000
2022	0	0	840,000	924,000
2023	0	0	840,000	924,000
2024	0	0	840,000	924,000
2025	0	0	840,000	924,000
2026	0	0	840,000	924,000
2027	0	0	840,000	924,000
2028	0	0	840,000	924,000
2029	0	0	840,000	924,000
2030	0	0	840,000	924,000
2031	0	0	840,000	924,000
2032	0	0	840,000	924,000
2033	0	0	840,000	924,000

WASTE ACCEPTANCE RATES

Results

Veer		Total landfill gas		Methane				
rear	(Mg/year)	(m³/year)	(av ft^3/min)	(Mg/year)	(m³/year)	(av ft^3/min)		
1994	0	0	0	0	0	0		
1995	3.233E+03	2.916E+06	1.960E+02	5.642E+02	8.458E+05	5.683E+01		
1996	6.102E+03	5.504E+06	3.698E+02	1.065E+03	1.596E+06	1.072E+02		
1997	7.569E+03	6.826E+06	4.587E+02	1.321E+03	1.980E+06	1.330E+02		
1998	8.652E+03	7.804E+06	5.243E+02	1.510E+03	2.263E+06	1.521E+02		
1999	1.071E+04	9.661E+06	6.491E+02	1.869E+03	2.802E+06	1.882E+02		
2000	1.639E+04	1.478E+07	9.933E+02	2.860E+03	4.287E+06	2.881E+02		
2001	1.971E+04	1.778E+07	1.194E+03	3.439E+03	5.155E+06	3.464E+02		
2002	2.202E+04	1.986E+07	1.334E+03	3.843E+03	5.760E+06	3.870E+02		
2003	2.295E+04	2.070E+07	1.391E+03	4.005E+03	6.004E+06	4.034E+02		
2004	2.101E+04	1.895E+07	1.273E+03	3.666E+03	5.495E+06	3.692E+02		
2005	1.963E+04	1.770E+07	1.189E+03	3.425E+03	5.133E+06	3.449E+02		
2006	1.633E+04	1.473E+07	9.898E+02	2.850E+03	4.272E+06	2.870E+02		
2007	1.959E+04	1.767E+07	1.187E+03	3.419E+03	5.125E+06	3.444E+02		
2008	2.060E+04	1.858E+07	1.248E+03	3.594E+03	5.387E+06	3.619E+02		
2009	2.217E+04	1.999E+07	1.343E+03	3.868E+03	5.798E+06	3.896E+02		
2010	1.861E+04	1.679E+07	1.128E+03	3.248E+03	4.869E+06	3.271E+02		
2011	1.326E+04	1.196E+07	8.035E+02	2.314E+03	3.468E+06	2.330E+02		
2012	9.749E+03	8.793E+06	5.908E+02	1.701E+03	2.550E+06	1.713E+02		
2013	1.843E+04	1.662E+07	1.117E+03	3.215E+03	4.819E+06	3.238E+02		
2014	1.133E+04	1.022E+07	6.866E+02	1.977E+03	2.964E+06	1.991E+02		
2015	5.626E+03	5.075E+06	3.410E+02	9.818E+02	1.472E+06	9.888E+01		
2016	2.794E+03	2.520E+06	1.693E+02	4.876E+02	7.308E+05	4.910E+01		
2017	1.387E+03	1.251E+06	8.408E+01	2.421E+02	3.629E+05	2.438E+01		
2018	6.890E+02	6.214E+05	4.175E+01	1.202E+02	1.802E+05	1.211E+01		
2019	3.421E+02	3.086E+05	2.073E+01	5.970E+01	8.949E+04	6.013E+00		
2020	1.699E+02	1.532E+05	1.030E+01	2.965E+01	4.444E+04	2.986E+00		
2021	8.437E+01	7.610E+04	5.113E+00	1.472E+01	2.207E+04	1.483E+00		
2022	4.190E+01	3.779E+04	2.539E+00	7.311E+00	1.096E+04	7.363E-01		
2023	2.081E+01	1.877E+04	1.261E+00	3.631E+00	5.442E+03	3.657E-01		
2024	1.033E+01	9.319E+03	6.261E-01	1.803E+00	2.702E+03	1.816E-01		
2025	5.131E+00	4.628E+03	3.109E-01	8.953E-01	1.342E+03	9.017E-02		
2026	2.548E+00	2.298E+03	1.544E-01	4.446E-01	6.664E+02	4.478E-02		
2027	1.265E+00	1.141E+03	7.667E-02	2.208E-01	3.309E+02	2.224E-02		
2028	6.283E-01	5.667E+02	3.807E-02	1.096E-01	1.643E+02	1.104E-02		
2029	3.120E-01	2.814E+02	1.891E-02	5.444E-02	8.161E+01	5.483E-03		
2030	1.549E-01	1.397E+02	9.389E-03	2.704E-02	4.052E+01	2.723E-03		
2031	7.694E-02	6.939E+01	4.663E-03	1.343E-02	2.012E+01	1.352E-03		
2032	3.821E-02	3.446E+01	2.315E-03	6.667E-03	9.993E+00	6.714E-04		
2033	1.897E-02	1.711E+01	1.150E-03	3.311E-03	4.963E+00	3.334E-04		
2034	9.421E-03	8.498E+00	5.710E-04	1.644E-03	2.464E+00	1.656E-04		
2035	4.679E-03	4.220E+00	2.835E-04	8.164E-04	1.224E+00	8.222E-05		
2036	2.323E-03	2.095E+00	1.408E-04	4.054E-04	6.077E-01	4.083E-05		
2037	1.154E-03	1.041E+00	6.992E-05	2.013E-04	3.018E-01	2.028E-05		
2038	5.729E-04	5.167E-01	3.472E-05	9.998E-05	1.499E-01	1.007E-05		
2039	2.845E-04	2.566E-01	1.724E-05	4.965E-05	7.442E-02	5.000E-06		
2040	1.413E-04	1.274E-01	8.562E-06	2.465E-05	3.695E-02	2.483E-06		
2041	7.016E-05	6.328E-02	4.252E-06	1.224E-05	1.835E-02	1.233E-06		
2042	3.484E-05	3.142E-02	2.111E-06	6.080E-06	9.113E-03	6.123E-07		
2043	1.730E-05	1.560E-02	1.048E-06	3.019E-06	4.525E-03	3.040E-07		

Voor		Total landfill gas			Methane	
rear	(Mg/year)	(m ³ /year)	(av ft^3/min)	(Mg/year)	(m³/year)	(av ft^3/min)
2044	8.591E-06	7.749E-03	5.206E-07	1.499E-06	2.247E-03	1.510E-07
2045	4.266E-06	3.848E-03	2.585E-07	7.445E-07	1.116E-03	7.498E-08
2046	2.119E-06	1.911E-03	1.284E-07	3.697E-07	5.541E-04	3.723E-08
2047	1.052E-06	9.489E-04	6.376E-08	1.836E-07	2.752E-04	1.849E-08
2048	5.224E-07	4.712E-04	3.166E-08	9.117E-08	1.366E-04	9.181E-09
2049	2.594E-07	2.340E-04	1.572E-08	4.527E-08	6.786E-05	4.559E-09
2050	1.288E-07	1.162E-04	7.807E-09	2.248E-08	3.370E-05	2.264E-09
2051	6.398E-08	5.770E-05	3.877E-09	1.116E-08	1.673E-05	1.124E-09
2052	3.177E-08	2.865E-05	1.925E-09	5.544E-09	8.310E-06	5.583E-10
2053	1.578E-08	1.423E-05	9.561E-10	2.753E-09	4.126E-06	2.773E-10
2054	7.834E-09	7.066E-06	4.748E-10	1.367E-09	2.049E-06	1.377E-10
2055	3.890E-09	3.509E-06	2.358E-10	6.789E-10	1.018E-06	6.837E-11
2056	1.932E-09	1.742E-06	1.171E-10	3.371E-10	5.053E-07	3.395E-11
2057	9.594E-10	8.653E-07	5.814E-11	1.674E-10	2.509E-07	1.686E-11
2058	4.764E-10	4.297E-07	2.887E-11	8.313E-11	1.246E-07	8.372E-12
2059	2.366E-10	2.134E-07	1.434E-11	4.128E-11	6.188E-08	4.158E-12
2060	1.175E-10	1.060E-07	7.119E-12	2.050E-11	3.073E-08	2.065E-12
2061	5.834E-11	5.262E-08	3.535E-12	1.018E-11	1.526E-08	1.025E-12
2062	2 897E-11	2 613E-08	1.756E-12	5.055E-12	7.577E-09	5.091E-13
2063	1 439E-11	1 298E-08	8 718E-13	2.510E-12	3 763E-09	2.528E-13
2064	7 144F-12	6 443E-09	4.329E-13	1 247E-12	1.869E-09	1 255E-13
2065	3 548E-12	3 200E-09	2 150E-13	6 191E-13	9 279E-10	6 235E-14
2066	1 762E-12	1 589E-09	1.068E-13	3.074E-13	4 608E-10	3.096E-14
2067	8 748E-13	7.890E-10	5 301E-14	1.527E-13	2 288E-10	1.537E-14
8909	1 344E-13	3 018E-10	2.633E-14	7 581E-14	1 136E-10	7.635E-15
000	2 157E-13	1.0/6E-10	1 207E-14	3 76/E-14	5.6/3E-11	2 701E-15
2009	1.071E-13	0.662E-11	6.402E-15	1 860E-14	2 802E-11	1 992E-15
070	5 220E 14	3.002L-11	0.492L-15	0.202E 15	1 201E 11	0.240E 16
071	0.640E-14	4.790E-11	3.224E-13	9.203E-15	1.391E-11	9.349E-10
072	2.042E-14	2.303E-11	7.0505.46	4.010E-15	0.910E-12	4.043E-10
073	1.312E-14	1.103E-11	7.950E-16	2.209E-15	3.431E-12	2.303E-10
2074	0.014E-10	3.0/0E-12	3.946E-10	1.137E-13	1.704E-12	1.143E-10
075	3.233E-13	2.910E-12	1.900E-10	0.040E-10	0.401E-13	3.003E-17
2076	1.000E-15	1.449E-12	9.730E-17	2.003E-10	4.202E-13	2.023E-17
2077	7.977E-10	7.190E-13	4.034E-17	1.392E-10	2.007E-13	1.402E-17
070	3.901E-10	3.373E-13	2.401E-17	0.913E-17	1.030E-13	0.902E-10
2079	1.907E-10	1.774E-13	1.192E-17	3.433E-17	5.145E-14	3.457E-18
2080	9.769E-17	8.811E-14	5.920E-18	1.705E-17	2.555E-14	1.717E-18
2081	4.851E-17	4.375E-14	2.940E-18	8.465E-18	1.269E-14	8.525E-19
2082	2.409E-17	2.173E-14	1.460E-18	4.204E-18	6.301E-15	4.234E-19
2083	1.196E-17	1.079E-14	7.249E-19	2.087E-18	3.129E-15	2.102E-19
2084	5.940E-18	5.358E-15	3.600E-19	1.037E-18	1.554E-15	1.044E-19
2085	2.950E-18	2.661E-15	1.788E-19	5.148E-19	7.716E-16	5.184E-20
2086	1.465E-18	1.321E-15	8.877E-20	2.556E-19	3.832E-16	2.574E-20
2087	7.274E-19	6.561E-16	4.408E-20	1.269E-19	1.903E-16	1.278E-20
2088	3.612E-19	3.258E-16	2.189E-20	6.304E-20	9.449E-17	6.348E-21
2089	1.794E-19	1.618E-16	1.087E-20	3.130E-20	4.692E-17	3.153E-21
2090	8.908E-20	8.034E-17	5.398E-21	1.554E-20	2.330E-17	1.566E-21
2091	4.424E-20	3.990E-17	2.681E-21	7.719E-21	1.157E-17	7.774E-22
2092	2.197E-20	1.981E-17	1.331E-21	3.833E-21	5.746E-18	3.860E-22
2093	1.091E-20	9.839E-18	6.611E-22	1.904E-21	2.853E-18	1.917E-22
2094	5.417E-21	4.886E-18	3.283E-22	9.453E-22	1.417E-18	9.520E-23

		Total landfill gas		Methane				
rear	(Mg/year)	(m ³ /year)	(av ft^3/min)	(Mg/year)	(m³/year)	(av ft^3/min)		
2095	2.690E-21	2.426E-18	1.630E-22	4.694E-22	7.036E-19	4.727E-23		
2096	1.336E-21	1.205E-18	8.095E-23	2.331E-22	3.494E-19	2.348E-23		
2097	6.633E-22	5.983E-19	4.020E-23	1.158E-22	1.735E-19	1.166E-23		
2098	3.294E-22	2.971E-19	1.996E-23	5.748E-23	8.616E-20	5.789E-24		
2099	1.636E-22	1.475E-19	9.913E-24	2.854E-23	4.279E-20	2.875E-24		
2100	8.123E-23	7.326E-20	4.923E-24	1.417E-23	2.125E-20	1.428E-24		
2101	4.034E-23	3.638E-20	2.444E-24	7.039E-24	1.055E-20	7.089E-25		
2102	2.003E-23	1.807E-20	1.214E-24	3.495E-24	5.239E-21	3.520E-25		
2103	9.947E-24	8.972E-21	6.028E-25	1.736E-24	2.602E-21	1.748E-25		
2104	4.940E-24	4.455E-21	2.993E-25	8.620E-25	1.292E-21	8.681E-26		
2105	2.453E-24	2.212E-21	1.486E-25	4.280E-25	6.416E-22	4.311E-26		
2106	1.218E-24	1.099E-21	7.382E-26	2.126E-25	3.186E-22	2.141E-26		
2107	6.049E-25	5.456E-22	3.666E-26	1.056E-25	1.582E-22	1.063E-26		
2108	3.004E-25	2.709E-22	1.820E-26	5.242E-26	7.857E-23	5.279E-27		
2109	1.492E-25	1.345E-22	9.039E-27	2.603E-26	3.902E-23	2.621E-27		
2110	7.407E-26	6.681E-23	4.489E-27	1.293E-26	1.937E-23	1.302E-27		
2111	3.678E-26	3.318E-23	2.229E-27	6.419E-27	9.621E-24	6.464E-28		
2112	1.827E-26	1.647E-23	1.107E-27	3.187E-27	4.778E-24	3.210E-28		
2113	9.071E-27	8.181E-24	5.497E-28	1.583E-27	2.373E-24	1.594E-28		
2114	4.504E-27	4.063E-24	2.730E-28	7.860E-28	1.178E-24	7.916E-29		
2115	2.237E-27	2.017E-24	1.356E-28	3.903E-28	5.851E-25	3.931E-29		
2116	1.111E-27	1.002E-24	6.731E-29	1.938E-28	2.905E-25	1.952E-29		
2117	5.516E-28	4.975E-25	3.343E-29	9.625E-29	1.443E-25	9.694E-30		
2118	2.739E-28	2.470E-25	1.660E-29	4.780E-29	7.164E-26	4.814E-30		
2119	1.360E-28	1.227E-25	8.243E-30	2.374E-29	3.558E-26	2.390E-30		
2120	6.754E-29	6.092E-26	4.093E-30	1.179E-29	1.767E-26	1.187E-30		
2121	3.354E-29	3.025E-26	2.033E-30	5.853E-30	8.773E-27	5.895E-31		
2122	1.666E-29	1.502E-26	1.009E-30	2.907E-30	4.357E-27	2.927E-31		
2123	8.271E-30	7.460E-27	5.012E-31	1.443E-30	2.163E-27	1.454E-31		
2124	4.107E-30	3.705E-27	2.489E-31	7.167E-31	1.074E-27	7.218E-32		
2125	2.040E-30	1.840E-27	1.236E-31	3.559E-31	5.335E-28	3.585E-32		
2126	1.013E-30	9.135E-28	6.138E-32	1.767E-31	2.649E-28	1.780E-32		
2127	5.030E-31	4.537E-28	3.048E-32	8.777E-32	1.316E-28	8.840E-33		
2128	2.498E-31	2.253E-28	1.514E-32	4.359E-32	6.533E-29	4.390E-33		
2129	1.240E-31	1.119E-28	7.517E-33	2.164E-32	3.244E-29	2.180E-33		
2130	6.159E-32	5.555E-29	3.733E-33	1.075E-32	1.611E-29	1.082E-33		
2131	3.059E-32	2.759E-29	1.854E-33	5.337E-33	8.000E-30	5.375E-34		
2132	1.519E-32	1.370E-29	9.204E-34	2.650E-33	3.973E-30	2.669E-34		
2133	7.542E-33	6.803E-30	4.571E-34	1.316E-33	1.973E-30	1.326E-34		
2134	3.745E-33	3.378E-30	2.270E-34	6.536E-34	9.797E-31	6.582E-35		

Year		Carbon dioxide			NMOC	
	(Mg/year)	(m³/year)	(av ft^3/min)	(Mg/year)	(m³/year)	(av ft^3/min)
1994	0	0	0	0	0	0
1995	3.790E+03	2.071E+06	1.391E+02	6.272E+00	1.750E+03	1.176E-01
1996	7.153E+03	3.908E+06	2.626E+02	1.184E+01	3.302E+03	2.219E-01
1997	8.872E+03	4.847E+06	3.257E+02	1.468E+01	4.096E+03	2.752E-01
1998	1.014E+04	5.541E+06	3.723E+02	1.678E+01	4.682E+03	3.146E-01
1999	1.256E+04	6.859E+06	4.609E+02	2.078E+01	5.797E+03	3.895E-01
2000	1.921E+04	1.050E+07	7.052E+02	3.179E+01	8.870E+03	5.960E-01
2001	2.310E+04	1.262E+07	8.480E+02	3.823E+01	1.067E+04	7.166E-01
2002	2.581E+04	1.410E+07	9.475E+02	4.271E+01	1.192E+04	8.007E-01
2003	2.691E+04	1.470E+07	9.876E+02	4.452E+01	1.242E+04	8.346E-01
2004	2.463E+04	1.345E+07	9.039E+02	4.075E+01	1.137E+04	7.639E-01
2005	2.301E+04	1.257E+07	8.444E+02	3.807E+01	1.062E+04	7.136E-01
2006	1.915E+04	1.046E+07	7.027E+02	3.168E+01	8.839E+03	5.939E-01
2007	2.297E+04	1.255E+07	8.431E+02	3 801E+01	1.060E+04	7.124E-01
2008	2 414E+04	1.319E+07	8.861E+02	3.995E+01	1.115E+04	7.489E-01
2009	2.598E+04	1 420E+07	9.538E+02	4 300E+01	1.200E+04	8.060E-01
2010	2 182E+04	1 192E+07	8.009E+02	3.611E+01	1.007E+04	6 768E-01
2011	1 554E+04	8.490E+06	5 705E+02	2.572E+01	7 175E+03	4 821E-01
2012	1 143E+04	6.243E+06	4 195E+02	1 891E+01	5 276E+03	3 545E-01
2012	2 160E+04	1 180E+07	7 928E+02	3 574E+01	9.971E+03	6 700E-01
2017	1 328E±04	7 256E±06	1.320E+02	2 108E±01	6.132E±03	4 120E-01
2015	6 595E±03	3.603E±06	2 /21E+02	1.001E±01	3.045E±03	2.046E-01
2013	2 275E±02	1 780E±06	7805+06 2.4212+02 1.0912+01		1.512E+03	1.016E-01
2010	1 626E±03	8 885E±05	5.070E+01	2.601E+00	7.508E±02	5.045E-02
2017	0.076E + 02	4 412E + 05	2.0655.01	1 227E+00	2 720E + 02	2.5055.02
2010	0.070E+02	4.412E+05	2.903E+01	1.337E+00	3.729E+02	2.505E-02
2019	4.011E+02	2.191E+00	7.2400 + 00	0.037E-01	1.052E+02	1.244E-02
2020	1.992E+02	1.000E+00	7.310E+00	3.290E-01	9.195E+01	0.1/0E-03
2021	9.090E+01	5.403E+04	3.030E+00	1.037E-01	4.000E+01	3.000E-03
2022	4.911E+01	2.683E+04	1.803E+00	8.127E-02	2.267E+01	1.523E-03
2023	2.439E+01	1.332E+04	8.952E-01	4.036E-02	1.126E+01	7.565E-04
2024	1.211E+01	6.616E+03	4.445E-01	2.004E-02	5.591E+00	3.757E-04
2025	6.014E+00	3.286E+03	2.208E-01	9.952E-03	2.777E+00	1.866E-04
2026	2.987E+00	1.632E+03	1.096E-01	4.942E-03	1.379E+00	9.264E-05
2027	1.483E+00	8.102E+02	5.444E-02	2.454E-03	6.847E-01	4.600E-05
2028	7.365E-01	4.023E+02	2.703E-02	1.219E-03	3.400E-01	2.284E-05
2029	3.657E-01	1.998E+02	1.342E-02	6.052E-04	1.688E-01	1.134E-05
2030	1.816E-01	9.922E+01	6.666E-03	3.005E-04	8.384E-02	5.633E-06
2031	9.019E-02	4.927E+01	3.310E-03	1.492E-04	4.164E-02	2.798E-06
2032	4.479E-02	2.447E+01	1.644E-03	7.411E-05	2.068E-02	1.389E-06
2033	2.224E-02	1.215E+01	8.163E-04	3.680E-05	1.027E-02	6.899E-07
2034	1.104E-02	6.033E+00	4.054E-04	1.828E-05	5.099E-03	3.426E-07
2035	5.484E-03	2.996E+00	2.013E-04	9.075E-06	2.532E-03	1.701E-07
2036	2.723E-03	1.488E+00	9.996E-05	4.507E-06	1.257E-03	8.448E-08
2037	1.352E-03	7.388E-01	4.964E-05	2.238E-06	6.244E-04	4.195E-08
2038	6.716E-04	3.669E-01	2.465E-05	1.111E-06	3.100E-04	2.083E-08
2039	3.335E-04	1.822E-01	1.224E-05	5.519E-07	1.540E-04	1.034E-08
2040	1.656E-04	9.047E-02	6.079E-06	2.741E-07	7.646E-05	5.137E-09
2041	8.224E-05	4.493E-02	3.019E-06	1.361E-07	3.797E-05	2.551E-09
2042	4.084E-05	2.231E-02	1.499E-06	6.758E-08	1.885E-05	1.267E-09
2043	2.028E-05	1.108E-02	7.444E-07	3.356E-08	9.363E-06	6.291E-10

Vaar		Carbon dioxide		NMOC					
Year —	(Mg/year)	(m³/year)	(av ft^3/min)	(Mg/year)	(m³/year)	(av ft^3/min)			
2044	1.007E-05	5.502E-03	3.697E-07	1.667E-08	4.649E-06	3.124E-10			
2045	5.001E-06	2.732E-03	1.836E-07	8.276E-09	2.309E-06	1.551E-10			
2046	2.483E-06	1.357E-03	9.116E-08	4.110E-09	1.147E-06	7.703E-11			
2047	1.233E-06	6.737E-04	4.527E-08	2.041E-09	5.693E-07	3.825E-11			
2048	6.124E-07	3.346E-04	2.248E-08	1.013E-09	2.827E-07	1.900E-11			
2049	3.041E-07	1.661E-04	1.116E-08	5.032E-10	1.404E-07	9.433E-12			
2050	1.510E-07	8.250E-05	5.543E-09	2.499E-10	6.972E-08	4.684E-12			
2051	7.499E-08	4.097E-05	2.753E-09	1.241E-10	3.462E-08	2.326E-12			
2052	3.724E-08	2.034E-05	1.367E-09	6.163E-11	1.719E-08	1.155E-12			
2053	1.849E-08	1.010E-05	6.788E-10	3.060E-11	8.538E-09	5.736E-13			
2054	9.183E-09	5.017E-06	3.371E-10	1.520E-11	4.240E-09	2.849E-13			
2055	4.560E-09	2.491E-06	1.674E-10	7.546E-12	2.105E-09	1.415E-13			
2056	2.265E-09	1.237E-06	8.312E-11	3.747E-12	1.045E-09	7.025E-14			
2057	1.125E-09	6.143E-07	4.128E-11	1.861E-12	5.192E-10	3.488E-14			
2058	5 584E-10	3.051E-07	2.050E-11	9.241E-13	2.578E-10	1.732E-14			
2059	2.773E-10	1.515E-07	1.018F-11	4.589E-13	1.280F-10	8.602E-15			
2060	1 377E-10	7 523E-08	5.055E-12	2 279E-13	6 358E-11	4 272E-15			
2061	6.838E-11	3 736E-08	2 510E-12	1 132E-13	3 157E-11	2 121E-15			
2062	3 306E-11	1.855E-08	1 2/6E-12	5.620E-14	1.568E-11	1.053E-15			
2002	1 686E-11	0.212E-00	6 100E-12	2 701E-14	7 7855-12	5.221E-16			
2003	8 37/E-12	9.212L-09	0.190E-13	1 2865-14	3 866E-12	2.508E-16			
2004	1 158E-12	2.272E_00	1.526E-13	6.881E-15	1.020E-12	1 200E-16			
2003	4.130L-12	1 129E 00	2E-09 1.526E-13 0.001E-1						
2000	2.005E-12	F 602F 40	1.120E-09 7.300E-14 3.417E-15 9.533		9.000E-10	0.400E-17			
2007	1.023E-12	3.002E-10	3.704E-14	1.097E-15	4.734E-13	3.101E-17			
2000	5.092E-13	2.702E-10	1.009E-14	0.427E-10	2.301E-13	1.000E-17			
2069	2.529E-13	1.381E-10	9.282E-15	4.185E-16	1.10/E-13	7.844E-18			
2070	1.256E-13	6.860E-11	4.609E-15	2.078E-16	5.797E-14	3.895E-18			
2071	6.236E-14	3.407E-11	2.289E-15	1.032E-16	2.879E-14	1.934E-18			
2072	3.097E-14	1.692E-11	1.137E-15	5.124E-17	1.430E-14	9.605E-19			
2073	1.538E-14	8.401E-12	5.644E-16	2.545E-17	7.099E-15	4.770E-19			
2074	7.636E-15	4.172E-12	2.803E-16	1.264E-17	3.525E-15	2.369E-19			
2075	3.792E-15	2.072E-12	1.392E-16	6.275E-18	1.751E-15	1.176E-19			
2076	1.883E-15	1.029E-12	6.912E-17	3.116E-18	8.693E-16	5.841E-20			
2077	9.351E-16	5.108E-13	3.432E-17	1.547E-18	4.317E-16	2.901E-20			
2078	4.644E-16	2.537E-13	1.704E-17	7.684E-19	2.144E-16	1.440E-20			
2079	2.306E-16	1.260E-13	8.464E-18	3.816E-19	1.065E-16	7.153E-21			
2080	1.145E-16	6.256E-14	4.203E-18	1.895E-19	5.286E-17	3.552E-21			
2081	5.686E-17	3.106E-14	2.087E-18	9.410E-20	2.625E-17	1.764E-21			
2082	2.824E-17	1.543E-14	1.036E-18	4.673E-20	1.304E-17	8.759E-22			
2083	1.402E-17	7.660E-15	5.147E-19	2.320E-20	6.474E-18	4.350E-22			
2084	6.963E-18	3.804E-15	2.556E-19	1.152E-20	3.215E-18	2.160E-22			
2085	3.458E-18	1.889E-15	1.269E-19	5.722E-21	1.596E-18	1.073E-22			
2086	1.717E-18	9.381E-16	6.303E-20	2.842E-21	7.927E-19	5.326E-23			
2087	8.527E-19	4.658E-16	3.130E-20	1.411E-21	3.937E-19	2.645E-23			
2088	4.234E-19	2.313E-16	1.554E-20	7.007E-22	1.955E-19	1.313E-23			
2089	2.103E-19	1.149E-16	7.718E-21	3.480E-22	9.708E-20	6.523E-24			
2090	1.044E-19	5.704E-17	3.833E-21	1.728E-22	4.821E-20	3.239E-24			
2091	5.185E-20	2.833E-17	1.903E-21	8.581E-23	2.394E-20	1.608E-24			
2092	2.575E-20	1.407E-17	9.452E-22	4.261E-23	1.189E-20	7.987E-25			
2093	1.279E-20	6.985E-18	4.694E-22	2.116E-23	5.903E-21	3.966E-25			
2094	6.350E-21	3.469E-18	2.331E-22	1.051E-23	2.931E-21	1.970E-25			

Ma an		Carbon dioxide			NMOC			
Year	(Mg/year)	(m ³ /year)	(av ft^3/min)	(Mg/year)	(m ³ /year)	(av ft^3/min)		
2095	3.153E-21	1.723E-18	1.157E-22	5.218E-24	1.456E-21	9.781E-26		
2096	1.566E-21	8.554E-19	5.747E-23	2.591E-24	7.229E-22	4.857E-26		
2097	7.776E-22	4.248E-19	2.854E-23	1.287E-24	3.590E-22	2.412E-26		
2098	3.861E-22	2.109E-19	1.417E-23	6.390E-25	1.783E-22	1.198E-26		
2099	1.917E-22	1.048E-19	7.038E-24	3.173E-25	8.852E-23	5.948E-27		
2100	9.522E-23	5.202E-20	3.495E-24	1.576E-25	4.396E-23	2.954E-27		
2101	4.728E-23	2.583E-20	1.736E-24	7.825E-26	2.183E-23	1.467E-27		
2102	2.348E-23	1.283E-20	8.619E-25	3.886E-26	1.084E-23	7.283E-28		
2103	1.166E-23	6.370E-21	4.280E-25	1.930E-26	5.383E-24	3.617E-28		
2104	5.790E-24	3.163E-21	2.125E-25	9.582E-27	2.673E-24	1.796E-28		
2105	2.875E-24	1.571E-21	1.055E-25	4.758E-27	1.327E-24	8.919E-29		
2106	1.428E-24	7.800E-22	5.241E-26	2.363E-27	6.592E-25	4.429E-29		
2107	7.090E-25	3.874E-22	2.603E-26	1.173E-27	3.273E-25	2.199E-29		
2108	3.521E-25	1.924E-22	1.292E-26	5.827E-28	1.626E-25	1.092E-29		
2109	1.748E-25	9.552E-23	6.418E-27	2.893E-28	8.072E-26	5.424E-30		
2110	8.683E-26	4.743E-23	3.187E-27	1.437E-28	4.008E-26	2.693E-30		
2111	4.312E-26	2.355E-23	1.583E-27	7.135E-29	1.991E-26	1.337E-30		
2112	2.141E-26	1.170E-23	7.859E-28	3.543E-29	9.885E-27	6.642E-31		
2113	1.063E-26	5.809E-24	3.903E-28	1.759E-29	4.909E-27	3.298E-31		
2114	5.280E-27	2.884E-24	1.938E-28	8.737E-30	2.438E-27	1.638E-31		
2115	2.622E-27	1.432E-24	9.624E-29	4.339E-30	1.210E-27	8.133E-32		
2116	1.302E-27	7.113E-25	4.779E-29	2.155E-30	6.011E-28	4.039E-32		
2117	6.466E-28	3.532E-25	2.373E-29	1.070E-30	2.985E-28	2.006E-32		
2118	3.211E-28	1.754E-25	1.179E-29	5.313E-31	1.482E-28	9.959E-33		
2119	1.594E-28	8.710E-26	5.852E-30	2.638E-31	7.361E-29	4.946E-33		
2120	7.918E-29	4.325E-26	2.906E-30	1.310E-31	3.655E-29	2.456E-33		
2121	3.932E-29	2.148E-26	1.443E-30	6.506E-32	1.815E-29	1.220E-33		
2122	1.952E-29	1.067E-26	7.167E-31	3.231E-32	9.014E-30	6.056E-34		
2123	9.696E-30	5.297E-27	3.559E-31	1.604E-32	4.476E-30	3.007E-34		
2124	4.815E-30	2.630E-27	1.767E-31	7.967E-33	2.223E-30	1.493E-34		
2125	2.391E-30	1.306E-27	8.776E-32	3.957E-33	1.104E-30	7.416E-35		
2126	1.187E-30	6.486E-28	4.358E-32	1.965E-33	5.481E-31	3.683E-35		
2127	5.896E-31	3.221E-28	2.164E-32	9.757E-34	2.722E-31	1.829E-35		
2128	2.928E-31	1.599E-28	1.075E-32	4.845E-34	1.352E-31	9.082E-36		
2129	1.454E-31	7.943E-29	5.337E-33	2.406E-34	6.712E-32	4.510E-36		
2130	7.220E-32	3.944E-29	2.650E-33	1.195E-34	3.333E-32	2.240E-36		
2131	3.585E-32	1.959E-29	1.316E-33	5.933E-35	1.655E-32	1.112E-36		
2132	1.780E-32	9.726E-30	6.535E-34	2.946E-35	8.220E-33	5.523E-37		
2133	8.841E-33	4.830E-30	3.245E-34	1.463E-35	4.082E-33	2.742E-37		
2134	4.390E-33	2.399E-30	1.612E-34	7.265E-36	2.027E-33	1.362E-37		

Graphs







16.0 <u>Estimated Annual and Cumulative quantities of Indirect Emissions to Groundwater</u>

None to report.

17.0 Annual Water Balance Calculation and Interpretation

The predicted Water Mass Balance calculation shows predicted leachate production for 2012.

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

			1		2		3					
year	Active Phase	Active Area	Active Area infiltration	Restored Phase No.	Liquid Waste	Restored Area	Restored Area Infiltration	Total Water	Absorptive Capacity	Predicted Leachate Produced	Actual Leachate	Difference
		A (m2)	R(A) m3		LW (m3)	RCA (m2)	IRCA (m3)	1 +2+3 (m3)	aW (m3)	Lo (m3)	m3	
2002	5	11,800.00	19918.4	1,2,3	0	22,050.00	2840.04	22,758.44	1770.8075	23,885.63	34,218.23	10,332.60
2003	6	16,100.00	20946.1	1,2,3,4	0	25,450.00	2547.545	23,493.65	879.11758	24,866.78	30,721.59	5,854.81
2004	6	19,500.00	32416.8	1,2,3,4	0	27,550.00	3306	35,722.80	840.95323	37,947.25	45,130.40	7,183.15
2005	6,7	16,200.00	27596.7	1,2,3,4,5	0	29,600.00	4004.88	31,601.58	602.53935	34,155.79	54,784.59	20,628.80
2006	7	28,800.00	27596.7	1,2,3,4,5	0	29,600.00	4025.6	31,622.30	1050.4414	33,361.86	60,922.61	27,560.75
2007	7	14,400.00	24036.48	1,2,3,4,5,6	0	53,340.00	6769.913	30,806.39	1391.4589	33,307.30	55,436.15	22,128.85
2008	8	24,300.00	50,517.27	1,2,3,4,5,6	0	53,340.00	6,931.00	57,448.27	1,528.82	59,811.81	78,558.23	18,746.42
2009	8	32,400.00	62,763.98	1,2,3,4,5,6	0	53,340.00	2997.015	65,761.00	439.04833	66,586.16	73,727.85	7,141.69
2010	8	32,400.00	44,248.68	1,2,3,4,5,6,7	0	63,340.00	3558.885	47,807.56	439.04833	48,632.72	42,442.00	-6,190.72
2011	8	32,400.00	45,392.40	1,2,3,4,5,6,7	0	63,340.00	3558.885	48,951.28	439.04833	49,776.44	50,108.00	331.55
2012	9	33,616.67	61,619.36	1,2,3,4,5,6,7,8	0	95,740.00	5379.34	66998.70	439.04833	67,823.86	69,063.01	1239.15

18.0 <u>Report on the Progress towards Achievement of Environmental Objectives contained in previous AER</u>

Target Area	Objective	Works Carried Out	Results
Odour Management	Reduction in number of off site	Regular patrol of gas collection	Odour Complaints increased from 1 in
Reduction in Fugitive Gas Emissions	odours experienced	infrastructure to ensure that there is no	2011 to 16 in 2012.
		blockages on the lines.	
		Adequate intermediate capping on cells	
		prior to final cap	
		Gas extraction of intermediately capped	
		cells.	
Surface Water Emissions	Keep Surface Water Emissions	Proper management of leachate on site.	Two ammonia levels exceeded during
	within agreed limits	Regular inspection of surface water	the reporting period.
		drains	
		Meters on site.	
		Regular inspection of bunded area for	
		integrity on site	
Ground Water Emissions	Keep Ground Water Emissions	Proper management of leachate levels	No licenced limits exceeded
	to within agreed limits	on site.	
		Regular inspection of bunded area for	
		integrity on site.	
Leachate Management	Reduction in the quantity of	Capping cells 15B and 16 within 1 year	Increase in leachate produced on site
	leachate produced on site	of final placement of waste	during reporting period due to wetter
		Reduction in the fill area of cell into	weather. Phases 1 to 8 are now
		which surface water flows.	permanently capped.
Dust	Keep dust deposit limits within	Regular spray of site roads with water	No licenced limits exceeded
	allowable level	at time of dry and windy weather.	

Target Area	Objective	Works Carried Out	Results
Vermin	Keep vermin population on site	Regular baiting of bait boxes through	No visible activity of vermin on site
	to a minimum	out the site	
		Particular attention to be paid to area of	
		know or sighted vermin activity	
Bird Control	Keep number of crow and sea	Bird control on site from Dawn to Dusk	No bird nuisances during reporting
	gulls on site to a minimum	to aid in the reduction in the number of	period. Daily report completed.
		bird on site during day light.	
Flies	Keep the fly population on site	Regular spray of the waste in the active	New fly spraying procedure introduced
	down in the active cell	cell at times of heat and particular	on site and report sheets completed
		emphasis on spraying during summer	after each spray.
		months	
Litter – windblown on site	No windblown litter visible	Proper and complete netting around the	No visible wind blown litter on site
	outside the active cell area	active cell	during reporting period.
		Regular litter picking patrols on site to	There are increased litter patrols on
		pick up any windblown litter.	phase 9 due to the proximity of the
		Stopping the access to the site of rota-	public road.
		press vehicles at times of high winds	
Litter – On main road to landfill site	Reduction in the number of bags	Enforcement of the three strikes and	Continued enforcement of covered
	of waste lost from trailer on the	you're out rule in operation on site in	loads to landfill site and regular litter
	way to the landfill	relation to uncovered loads entering the	patrols on main access routes to landfill
		landfill site.	site
		Quick response to clean up any	
		reported waste on the main road to the	
		landfill	

Target Area	Objective	Works Carried Out	Results
Energy Resources	Reduce the quantity of diesel		Increase in diesel and a reduction in
	and electricity used on site		electricity consumption on site. An
			increase in diesel was due to an
			increased use of plant on site due to
			larger volumes of waste disposed over
			the reporting period.
Reduction of BMW entering the landfill	Reduce the percentage of	Provided organic bin for cold callers to	Removal of green waste from site for
site.	biological municipal waste	the site and have such material	further processing during reporting
	entering the landfill site to 55%.	removed for further processing.	period.
		We have stopped the use of green	
		waste as cover material.	
		Continue to take green waste on site	
		but charge the true cost of treatment for	
		the green waste and have it removed by	
		contractor for further processing.	

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		2013	2014	2015	2016	2017
Odour Management Reduction in Fugitive Gas	Reduction in number of off site	 Regular patrol of gas collection infrastructure to ensure satisfactory 	FM	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Emissions	odour experienced	 operation o Intermediate capping of cell 17,18 and 19. o Permanent gas wells to intermediately capped cells 	SEE	Ongoing Q3/4	Q1			
Surface Water Emissions	Keep surface water emissions within limits	 Proper management of leachate on site Regular inspection of surface water drains Regular inspection of bunded area for integrity on site 	FM FM FM	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing	Ongoing Ongoing Ongoing
Ground Water Emissions	No emissions	 Proper management of leachate on site Regular inspection of bunded area for integrity on site 	FM FM	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing
Leachate Management	Reduction in the quantity of leachate produced on site	 Capping of intermediately capped cells Reduction in the fill area of cell into which surface water flows. 	SEE	Q3/4 Complete	Ongoing			
Dust	Keep dust deposit limits within allowable level	 Regular spray of site roads with water at time of dry and windy weather. 	FM	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Vermin	Keep vermin population on site to a minimum	 Regular baiting of bait boxes through out the site Particular attention to be paid to area of particular attention of the site of the si	FM	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing	Ongoing Ongoing
Bird Control	Minimise bird nuisance	 Bird control on site from to aid in the reduction in the number of birds on site. 	FM	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Flies	Minimise fly nuisance	 Regular spray of the waste in the active cell at times of heat and particular emphasis on spraying during summer months 	FM	Ongoing	Ongoing	Ongoing	Ongoing	Ongoing
Litter – windblown on site	No windblown litter visible outside the active cell area	 Proper and complete netting around the active cell Regular litter picking patrols on site to pick up any windblown litter. 	FM	Ongoing Ongoing	Ongoing	Ongoing	Ongoing	Ongoing

Target Area	Objective	Actions to be progressed and methods	Ву	2013	2014	2015	2016	2017
Energy Resources	Reduce the quantity of diesel and electricity used on site	 Progress gas to energy project 	FM	Ongoing				
Reduction of BMW entering the landfill site	Reduce the percentage of biological municipal waste entering the landfill site to 40%	 Continue to take green waste on site and charge the true cost of treatment for the green waste and have it removed by contractor for further processing. 	FM	Ongoing	Ongoing	Ongoing	Ongoing	
Leachate Management	Develop Integrate Constructive Wetland in order to reduce Environmental Emissions and the strength and Volume of Leachate leaving the Facility Site	 Commission ICW Operate & Monitor ICW Present Results to EPA of Project 	FM	Q2 Ongoing Ongoing	Ongoing Ongoing			

FM — Facility Manager SEE — SEE Waste Management

20.0 Summary of Procedures Developed by the Licensee

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

Procedures

- o Waste Acceptance Procedure Uncovered loads entering landfill site
- o Complaints Management Procedure.
- Fly Spraying procedure.

<u>Plans</u>

• No plans developed in 2012.

21.0 Tank, Pipeline and Bund Testing and Inspection Report

None under taken during the reporting period.

Integrity testing completed on leachate lagoon 2 in March 2013.

22.0 Environmental Incidents and Complaints

Environmental Incidents

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

It is noted that there is no odour nuisance or vegetative die back and it is thought that the readings refer to a sump effect in a rock fill embankment that is at a finished construction height above the original ground level. There were two incidents of trigger level exceedances in the surface water lagoons during the reporting period

Complaints

There were 37 complaints received for the reporting period (21 in 2011). The complaints can be broken down into the following categories:

Issue	2008	2009	2010	2011	2012
Odour	26	9	6	1	16
Illegal Dumping	8	3	7	6	3
Rubbish on Main Road	3	3	1	2	1
Uncovered/unsecure loads being admitted into landfill site	3	0	0	0	0
Flies	2	0	1	5	5
Site Infrastructure	2	1	3	6	3
Speeding Leachate Trucks	0	1	0	0	0
Noise from Leachate Lorries at Treatment Plant	2	1	1	1	0
Windblown litter	1	0	0	0	0
Total Number of Complaints	47	18	19	21	37

Table 18.1: Breakdown of complaints received.



23.0 Review of Nuisance Controls

Odour.

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

Connection of the permanent vertical gas wells in cells 15B/16 to the gas utilisation engine will be completed by May 2013.

Illegal Dumping.

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

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

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

Site Infrastructure.

These complaints referred to the layout of the CAS. Signage has been raised for better visibility and improved.

Fly nuisance.

The frame on the sprayer has been modified for 2013 and a procedure in place when spraying. This includes the location, date and amount of fly spray used.

24.0 Report on Financial Provision

Kerry County Council has a Landfill Aftercare and Development Fund.

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



26.0 Programme of Public Information

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

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

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

27.0 Training of Staff

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

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

28.0 Report on the use of the Community Fund.

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

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

29.0 Statement on Cost of Landfill

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

Table 22.2 - Financial outlay 2012

Landfill Costs	Total Charge Euro
Wages	118,027.88
Salaries	35,919.52
ER PRSI	23,174.14
Overtime	43,706.54
Arrears	-505.62
Sick Pay	7,293.72
Annual Leave	18,594.86
Bank Holiday Leave	4,830.25
Travel/Subsistence	518.92
Eating on site allowance	1,740.40
Acting Allowance	1,410.50
Minor Contracts- Trade Services & other works	280,944.49
Transfer to/from Cap/Rev (Exp)	75,000.00
Non-Capital Equip Purchase - Fire Services	68.50
Non-Capital Equip Purchase - Other	540.75
Hire (Ext) - Plant/Transport/Machinery & Equipment	64,370.60
Repairs & Maint - Plant	16,890.97
Repairs & Maint -Computer Equip	595.00
Repairs & Maint - Other Equip	997.14
Transfers from Machinery Yard	26,007.00
Other Vehicle Expenses	694.00
Materials	137,765.46
Issues from Stores	5,176.15
Insurance	9,351.23
Staff Travelling & Subsistence Expenses	3,159.74
Computer Software and Maintenance Fees	4,125.00
Communication Expenses	1,853.78
Courier	781.42
Training	1,161.21
Legal Fees and Expenses	462.50
Consultancy/Professional Fees and Expenses	2,354.41
Advertising	403.80
Printing & Office Consumables	923.53
Statutory Contributions to Other Bodies	18,187.43
Rates & Other LA Charges	44,439.12
Cleaning	5,284.00
Energy	90,684.93
Miscellaneous Expenses	100.00
Refunds	20.00
Total	1,047,053.27

Wages	29,016.01
Salaries	8,510.25
ER PRSI	5,004.55
Overtime	10,015.11
Arrears	-126.40
Sick Pay	28.44
Annual Leave	592.80
Bank Holiday Leave	619.76
Travel/Subsistence	3,500.52
Eating on site allowance	237.50
Acting Allowance	346.17
Minor Contracts- Trade Services & other works	31,056.08
Non-Capital Equip Purchase - Other	7.03
Repairs & Maint - Plant	564.90
Transfers from Machinery Yard	0.00
Other Vehicle Expenses	0.00
Materials	3,166.37
Issues from Stores	0.00
Insurance	0.00
Staff Travelling & Subsistence Expenses	559.48
Computer Software and Maintenance Fees	0.00
Communication Expenses	264.45
Courier	0.82
Security - Property	0.00
Training	273.89
Consultancy/Professional Fees and Expenses	0.00
Advertising	30.00
Printing & Office Consumables	23.00
Statutory Contributions to Other Bodies	2,020.82
Rates & Other LA Charges	3,349.50
Cleaning	0.00
Energy	7,856.88
Total	106,917.92

Table 23.1, Rainfall data 2011/2012

	2011			2012			
	Rainfall (mm)	True Evaporation (mm)	Effective Rainfall (mm)	Rainfall (mm)	True Evaporation (mm)	Effective Rainfall (mm)	
Jan	146.9	108.18	38.72	193.7	-29.20	222.9	
Feb	159.5	126.23	33.37	67.9	6.18	61.72	
Mar	74.3	47.79	26.51	42.8	31.02	11.78	
Apr	74.2	21.8	52.4	169.5	44.66	124.84	
May	174.7	140.68	34.02	46.7	44.48	2.54	
Jun	No data	No data	No data	215.4	38.88	176.52	
Jul	No data	No data	No data	170.3	33.60	136.7	
Aug	No data	No data	No data	159.3	43.38	115.92	
Sep	155.4	134.22	21.8	118.0	13.58	104.42	
Oct	145.2	-153.84	-8.14	152.8	-10.94	163.74	
Nov	215.2	-218.26	-3.06	242.5	-4.88	247.38	
Dec	251.6	-253.48	-1.88	181.4	-7.08	188.48	
Total	1,401.20	1198,98	219.9	1760.3	203.68	1556.94	

Noise Monitoring 2012

Southern Scientific were commissioned by Kerry County Council to undertake a noise survey at North Kerry Landfill. The LAeq(30min) levels detected during the survey were within the prescribed limit of 55dB at two of the six monitoring locations. The locations of the two stations which exceeded the 55dB limit are close to the public road and so subject to passing traffic.

Table 23.2, Noise monitoring data

Location	Laeq 30min dB	Laf10 30min	Laf90 30min
N1	38.6	39.0	32.5
N2	39.5	37.8	34.4
N3	38.2	40.6	33.7
E1	38.6	42.4	26.9
E2	59.6	51.4	31.5
E3	57.4	49.3	29.0

Dust Monitoring 2012

Southern Scientific was commissioned by Kerry County Council to carry out dust deposition monitoring at four locations at North Kerry Landfill in 2012.

All of the results were inside the allowable limits.

Table 23.3, Dust Monitoring Results

7/6/12 to 11/6/12	Total particulates, mg/m ² /d	23	166	58	172
	Inorganic particulates, mg/m ² /d	<10	141	<10	118
10/8/12 to 17/8/12	Total particulates, mg/m2/d	133	196	99	87
	Inorganic particulates,				
	mg/m2/d	92	82	27	23
7/6/12 to 11/6/12	Total particulates, mg/m2/d	95	46	34	86
	Inorganic particulates, mg/m2/d	74	39	29	39
31.0 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	Total Qty	% BMW		
Billing Condition Applies	DIVIVV			
71,006.59	44,689.45	62.94%		

AppendixB shows the yearly breakdown of tonnage and %BMW entering the landfill site between 1st January – 31st December 2012 as submitted to the Agency.

Comment:

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

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

Appendix A – Waste Tonnage into NKL for 2012

NATIONAL WASTE REPORT 2012 SURVEY

PART 2 - Wastes Disposed and Recovered at Landfill in 2012

Please complete sections A and B (and C Repatriated Waste, where applicable). Insert more rows as necessary.

This data will be cross-checked against information provided by other waste operators and may be subject to audit.

Tonnage of waste accepted at landfill in 2012 (excluding repatriated waste) (autocalculates)	71,006
Tonnage of waste disposed at landfill in 2012 (autocalculates)	71,006
Tonnage of waste recovered at landfill in 2012 (autocalculates)	0

Section A. Kerbside collect	t ions (this means any	waste delivered direc	tly from the household, business or other premises w	here it was first ger	nerated, but not from	another waste facility)			
Name of EACH collector delivering waste directly from kerbside	Source of waste	Waste description	EWC code	Quantity waste accepted (tonnes)	Quantity waste recovered at the landfill (tonnes)	Recovery/recycling code	Quantity waste disposed of at the landfill (tonnes)	Disposal code	Quantity waste remaining in storage at end of year (tonnes)
1 KTC Refuse	Household	Collection	20 03 01	1	0) SELECT	1	D05	
Public Domestic Waste	Household	Weighed Waste	20 03 01	337	(SELECT	337	D05	
3 Public Commercial	Commercial	Commercial Waste Delivered too landfill site.	20 03 01	220.86) SELECT	220.86	D05	
		Flytipping/Street							
4 Waste Recovery Services	Commercial	Cleaning etc.	20 03 01	95.26		SELECT	95.26	D05	
5 Higgans	Commercial	Commercial Bin	20 03 01	30.56	C	SELECT	30.56	D05	
6 KWD	Commercial	Commercial bin Collection	20 03 01	10932.24	C) SELECT	10932.24	D05	
7 Wards	Commercial	Commercial bin Collection	20 03 01	464.44	C) SELECT	464.44	D05	
BKCC Misc.	Household	Housing etc.	20 03 01	95.62	0	SELECT	95.62	D05	
9 LTC Misc.	Household	Housing etc.	20 03 01	5.48) SELECT	5.48	D05	
KCC Road Sweeping	Litter/street sweepings	Road Sweeping	20 03 03	73.02	C)	73.02	D05	
TTC road Sweeping	Litter/street sweepings	Road Sweeping	20 03 03	900.7	C		900.7	D05	
Graveyard Waste	Park & cemetery	Clean up	20 03 03	7.3	C)	7.3	D05	
LTC Road Sweeping	Litter/street sweepings	Road Sweeping	20 03 03	4.48)	4.48	D05	
TC Clean Up	Litter/street sweepings	Clean Up	20 03 03	0.54	c)	0.54	D05	
KCC Clean Up	Litter/street sweepings	Clean Up	20 03 03	188	c)	188	D05	
Greenstar	Litter/street sweepings	Road Sweeping	20 03 03	258.52	C)	258.52		
Dillon Waste	Commercial	Commercial bin Collection	20 03 01	9643.28	c c		9643.28	D05	

						1			
		Commercial							
Greenstar	Commercial	collection	20 03 01	21924.52	0		21924.52	D05	
		Commercial							
Mr.Binman	Commercial	collection	20 03 01	7100.8	0		7100.8	D05	
		Commercial							
Country Clean Recycling	Commercial	Collection	20 03 01	7699.26	0		7699.26	D05	
		Commercial							
South West Bins	Commercial	Collection	20 03 01	5145.54			5145.54	D05	
Coillte Fly Tipping	Fly-tipped material	Flytipping	20 03 03	11.76	0		11.76	D05	
(To add more rows, select									
the last row click 'Insert'									
and then Rows)	SELECT		20 01 01			SELECT		SELECT	

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

Name of EACH facility from which waste was delivered and License/ permit no. of this facility	Source of waste	Waste description	EWC code	Quantity waste accepted (tonnes)	Quantity waste recovered at the landfill (tonnes)	Recovery/recycling code	Quantity waste disposed of at the landfill (tonnes)	Disposal code	Quantity waste remaining in storage at end of year (tonnes)
Coolcashlagh Transfer									
Station W0072-3	Household	KTC Refuse	20 03 01	968		SELECT	968	D05	
Coolcashlagh Transfer									
Station W0072-3	Household	Public Car	20 03 01	673		SELECT	673	D05	
Coolcashlagh Transfer		Non							
Station W0072-3	Household	weighed/tickets	20 03 01	501		SELECT	501	D05	
Coolcashlagh Transfer		A/C holders							
Station W0072-3	Commercial	Inclusive VAT	20 03 01	35		SELECT	35	D05	
Coolcashlagh Transfer									
Station W0072-3	Household	KTC Internal Depts	20 03 01	19		SELECT	19	D05	
Coolcashlagh Transfer	Litter/street	KCC Road							
Station W0072-3	sweepings	Sweeping	20 03 03	1.88		SELECT	1.88	D05	
Coolcashlagh Transfer	Litter/street	KTC Road							
Station W0072-3	sweepings	Sweeping	20 03 03	125.74		SELECT	125.74	D05	
Coolcashlagh Transfer									
Station W0072-3	Park & cemetery	Graveyard Waste	20 03 03	14.72		SELECT	14.72	D05	
Coolcashlagh Transfer									
Station W0072-3	Fly-tipped material	KCC Clean Ups	20 03 03	51.34		SELECT	51.34	D05	
Coolcashlagh Transfer									
Station W0072-3	Fly-tipped material	KUDC Clean ups	20 03 03	13.72			13.72	D05	
Coolcashlagh Transfer									
Station W0072-4	Commercial	KCC Internal Depts	20 03 01	5.72			5.72	D05	
Milltown Transfer Station									
W0069-01	Household	KIC Refuse	20 03 01	4		SELECT	4	D05	
Militown Transfer Station W0069-01	Household	Public Car	20 03 01	645		SELECT	645	D05	

Milltown Transfer Station		Non						
W0069-01	Household	weighed/tickets	20 03 01	592	SELECT	592	D05	
Milltown Transfer Station		A/C holder Vat						
W0069-01	Commercial	exempt	20 03 01	46	SELECT	46	D05	
Milltown Transfer Station		A/C holders				1		
W0069-01	Commercial	Inclusive VAT	20 03 01	69	SELECT	69	D05	
Milltown Transfer Station								
W0069-01	Household	KTC Internal Depts	20 03 01	5	SELECT	5	D05	
Milltown Transfer Station	Litter/street	KCC Road						
W0069-01	sweepings	Sweeping	20 03 03	64.56	SELECT	64.56	D05	
Milltown Transfer Station	Litter/street	KTC Road						
W0069-01	sweepings	Sweeping	20 03 03	0.9	SELECT	0.9	D05	
Milltown Transfer Station								
W0069-01	Park & cemetery	Graveyard Waste	20 03 03	0	SELECT	0	D05	
Milltown Transfer Station								
W0069-01	Fly-tipped material	KCC Clean Ups	20 03 03	60.14	SELECT	60.14	D05	
Caherciveen Transfer								
Station W0087-01	Household	Public Car	20 03 01	290.4		290.4	D05	
Caherciveen Transfer		Non weighed						
Station W0087-01	Household	inclusive of tickets	20 03 01	182.46		182.46	D05	
Caherciveen Transfer		A/C holders						
Station W0087-01	Commercial	Inclusive VAT	20 03 01	25.26		25.26	D05	
Caherciveen Transfer		A/C holder Vat						
Station W0087-01	Commercial	exempt	20 03 01	8.2		8.2	D05	
Caherciveen Transfer								
Station W0087-01	Household	KCC Internal Depts	20 03 01	4.18		4.18	D05	
Caherciveen Transfer	Litter/street	Road Sweeping /						
Station W0087-01	sweepings	Street Cleaning	20 03 03	28.88		28.88	D05	
Caherciveen Transfer		_						
Station W0087-01	Park & cemetery	Graveyard Waste	20 03 03	1.98		1.98	D05	
Caherciveen Transfer		Clean up / fly						
Station W0087-01	Fly-tipped material	tipping	20 03 03	16.4		16.4	D05	
Kenmare Transfer Station								
W0086-01	Household	Public Car	20 03 01	217.24		217.24	D05	
Kenmare Transfer Station			00.00.01	17.00		17.00	Doc	
W0086-01	Commercial	Public Commercial	20 03 01	17.22		17.22	D05	
Kenmare Transfer Station	Line also lat	NON	00.00.04	45.4.7		45 4 7	Doc	
W0086-01	Housenoid	weighed/tickets	20 03 01	454.7		454.7	D05	
	Commercial	AVC HOIDERS	20.02.04	100.00		100.00	DOF	
Konmara Transfer Station	Commercial		20 03 01	102.32		102.32	D05	
	Commercial	avempt	20.03.01	4 7		4 7	D05	
Kopmara Transfer Station	Commercial	exempt	20 03 01	1.7		1.7	D05	
	Household	KCC Internal Dente	20.03.01	10.6		12.6	D05	
Kenmare Transfer Station	Litter/street	Road Sweening /	20 03 01	12.0		12.0	005	
W0086-01	SWEEDINGS	Street Cleaning	20 03 03	212		2 4 2	D05	
Kenmare Transfer Station	3 weepings	Succession	20 00 00	2.42		2.42	200	
W0086-01	Park & comptony	Gravevard Waste	20.03.03	2.08		2.08	D05	
Kenmare Transfer Station	i and a centelety	Clean un / fly	20 03 03	2.00		2.00	005	
W0086-01	Elv-tinned material	tinning	20.03.03	13.86		13.86	D05	
110000-01	i i i i i i ppeu material	"PPING	20 00 00	13.00		10.00	200	

Dingle Civic Amenity Site								
W0225-01	Household	Public Car	20 03 01	58.68		58.68	D05	
		Non weighed						
Dingle Civic Amenity Site		waste inclusive of						
W0225-01	Household	tickets	20 03 01	167.96		167.96	D05	
Dingle Civic Amenity Site								
W0225-01	Park & cemetery	Graveyard Waste	20 03 01	0.16		0.16	D05	
Dingle Civic Amenity Site		Clean up / fly						
W0225-01	Fly-tipped material	tipping	20 03 01	16.98		16.98	D05	
NKL Civic Amenity Site	Household	Ticketed Waste	20 03 01	264.01		264.01	D05	
(To add more rows, select								
the last row, click 'Insert'								
and then 'Rows')							D05	

Section C. Repatriated Waste (this means any waste accepted from sites in Northern Ireland where Rol waste was illegally dumped)										
Name of site from which waste was delivered	Waste description	EWC code	Quantity waste accepted (tonnes)	Quantity waste recovered at the landfill (tonnes)	Recovery/recycling code	Quantity waste disposed of at the landfill (tonnes)	Disposal code			
		SELECT			SELECT		SELECT			
		SELECT			SELECT		SELECT			
		SELECT			SELECT		SELECT			
		SELECT			SELECT		SELECT			
(To add more rows, select the last row, click 'Insert'										
and then 'Rows')		SELECT			SELECT		SELECT			

Appendix B: % BMW Report 2012

Biodegradable Municipal Waste Reporting Landfill Submission Report

Waste licence number:	W0001-04 North Kerry La	ndfill Site	
Report created on:	08/01/2013 16:02		
Submission details			
Year:	2012	Quarter:	4
Reporting period:	October - December		
Reference number:	R-W0001-2012-4		
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 p	erson who made the re	turn	
Contact name:	John Ahem	Contact position:	
Email address:	jahem@kerrycoco.ie	Telephone number:	0667162000

Fax number:

BMW details

Mobile number:

Summary for Q4 2012

Type of MSW	Total Qtv MSW	Factor Type	Factor Value	Total Qtv BMW	Comment	% BMW
2-bin residual commercial waste	351.3	EPA Approved factor	0.75	263.48		75.00
Other	0.06	Site Specific factor	0.00	0.00	Graveyard Waste	0
Residual MSW from civic amenity facility	140.38	EPA Approved factor	0.63	88.44		63.00
Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	568.06	EPA Approved factor	0.65	369.24		65.00
Other	59.12	Site Specific factor	0.63	37.25	Dingle CA	63.01
Other	331	Site Specific factor	0.64	211.84	Milltown TS	64
Other	546.3	Site Specific factor	0.57	311.39	Coolcaslagh TS	57.00
Other	193.54	Site Specific factor	0.65	125.80	Kenmare Transfer Station	65.00
Other	121.26	Site Specific factor	0.63	76.39	Caherciveen Transfer Staion	63.00
Other	6348.6	Site Specific factor	0.60	3809.16	KWD Recycling	60
Other	9576.44	Site Specific factor	0.71	6799.27	Greenstar Ltd	71.00
Other	356.78	Site Specific factor	0.58	206.93	SWB	58.00
Other	4815	Site Specific factor	0.56	2696.40	Dillon Waste	56
Other	7699.28	Site Specific factor	0.60	4619.57	7699.28	60.00
	31107.12			19615.16		63.06

Cumulative report for year

Quarter	Type of MSW	Total Qty MSW	Factor Type	Factor Value	Total Qty BMW	Comment	% BMW
Q1	2-bin residual	112.28	EPA Approved factor	0.75	84.21		75.00
	commercial waste						
Q1	Other	3.50	Site Specific factor	0.00	0.00	Graveyard Waste	0.00
Q1	Residual MSW from civic amenity facility	150.58	EPA Approved factor	0.63	94.87		63.00
Q1	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	240.36	EPA Approved factor	0.65	156.23		65.00
Q1	Other	52.74	Site Specific factor	0.63	33.23	Dingle CA	63.01
Q1	Other	362.02	Site Specific factor	0.64	231.69	Milltown TS	64.00
Q1	Other	679.98	Site Specific factor	0.58	394.39	Coolcaslagh TS	58.00
Q1	Other	220.48	Site Specific factor	0.65	143.31	Kenmare Transfer Station	65.00
Q1	Other	134.48	Site Specific factor	0.64	86.07	Caherciveen Transfer Staion	64.00
Q1	Other	786.40	Site Specific factor	0.60	471.84	KWD Recycling	60.00
Q1	Other	7991.76	Site Specific factor	0.72	5754.07	Greenstar Ltd	72.00
Q1	Other	7100.80	Site Specific factor	0.57	4047.46	Mr Binman Ltd	57.00
Q1	Other	1202.92	Site Specific factor	0.58	697.69	South West Bins	58.00
Q1	Other	1384.24	Site Specific factor	0.56	775.17	Dillon Waste	56.00
Q2	2-bin residual commercial waste	56.82	EPA Approved factor	0.75	42.62		75.01
Q2	Other	3.74	Site Specific factor	0.00	0.00	Graveyard Waste	0.00
Q2	3-bin residual household waste	1.38	EPA Approved factor	0.47	0.65		47.10
Q2	Other	57.56	Site Specific factor	0.63	36.26	Dingle Civic Amenity Site	63.00
Q2	Other	374.70	Site Specific factor	0.64	239.81	Milltown TS	64.00
Q2	Other	590.70	Site Specific factor	0.57	336.70	Coolcaslagh TS	57.00
Q2	Other	240.18	Site Specific factor	0.65	156.12	Kenmare TS	65.00
Q2	Other	147.90	Site Specific factor	0.64	94.66	Caherciveen TS	64.00
Q2	Other	1185.24	Site Specific factor	0.60	711.14	KWD Recycling	60.00
Q2	Other	2307.76	Site Specific factor	0.72	1661.59	Greenstar Ltd	72.00
Q2	Other	1993.22	Site Specific factor	0.58	1156.07	South West Bins	58.00
Q2	Other	1976.86	Site Specific factor	0.56	1107.04	Dillon Waste	56.00
Q2	Residual MSW from civic amenity facility	156.43	EPA Approved factor	0.63	98.55		63.00
Q2	Other	155.70	Site Specific factor	0.63	98.09	Wards	63.00
Q2	Other	9.72	Site Specific factor	0.63	6.12	Higgins	62.96
Q2	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	261.12	EPA Approved factor	0.65	169.73		65.00
Q3	2-bin residual commercial waste	226.40	EPA Approved factor	0.75	169.80		75.00
Q3	Other	74.36	Site Specific factor	0.63	46.85	dingle CA	63.00
Q3	Other	419.98	Site Specific factor	0.64	268.79	milltown ts	64.00
Q3	Other	249.94	Site Specific factor	0.66	164.96	kenmare ts	66.00
Q3	Other	154.12	Site Specific factor	0.64	98.64	caherciveen ts	64.00
Q3	Other	2612.02	Site Specific factor	0.60	1567.21	kwd recycling	60.00
Q3	Other	2048.56	Site Specific factor	0.71	1454.48	Greenstar Itd	71.00
Q3	Other	1592.62	Site Specific factor	0.58	923.72	siouth west bins	58.00
Q3	Other	1467.18	Site Specific factor	0.56	821.62	Dillons Waste	56.00
Q3	Residual MSW from civic amenity facility	153.12	EPA Approved factor	0.63	96.47		63.00
Q3	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	367.44	EPA Approved factor	0.65	238.84		65.00
Q3	Other	592.16	Site Specific factor	0.57	337.53	Coolcaslagh Transfer Station	57.00
Q4	2-bin residual commercial waste	351.30	EPA Approved factor	0.75	263.48		75.00
Q4	Other	0.06	Site Specific factor	0.00	0.00	Graveyard Waste	0.00
Q4	Residual MSW from civic amenity facility	140.38	EPA Approved factor	0.63	88.44		63.00
Q4	Untreated cleansing waste (fly-tipping, street bins, road sweepings etc.)	568.06	EPA Approved factor	0.65	369.24		65.00
Q4	Other	59.12	Site Specific factor	0.63	37.25	Dingle CA	63.01
Q4	Other	331.00	Site Specific factor	0.64	211.84	Milltown TS	64.00
Q4	Other	546.30	Site Specific factor	0.57	311.39	Coolcaslagh TS	57.00
Q4	Other	193.54	Site Specific factor	0.65	125.80	Kenmare Transfer	65.00
Q4	Other	121.26	Site Specific factor	0.63	76.39	Station Caherciveen Transfer	63.00
						Staion	
Q4	Other	6348.60	Site Specific factor	0.60	3809.16	KWD Recycling	60.00
Q4	Other	9576.44	Site Specific factor	0./1	6799.27	Greenstar Ltd	/1.00
Q4	Other	356.78	Site Specific factor	0.58	206.93	SWB	58.00

Q4	Other	4815.00	Site Specific factor	0.56	2696.40	Dillon Waste	56.00
Q4	Other	7699.28	Site Specific factor	0.60	4619.57	7699.28	60.00
		71006.59			44689.45		62.94

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

Waste Landfill Leachate off Site				
		Leachate		
	Waste Lonnes	m3	tonnes/m3	
1994	16,902	1,494.00	11.31325	
1995	23,505	6,475.00	3.630116	
1996	23,722	8,496.37	2.792016	
1997	25,581.88	12,175.49	2.101097	
1998	33,529.67	20,318.09	1.650237	
1999	57,872.71	22,822.95	2.535724	
2000	60,473.65	36,780.71	1.644168	
2001	63,945.91	18,953.85	3.373769	
2002	62,821.52	34,218.23	1.835908	
2003	50,235.29	30,721.59	1.635179	
2004	48,054.47	45,130.40	1.064792	
2005	34,430.82	54,784.59	0.628476	
2006	60,025.22	60,922.61	0.98527	
2007	56,794.24	55,436.15	1.024498	
2008	62,412.96	78,558.53	0.794477	
2009	39,755.40	73,727.85	0.539218	
2010	20,986.80	42,442.73	0.494473	
2011	16,545.71	50,108.58	0.330197	
2012	71,006.59	69,063.01	1.028142	
Total	828,602	722,631	1.15	

Appendix D: Waste Recycling and Recovery

Material type	Suggested EWC codes		Household waste	Name of destination facility(ies), or collector(s) if directly exported	Comments (Use the cells in this column to comment on any significant changes in the waste tonnages accepted in 2012 compared to 2011 data)
(If you must depart from this list, please provide details on a separate sheet)	(overwrite as appropriate)	Notes	(tonnes)	(please provide licence/permit number)	
Mixed residual waste	20 03 01		264	n/a	Landfilled in North Kerry Landfill
Organic waste (food and garden)			47		
if segregated, provide specific information on food and garden waste					
food	20 01 08			Deni se Mese	Cross Weste Weighted and Technologied
garden	20 02 01		47	Horticulture W0198-01	by Bord na Mona
Mixed dry recyclables	20 03 01		<u>18</u>	Disposal W0217	Eco Sense Bags sold for Dry recyclables
Cardboard, newspaper and other paper			86		
cardboard and paper in the rows below				Crosseter Desuring	
cardboard packaging	15 01 01		34	(munster) Glanmire W0136	Material weighed on site
caraboara non-packaging	20 01 01				
paper packaging	15 01 01				
paper non-packaging	20 01 01			Dillon Waste Ltd.	
newspaper and magazines	20 01 01		51	WP/07-30	Material weighed on site
Uld 55			<u>36</u>		
if segregated, provide the breakdown of glass in the next two rows					
glass packaging	15 01 07		36	Glassco recycling (jan - March) Dillon Waste Ltd (March - Dec)	
glass non-packaging	20 01 02				
Metals			37		
if segregated, provide the breakdown of metals in the next four rows					
aluminium cans (packaging)	15 01 04		2	Glassco recycling (jan - March) Dillon Waste Ltd (March - Dec)	
steel cans (packaging)	15 01 04		5	March) Dillon Waste Ltd (March - Dec) Hegarty Metals WCP-	
otner metais (non-packaging)	20 01 40		30	LK-027/02b	
			21		
if segregated, provide the breakdown of plastic waste in the next two rows					
plastic packaging	15 01 02		21	Dillon Waste Ltd. WP/07-30	Plastc Bottles weighed on site
plastic non-packaging	20 01 39				
polystyrene	15 01 02				
Composite packaging (e.g. tetrapaks)	15 01 05				
Textiles for recovery or disposal	Do not repor reu	t on textiles collected for use by charities	<u>4</u>		
if segregated, provide the breakdown of textiles in the next two rows					
textiles, packaging	15 01 09				
textiles, non-packaging	20 01 11		4	Cookstown recycling	Old clothes
Wood			<u>0</u>		
if segregated, provide the breakdown of wood waste in the next four rows					
wood packaging	15 01 03				
wood non-packaging	20 01 38				
mixed, uncontaminated wood packaging and non-packaging	15 01 03; 20 01 38				
wood, treated, hazardous	20 01 37*				
Batteries	Portable batter are not exclus electrical vehicle used for auto in	ies weigh <2kg, are sealed, ively designed to propel an e, and are not intended to be motive starter, lighting or gnition power.	<u>0.96</u>		
lead acid batteries and accumulators	16 06 01*	portable non-portable (automotive	0.96	Portloaise	
Ni-Cd batteries and accumulators	16 06 02*	portable non-portable (automotive			
Other (e.g. alkaline) batteries and	16 06 04	and industrial) portable			
accumulators		non-portable (automotive and industrial)		Enva Ireland Limito-	
Waste mineral oils	13 02 05*	machine, etc.	5.26	Portloaise Enva Ireland Limited	
Oil filters (vehicles)	16 01 07* 15 01 10*/		0.29	Portloaise Envalreland Limited	
metal Waste cooking or vegetable oils	15 01 11*		0.11	Portloaise Envite Cork	
Waste paint and varnish (including	20 01 27*		0.11	Enva Ireland Limited	
Containers)	16.01.02		0.17	Portloaise	
- , 0	.50103				

ANNUAL ENVIRONMENT REPORT Physio-chemical and Biological Monitoring of North Kerry Landfill 2012

Prepared by: David Lenihan Senior Executive Chemist

28th February 2013

INTRODUCTION

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

Enclosed are:

- Interpretation of results pertaining to three matrices of concern i.e. Groundwater, Surface water and Leachate.
- *Table 1:* Outlines trigger values for strategic parameters analysed in groundwater.
- *Appendix 1:* Detailing sample locations and associated grid references used in report
- *Appendix 2:* Details list of List 1,2 Organics monitored and their associated Limits of Detection (LODs).
- *Appendix 3*: Trend Graphs for Total Organic Carbon Results and associated conductivity measurements for each of boreholes.
- *Appendix 4:* Invertebrate Assessment of Surface Water Impact Sites conducted by KCC Scientific staff
- *Appendix 5:* Results from ELS contract laboratory pertaining to individual List 1 and List 2 organics which were analysed for in Nov 2012 at three groundwater locations.
- Appendix 6: Annual Results in spreadsheet format for Leachate, Surface Water and Groundwater as required per monitoring provisions as of licence requirements for 2012.

All except for analysis of *Total Cyanide*, *List 1* and *List 2 Organic Substances* was conducted at KCC laboratory. Analysis on these Parameters (italics *and asterix*) was farmed out to *ELS Laboratories*, Mahon Industrial Estate, Cork City, Co. Cork.

A summary of Environmental requirements has been prepared by Tobin Consulting Engineers. This is the document we are using. Results are also included for monthly analysis of groundwater as required by provisions of old licence.

In 2012 a total of **223** samples were sampled by KCC Laboratory personnel.

Altogether 2332 tests were analysed to satisfy requirements of licence monitoring. Of these

- 2297 tests were analysed in KCC laboratory
- *35* tests were analysed by *ELS laboratories*. The latter included Cyanide and List1 / 2 organics as required on an annual basis for three groundwater locations It must however be stressed that each test for SVOCs or VOCs comprises analysis for 153 specific compounds

The monitoring locations monitored are as per requirements of new licence. *Appendix 1* outlines locations and associated northings and eastings.

Trigger Limits (Groundwater Regulations 2010)

Trigger limits are required to be set for certain parameters in groundwater and submitted to EPA. Perhaps the best such limits to use are groundwater threshold values as set out in Groundwater Regulations 2010. Other standards used, correspond to drinking water regulatory standards. However where drinking water limits cannot be adhered to because of natural conditions (non anthropogenic effects) i.e. Ph the trigger value would have to be more flexible. The trigger values for Boreholes 1 to 4 are as highlighted in Table 1. Borehole 5 appears to be monitoring an aquifer which contains a lot of decaying organic matter more than likely from natural sources. Therefore trigger value for ammonia may be too strict.

Table I	Parametric	Trigger	values for	Groundwater
---------	------------	---------	------------	-------------

Parameter	units	Trigger value (max)	Trigger value(min)
Ammonium	mg/L	0.225	
Nitrite	mg/L	0.38	
Total Oxidised Nitrogen	mg/L	37.5	
~	(NO ₃)		
Conductivity	Us/cm	800	
Ph	Ph units	10	4.5
Dissolved Oxygen	mg/L O2		1.0
Chloride	mg/L	200	
Flouride	ug/L	1000	
Sodium	mg/L	150	
Potassium	mg/L	10	
Boron	mg/L	0.75	
Copper	mg/L	1.5	
Cadmium	ug/L	3.75	
Chromium	ug/L	37.5	
Arsenic	ug/L	7.5	
Lead	ug/L	10	
Nickel	ug/L	15	

Parameter	units	Trigger value (max)	Trigger value(min)
Mercury	ug/L	0.75	
Total Cyanide	ug/L	37.5	
<u>VOCs</u>			
Benzene	ug/L	0.75	
1,2 dichloroethane	ug/L	2.25	
Tetra chloroethene and Trichloroethene	ug/L	7.5	
Toluene	ug/L	5	
Phenols	mg/L	0.05	
<u>SVOCs</u>			
Atrazine	ug/L	0.075	
Simazine	ug/L	0.075	
Poly aromatic Hydrocarbons ¹	ug/L	0.075	
Pesticides ^{2,3}	ug/L	0.375	

¹ PAHs neasured should include at least benzo(b)Fluoranthene, benzo(k Fluoranthene, benzo(ghi)perylene,indeno(123-cd)pyrene Fluoranthene

² the trigger value applies to each individual pesticide measured.

³Pesticides include organic insecticides, Organic herbicides, Organic nematocides, organic acaricides, organic algicides, organic rodenticides, organic slimicides, related products (inter alia, growth regulators

List 1 and List 2 Organics

Under the provisions of monitoring requirements we are required to monitor List 1 and List 2 organic compounds in three groundwater locations on an annual basis. These locations have to be agreed with EPA. In this report, we report on three groundwater locations which were monitored for these compounds i.e. *Borehole 1*, *4* and *5*.

The compounds analysed comprised of two types Volatile Organic Compounds (*V.O.Cs.*) and Semi Volatile Organic Compounds (*SVOCs*). V.O.Cs. comprise of organic compounds with boiling points close to or less than that of Water i.e. *Petroleum Products* and common solvents –up to 83 compounds were screened for using Purge and Trap GC MS.

Semi Volatile Compounds comprise of higher boiling point organics and comprise of classes of compounds such as *Pesticides, Herbicides, PCBs* (*Polychlorinated Biphenyls*) and *PAHs* (*Poly aromatic Hydrocarbons*). Up to 63 different compounds in this category were screened for. A list of these compounds, together with limits of detection is given in *Appendix 2*.

Of the 83 VOCs analysed only one was detected above their respective Limits of detection in each of the three wells i.e. Borehole 1, 2 and 3

The only compound detected was Carbon disulphide 11.2. 3.6 & d 3.2 ug/L respectively These levels are miniscule and are not of significance. No SVOCs were detected in any of samples.

Heavy Metals

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

*Inductively coupled Plasma Mass spectrometer

INTERPRETATION OF RESULTS

Groundwater: See also trend graphs for Total Organic Carbon (with associated conductivity) for each Borehole (encl)

All boreholes are showing evidence of surface water contamination to a greater or lesser extent –borehole 2 been least affected. . This is evident from turbidity and Total Organic carbon levels. The source of this surface water contamination, greater than earlier years was undoubtedly exacerbated by abnormally high rainfall particularly in summer months.

The high Nickel and lead levels experienced in January particularly in Borehole 4 may have been due to inadequate purging of wells at that time. Subsequent investigative analysis reveals normal or close to background levels for most of wells. However Borehole 1 still has high levels of some heavy metals. In the latter case, this may be due to fact that the well was recently bored and thus some leaching of casing is still occurring.

Borehole 4 had two high Ammonia levels in January and March, since then there has been no recurrence. This points to evidence of surface water contamination in period January to March 2012.

Borehole 5 continues pattern of other years i.e. high ammonias coupled with highest levels of colour and molybdate reactive Phosphorous. The primary source of this would appear to be natural decomposition material in peaty soil.

One of boreholes however i.e. Borehole No 3 does not require purging prior to monitoring as this well is used as source of water for canteen and is thus actively used. Curiously in this case both ammonia (*see Fig 1*) and TOC levels were abnormally high in January which suggests that there may have been some actual contamination of this well at that time. Subsequent investigative and compliance sampling has revealed no elevated levels of ammonia although TOC levels were relatively high . *See Fig 1*.





Boreholes 1, 2 and 3 were tested for list 1, 2 organics. Outside of traces of Carbon disulphide No organics of significance were found here.

Surface Water:

Impact of Suspended Solids:

Results from monitoring over last 10 years indicates that most significant threat or impact from Landfill activities in surrounding waters is suspended solids

Samples were obtained "in site monitoring" from Stations SWML 1,2,3,4,5,10,11 and new lagoon SWMLE1.

Occasional excesses of suspended solids are noted at on site impact stations i.e. at new surface water lagoon (*SWMLE1*) and SWML 10 in Nov. Figs 3 and 6

While overall there was a noticeable decrease in suspended solids in receiving waters at W1 during 2012 relative to earlier years- there was a spike observed in October probably exacerbated by heavy rainfall prior to sampling. *See Fig 4 Suspended solids @ W1 2009/2011.*





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







High suspended solids in river waters may impair fish spawning grounds particularly in winter and spring. Occasional pulses of suspended matter entering these sites are more than $P_{\text{age 53 of 155}}$

likely the main contributory factor for unsatisfactory biological quality at this site in the past (see 2011 AER).

Ecological assessment of W1 In 2012 denotes a Q3-5 value (moderate pollution), which still reflects some impact See *Invertebrate monitoring report 2012*. A slight improvement is noted from last year where same site scored a Q 3. Biological assessment at station on Lee about 3 km downstream W2 (O'Brennans Bridge) indicates a stream of good quality i.e. Q = 4-5.

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

Impact of Ammonia levels on receiving waters

At present as part of operational monitoring instruments for automated monitoring of Ammonia in lagoons is been sourced. In the interim grab samples for this parameter are been taken from lagoons and analyzed in laboratory (*appropriate preservative has been added prior to sampling to sample bottles*). This analysis is reported separately which accompanies this report.

In 2010 some impact was noted from landfill on receiving waters gauged by Ammonia levels at Location W1 (see 2010 AER). However during course of 2011 and 2012 no such impact was observed.

However significant impact judging by Ammonia levels was noted in Nov at new lagoon (SWMLE1), which continued to at least December. See sheet of results on investigative monitoring.

Latest provisional results show that contamination was still continuing at time of writing this report. An intensive investigation and remedial action is underway.

Leachate Results

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

Conclusion

- Evidence of surface water contamination noted in all boreholes –marked increase from earlier years
- Biological assessment in 2012 denoted improvement in main surface water impact site i.e. W1 from Q 3 to Q 3-5
- Ammonia detected at significant levels in New surface water lagoon SWML E1
- Evidence of leachate was detected in all three leachate detection manholes

References:

1. Summary of Environmental Monitoring requirements For- Kerry Co Council Landfill, Muingnaminnane, Tralee, Co Kerry -Waste Licence Ref No: 1-3: Tobin Consulting Engineers

2. Biological Invertebrate Monitoring of Surface Waters 2012; Laboratory KCC

Appendix 1: Monitoring Pts

<u>Location</u>	<u>comments</u>	old or alternative name	Location Easting	Location Northing	
Groundwater					
specified groundwater monitoring pts					
Groundwater - BH-1			94697	117360	
Groundwater - BH-2			94814	117306	
Groundwater - BH-3			94808	117005	
Groundwater - BH-4			95430	117040	
Groundwater - BH-5			94917.5	117152.7	
Groundwater - BH-6			94843	117658	
Private boreholes adjacent to landfill					
horebole: Dennis O Mahony	not specified in new licence		97390 7	1183/8 7	
borehole: Gerry Sugrue	not specified in new licence		97390.7	116/89 5	
	not specified in new idence		33037.0	110403.5	
Leachate					
Detection manholes					
LD-1		leachate detection manhole 1	94909	117268	
LD-2		leachate detection manhole 2	94894	117298	
LD-3		leachate detection manhole from lagoon	94905	117264	
Lagoon sampling pts					
LL-1		Leachate in lagoon 1	94904	117237	
LL-2		leachate in Lagoon 2	94927	117166	
LL-3		lagoon containing run off from compost	94979	117414	
Ancillary pts					
Puraflo Treatment Inlet	not specified in new licence				
Puraflo Treatment Outlet	not specified in new licence		94867.2	117332	
Wheelwash	Not specified in new licence				
Surface water					
Off site sampling pts					
Surface Water sampling point: W1	not specified in new licence	biological station	94493.3	117107.5	
Surface water sampling point: E2	Not specified in new licence	O'Learys farm	95870.6	116575.6	
Surface water sampling point: W2	Not specified in new licence		94493.3	117159.9	
SW-1		previously E1	95471	117077	
SW-2			95143.6	117969.4	
SW-3			94853	118263	
On site sampling pts					
SWML-1		previously 1	94948.3	117376.4	
SWML-2	Western Lagoon	previously 2	94837.9	117263.7	
SWML-3			94866	117221	
SWML-4		previously 4	94883.9	117092.6	
SWML-5			94911	117027	
SWML-10	Eastern lagoon		95092	117470	
SWML-11		previously 11	95067	117520	
SWML-E1	New surface water lagoon		94592	117510	

Appendix1: Details Sampling points referred to in report

APPENDIX 2: LIST 1, 2 Organics

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

<u>Parameter</u>	<u>limit of</u> detection	<u>units</u>
1.3 - Dichlorobenzene	1	ug/l
1.4 - Dichlorobenzene	1	ug/l
Hexachloroethane	1	ug/l
bis(2-Chloroethyl) ether	1	ug/l
1,2-Dichlorobenzene	1	ug/l
bis(2-Chloroisopropyl) ether	1	ug/l
N-Nitrosodi-n-propylamine	1	ug/l
Nitrobenzene	1	ug/l
Hexachlorobutadiene	1	ug/l
1,2,4-Trichlorobenzene	1	ug/l
Isophorone	1	ug/l
Naphthalene	1	ug/l
bis(2-Chlororthoxy)		
methane	1	ug/l
Hexachlorocyclopentadiene	1	ug/l
2-Chloronaphthalene	1	ug/l
Acenaphthylene	1	ug/l
Acenaphthene	1	ug/l
Dimethyl phthalate	1	ug/l
2,6-Dinitrotoluene	1	ug/l
Fluorene	1	ug/l
4-Chlorophenyl phenyl ether	1	ug/l
2,4-Dinitrotoluene	1	ug/l
Diethyl phthalate	1	ug/l
N-Nitrosodiphenylamine	1	ug/l
Hexachlorobenzene	1	ug/l
a-BHC	1	ug/l
4-Bromophenyl phenyl ether	1	ug/l
y-BHC	1	ug/l
Phenanthrene	1	ug/l
Anthracene	1	ug/l
B-BHC	1	ug/l
Heptachlor	1	ug/l
d-BHC	1	ua/l
Aldrin	1	ua/l
Dibutyl phthalate	1	ua/l
Heptachlor epoxide	1	ua/l
Endosulfan I	1	ua/l
Fluoranthene	1	ug/l
Dieldrin	1	ua/l
4.4'-DDF	1	ug/l
Pyrene	1	ug/l
Endrin	1	ug/i
Endosulfan II	1	~9/1
4 4'-DDD	1	ug/i
Benzidine	1	ug/i
Denziullie	1	ug/i

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

-

<u>Parameter</u>	<u>limit of</u> detection	<u>units</u>
Dichlorodifluoromethane	10	ug/l
Chloromethane	0.5	ug/l
Ethyl Chloride/Chloroethane	0.5	ug/l
Vinyl Chloride/Chloroethene *(0.5ppb)	0.5	ug/l
Vinyl Chloride/Chloroethene * (25ppb)	0.5	ug/l
Bromomethane	0.5	ug/l
Trichloromonofluoromethane	0.5	ug/l
Ethyl Ether/Diethyl Ether	0.5	ug/l
11 Dichloroethene	0.5	ug/l
Acetone	2	ug/l
Iodomethane/Methyl Iodide	0.5	ug/l
Carbon Disulphide	0.5	ug/l
Allyl Chloride	0.5	ug/l
Methylene Chloride/DCM	5	ug/l
2-Propenenitrile/Acrylonitrile	2	ug/l
Chloroacetonitrile	0.5	ug/l
Nitrobenzene	0.5	ug/l
Propanenitrile	10	ug/l
Hexachlorobutadiene	0.5	ug/l
Trans-1,2 Dichloroethene	0.5	ug/l
MtBE	0.5	ug/l
11 Dichloroethane	0.5	ug/l
22 Dichloropropane	0.5	ug/l
cis-12 Dichloroethene	0.5	ug/l
2-Butanone	5	ug/l
Methyl Acrylate	5	ug/l
Bromochloromethane	0.5	ug/l
Methacrylonitrile	5	ug/l
Tetrahydrofuran	5	ug/l
Chloroform*	1	ug/l
111 Trichloroethane	0.5	ug/l
1-Chlorobutane	0.5	ug/l
Carbon Tetrachloride	0.5	ug/l
11 Dichloropropene	0.5	ug/l
Benzene	0.1	ug/l
12 Dichloroethane)	0.1	ug/l
Trichloroethylene/ Trichloroethene	0.1	ug/l
12 Dichloropropane	0.5	ug/l
Dibromomethane	0.5	ug/l
Methyl Methacrylate	0.5	ug/l
Bromodichloromethane*	2	ug/l
13 Dichloropropene, cis	2	ug/l
MIBK/4 Methyl 2 Pentanone	2	ug/l
Toluene	0.5	ug/l
13 Dichloropropene, trans	2	ug/l

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

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

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

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

APPENDIX No: 3 Trend Graphs for Total Organic Carbon Results

Borehole 1: TOC vs. Conductivity 2006 to Feb2013



Borehole 2: TOC vs. Conductivity 2006 to Feb 2013

Landfill - North Kerry Landfill

Parameter Trend Graph - Total Organic Carbon (mg/l) Sample Location : Groundwater:Borehole No 2 : 4 Selected Templates



Summary Statistics :	No. of Samples : 28	Maximum Result : 16.8	Mean : 4.21
		Minimum Result : < 1	Median : 2.5
			Standard Deviation : 3.99

Borehole 3: TOC vs. Conductivity 2006 to Feb 2013

Parameter Trend Graph - Total Organic Carbon (mg/l) Sample Location : Groundwater :Borehole No 3 : 4 Selected Templates Total Organic Carbon (mg/l) Conductivity @ 20 oC (µS/cm) 25 500 22/11/2012 18/01/2012 20 400 15 23/08/2012 10 200 100 5 ſ Feb:13 Feb:06 Time





Borehole 4: TOC vs. Conductivity 2006 to Feb 2013



Standard Deviation : 7.69



Borehole 5: TOC vs. Conductivity 2010 to Feb 2013





Summary Statistics :	No. of Samples	: 10	Maximum Result	: 27.1	Mean	: 8.75
			Minimum Result	: < 1	Median	: 6.25
					Standard Deviation :	8.35

<u>APPENDIX No.4: Invertebrate Assessment of Surface Water Impact</u> <u>Sites</u>

Biological Invertebrate Monitoring

Of

Surface Waters

Draining North Kerry Landfill

2012

Laboratory KCC C Markey, C McCaffrey, I McGloin

date of report: 01/12/2012

Introduction:

Under the EPA License granted to North Kerry Landfill at Muingnaminane surface waters draining the from landfill are continually monitored. Condition 9.9 of the EPA waste licence requires biological assessment to be carried out annually. Seven sites are chosen: W1, W2, E1, E2, G1, G2 and N1 (See Map). All sites were sampled on 17th Sept 2012.

Two of these i.e. W1 and W2 were also sampled earlier on 21st and 22nd of May

Biological Q Rating:

The samples were classified using the Biological Quality Rating System for Rivers (Q Rating System) as outlined by the Environmental Protection Agency (EPA). The Biological Quality Rating System for Rivers (Q ratings) ranges from Q1 to Q5 where a Q5 denotes a pristine river and Q1 indicates serious pollution (see Quality Rating Table below). From the point of view of the Water Framework Directive all designated river and stream stations must attain least Good status. i.e.Q4, before 2015. High Status River stations are not allowed to deteriorate. There are different classifications for depositing and eroding substrates. The Q system is aimed particularly at larger streams and rivers and is carried out between May and September. Three-minute kick samples are carried out at each station accompanied by stone examinations and weed sweeps.

Table	1:	Q	Invertebrate	Status	Rating	vs.	Water	Framework	Directive	(WFD)
Qualit	y S	tati	us							

Biotic Index	Water Quality	WFD Quality Status
Q5	pristine	High
Q4-5	Very good	IIIgii
Q4	Good	Good
Q3-4	Slightly Polluted	Moderate
Q3	Moderately Polluted	
Q2-3	Moderate to Poor	
Q2	Poor	Poor
Q1-2	Poor to bad	
Q1	Bad	

Results:

Biological Station	Lab Ref No	Date	Result
W1	2012 / 2448	22/05/2012	4
	2012 / 4517 2011 / 3450	17/09/2012 03/08/2011	3-4 3
W2	2012 / 2419 2012 / 4518	21/05/2012 17/09/2012	4-5 4-5
E1	2012 / 4519	17/09/2012	4-5
E2	2012 / 4570	19/09/2012	3-4
G1	2012 / 4556	18/09/2012	4-5
G2	2012 / 4557	18/09/2012	4-5
N1	2012 / 4558	18/09/2012	3-4

 Table 2: Biological Q Rating (Final Results and comparison with 2011)

Table 3: Chemical results

			Parameter	Ammonia	Hd	Conductivity	Chloride	Dissolved Oxygen	Suspended solids	Temp	Total Oxidised nitrogen	Molybdate Reactive Phosphorous
				Ν			CI	O2			N	Р
			Max.		9			15				
			Target									
			Min.		6			5				
Location	Lab Ref no.	Date	Comments	mg/l	pH units	µS/cm	mg/l	mg/l	mg/l	Degrees C	mg/l	mg/l
W1	2012/2448	22-May-12		< 0.02	6.9	124		10.2	2	12.1	0.04	0.005
W1	2012/4517	17-Sep-12		< 0.02	6.6	77		9.9	4	11.8	< 0.005	0.017
W2	2012/2419	21-May-12		0.02	8	148		10.5	5	12.6	0.84	0.014
W2	2012/4518	17-Sep-12		< 0.02	7	110		10	1	12.2	0.504	0.02
E1	2012/4519	17-Sep-12		< 0.02	6.6	77		8.8	3	11.9	< 0.005	0.019
E2	2012/4556	18-Sep-12		< 0.02	6.4	58		10.2	8	10.5	< 0.005	0.016
G1	2012/4557	18-Sep-12		< 0.02	6.7	65		10	5	11.8	< 0.005	0.015
G2	2012/4558	18-Sep-12		< 0.02	6.4	67		10.2	9	12.7	< 0.005	0.038
N1	2012/4570	19-Sep-12		0.02	5	57	13.6	10.3	3	11.3	< 0.005	0.032

Discussion: See Map in Appendix 1 and detailed field sheets in Appendix 1

W1:



W1 - Biological Station drains the western side of North Kerry Landfill and is the principle impact site from the facility. It is a very small stream just downstream of the landfill. The terrain is very steep, the stream is very narrow and the water flows over a series of small falls. Consequently, the very nature of the stream makes it difficult to classify with certainty under the EPA Q Rating System. As this stream begins just below the landfill it is not possible to have an upstream control site. The site is awarded a **Q 3-4**. One A Group species (Taeniopterygidae) was found in scarce abundance and the more tolerant Group C species were superabundant. Almost four months earlier in May 2012 this site merited a **Q 4** with the same A Group species of Taeniopterygidae found in greater abundance and the C Group in lesser numbers. A prolonged dry spell preceded May sample. The September sample was preceded by one of wettest summers in record.

However, there was a significant improvement relative to 2011 where this site only scored a Q3 denoting moderate pollution conditions.

Results of chemical parameters denote water which complies with standards for high water quality in accordance with surface water regulations.

W2: R Lee at O'Brennans Bridge



W2 - Biological Station is at O'Brennan's Br on the River Lee about 3km downstream of W1. It also drains the Western side of the landfill including many of the surface water drains. This site merited a Q rating of 4-5 denoting very clean unpolluted conditions. Six species of the very sensitive A Group were found in very good numbers. A biological assessment carried out here in May also obtained a *Q4-5*. This site is a designated station as per Water Framework Directive.

Results of chemical parameters denotes a water which complies with standards for high water quality in accordance with surface water regulations



E1 - Biological Station is a small stream draining the Eastern side of the landfill. It runs through bog land and appears to have naturally occurring iron oxide. It merits a Q rating of *4-5* suggesting extremely good quality and unpolluted conditions. Three species of the tolerant A group were found in "numerous" abundance, with a relatively low abundance in the very diverse C Group. The more tolerant D and E groups were scarce and absent respectively giving rise to the high Q rating. This site is **not** a designated station as per Water Framework Directive.

Results of chemical parameters denote water which complies with standards for high water quality in accordance with surface water regulations.



E2 - Biological Station also drains the Eastern side of the landfill. It is a tributary of the Smearlagh River. It obtains a Q 3-4 rating indicating slight pollution. Group A are present although in very small numbers. This site is **not** a designated station as per Water Framework Directive.

Results of chemical parameters denote water which complies with standards for high water quality in accordance with Surface Water Regulations.



G1 - Biological Station is on the Glashoreag River upstream of the Northern stream confluence. It scores a <u>Q4-5</u> indicating very clean unpolluted conditions. Sensitive A species were found in very good density and diversity, with a total absence of the most tolerant D and E group species. This site is **not** a designated station as per Water Framework directive. Results of chemical parameters denote water which complies with standards for high water quality in accordance with Surface Water Regulations.



N1 - Biological Station is situated on a small stream which drains forestry on the northern side of the landfill. It is a tributary of the Glashoreag, its confluence lying between biological stations G1 and G2. It scores a biological Q rating of *3-4* indicating slight pollution. This site is **not** a designated station as per Water Framework Directive.

Results of chemical parameters denote water which complies with standards for good water quality status in accordance with surface water regulations. The elevated level of MRP (0.038) may be as a result of forestry activities.

G2 - Glashoreag



G2 - Biological Station is located on the Glashoreag River downstream of the N1 confluence. It scores a Q 4-5 indicating very clean unpolluted conditions. This site is very similar in spread to G1 with a high abundance of sensitive species and absence of tolerant ones. This site is **not** a designated station as per Water Framework Directive.

The elevated level of MRP may be as a result of forest activities as highlighted for N1.

Conclusion:

- On the Western side of North Kerry Landfill W1 station shows deterioration between May and September from *Q4* to *Q3-4*. However there is an improvement from earlier years i.e. *Q3* in 2011 further downstream at W2, which is only designated river station site under Water framework Directive, a Q *4-5* indicates very high water quality. There is good improvement moving downstream.
- On the Eastern side the quality deteriorates from a Q4-5 at E1 to a Q 3-4 at E2.
- The Northern stream drains forestry to the North of the landfill and its 3-4 Q rating suggests slight pollution. However water quality in the Glashoreag River upstream and downstream of the Northern stream confluence is of very high quality. Both sites, G1 (upstream) and G2 (downstream) score a Q4-5 indicating very clean unpolluted conditions and would suggest that the northern stream is not having a significant impact.

Appendix 1: Map of Sampling Stations



APPENDIX 2: Field Biological Sheets	5
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River Code:	Date: 17/09/12	Time: 11:10	Grid: 94472 16728	
Headwaters of Lee				
DO%	93.9	Location:	Stream flow:	
DO mg/l	9.91	NKL Biological Site W1		
Temp degC	11.8		Riffle	
Conductivity			Riffle/glide	
pH Bank width (m)	1m	Substratum Condition:		
Wet width (m)	1m	Cobble 70%	Shading: H-M-L-N	
(m)	0.25m	Gravel 20%		
Velocity:	Colour:	Silt 10%	Cattle access:	
			Y u/s-d/s or N	
Torrential	None			
Fast	Slight		Litter: NO-P-M-A	
Moderate	Moderate			
Slow	High	Main land use u/s	Photo: Y -N	
Very slow			5	
Clarity:	Discharge:	Pasture		
		Bog	Chemical Sample taken:	
Very Clear	Flood	Forestry		
Clear Slightly	Normal	Urban	Y-N 2012/4517	
Turbid	Low	Tillage		
Highly Turbid	Recent flood	Other: Landfill		
	Very low			
	Dry			
	Macrophyt	e Type & Abundance:		

Group	No. of Species	Abundance	e & Percentage	Abundance Category
Α	1	1	< 1%	scarce
В	2	17	12%	Common
С	6	113	78%	Superabundant/Excessive
D	0	0	0%	Absent
E	2	10	7%	Fair numbers

Comments:

Analyst:

Only 1 Taeniopterygidae in sample 7 in May 2012

Q Rating: Q3_4

Caroline Markey & Claire McCaffrey
River & Lo	cation: NKL Biol St	W1				
Таха	Species	Group	Abundance	Ind	Combined	Group
				Total	Total	Total
Plecoptera	Perla					
	Isoperla	Α				
	Chloroperla	Α				
	Protonemura	Α				
	Amphinemura	Α				
	Taeniopterygidae	A			1	
Ephemeroptera	Heptagenia	A				
	Ecdyonurus	Α				
	Rhithrogena	A				
	Ephemera danica	A				
						1
Plecoptera	Leuctra	В			2	
Ephemeroptera	Baetidae	В				
Tristantens	Paraleptophiebia	В			45	
l richoptera		В			15	
	Sericostomatidae	В				
	Goeridae	В				
Odenete	Glossosomatidae	В				
Homintoro	All laxa	В				
Hemiptera	Aprielocheirus aestivalis	В				17
Enhomorontora	Baatic rhadani	<u> </u>			21	17
Ephemeroptera	Coopie				31	
	Enhomorolla					
Trichontera	Hydronsycho					
Пспортега	Polycentropus				Λ	
	Rhyaconhila	0 C			7	
	Philopotamus	C C				
Hemintera		0 C				
Coleontera	Coleontera	0 C				
Dintera	Chironomidae	0 C			1	
Diptera	Simuliidae	0 0			44	
	Tipulidae	C C			2	
Hydracarina	Hydracarina	C C				
Crustacea	Gammarus	C C			31	
Gastropoda	Potamopyrgus	C				
	Planorbis	С				
	Ancvlidae	С				
Hirudinea	Piscicola	С				
Platyhelminthes	All Spp	С				
	••					113
Megaloptera	Sialidae	D				
Crustacea	Asellus	D				
Gastropoda	Lymnea peregra	D				
	Physa	D				
Hirudinea	All except Piscicola	^{age 73 of 1} . D	0.5			
						0
Dintera	Chironomus	F				

River Code:	Date: 17/09/12	Time: 14:15	Grid: 92265 14959
River: Lee			
DO%	93.6	Location:	Stream flow:
DO mg/l	9.98	NKL Biological Site W2	
Temp degC	20.2	O'Brennan's Br	Riffle
Conductivity	12.2		Riffle/glide
рН		Substratum Condition:	
Bank width (m)	6.5	Cobble 45%	
Wet width (m)	4.5	Gravel 50%	Shading: H-M-L-N
Avg depth (m)	0.15	Fine gravel 5%	
Velocity:	Colour:		Cattle access:
			Y u/s-d/s or N
Torrential	None		
Fast	Slight		Litter: NO-P-M-A
Moderate	Moderate		
Slow	High	Main land use u/s	Photo: Y -N
Very slow			6
Clarity:	Discharge:	Pasture	
		Bog	Chemical Sample taken:
Very Clear	Flood	Forestry	
Clear	Normal	Urban	Y-N 2012/4518
Slightly Turbid	Low	Tillage	
Highly Turbid	Recent flood	Other	
	Very low		
	Dry		
ohyte Type & Abund	dance:		

Group	No. of Species	Abundance	e & Percentage	Abundance Category
Α	6	70	28%	Numerous
В	3	31	13%	Common
С	12	146	59%	Superabundant/Excessive
D	0	0	0%	Absent
E	0	0	0%	Absent

Comments:

Q Rating: 4_

4_5

Analyst: Claire McCaffrey & Caroline Markey

River & Loo	cation: NKL Biol St \	N2 O'B	rennan's br			
Таха	Species	Group	Abundance	Ind	Combined	Group
				Total	Total	Total
Plecoptera	Perla	Α				
	Isoperla	Α			3	
	Chloroperla	Α			2	
	Protonemura	Α			3	
	Amphinemura	Α				
	Taeniopterygidae	A			3	
Ephemeroptera	Heptagenia	A				
	Ecdyonurus	A			2	
	Rhithrogena	A			57	
	Ephemera danica	A				70
Blacantara	L a vatra	Р			20	70
Enhomorontora	Leucira	D			20	
Ephemeroptera	Baralantanhlahia					
Trichontora		B				
Пспортега	Soricostomatidao	B			6	
	Goeridae	B			0	
	Glossosomatidae	B			5	
Odonata	All taxa	B				
Hemiptera	Aphelocheirus aestivalis	B				
		_				31
Ephemeroptera	Baetis rhodani	С			22	-
	Caenis	Č			1	
	Ephemerella	C				
Trichoptera	Hydropsyche	С			1	
	Polycentropus	C			1	
	Rhyacophila	С			8	
	Philopotamus	С			1	
Hemiptera	All except A. aestivalis	С				
Coleoptera	Coleoptera	С			7	
Diptera	Chironomidae	С			32	
	Simuliidae	С			40	
	Tipulidae	С			1	
Hydracarina	Hydracarina	С			1	
Crustacea	Gammarus	С			31	
Gastropoda	Potamopyrgus	С				
	Planorbis	C				
	Ancylidae	C			ļ	
Hirudinea	Piscicola	C		I	ļ	
Platyhelminthes	All Spp	С				4.40
						146
Megaloptera	Sialidae	D				
Crustacea	Asellus	D				
Gastropoda	Lymnea peregra					
Hirudinaa	All execut Discission				2	
nirudinea	All except Piscicola	U			2	2
Dintora	Chironomus	E				2
Diptera	Eriotolio			-	}	
Oligochaeta	Tubificidoo					
Ungochaeld		F				
	Fisoniello	F		<u> </u>		
		-				
Overall Tetal		1		I		240
						249

River Code:	Date:17/09/12	Time:	12:50	Grid: 95471 17058
Eastern stream ;	upsream of landfill			
DO%	84%	Loca	ation:	Stream flow:
DO mg/l	8.85	NKL Biol	ogical Site	
Temp degC	11.9	E	1	Riffle
Conductivity				Riffle/glide
pН		Substratur	n Condition:	
Bank width (m)	0.8m			
Wet width (m)	0.8m	Cobble	70 %	Shading: H-M-L-N
Avg depth (m)	0.15m	Gravel	25 %	
Velocity:	Colour:	Silt	5%	Cattle access:
				Y u/s-d/s or N
Torrential	None			
Fast	Slight			Litter: NO-P-M-A
Moderate	Moderate			
Slow	High	Main lan	nd use u/s	Photo: Y -N
Very slow				7
Clarity:	Discharge:	Pas	sture	
		В	og	Chemical Sample taken:
Very Clear	Flood	For	estry	
Clear	Normal	Ur	ban	Y-N 2012/4519
Slightly Turbid	Low	Til	lage	
Highly Turbid	Recent flood	Other Land	fill Windfarm	
	Very low			
	Dry			
Macrophyte Ty	ype & Abundance:			

Group	No. of Species	Abundance	& Percentage	Abundance Category
A	3	49	32%	Common
В	2	38	25%	Fair numbers
С	6	65	44%	Abundant/Dominant
D	1	2	1%	Scarce
E	0	0	0%	Absent

Comments: stream more suited to SSRS Phenolic smell from landfill

Q Rating: 4_5

Analyst:

Caroline Markey and Claire McCaffrey

River & Lo	cation: NKL Biol St	E1				
Таха	Species	Group	Abundance	Ind Total	Combined Total	Group Total
Plecoptera	Perla	Α				
	Isoperla	Α				
	Chloroperla	Α				
	Protonemura	Α				
	Amphinemura	Α				
	Taeniopterygidae	Α			30	
Ephemeroptera	Heptagenia	Α				
	Ecdyonurus	Α			10	
	Rhithrogena	Α			9	
	Ephemera danica	A				
		_				49
Plecoptera	Leuctra	В			37	
Ephemeroptera	Baetidae	В				
Talahandana	Paraleptophiebia	В				
Irichoptera		В			1	
	Sericostomatidae	В			1	
	Goeridae	В				
Odonata		B				
Hemintera		B				
Temptera	Aprielocheirus aestivalis	В				38
Ephemeroptera	Baetis rhodani	С			17	
	Caenis	c				
	Ephemerella	С				
Trichoptera	Hydropsyche	С				
•	Polycentropus	С			11	
	Rhyacophila	С				
	Philopotamus	С				
Hemiptera	All except A. aestivalis	С				
Coleoptera	Coleoptera	С				
Diptera	Chironomidae	С			1	
	Simuliidae	С			3	
	Tipulidae	С			32	
Hydracarina	Hydracarina	С				
Crustacea	Gammarus	С				
Gastropoda	Potamopyrgus	С				
	Planorbis	C			1	
	Ancylidae	C				
Hirudinea	Piscicola	C				
Platyhelminthes	All Spp	С				C F
Mogoloptors	Siolidaa					CO
	Siaildae					
Gastropodo						
Gasiropoda	Physa					ļ
Hirudinea	All except Piscicola				2	
i ili adilica	, in cheept 1 1301001a				2	2
Diptera	Chironomus	F				
	Eristalis	E				
Oligochaeta	Tubificidae	E				
	Lumbriculus	E				
	Eiseniella	E				
				-		
Overall Total						154

С	5	74/129	57%
D	0	0	0
E	1	6/129	5%

Comments: Moss on stones

Q Rating: 3_4

Analyst: CM & CMc C

River & Location:Eastern stream E2						
Таха	Species	Group	Abundance	Ind	Combined	Group
				Total	Total	Total
Plecoptera	Perla	Α				
	Isoperla	Α				
	Chloroperla	Α				
	Protonemura	Α			1	
	Amphinemura	Α				
	Taeniopterygidae	Α			2	
Ephemeroptera	Heptagenia	Α				
	Ecdyonurus	Α				
	Rhithrogena	A				
	Ephemera danica	A				0
						3
Plecoptera	Leuctra	В			41	
Ephemeroptera	Baetidae	В				
Trichartere		В				
		B			5	
	Gooridaa	P				
	Glossosomatidas	P				
Odonata						
Hemintera	Annaza Anhelocheirus aestivalis	B				
						46
Enhemerontera	Baetis rhodani	C			36	
	Caenis	c c				
	Ephemerella	c				
Trichoptera	Hydropsyche	c		L	3	
	Polycentropus	c				
	Rhvacophila	c				
	Philopotamus	C				
Hemiptera	All except A. aestivalis	С				
Coleoptera	Coleoptera	С			3	
Diptera	Chironomidae	С			3	
	Simuliidae	С			32	
	Tipulidae	С				
Hydracarina	Hydracarina	С				
Crustacea	Gammarus	С				
Gastropoda	Potamopyrgus	С				
	Planorbis	С				
	Ancylidae	С				
Hirudinea	Piscicola	С				
Platyhelminthes	All Spp	С				
						74
Megaloptera	Sialidae	D				
Crustacea	Asellus	D				
Gastropoda	Lymnea peregra	D				
	Physa	D				
Hirudinea	All except Piscicola	D				
		<u> </u>				0
Diptera	Chironomus	E				
	Eristalis	E				
Oligochaeta	Iubificidae	E			6	
	Eiseniella					E
Overall Total						0 120
						123

River Code:	Date:18/09/12	Time: 12:10	Grid: 95402 /19242
River.	 Northern Stream us cor	nfluence w Glashoreag	
DO%	93.90%	Landfill Location Code:	Stream flow:
DO mg/l	10.16	NKL N1	
Temp degC	11.3		Riffle
Conductivity			Riffle/glide
рН		Substratum Condition:	
Bank width (m)	2m		
Wet width (m)	2m	Boulder 30%	Shading: H-M-L-N
Avg depth (m)	25cm	Cobble 65%	
Velocity:	Colour:	Gravel 5%	Cattle access:
			Y u/s-d/s or N
Torrential	None	Some compaction	
Fast	Slight		Litter: NO-P-M-A
Moderate	Moderate		
Slow	High	Main land use u/s	Photo: Y -N No 6
Very slow			
Clarity:	Discharge:	Pasture	
		Bog	Chemical Sample taken:
Very Clear	Flood	Forestry	
Clear	Normal	Urban	Y-N 2012/4558
Slightly Turbid	Low	Tillage	
Highly Turbid	Recent flood	Other	
	Very low		
	Dry		
	Macrophyte Type 8	Abundance:	

Group	No. of Species	Abundance	& Percentage	Abundance Category
Α	1	1/65	1.5%	Small nos
В	2	5/65	8%	Fair nos
С	7	53/65	82%	Superabundant / Excessive
D	0	0	0	Absent
E	3	6/65	9%	Fair Nos

Comments: Lot of black peat like sediment on bed of river and stones

Q Rating:

3_4

Analyst:

Claire Mc Caffery and Caroline Markey

						River & Location: NKL N 1							
Таха	Species	Group	Abundance	Ind Total	Combined Total	Group Total							
Plecoptera	Perla	Α											
	Isoperla	Α											
	Chloroperla	Α											
	Protonemura	Α			1								
	Amphinemura	Α											
	Taeniopterygidae	Α											
Ephemeroptera	Heptagenia	Α											
	Ecdyonurus	Α											
	Rhithrogena	Α											
	Ephemera danica	Α											
						1							
Plecoptera	Leuctra	В			1								
Ephemeroptera	Baetidae	В											
	Paraleptophlebia	В											
Trichoptera	Limnephilidae	В				ļ							
	Sericostomatidae	В											
	Goeridae	В			4								
	Glossosomatidae	В											
Odonata	All taxa	В											
Hemiptera	Aphelocheirus aestivalis	В											
						5							
Ephemeroptera	Baetis rhodani	С			32								
	Caenis	С											
	Ephemerella	С											
Trichoptera	Hydropsyche	С			3								
	Polycentropus	C											
	Rhyacophila	C			1								
	Philopotamus	С											
Hemiptera	All except A. aestivalis	C											
Coleoptera	Coleoptera	C			1								
Diptera	Chironomidae	C			5								
	Simuliidae	C			3								
	lipulidae	C			8								
Hydracarina	Hydracarina	с 0											
Crustacea	Gammarus	C											
Gastropoda	Potamopyrgus	с с											
	Planorbis												
	Ancylidae												
Hirudinea Distuk siminthas													
Flatyneimintnes	All Spp	U U				53							
Magalantara	Ciplidee	D				55							
Crustacaa													
Gastropodo	Aselius												
Jasuopoua	Dhyco												
Hirudinaa	All except Disciscle												
niiuumea		U											
Dintera	Chiropomus	F											
Diptera	Erietolio	E				1							
Oligochaeta	Tubificidoo	F			2								
Ungochaeta		F			2	1							
	Eisopiella	F			2								
					4								
	LISEI liella					6							

Clarity:	Discharge:	Pasture		
-	_	Bog		Chemical Sample taken:
Very Clear	Flood	Forestry	,	-
Clear	Normal	Urban		Y-N 2012/4556
Slightly Turbid	Low	Tillage		
Highly Turbid	Recent flood	Other		
	Very low			
	Dry			
	Macrophyte Type & Al	bundance:		
Group	No. of Species	Abundance & Pe	rcentage	Abundance Category
	1	<u> </u>		
Α	3	27/114	24%	Common
			100/	
В	2	22/114	19%	Common
	0	65/11/	E70/	Abun/Dominant
C C	9	00/114	57%	Abun/Dominant
D	0	0	0	Absent
	0	0	0	Absent
E	0	0	0	Absent
			-	
Comments:				
Q Rating:	45			
	—			
Analyst:	Claire Mc Caff	ery & Caroline Mark	ey	
		- ,	- ,	

River & Location: NKL G1							
Таха	Species	Group	Abundance	Ind	Combined	Group	
				Total	Total	Total	
Plecoptera	Perla	Α					
	Isoperla	A					
	Chloroperla	A					
	Protonemura	A			12		
	Amphinemura	A					
	Taeniopterygidae	<u>A</u>					
Ephemeroptera	Heptagenia	<u>A</u>			_		
	Ecdyonurus	<u> </u>			7		
	Rhithrogena	A			8		
	Ephemera danica	A				27	
Plecoptera	Leuctra	в			17		
Ephemeroptera	Baetidae	В					
	Paraleptophlebia	в					
Trichoptera	Limnephilidae	в					
•	Sericostomatidae	в			5		
	Goeridae	в					
	Glossosomatidae	в					
Odonata	All taxa	в					
Hemiptera	Aphelocheirus aestivalis	в					
						22	
Ephemeroptera	Baetis rhodani	С			30		
	Caenis	С					
	Ephemerella	С					
Trichoptera	Hydropsyche	С			6		
	Polycentropus	С			4		
	Rhyacophila	С			2		
	Philopotamus	С					
Hemiptera	All except A. aestivalis	С					
Coleoptera	Coleoptera	c			1		
Diptera	Chironomidae	C			10		
	Simuliidae	<u>с</u>			3		
	l ipulidae	<u> </u>			5		
Grueteeee	Aydracanna				4		
Gastropoda	Botamonyrqus						
Gastropoda	Planorbis	C C					
	Ancylidae	C C					
Hirudinea	Piscicola	c					
Platybelminthes	All Spp	c					
						65	
Megaloptera	Sialidae	D					
Crustacea	Asellus	D					
Gastropoda	Lymnea peregra	D					
	Physa	D					
Hirudinea	All except Piscicola	D					
						0	
Diptera	Chironomus	E					
	Eristalis	Е					
Oligochaeta	Tubificidae	E					
	Lumbriculus	E					
	Eiseniella	E					
						0	
Overall Total						114	

River Code:	Date: 18/09/12	Time: 14:15	Grid: 95821 / 119390
River. Glashoreag			
DO%	94.7	Location: NKL G2	Stream flow:
DO mg/l	99		
Temp degC	12.7		Riffle
Conductivity			Riffle/glide
pН		Substratum Condition:	-
Bank width (m)	3.5	Boulder 10%	
Wet width (m)	3.5	Cobble 60%	Shading: H-M-L-N
Avg depth (m)	20cm	Gravel 20%	
Velocity:	Colour:	Silt 10%	Cattle access:
			Y u/s-d/s or N
Torrential	None		
Fast	Slight		Litter: NO-P-M-A
Moderate	Moderate		
Slow	High	Main land use u/s	Photo: Y -N
Very slow			
Clarity:	Discharge:	Pasture	
		Bog	Chemical Sample taken:
Very Clear	Flood	Forestry	
Clear	Normal	Urban	Y-N 2012/4557
Slightly Turbid	Low	Tillage	
Highly Turbid	Recent flood	Other	
	Very low		
	Dry		
ohyte Type & Abund	dance:		

Group	No. of Species	Abundance & Percentage		Abundance Category
A	3	42/142	30%	Numerous
В	5	12/142	12%	Common
С	8	83/142	58%	Abun /Dominant
D	0	0	0	Absent
E	0	0	0	Absent

Comments: Parked at grid ref 95826 / 19437 opp site. Very difficult to access site due to terraine , boggy with decidious tree planting. Lot of dykes and overgrown brambles near river.

Q Rating: 4_5

Analyst:

Caroline Markey& Claire Mc Caffery

River & Location: NKL G2							
Таха	Species	Group	Abundance	Ind	Combined	Group	
				Total	Total	Total	
Plecoptera	Perla	Α					
	Isoperla	Α					
	Chloroperla	Α					
	Protonemura	Α			9		
	Amphinemura	Α					
	Taeniopterygidae	Α					
Ephemeroptera	Heptagenia	A					
	Ecdyonurus	A			22		
	Rhithrogena	A			11		
	Epnemera danica	A				42	
Discontors	Louotro	В			F	42	
Fiecoptera	Leucira	В			5		
Ephemeroptera	Daelluae	B					
Trichontora	Limpophilidao	B			1		
Пспортега	Soricostomatidao	B			1		
	Cooridoo	B			1		
	Glossosomatidao	B			9		
Odonata		B			1		
Hemintera		B					
пенпрега	Aprielocrieirus aestivalis	В				17	
Enhemerontera	Baetis rhodani	C			53		
Ephemeroptera	Caenis	C C					
	Ephemerella	C C					
Trichoptera	Hydropsyche	C C			9		
Thomopteru	Polycentropus	c			5		
	Rhyacophila	C C			1		
	Philopotamus	c			2		
Hemiptera	All except A. aestivalis	c					
Coleoptera	Coleoptera	C			7		
Diptera	Chironomidae	С			3		
	Simuliidae	С			2		
	Tipulidae	С			5		
Hydracarina	Hydracarina	С			1		
Crustacea	Gammarus	С					
Gastropoda	Potamopyrgus	С					
	Planorbis	С					
	Ancylidae	с					
Hirudinea	Piscicola	С					
Platyhelminthes	All Spp	С					
						83	
Megaloptera	Sialidae	D					
Crustacea	Asellus	D					
Gastropoda	Lymnea peregra	D					
	Physa	D					
Hirudinea	All except Piscicola	D					
Diptera	Chironomus	E				L	
	Eristalis	E					
Oligochaeta	Tubificidae	E					
	Lumbriculus	E					
	Eiseniella	E					
						4.40	
Overall Total						142	

Appendix 5: Environmental Laboratory Services Results

el	S SEMICES	SCART SAL	ENVIRON LABORATOI Acom Busis Mahon Ind Black Cr. Irel Tel: +353 Fac: +353 Web: <u>www.inde</u>	WIENTAL RY SERVICES ustrial Park, trock, ork land 21 453 6141 21 453 6149 watertesting com				
Contact Name Address	Tim Supple Kerry County Council County Buildings, Tralee,		Report Nur Sample Nur Date of Rec Date Starter	mber mber seipt d		61982 - 1 61982/001 23/11/2012 23/11/2012		
Tel No Fax No Customer PO Quotation No Customer Ref	066-7183592 400305176 QN001579 2012/5699		Received or Collected Condition on Receipt Date of Report Sample Type			An Post Good 29/11/2012 Waste Water	6	
		CERTIFICA	TE OF ANAL	YSIS				
TEST ANALY	TE 5	ив метно	D LOQ	SPEC	RESULT	UNITS	ACCRED.	0
Cyanide-Free Cyanile-Free		EW154M	25.0		<25.0	ugit.		

Frenca x 29/11/2012 Signed : . Technical Manager (or Deputy): Brendan Murray

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2.8PEC- Allowable limit or parametric value

3.008-Result which is outside specification highlighted as 008

4.LOG-Limit of Quantification or lowest value that can be reported for the test

5.ACCRED-indicates matrix accreditation for the test, a biank field indicates not accredited

Page 1 of 6

Contact Name Address	SERVICES Tim Supple Kerry Council	Pec: +353 21 453 6140 Web: www.indextenting.com Report Number Sample Number	61982 - 1 61982/00
el	S	ENVIRONMENTAL LABORATORY SERVICES Accent Business Campia Mahon Industrial Park, Bisekmek, Cork Treland Tel: +353 21 453 6141	

Address	Kerry County Council	Sample Number	61982/002	
	County Buildings,	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	29/11/2012	
Quotation No	QN001579	Sample Type	Waste Water	
Customer Ref	2012/5700		1. STAR 9. STAR 7. STAR 12	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-Fre	e			1000					
Cyanide-Fre	12		EW154M	25.0		<25.0	ug/L		

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3.003-Result which is outside specification highlighted as OOS 4.LOG-Limit of Quantification or lowest value that can be reported for the test

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ENVIRONMENTAL LABORATORY SERVICES Acorn Business Campus Mahon Industrial Park, Bisckrock, Cork Ireland Tel: +353 21 453 6141 Fsx: +355 21 453 6149 Web: www.irishwstertesting-

Contact Name	Tim Supple	Report Number	61982 - 1	
Address	Kerry County Council	Sample Number	61982/003	
	County Buildings,	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	29/11/2012	
Quotation No	QN001579	Sample Type	Waste Water	
Customer Ref	2012/5701			

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-F	ree					1.2 - 2224			
Cyanide-I	inat .		EW154M	25.0		<25.0	щ.Т.		

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29/11/2012

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5.ACCRED+indicates matrix accreditation for the test,a blank field indicates not accredited

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ENVIRONMENTAL LABORATORY SERVICES Acorn Businets Campus Mahon Industrial Park, Blackrock, Cork Tellend Tell +353 21 453 6141 Face +355 21 453 6149 Web: www.industreting.com

Contact Name	Tim Supple	Report Number	61982 - 1
Address	Kerry County Council	Sample Number	61982/004
	County Buildings.	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	29/11/2012
Quotation No	QN001579	Sample Type	Waste Water
Customer Ref	2012/5702	20 DZ	

					1.1				
TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-I	Free	undita:	1000000000						
Paralle	Date		THUISON !	160		1.05	and.		

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3.008-Result which is outside specification highlighted as 008

4.LOG-Limit of Guantification or lowest value that can be reported for the test

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el	S SEMICES	ENVIRONMENTAL LABORATORY SERVICES Accen Humess Campus Mahon Industrial Park, Biackrock, Cock Ineland Tol: +353 21 453 6141 Fac: +353 21 453 6149 Web: www.industortuning.com		
Contact Name	Tim Supple	Report Number	61982 - 1	
Address	Kerry County Council	Sample Number	61982/005	
	County Buildings,	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	29/11/2012	
Quotation No	QN001579	Sample Type	Waste Water	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-F	ree			1852					
Cyanido-	Free		EW154M	25.0		<25.0	ug/1,		

7 Dry

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Customer Ref

2012/5703

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el	S SERVICES	ENVIRONMENTAL LABORATORY SERVICES Accen Business Campus Mahon Indiastrial Park, Blackrock, Cork Isoland Tel: +353 21 453 6141 Fac: +353 21 453 6149 Web: <u>aww itshewtertrating com</u>	
Contact Name	Tim Supple	Report Number	
Address	Kerry County Council	Sample Number	
	County Buildings	Date of Receipt	- ă
	Tralee.	Date Started	1

066-7183592 Tel No Fax No Customer PO 400305176 QN001579 Quotation No 2012/5704 Customer Ref

61982 - 1 Received or Collected Condition on Receipt Date of Report

61982/006 23/11/2012 23/11/2012 An Post Good 29/11/2012 Waste Water

CERTIFICATE OF ANALYSIS

Sample Type

TEST A	NALVTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	00\$
Cyanide-Free									
Cyanido-Free			EW154M	25.0		<25.0	ag/t.		

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3.008-Result which is outside specification highlighted as 008 4.LOG-Limit of Quantification or lowest value that can be reported for the test

5.ACCRED-indicates matrix accreditation for the test, a blank field indicates not accredited

el	S SEMICES	ENVIRONMENTAL LABORATORY SERVICES Acom Business Campus Mahon Industrial Park, Blackrock, Cock Teland Tel. +353 21 453 6141 Fax. +353 21 453 6149 Web. <u>www.irishwatertesting.com</u>	
Contact Name Address	Tim Supple Kerry County Council County Buildings, Traise	Report Number Sample Number Date of Receipt Date Started	61983 - 1 61983/001 23/11/2012 23/11/2012
Tel No Fax No Customer PO Quotation No	066-7183592 400305176 QN001579 2012/5680	Received or Collected Condition on Receipt Date of Report Sample Type	An Post Good 29/11/2012 Ground Waters

OERTIFICATE OF ARAETSIS									
TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	OOS
Cyanide-H	Free								
Cyanide-	Free		EW154M	5.000		<5.0	ug/L		

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2.8PEC- Allowable limit or parametric value 3.008-Result which is outside specification highlighted as 008

4.LOG-Limit of Guantification or lowest value that can be reported for the test 5.ACCRED-indicates matrix accreditation for the test, a blank field indicates not accredited

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ENVIRONMENTAL LABORATORY SERVICES Acom Business Campus Mahon Industrial Park, Blackmede, Cork Ireland Tel: +353 21 453 6140 Fax: +353 21 453 6140 Web: www.irelesatertaing.com

Contact Name	Tim Supple	Report Number	61983 - 1
Address	Kerry County Council	Sample Number	61983/002
	County Buildings.	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	29/11/2012
Quotation No	QN001579	Sample Type	Ground Waters
Customer Ref	2012/5691	10	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-H	ree		Service States and States an						
Cyanido-	Free		EW154M	5.000		<5.0	ugit.		

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3.008-Result which is outside specification highlighted as 008

4.LOQ-Limit of Quantification or lowest value that can be reported for the test 5.ACCRED-indicates matrix accreditation for the test, a blank field indicates not accredited

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		SERVICES

ENVIRONMENTAL LABORATORY SERVICES Acom Business Campus Mahon Industrial Fark, Blackrock, Cork Telland Tel: +353 21 453 6149 Fax: +353 21 453 6149 Web: www.industrating.com

Contact Name	Tim Supple	Report Number	61983 - 1	
Address	Kerry County Council	Sample Number	61983/003	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	29/11/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5692			

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-F	ree								-
Cyanido-H	Free		EW154M	5.000		<5.0	ug:1,		

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3.008-Result which is outside specification highlighted as 008 4.LOQ-Limit of Guantification or lowest value that can be reported for the test

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el	S SEPACE	Last Patient		ENVIRON LABORATOF Acorn Bunis Mahon Ind Black Cc bel Tel: +353 Fas: +353 Web: <u>www_inshi</u>	MENTAL NY SERVICES eas Campto atrial Pack, rock, esk end 21 453 6141 21 453 6149 externetisting con	6 11			
Contact Name Address	Tim Supple Kerry County Council County Buildings, Tralee,			Report Nur Sample Nur Date of Rec Date Starter	nber nber eipt d		61983 - 1 61983/004 23/11/2012 23/11/2012		
Tel No Fax No Customer PO Quotation No Customer Ref	066-7183592 400305176 QN0D1579 2012/5693			Received or Condition o Date of Rep Sample Typ	r Collected n Receipt ort e		An Post Good 29/11/2012 Ground Wat	ers	
		CE	RTIFICAT	E OF ANAL	YSIS				
TEST ANALY	TE	SUB	METHOD	roð	SPEC	RESULT	UNITS	ACCRED.	C
Cyanide-Free Cyanide-Free			EW154M	5.000		<30	պոե		

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ENVIRONMENTAL LABORATORY SERVICES Acorn Businets Campan Mahon Industrial Park, Blackrock, Cork Ireland Tel: +353 21 453 6140 Fax: +353 21 453 6149 Wel: www.irelawatertesting.com

Contact Name	Tim Supple	Report Number	61983 - 1
Address	Kerry County Council	Sample Number	61983/005
	County Buildings.	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	29/11/2012
Quotation No	QN001579	Sample Type	Ground Waters
Customer Ref	2012/5694		

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-F	ree			1997.27					
Cyanida-l	Free		EW154M	5.000		<5.0	ug/L		

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	ENVIRONMENTAL LABORATORY SERVICES Acom Business Campus Mahon Industrial Park, Bisekrock, Cork Industrial Park, 1911 + 353 21 453 6141 Park, + 353 21 453 6140 Web users industrations com

Contact Name	Tim Supple	Report Number	61983 - 1	
Address	Kerry County Council	Sample Number	61983/006	
	County Buildings,	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	29/11/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5695	CONTRACTOR CONTRACTOR	CH (1987) M (1987) (1983)	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-F	ree								
Cyanido-	Free		EW154M	5.000		<5.0	ഷ്യപ്പ		

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ENVIRONMENTAL LABORATORY SERVICES Acom Busices Campus Mahos Industrial Park, Blackrock, Cork Ieland Tel: +353 21 453 6149 Fax: +353 21 453 6149 Web: www.industertailing.com

Contact Name	Tim Supple	Report Number	61983 - 1
Address	Kerry County Council	Sample Number	61983/007
	County Buildings.	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	29/11/2012
Quotation No	QN001579	Sample Type	Ground Waters
Customer Ref	2012/5696		

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-H	Free		(* 10 hours)	Sec. 1.		-			
Cyanido-	-Free		EW154M	5.000		<5.0	ug3.		

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els	SERVICES	ENVIRONMENTAL LABORATORY SERVICES Acom Businets Campus Mahon Industrial Park, Biaskrock, Cork Ireland Tol. +353 21 453 6149 Fax: +353 21 453 6149 Web: www.inducatorsting.com
 A second state of the second stat		

Contact Name	Tim Supple	Report Number	61983 - 1	
Address	Kerry County Council	Sample Number	61983/008	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	29/11/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5697	Service of the service of the service		

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-F	ree		-				-		
Cyanide-I	Free		EW154M	5.000		<5.0	ng/L		

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_ 29/11/2012

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Contact Name	Tim Supple	Report Number	61983 - 1	
Address	Kerry County Council	Sample Number	61983/009	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	29/11/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5698			

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	roð	SPEC	RESULT	UNITS	ACCRED.	005
Cyanide-F	ree								
Cyanide-I	Free		EW154M	5.000		<5.0	ug/L		

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3.008-Result which is outside specification highlighted as 008

4.LOQ-Limit of Quantification or lowest value that can be reported for the test

5.ACCRED-indicates matrix accreditation for the test, a blank field indicates not accredited

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QN001579 2012/5690

Contact Name Address

Customer PO **Quotation No**

Customer Ref

Tel No Fax No

ENVIRONMENTAL LABORATORY SERVICES Acorn Business Campus Mahon Industrial Park, Blackrock, Cork Ireland Tel: +353 21 453 6141 Fax: +353 21 453 6149 Web: www.irishwatertesting



Tim Supple	Report Number	61979 - 1	
Kerry County Council	Sample Number	61979/001	
County Buildings,	Date of Receipt	23/11/2012	
Tralee,	Date Started	23/11/2012	
066-7183592	Received or Collected	An Post	
	Condition on Receipt	Good	
400305176	Date of Report	10/12/2012	
QN001579	Sample Type	Ground Waters	
CALLY MADE RECTATI			

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC (su	ib)								
1.2.4 Tri	chlorobenzene	S.#2	Default	1.0		<4.0	425.	YES	
1.2-Dich	lorobenzene		Default.	1.0		<4.0	42.7.	YES	
1,3-Dich	lorobeszene		Default	1.0		<40	NOT.	YES	
1.+Dich	lorobenzene		Default	1.0		<4.0	цая.	YES	
2,4,5-Tri	chlorophenol		Default	1.0		<4.0	42/1.	YES	
2,4,6-Tri	ichlorophenol		Default	1.0		<4.0	ug/L	YES	
2.4 Dich	lorophenol		Default	1.0		<4.0	ug/L	YES	
2.4-Dim	ethylphenol	•	Default.	1.0		<4.0	427.	YES	
2.4-Dinit	rotologar		Default	1.0		<4.0	ugit.	YES	
2,6-Dinit	totolame		Default	1.0		<4.0	ug/L	YES	
2-Chiceo	susphthalene	(*) (*)	Default	1.0		<4.0	uart.	YES	
2-Chloro	optenol	(•))	Default	1.0		<4.0	ug/L	YES	
2-h6ethy	insphilalene	S. 10	Default	1.0		<4.0	ugil.	YES	
2-Methy	lphenol		Default.	1.0		<4.0	ugit.	YES	
2-Mitropi	henol		Default	1.0		<4.0	ug/L	YES	
3#4-Mr	thylphonol		Default	1.0		<40	ug/1.	YES	
4Bromo	sphenyl Phonyl Ether		Default	1.0		<4.0	427.	YES	
4-Chloro	-3-methylphenol	(•))	Default	1.0		<4.0	ug/L	YES	
4-Chloro	ohenyi phenyi ethar	S. 10	Default	1.0		<40	4271.	YES	
4-Nitroph	henol		Default.	5.0		<20.0	чат.	YES	
Acenaph	thene		Default	1.0		<4.0	ug L	YES	
Acenaph	thylene	•	Default	1.0		<40	ug/1.	YES	
Anthrace		1.00	Default	1.0		<40	12/1.	YES	
Benzo(a)	anthracene	3. 9 .7	Default	1.0		<4.0	ug/L	YES	
Benzu(a)	pyrene		Default	1.0		<40	ug/L	YES	
Benzo(b)	duoranthene	(A)	Default	1.0		<4.0	ца/Т.	YES	
Bmax(g.	h.) yerylene	2.00	Default	1.0		<4.0	ug/L	YES	
Benzo(k)	gluoranthene	•	Default	1.0		<40	ug/1.	YES	
Benzyl B	Sutyl Phibalate	1.0	Default	3.0		<40	127.	YES	
Bis(2-ch)	loroethoxy insethane		Default	1:0		<40	42/1.	YES	
Bis(2-ch)	koroethy/Dethier		Default.	1.0		<40	ug/L	YES	
Bin(2-chi	loroisopropyDether	(A)	Definit	1.0		<4.0	42/L	YES	
Bin(2-e2	ty theny i) pluthalate	2.52	Default	5.0		<20.0	42/1.	YES	
Chrysens	¢	2. • (Default	1.0		<40	ug/1.	YES	
Dihmija	h)anthracene	1.0	Default	3.0		<40	up/L	YES	
Dibenzot	furm	3.520	Default	1:0		<4.0	чал.	YES	
						1			

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Technical Manager (or Deputy): **Brendan Murray** 10/12/2012

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Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/001	
1000310210000	County Buildings	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5690			

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
SVOC (su	b)								
Dietkylph	hthalate		Default	1.0		<4.0	ug/L	YES	
Dunethyl	iphthalate		Default	1.0		<4.0	ug/L	YES	
di-n-Buty	di-n-Butylphthalate *		Default	1.0		<4.0	ug/1.	YES	
Di-n-octy	lphthalata		Default	1.0		<4.0	ug/1.	YES	
Diphenyl	amine		Default	1.0		<4.0	ug/L	YES	
Fluoranth	vetse		Default	1.0		<4.0	ug/L	YES	
Flucene			Default	1.0		<4.0	ug/L	YES	
Herathio	robenzene	19	Default	1.0		<4.0	ug/L	YES	
Hexachio	robutadiene	3. *	Default	1.0		<4.0	ug/L	YBS	
Hexachio	roethane		Default	1.0		<4.0	ug/t.	YES	
Indent(I.	2,3-c,d)pyrene		Default	1.0		<4.0	ug/L	YES	
laophoror	0¢		Default	1.0		<4.0	ug/L	YES	
Naphthal	ene	- 23	Default	2.0		<8.0	ug/L	YES	
Nimdens	antar -	19	Default	1.0		<4.0	ug/L	YES	
n-Nitroso	di-n-propylamine	3 4	Default	1.0		<4.0	ug/1.	YBS	
Pentachic	prophesol		Default	1.0		<4.0	aget.	YES	
Phrants	1505	•	Default	1.0		<4.0	ug/L	YES	
Phenol			Default	1.0		<4.0	ug/L	YES	
Pynne			Default	1.0		<4.0	ug/L	YES	
Ani	alyst QC Comment: Raised reporting (imits for SVOC's	tue to sample mat	nts.					
VOC Full	Suite								
Dichloros	difluoromethate		EO025	10.0		<10.0	ug/L		
Chlorom	othano		E0025	0.5		<0.5	ug/1.		
Ethyl Chi	lonide/Chloroethane		E0025	0.5		<0.5	ug/L		
Vinyl Chi	lorde		E0025	0.5		<0.5	us/L		
Bromonu	ethsne		EO025	0.500		<0.5	ug.L	INAB	
Trichloro	monofluoromethane		E0025	0.5		<0.5	age/L		
Edyl Eth	er/Diethyl Ether		EO025	0.500		<0.5	ug/L	INAB	
H Dichle	aroethene		E0025	0.589		<0.5	ug/L	INAB	
Acetone			E0025	2.0		<2.0	up.T.		
Sedomnth	unns%dethyl Iodide		E0025	0.500		<0.5	ug/L	DIAB	
Carbon D	Sinalphide		E0025	0.500		11.2	ug/L	INAB	
Ally! Chi	loride		E0025	0.500		<0.5	uol.	INAB	
Dichloron	methane		EO025	5.0		<5.0	ug/L	INAB	
Chlormet	hyl Cyanido/Chloroacetonitrile		E0025	0.589		<0.5	ugit	INAB	
Nitrobena	ante		E0025	0.5		<0.5	up7.		
Propanm	itrile		B0025	10.0		<10.0	ug/t.		

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Technical Manager (or Deputy):

10/12/2012

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Contact Name	Tim Supple	Report Number	61979 - 1
Address	Kerry County Council	Sample Number	61979/001
	County Buildings,	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	10/12/2012
Quotation No	QN001579	Sample Type	Ground Waters
Customer Ref	2012/5690	Contraction Contraction Contraction	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC Full S	Suite								
Heuschlor	obutadiene		EO025	0.500		<0.5	142/1-	INAB	
Trans-1.21	Dichlorosthene		EO025	0.500		<0.5	uz/L	INAB	
MBE	Electronic Contra		E0025	0.500		<0.5	112/1.	INAB	
1,1-dichlo	roethane		EO025	0.500		<0.5	1020/L	INAB	
2.2-dichlo	ropropane		EO025	0.500		<0.5	upl.	INAB	
cis-12 Dic	hloroethene		EO025	0.500		<0.5	ug/1.	INAB	
2-Butanon	¢		EO025	5.0		<5.0	142/1_		
Idethyl Ac	sylate		EO025	0.500		<0.5	ug/L	INAB	
Bromochio	promethane		EO925	0.500		<0.5	u2/L	INAB	
Methocryb	onitrile		EO025	5.0		<5.0	ug/1.		
Tetrahydro	sfæsn		EO025	0.500		<0.5	up".	INAB	
Chlorofor	1		EO025	1.000		<1.0	ug/L	INAB	
1,1,1-trich	losoethane		BO025	0.500		<0.5	щ/1.	INAB	
1-Chlorob	uline		EO025	0.500		<0.5	ug/L	INAB	
Carbon Te	trachloride		E0925	0.500		<0.5	ug/L	INAB	
11 Dichlor	opropene		EO025	0.500		<0.5	ug/1.	INAB	
Benzene			BO025	0.100		<0.1	125.	INAB	
1,2 dictore	othane		EO025	0.1		<0.1	ug/1.	INAB	
Trichloroe	thene		E0025	0.100		<0.1	ug/L	INAB	
1,2-dichie	repropane		BO925	0.500		<0.5	ng/L	INAB	
Dibromoti	uthane		EO925	0.500		<0.5	ug/L	INAB	
Methyl Me	ethnerylate		EO025	0.500		<0.5	ug/1.	INAB	
Bromoslich	lommethane		BO025	2.000		<20	ngd.	INAB	
13 Dichior	opropene,cia		80025	2.000		<2.0	42/2-	INAB	
MIBK/4 M	fethyl 2 Pertunine		EO025	2.000		<2.0	ug/L	INAB	
Tolurne			BO925	0.500		<0.5	ng/L	INAB	
13 Dichior	opropene,trana		EO025	2.000		<2.0	ug/L	INAB	
Ethyl Med	hacrylate		EO025	2.000		<2.0	ug/1.	INAB	
112 Trichl	oroethane		80025	0.500		<0.5	ngd.	INAB	
Tetrachier	oethme		80025	0.100		<0.1	ug/%_	INAB	
1,3-dichio	ropropane		EO025	0.500		<0.5	ug/L	INAB	
2-Hevasor	we l		BO925	1.000		<1.0	ng/L	INAB	
Dibromosi	hioremethane		EO025	1.000		<1.0	ug/L	INAB	
1,2-dibron	anothene		EO025	0.500		<0.5	48/1.	INAB	
Chloroben	zene		80025	0.500		<0.5	ugat.	INAB	
1,1,1,2-141	nahloroethase		80025	2.000		<2.0	ug/7	INAB	
Ethylbena	ene		EO025	0.500		<0.5	40%	INAB	

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Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/001	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5690	the strength of the strength o		

CERTIFICATE OF ANALYSIS

and the second se									
TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC Full	Suite						-		
Xylone P.	&M		E0925	0.500		<0.5	ng/L	INAB	
Xylene -			E0025	0.500		<0.5	ugaT.	INAB	
Styrene			EO925	2.000		<20	40/L	INAB	
Bromofor	m		EO025	1.000		<1.0	407.	INAB	
hopropyl	benzene		E0025	0.500		<0.5	upī.	INAB	
Bromobe	12010		E0925	0.500		<0.5	421	INAB	
1.1,2,2-10	inschlororitane		E0025	0.500		<0.5	NOT.	INAB	
1,2,3-trid	hloropropane		E0025	2.000		<2.0	ug/L	INAB	
Trans 14	Dichloro 2 Butenz, tran		EO025	2.0		<2.0	42/1.		
Propylbe	izese		EO025	0.500		<8.5	ug/1.	INAB	
2-chlorot	olume		EO925	0.500		<0.5	ug/L	INAB	
4-chlorot	olisene		B0025	0.500		<0.5	ug/L	INAB	
1,3,5-trim	sethy lbenzone		50025	0.500		<0.5	MET.	INAB	
Tert Buty	Benzene		E0025	0.500		<0.5	цаТ.	INAB	
1.2,4-trim	sethylhenzene		E0025	0.500		<0.5	48/1.	INAB	
sec-bulyI	bengene		EO025	0.500		<8.5	ug/1.	INAB	
1.3-dotto	arobenzane		E0025	0.500		<0.5	ug/L	INAB	
P Isoprop	yltolaene		EO025	0.500		<0.5	up1.	INAB	
1,4-datab	arobenzens		E0025	0.500		<0.5	NOT.	INAB	
1,2-dichb	probenzene		EO025	0.500		<0.5	ug/L	INAB	
N Butyl S	Impere		EO025	0.500		<0.5	upT.	INAB	
Hexachio	roethane		EO025	5.000		<5.0	ug/1.	INAB	
1,2-diltro	mo-3-chloropropane		E0025	2.000		<2.0	ug/L	INAB	
1,2,4-trid	hlorobenzene		E0025	0.500		<0.5	ugo'L.	INAB	
Naphthal	ene		E0025	2.0		<2.0	ug/L		
1,2,3-trie	hlorobenzene		EO025	0.500		<0.5	ug/L	INAB	

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Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/002	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5691	2000 Bar 1 State 5		

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
SVOC (sul	b)			1117.5					
1.2,4 Tru	hlorobenzene		Default	1.0		<1.0	na/L	YES	
1,2-Dichl	orobenzene		Default	1.0		<1.0	ug/T.	YES	
1.3-Dichl	orobecome	•	Default	1.0		<1.0	up.T.	YBS	
1.4-Dishi	orobenzete		Default	1.0		<1.0	MDT.	YES	
2,4,5-Tri	hiorophenol	•	Default.	1.0		<1.0	ag/L	YES	
2,4,6-Tri	hlorophenol	24.0	Default	3.0		<1.0	1007.	YES	
2,4-Dichl	orophenol		Default	1.0		<1.0	427.	YES	
2,4-Dime	thylphenol	1	Default	1.0		<1.0	ug/T.	YES	
2,4-Dinit	ntolaene	•	Default	1.0		<1.0	ug/ī.	YBS	
2.6-Dinit	ntolsene		Default	1.0		<1.0	ug/1.	YES	
2-Chloros	aphthalene	•	Default.	1.0		<1.0	ug/L	YES	
2-Chlorog	bood		Default	1.0		<1.0	ug/L	YES	
2-h6rihyb	naphthalene		Default	1.0		<1.0	427.	YES	
2-Methyl	phenol	(A)	Default	1.0		<1.0	ugit.	YES	
2-Nitroph	ienol		Default	1.0		<1.0	ug/L	YES	
384-Met	hylphenol		Default	1.0		<1.0	ug/5.	YES	
4-Bromo	benyl Phonyl Ether	•	Default.	1.0		<1.0	ug/L	YES	
4-Chloro-	3-methylphenii		Default	1.0		<1.0	142.5	YES	
4-Chlorog	shenyî phenyî ether	•	Default	1.0		<1.0	ug/1.	YES	
4-Nitroph	ienol	243	Default.	5.0		<5.0	ug/L	YES	
Acenaphi	hene	•	Default	1.0		<1.0	ug/1.	YES	
Accoupli	hylene		Default	1.0		<1.0	ug/L	YES	
Anthrace	se		Default.	1.0		<1.0	ug/L	YES	
Benzo(a)	anthracepe	•	Default	1.0		<1.0	ug/1.	YES	
Benzo(a)	pyrene		Default	1.0		<1.0	ug/i.	YES	
Benzo(b)	floorenderen		Default.	1.0		<1.0	ugit.	YES	
Benzo(g.)	h,i 'perylene		Default	1.0		<1.0	ug/L	YES	
Benzo(k)	flooranthese	1.00	Default	1.0		<1.0	ug/l.	YES	
Benzyl B	utyl Phihalute		Default.	1.0		<1.0	ug/t.	YES	
Bin(3-ch0	ereetherry)methane		Default	1.0		<1.0	ug/1.	YES	
Bis(2-ch)	oroethyl)ethur	1.1	Default	1.0		<1.0	ug/l.	YES	
Bis(2-ch)	oroiaopropy Dether		Default	1.0		<1.0	w.T.	YES	
Bin(3-effe	ylhexyi)phthalste	•	Default	5.0		<5.0	ug/L	YES	
Chrysene		1.1	Default	1.0		<1.0	142/5.	YES	
Dihenz(a,	h)anthracene		Default.	1.0		<1.0	ug/L	YES	
Dibenzof	laram	5 A.	Default	1.0		<1.0	ug/1.	YES	
Dorthylph	thalate	1.1	Default	1.0		<1.0	ug/1.	YES	

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Contact Nar	ne Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/002	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer P	0 400305176	Date of Report	10/12/2012	
Quotation N	QN001579	Sample Type	Ground Waters	
Customer R	ef 2012/5691			

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
SVOC (sul	b)								
Dunethyl	phthalate	•	Default	1.0		<1.0	up/L	YES	
di-n-Buty	lphthalato		Default	1.0		<1.0	ug/1.	YES	
Di-n-octy	ipltfhalate		Default	1.0		<1.0	ug/L	YES	
Dephenyls	enine.	*	Default	1.0		<1.0	upt.	YES	
Fluoranth	dise		Default	1.0		<1.0	ug/1,	YES	
Flucene		•	Default	5.0		<1.0	ug/L	YES	
Hetachio	robengene	•	Default	1.0		<1.0	ugit.	YES	
Hexashlo	robutadiene		Default	1.0		<1.0	ug/1.,	YES	
Heusehlo	rodiano	•	Default	1.0		<1.0	ug/L	YES	
Indeno().	2,3-c,d)pyrene	*	Default	1.0		<1.0	upt.	YES	
laophorer	10	*:-	Default	1.0		<1.0	ug/1.	YES	
Naphthale	00s	•	Default	2.0		<2.0	щ/Г.,	YES	
Nitrobens	tene	÷.	Default	1.0		<1.0	ug/L	YES	
n-Mitroso	di-o-propylamine	.	Default	1.0		<1.0	112/2+	YES	
Pentschlo	rophesol	•	Default	1.0		<1.0	ug/L	YES	
Phenanthe	rene	*	Default	1.0		<1.0	upit.	YES	
Phenol		3.5	Default	1.0		<1.0	ug/%,	YES	
Pyrene		•	Default	2.0		<1.0	42%	YES	
VOC Full	Suite								
Dichlorod	lifuoresethase		E/0025	10.0		<10.0	112/L		
Chiorome	thane		E0025	0.5		<0.5	ug/L		
Ethyl Chi	orido/Chloroethane		E0025	0.5		<0.5	ug/1.		
Vinyl Chi	loride		EO025	0.5		<0.5	ug/L		
Bremome	shane		EO025	0.500		<0.5	up.t.	INAB	
Trichloro	monofluoromethane		EO025	0.5		<0.5	ug/1,		
Einyl Eth	ar/Diethyl Ether		EO025	0.500		<0.5	щ/Г.,	INAB	
11 Dichle	roethene		EO025	0.500		<0.5	ug/L	INAB	
Acetone			EO925	2.0		<2.0	ug/%,		
Indometh	ano/Methyl Jodide		EO025	0.500		<0.5	ug/L	INAB	
Carbon D	isulphide		EO025	0.500		3.6	ugit.	INAB	
Allyl Chi	oride		E0025	0.500		<0.5	ug/1.	INAB	
Dichloror	nethune		EO025	5.0		<5.0	щ/Г.,	INAB	
Chlormet	hyl Cyaride/Chloroacetonitrile		EO025	0.500		<0.5	ug/L	INAB	
Nerobens	csc		E0025	0.5		<0.5	M2/T+		
Propanen	itrile		E0025	10,0		<10.0	ug/L		
Hetachle	robutadiene		EO025	0.500		<0.5	upit.	INAB	
Trans-1,2	Dichloroethene		E0025	0.500		<0.5	ug/1.	INAB	

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Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/002	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Guotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5691	10. SAN		

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC Full	Suite								
MBE	63.1865.cz		BO025	0.500		<0.5	upl.	INAB	
1.1-664	kovethane		E0025	0.500		<0.5	02/1	INAB	
2.2-6(ch)	koropropape		E0025	0.500		<0.5	uoT.	INAB	
cis-12 D	ichlomethene		E0025	0.500		<0.5	us/L	INAB	
2-Butan	1000		E0025	5.0		<5.0	ug/L		
Method A	Acrylate		EO025	0.500		<0.5	ug/l.	INAB	
Bromoch	loromethane		BO025	0.500		<0.5	ugit.	INAB	
Methacry	ylonitrile		EO025	5.0		<5.0	ug/L	11000	
Tetrahyd	bofuna		B0025	0.500		<0.5	ug/1.	INAB	
Chierofo	em .		E0925	1.000		<1.0	ug/L	INAB	
1.1.1-tric	thloroothane		EO025	0.500		<8.5	us/L	INAB	
1-Chloro	dutane		E0025	8.500		<0.5	ug/l.	INAB	
Carbon 1	Tetrachloride		EO025	0.500		<0.5	ug/L	INAB	
11 Dichi	oropropene		EO025	0.500		<0.5	ug/L	INAB	
Bename			B0025	0.100		<0.1	ugit.	INAB	
1,2 dicio	roethane		BO925	0.1		<0.1	ug/L	INAB	
Trichlors	octione		E0025	0.100		<0.1	ug/L	INAB	
1,2-dichi	leropmpane		E0025	0.500		<0.5	ug/L	INAB	
Distore	enethano		BO025	0.500		<0.5	ug/1.	INAB	
Methyl h	defhacryiste		EO025	0.500		<0.5	ug/L	INAB	
Bromidi	ichloromethese		BO025	2.000		<2.0	ug/L	INAB	
13 Diphi	ioropropene,cis		E0925	2.000		<2.0	യുവ്.	INAB	
MBK/4	Methyl 2 Pentanne		EO025	2.000		<2.0	ug/L	INAB	
Toluene			BO025	0.500		<0.5	ug/L	INAB	
13 Dichi	oropropene,tmma		E0925	2.000		<2.0	ugit.	INAB	
Ethyl Me	etheorylate		EO025	2.000		<2.0	ug/L	INAB	
112 Trid	hloroethane		B/0025	0.500		<0.5	ug/L	INAB	
Tetrachis	crothine		EO025	0.100		<0.1	ug/L	INAB	
1,3-dichi	feropropane		EO025	0.500		<8.5	ug/L	INAB	
2-Heven	one		E0025	1.000		<1.0	ug/L	INAB	
Distores	schloromethane		EO025	1.000		<1.0	ug/L	INAB	
1,2-dibro	moethese		80025	0.500		<0.5	щ/1.	INAB	
Chlorobe	un sont an		E/0025	0.500		<0.5	ug/L	INAB	
1,1,1,2-4	etrachloroe@une		EO025	2.000		<2.0	ug/L	INAB	
Ethylben	izene		E0025	0.500		<0.5	up?L	INAB	
Xylene F	P&:M		E0025	0.500		<0.5	ug/L	INAB	
Xyimr -	0		E0025	0.500		<0.5	ug/L	INAB	

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Contact Name	Tim Supple	Report Number	61979 - 1
Address	Kerry County Council	Sample Number	61979/002
	County Buildings,	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	10/12/2012
Quotation No	QN001579	Sample Type	Ground Waters
Customer Ref	2012/5691	20 - 52	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC Full S	Suite	100000	1001000000						
Styrene			E0025	2.000		<2.0	ug/%.	INAB	
Bromoform	n		EO025	1.000		<1.0	ug/i.	INAB	
laopropyth	enzene		E0025	0.500		<0.5	w.T.	INAB	
Bromoben	ame		EO025	0.500		<0.5	ug/L	INAB	
1,1,2,2-tett	rachloroethane		EO025	0.500		<0.5	ug/1.	INAB	
1,2,3-trich	loropropane		E0025	2.000		<2.0	чр/Г.	INAB	
Trans 14 L	lichloro 2 Butene, wan		E0025	2.0		<2.0	ug/1.		
Propylben.	actie		EO025	0.500		<0.5	ug/1.	INAB	
2-chlmoto	luene		E0025	0.500		<0.5	ug/L	INAB	
4-chioroto	home		E0025	0.500		<0.5	ug/L	INAB	
1.3.5-trans	skylbenzene		E0025	0.500		<0.5	ug/T.	INAB	
Tert Butyl	Benzene		E0025	0.500		<0.5	чу/Т.	INAB	
1.2.4 uins	shylbenzene		E0025	0.500		<0.5	ug/1.	INAB	
sec-batyfb	enzene		E0025	0.500		<0.5	0gp/L	INAB	
1,3-dichles	obenaene		E0025	0.500		<0.5	ug/L	INAB	
P Isopropy	ltohaese		EO025	0.500		<0.5	ug/L	INAB	
1.4-dichics	obenzene		E0025	0.500		<0.5	ug/T.	DIAB	
1,2-dichlor	obenzene		E0025	0.500		<0.5	ugaī.	INAB	
N Butyl B	mpese		E0025	0.500		<0.5	ug/1.	INAB	
Hessehlor	oethane		EO025	5.000		<5.0	og/L	INAB	
1,2-dibron	io-3-chloropeopane		E0025	2.600		<20	ug/L	INAB	
1,2,4 trich	lorobenzenz		E0025	0.500		<0.5	ug/L	INAB	
Sighthale	an a		EO025	2.0		<2.0	ug/1.		
1,2,3-trich	lorobenzese		E0025	0.500		<0.5	ug/1.	INAB	

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Tim Supple 61979 - 1 Report Number Contact Name 61979/003 Address Kerry County Council Sample Number Date of Receipt 23/11/2012 County Buildings, 23/11/2012 Tralee, **Date Started** 066-7183592 An Post Tel No Received or Collected Good **Condition on Receipt** Fax No 400305176 10/12/2012 Customer PO Date of Report QN001579 Ground Waters **Quotation No** Sample Type Customer Ref 2012/5692

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC (su	b)								
1,2,4 Tri	chlorobengene	18	Default	1.0		<1.0	ug/L	YES	
1.2-Dichl	omhenzene		Default	1.0		<1.0	42/1.	YES	
1.3-Dichl	lorobenzene	*	Default	1.0		<1.0	up/L	YES	
1.4 Dichl	iorobenzene	*	Default	1.0		<1.0	up.t.	YES	
2.4.5-Tru	chlorophenol	•	Default	1.0		<1.0	ug/L	YBS	
2,4,6-Tri	chlorophenol	+	Default	1.0		<1.0	ug/L	YES	
2,4-Dichl	orophenol		Default	1.0		<1.0	ugaT.	YES	
2.4-Dime	shylphenol		Default	1.0		<1.0	ug/L	YES	
2,4-Dinit	rotolisese		Default	1.0		<1.0	ug/L	YES	
2,6-Dinit	rotoduene	•	Default	1,0		<1.0	up1.	YES	
2-Chloro	sphthalene		Default	1.0		<1.0	42/1.	YES	
2-Chloro	phenol	•	Default	1.0		<1.0	ug/L	YES	
2-Methyl	nsphüsslene	×	Default	1,0		<1.0	ugaT.	YES	
2-Methyl	phenol		Default	1.0		<1.0	ug/1	YES	
2-Nitroph	lenel	•	Default	1.0		<1.0	щ/1.	YES	
3£4-Met	hylphenol	•	Default	1,0		<1.0	apt.	YES	
4-Bremo	phenyi Phenyi Ether	1	Default	1.0		<1.0	42/1.	YES	
4-Chloro	-3-methylphenol	•	Default	1.0		<1.0	M27L	YES	
4-Chioro	phenyl phenyl ether	•	Default	1.0		<1.0	ug/L	YES	
4-Niteopl	ienol		Default	5.0		<5.0	4g/L	YES	
Acenaphi	hene		Default	1.0		<1.0	ug/1.	YES	
Acenaphi	hyliene	+	Default	1,0		<1.0	ug/L	YES	
Anthruce	58		Default	1.0		<1.0	ug/1.	YES	
Benzo(a)	anthracene	•	Default	1.0		<1.0	NOT.	YES	
Benzo(s)	рутене	•	Default	1.0		<1.0	ug/L	YES	
Benzo(b)	flooranthene		Default	10		<1.0	48/1.	YES	
Benzo(g.)	h,i 'perylene		Default	1.0		<1.0	щл.	YES	
Benzo(k)	fluoranthene	+	Default	1.0		<1.0	ug/L	YES	
Benzyl B	utyl Phthalate		Default	1.0		<1.0	ug/1.	YES	
Bin(2-chi	oroethoxy institune	•	Default	1.0		<1.0	upi.	YES	
Bin(2-ch)	oroethyl)ether	4	Default	1.0		<1.0	ug/L	YES	
Bis(2-ch)	oroisopeopyDethar	*	Default	1.0		<1.0	upT.	YES	
Bis(2-eth	ylhexyl)phthalate	•	Default	5.0		<5.0	ug/1.	YES	
Chrysene		+	Default	1.0		<1.0	ug/L	YES	
Dibenz(a	h)anthracene		Default	1.0		<1.0	ugo?L	YES	
Dibenzof	laries		Default	1.0		<1.0	NgoT.	YES	
Diethylph	sthalute	•	Default	1.0		<1.0	чал.	YES	

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	Contact Name	Tim Supple	Report Number	61979 - 1	
	Address	Kerry County Council	Sample Number	61979/003	
		County Buildings,	Date of Receipt	23/11/2012	
		Tralee,	Date Started	23/11/2012	
	Tel No	066-7183592	Received or Collected	An Post	
	Fax No		Condition on Receipt	Good	
	Customer PO	400305176	Date of Report	10/12/2012	
	Quotation No	QN001579	Sample Type	Ground Waters	
Į	Customer Ref	2012/5692		Contractions for the second	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
SVOC (sp	b)								
Dimethyl	phthalate	•	Default	1.0		<1.0	apt.	YES	
di-n-Euts	deithalate		Default	1.0		<1.0	su/L	YES	
Di-n-octy	iphthalate	•	Default	1.0		<1.0	M207.	YES	
Diphenyl	lamine .	*	Default	1.0		<1.0	us/L	YES	
Fluoranth	scise	•	Default	1.0		<1.0	427.	YES	
Fluorene		•	Default	1.0		<1.0	NDT.	YES	
Heuschlo	robenzene	÷	Default	1.0		<1.0	щат.	YES	
Hermitio	robutadiene		Default	1.0		<1.0	Ng/1.	YES	
Hexachio	roebane	•	Default	1.0		<1.0	ug/1.	YES	
Indexe(i	2,3-e,d)pyrene		Default	1.0		<1.0	ug/L	YES	
hepheror	ne	•	Default	1.0		<1.0	up/L	YES	
Naphthal	ene	•	Default	2.0		<2.0	NB/T.	YES	
Nitroben:	and	÷.	Default	1.0		<1.0	ug/L	YES	
n-Ndroso	di-n-propylamine		Default	1.0		<1.0	og/L	YES	
Pentachie	propisenol		Default	1.0		<1.0	ug/L	YES	
Phenanith	2000	+	Defeut	1.0		<1.0	ug/L	YES	
Phenol			Default	1.0		<1.0	ugo"L.	YES	
Pyrms			Default	1.0		<1.0	ug/L	YES	
VOC Full	Suite								
Dichleron	diffuoromethane		E0025	10.0		<10.0	MECT.		
Chlorom	ethane		E0025	0.5		<0.5	ug/L		
Edayl Chi	loride/Chlorosthane		EO925	0.5		<0.5	4g/L		
Vinyl Ch	loride		EO025	0.5		<8.5	чар.П.		
Bromonu	ethane		E/0925	0.500		<0.5	ugali.	INAB	
Trichloro	andamoraficar		80025	0.5		<0.5	Ngo'L		
Ethyl Eth	er/Diethyl Ether		BO025	0.500		<8.5	NgoT.	INAB	
11 Dichle	oroethene		EO025	0.500		<0.5	щоТ.	INAB	
Acetone			EO015	2.0		<2.0	48/1.		
Indometh	sno%dethyl Iodide		EO025	0.500		<0.5	ug/1_	INAB	
Carbon L	Disalphide		E0025	0.500		3.2	ug/L	INAB	
Allyl Chi	loride		EO025	0.500		<0.5	ug/L	INAB	
Dichlerer	methane		EO025	5.0		<5.0	MEDT.	INAB	
Chlormet	thyl Cyanide/Chlornacetonitrile		EO025	0.500		<0.5	ug/L	INAB	
Nitroben:	Sene		EO025	0.5		<0.5	ug/L		
Propanen	dtrile		EO025	10.0		<10.0	ug/7.		
Hexachio	robutadiese		E0025	0.500		<0.5	ug/L	INAB	
Trans-1,2	Dichloroefinne		EO025	0.500		<0.5	ugo'L.	INAB	

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Web: www.irishwatertesting-



Contact Name	Tim Supple	Report Number	61979 - 1
Address	Kerry County Council	Sample Number	61979/003
	County Buildings.	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	10/12/2012
Quotation No	QN001579	Sample Type	Ground Waters
Customar Pof	2012/5892	A STOLED OF A STOLED	

CERTIFICATE OF ANALYSIS

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IE81	ANALYTE	SUB	METHOD	rođ	SPEC	RESULT	UNITS	ACCKED.	005
VOC Ful	l Suite								
MIBE			E0025	0.500		<0.5	ug/L	INAB	
1,1-dich	loroethanz		EO025	0.500		<0.5	ug/L	INAB	
2,2-dich	loropropane		E0025	0.500		<0.5	ugit.	INAB	
cis-12 I	ichloroethene		EO925	0.500		<0.5	чат.	INAB	
2-Butan	one		EO025	5.0		<5.0	Ng/L		
Methyl	Acrylate		EO025	0.500		<0.5	ug/L.	INAB	
Bromoe	hieromethane		E0025	0.500		<0.5	ug/L	INAB	
Methan	ylonitrile		EO025	5.0		<5.0	ug/L		
Tetrahy	deofune:		E0025	0.500		<0.5	ugil.	INAB	
Chlorof	orm		E0025	1.000		<1.0	чат.	INAB	
1,1,1-tri	chlossethase		EO025	0.500		<0.5	ugit.	INAB	
1-Chice	obutane		EO025	0.500		<0.5	ug/1.	INAB	
Cabon	Tetrachloride		E0025	0.500		<0.5	ug/L	INAB	
11 Dich	loropropene		EO025	0.500		<0.5	ug/L	INAB	
Benzen	E.		E0025	0.100		<0.1	ugit.	INAB	
1,2 dich	rothane		E0025	0.1		<0.1	ugit.	INAB	
Trichles	oethene		EO025	0.100		<0.1	ug/L	INAB	
1,2-dich	loropropane		EO025	0.500		<0.5	ug/1.	INAB	
Dibrom	omethane		E0025	0.500		<0.5	ugit.	INAB	
Methyl	hfethacrylate		BO025	0.500		<0.5	ug/L	INAB	
Bromod	ichloromethane		EO025	2.000		<20	ug/L	INAB	
13 Dich	loropropene,cia		BO025	2.000		<2.0	цат.	INAB	
MIBK/4	Methyl 2 Pentanone		EO025	2.000		<2.0	ug L	INAB	
Tolucos	6		EO025	0.500		<0.5	ug/1.	INAB	
13 Dich	loropropene,trans		E/0025	2.000		<2.0	ug/L	INAB	
Ethyl M	ethacry late		BO025	2.000		<2.0	ug/L	INAB	
112 Tris	hloroethane		EO025	0.500		<0.5	ug/L	INAB	
Tetrachi	oroethene		EO025	0.100		<0.1	ца/Т.	INAB	
1,3-dich	loropropase		EO025	0.500		<0.5	ug/L	INAB	
2-Herae	900		EO025	1.000		<1.0	ug/1.	INAB	
Dibrom	schloromothane		E0025	1.000		<1.0	ug/L	INAB	
1.2-dibr	omoethane		BO025	0.500		<0.5	ug/L	INAB	
Chlorob	enzete		EO025	0.500		<0.5	ug/L	INAB	
1,1,1,2-	etrachloroethane		EO025	2.000		<2.0	ца/Т.	INAB	
E9tylbe	nzene		E0025	0.500		<0.5	1420L	INAB	
Xylene	F&M		EO025	0.500		<0.5	ug/1.	INAB	
Xylene	0		E0025	0.500		<0.5	1027.	INAB	
10.00000000	Let 1		10022002700			1914			

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Web: www.irishwatertesting.com



Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/003	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5692			

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC Full	Suite								
Styrene			E/0025	2.000		<2.0	ug/L	INAB	
Bromofo	em.		EO025	1.000		<1.0	ug/L	INAB	
[sopropy]	Ibenzene		EO025	0.500		<0.5	ug/L	INAB	
Bromohe	name		EO025	0.500		<0.5	uz/L	INAB	
1,1,2,2-6	trachlorostinane		E0025	0.500		<0.5	ug/L	INAB	
1,2,3-tric	hloropropane		EO025	2.000		<2.0	ug/1.	INAB	
Trans 14	Dichloro 2 Butene, tran		E/0025	2.0		<20	42/2.		
Propylbe	nsano		EO025	0.500		<0.5	ug/L	INAB	
2-chilorot	oloese		EO025	0.500		<0.5	ugit.	INAB	
4-chlorot	oluene		EO025	0.500		<0.5	ug/L	INAB	
1,3,5-trin	netity liserance		E0025	0.500		<0.5	u25.	INAB	
Tert Buty	d Benzene		E0025	0.500		<0.5	ug/1.	INAB	
1,2,4-trin	nethylbenzene		E/0025	0.500		<0.5	NO.	INAB	
sec-bulyl	benzene		EO025	0.500		<0.5	ца.	INAB	
1,3-40.65	orobenzene		EO025	0.500		<0.5	upt.	INAB	
P Isoprop	sylinhese		EO025	0.500		<0.5	ug/L	INAB	
1,4-dich0	orobenzene		E0025	0.500		<0.5	ug/L.	INAB	
1,2-dichà	orobenzene		EO925	0.500		<0.5	ugit.	INAB	
N Buryl 1	Ronsteine		EO025	0.500		<0.5	Ng/L	INAB	
Hexachie	rordano		EO025	5.000		<5.0	цу.Г.	INAB	
1,2-dibro	mo-3-chloropropute		E0025	2.000		<2.0	ug/L	INAB	
1,2,4-tric	hlorobenzene		EO025	0.500		<0.5	ug/L	INAB	
Naphthal	ene		E0025	2.0		<2.0	ug/L.		
1,2,3-tric	hlorobenzene		EO025	0.500		<0.5	ча/Т.	INAB	

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Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/004	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5898			

CERTIFICATE OF ANALYSIS

		(2							
TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
SVOC (su	b)								
1,2,4-Tri	chlorobenzene		Definit	1.0		<1.0	ug/L	YES	
1.2-Dich	korobennene		Definik.	1.0		<1.0	ug/L	YES	
1,3-Dich	lorobenzene	•	Default	1.0		<1.0	чал.	YES	
1,4 Dich	lorobenzene	(*)	Default	1.0		<1.0	Na/L	YES	
2,4,5-Tri	chlorophanol		Default	1:0		<1.0	ug/L	YES	
2,4,6-Tri	chlorophanol	(18)	Definit	1.0		<1.0	ug/L	YES	
2.4 Dich	lorophenol	•	Default	1.0		<1.0	ug/L	YES	
2.4-Dim	rthylphenol	1.00	Defmit	1.0		<1.0	ugit,	YES	
2,4-Dinit	rotoluene		Default	1.0		<1.0	ug/1.	YES	
2.6-Dint	mindisene	(•)	Defect	1.0		<1.0	NO.	YES	
2-Chlore	esphthalene		Default	1.0		<1.0	цая.	YES	
2-Chloro	phenol	243	Defail	1.0		<1.0	ug/L	YES	
2-Methy	inspirihalene	•	Default	1.0		<1.0	ug/L	YES	
2-Methy	iphenol	1.11	Default	1.0		<1.0	ug/L	YES	
2-Nitropi	henol	•	Default	1.0		<1.0	ug/1.	YES	
3£4-Mn	thylphonol	(e)	Defeat	1.0		<1.0	NO.	YES	
4-Bromo	phenyi Phenyi Ether		Default	1.0		<1.0	ug/L.	YES	
4-Chloro	-3-methylphenol	2• (Definit	1.0		<1.0	ug/L	YES	
4-Chloro	phonyl phonyl other		Default	1.0		<1.0	ug/L	YES	
4-Nitropi	henod	1.1	Default	5.0		<5.0	uga.	YES	
Acenaph	thene	•	Definit.	1.0		<1.0	ugit.	YES	
Acenaple	digiene	•	Defealt	1.0		<1.0	Ng/L	YES	
Anthrace	ne		Default	1.0		<1.0	ug/L	YES	
Benzo(a)	unthracene	2•S	Definit.	1.0		<1.0	ug/L	YES	
Benzo(a)	pytene		Default	1.0		<1.0	ug/L	YES	
Benzo(b)	fluoranthene		Default	1.0		<1.0	ug/L	YES	
Benzo(g.	h,i)perylene	•	Definit	1.0		<1.0	чат.	YES	
Benzo(k)	duoranthene		Default	1.0		<1.0	ug L	YES	
Benzyl B	satyl Phihalate	•	Default	1.0		<1.0	ug/1.	YES	
Bia(2-ch)	loroethory Inethane		Definit.	1.0		<1.0	ug/L	YES	
Bis(2-ch)	loroethyl)ether	(*).	Default	1.0		<1.0	ug/L	YES	
Bin(2-ch	leroisopropyl)etter	(•)	Default.	1.0		<1.0	ug/L	YES	
Bin(2-e5	ylhexyl]phthalate		Definit	5.0		<5.0	чат.	YES	
Chrysters			Default	1.0		<1.0	ug L	YES	
Dibenz(a	h)anthracene	(•)	Default	1.0		<1.0	ug/1.	YES	
Dibenzoi	furnet		Definit	1.0		<1.0	ugit.	YES	
Disthylp	hthalate	1.000	Default	1.0		<1.0	ug/L	YES	
			1.55			1			

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Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/004	
	County Buildings,	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5698	Service March		

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
SVOC (su	ıb)					1224			
Dunethy	lphthalste		Default	1.0		<1.0	ug/L	YES	
di-n-But	ylphthalate		Default.	1.0		<1.0	ug/L	YES	
Di-n-oct	ylphthalate		Definit	1.0		<1.0	щ/Т.	YES	
Dipheny	Service .	3.4.3	Defealt.	1.0		<1.0	ug/L	YES	
Fluorant	hene	2.00	Default	1.0		<1.0	ug/1.	YES	
Fluorenc		1.19.1	Defail	1.0		<1.0	up7.	YES	
Hexachi	orobename	8.0	Default	1:0		<1.0	ug/L	YES	
Heuschie	orohutadiene		Default	1.0		<1.0	ug/L	YES	
Hexachi	oroethane		Definit	1.0		<1.0	ug/L	YES	
Indene()	1,2,3-c,djpyrene	3.63	Definit	1.0		<1.0	MgoT.	YES.	
Isophore	0¢	2003	Default	1.0		<1.0	ug/l.	YES	
Nightha	lene		Default	2.0		<20	ug/L	YES	
Nitroben	izene	•	Default	1:0		<1.0	ug/L	YES	
n-bitros	odi-n-propylaminn		Definit	1.0		<1.0	ug/L	YBS	
Pentschl	lorophesol (•	Definit	1.0		<1.0	ug/L	YES	
Phenand	trene	•	Definit	1.0		<1.0	ugit,	YES	
Phenol		•	Definit	1.0		<1.0	ug/1.	YES	
Pyrene		(*)	Defeat	1.0		<1.0	NOV.	YES	
VOC Full	Suite								
Deblore	diffuormethase		E0025	30.0		<10.0	ug/L		
Chlorom	uthene		BO025	0.5		<0.5	ug/L		
Effyl Ci	ilorido/Chloroethane		E0025	0.5		<0.5	ug/L		
Vinyl Cl	aluride		EO025	0.5		<0.5	щ/Т.		
Bromom	ethane		E0025	0.500		<0.5	ug/L	INAB	
Trichlory	omonoflaceomethane		EO025	0.5		<0.5	ug/1.		
Ebyl Ed	her/Diethyl Eiber		E0025	0.500		<0.5	1027.	INAB	
11 Dichi	iorostiana		BO025	0.500		<0.5	ug/L	INAB	
Acctone			EO025	2.0		<2.0	ug/L		
ledomet	hane/Methyl Iodide		BO025	0.500		<0.5	ug/L	INAB	
Carbon I	Disciphide		E0025	0.500		<0.5	MgoT.	INAB	
Ally! Ch	doride		E0025	0.500		<0.5	ug/l.	INAB	
Dicklore	methane		E0025	5.0		<3.0	ug/L	INAB	
Chlorme	thyl Cyanide/Chloroacetonitrile		BO025	0.500		<0.5	ug/L	INAB	
Niroben	izate		E0025	0.5		<0.5	ug/L		
Propanet	nitrile		EO025	10.0		<10.0	ug/1.		
Hereachb	orobutadiene		E0025	0.500		<0.5	ugit.	INAB	
Trans-1,	2 Dichlorosthene		E0025	0.500		<0.5	ug/L	INAB	

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Technical Manager (or Deputy):

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Web: www.irishwatertesting



Contact Name	Tim Supple	Report Number	61979 - 1	
Address	Kerry County Council	Sample Number	61979/004	
	County Buildings.	Date of Receipt	23/11/2012	
	Tralee,	Date Started	23/11/2012	
Tel No	066-7183592	Received or Collected	An Post	
Fax No		Condition on Receipt	Good	
Customer PO	400305176	Date of Report	10/12/2012	
Quotation No	QN001579	Sample Type	Ground Waters	
Customer Ref	2012/5698			

CERTIFICATE OF ANALYSIS

VOC Full Suite E0025 0.500 <0.5	ಜ್ಞಾನ, ಜ್ಞಾನ, ಜ್ಞಾನ, ಜ್ಞಾನ, ಜ್ಞಾನ,	INAB INAB INAB INAB	
MdBE E0025 0.500 <0.5 1,1-doblarothane E0025 0.500 <0.5	401. 401. 401. 401. 401. 401.	INAB INAB INAB INAB	
1,1-debloredhane E0025 0.500 <0.5 2,2-debloremnare E0025 0.500 <0.5	વ્યુર વ્યુર વ્યુર વ્યુર વ્યુર	INAB DNAB DNAB	
2.2-dishkronmate E0025 0.500 <0.5	વ્યુત વ્યુત વ્યુત વ્યુત	DNAB DNAB	
	աչք. այք. այք. այք.	DIAB	
cis-12 Dichlomethene E0025 0.500 <0.5	ացե աջե աջե		
2-Bulance BO025 5.0 <5.0	ացե. ացե.		
Methyl Acrylate E0025 0.500 <0.5	ug/L.	INAB	
Bromochieromethane E0025 0.500 <0.5		INAB	
Methanylonitrile E0025 5.0 <5.0	ugit.	2002000	
Tetnikydrofurun EO025 0.500 <0.5	ug/L	INAB	
Chieroform E0025 1.009 <1.0	ug/L	INAB	
1.1.1-trichlossethase 80025 0.509 <0.5	ug/L.	DIAB	
1-Chlorobutane E0025 0.500 <0.5	ug/L	INAB	
Carbon Tetrachloride EO025 0.500 <0.5	ug/L	INAB	
11 Dichloropropene E0025 0.509 <0.5	ug/1.	INAB	
Bename E0025 0.100 <0.1	ug/L	INAB	
1,2 diclorechane E0025 0.1 <0.1	ug/L	INAB	
Trichloroethene BO025 0.109 <8.1	ug/L	DIAB	
1,2-dishloropmpane B0025 0.500 <0.5	чα/Т.	INAB	
Diferenceathane E0025 0.509 <0.5	ugit.	INAB	
Methyl Methacrylate EO025 0.509 <0.5	ug/1.	INAB	
Brunshichlorumethane E0025 2.009 <2.0	ug/t.	DIAB	
13 Dichloropropene,cis E0025 2.009 <2.0	ug/L	INAB	
MBK/4 Mediyl 2 Pentanne B0025 2.000 <2.0	ug/L.	INAB	
Toluene E0025 0.500 <0.5	ug/L	INAB	
13 Dishlaropropens, Inna E0025 2.000 <2.0	ug/L	INAB	
Ethyl Methacrylate E0025 2,000 <2.0	ug/L	INAB	
112 Trichlocothane E0025 0.500 <0.5	ug/t.	DIAB	
Tetrachlorosthene E0025 0.109 <0.1	ug/L	INAB	
1.3-dichloropropans EO025 0.509 <0.5	ug/L.	INAB	
2-Hevasone E0025 1.000 <1.0	ug/L	INAB	
Dibromochloromethane E0025 1.000 <1.0	ug/L	INAB	
1,2-dibromoethate E0025 0.509 <0.5	ug/L	INAB	
Chlorobename E0025 0.500 <0.5	ug/t.	DIAB	
1.1.1.2-tetrachiorosthane E0025 2.000 <2.0	ug/L	INAB	
Edytheniene E0025 0.500 <0.5	ug/L	INAB	
Xylene P&M E0025 0.500 <0.5	ugot.	INAB	
Xylene -0 E0025 0.500 <0.5	ug/t.	INAB	

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Technical Manager (or Deputy):

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Contact Name	Tim Supple	Report Number	61979 - 1
Address	Kerry County Council	Sample Number	61979/004
	County Buildings.	Date of Receipt	23/11/2012
	Tralee,	Date Started	23/11/2012
Tel No	066-7183592	Received or Collected	An Post
Fax No		Condition on Receipt	Good
Customer PO	400305176	Date of Report	10/12/2012
Quotation No	QN001579	Sample Type	Ground Waters
Customer Ref	2012/5698	10	

CERTIFICATE OF ANALYSIS

TEST	ANALYTE	SUB	METHOD	LOQ	SPEC	RESULT	UNITS	ACCRED.	005
VOC Full	Suite								
Styrene			E0025	2.000		<2.0	ug/L	INAB	
Bremolo	m		E0025	1.000		<1.0	ug/L.	INAB	
hopropy	Ibentene		E0025	0.590		<0.5	up"L	INAB	
Bromobe	niete		EO025	0.500		<0.5	ug/l.	INAB	
1,1,2,2-00	trachloroethase		E0025	0.500		<0.5	ug/L	INAB	
1,2,3-trie	hloropropane		EO025	2.000		<2.0	ug/L	INAB	
Trans 14	Dichloro 2 Butene, tran		E0025	2.0		<2.0	ug/1.,		
PropyBe	nixene		EO025	0.500		<0.5	ngvī.	INAB	
2-chlorot	olume		E0025	0.500		<0.5	upt.	INAB	
4-chlorot	olaese		EO025	0.500		<0.5	ug/L	INAB	
1,3,5-trin	selayibendene		EO025	0.500		<0.5	ug/L	INAB	
Tert Buty	Benzene		EO025	0.500		<0.5	upT.	INAB	
1.2,4-trie	sofhylbenaene		EO025	0.500		<0.5	ug/1,	INAB	
sec-butyl	benzene		EO025	0.500		<0.5	ug/L	INAB	
1,3-dochi	orobentene		EO025	0.590		<0.5	ug/L	INAB	
P Isoprop	vitoluese		EO025	0.500		<0.5	ug/1.	INAB	
1,4-dichi	orobenzene		EO025	0.500		<0.5	ug/L,	INAB	
1,2-dichi	orobenzene		EO025	0.500		<0.5	ug/L	INAB	
N Butyl 1	Benzene		EO925	0.500		<0.5	ug/1.,	INAB	
Heusehle	rochane		EO025	5.000		<5.0	ug/L	INAB	
1,2-dihno	mo-3-chloropropane		EO025	2,000		<2.0	ug/L	INAB	
1,2,4-tric	hlorobenzete		EO025	0.500		<0.5	ug/1.	INAB	
Nephthal	ene		E/O025	2.0		<2.0	ug/L,		
1,2,3-tric	hlorobenzene		EO025	0.500		<0.5	ug/L	INAB	

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<u>Appendix 6 – Surface Water Monitoring Results</u>

	A	В	C	E	G	н		1	K	L	M	N	0	P
						Parameter	Appe man nos	Sav	Flow	Amnonium	Ŧ.	BOD (sday)	Conductivity @ 20 oC	Chemical Oxygen Demand
2		Č Š				1	ŧ.		_	NHA		02		02
						Max	825	026		D.06(impact				
3	0						1000	1000		6ites)				
-			Á.			C-1100					14			
5	Location	Location Reference	Sample Template	Sample Date	Sampled By	Comments	Descriptive	Descriptive		P	en He	10u	maysri	you
6		8			, j			-						
7		1			-								210	
0	Lins of M.H. (surface water along by cell 13) Lins of M.H. (surface water along by cell 13)	<u>E</u> 3	General Landfil: Surface water	19-Jun-12 22-Jun-12	Tim Supple	nh cond NH4_COD_C			-	0.02	7.2		201	30
10	and to the in the most making of the rol	8			nin coppe				2 3			8		1
11	Rhs of M.H. (surface water along by cell 12)		General Landfill: Surface water	19-Jun-12	Tim Supple	f M.H. Surface water flowing along the outer rim of 0				0.12	6.9		357	29
12	Rhs of M.H. (surface water along by cell 12)	2 S	General Landfil: Surface water	22-Jun-12	Tim Supple	ph cond NH4 COD Ci			8 8	0.06	7.1		157	51
14				-					12 5					4
15		8							8. 8					
23	Surface water: SWML-E1(Northern Lagoon)	new Surface water Lagoon	EPA: North kerry: Surface Water monthly	18-Jan-12	Tómas Ó Sullivan	E1 New SWML Sampling point	clear	ND	10 1)	7.9		139	
24	Surface water: SWML-E1(Northern Lagoon)	new Sunace water Lagoon	EPA: North kerry: Surface Water monthly	21-Feb-12	Andrew Scanion		Slight Colour	ND	S 9	0.00				
20	Surface water: SWML-E1(Northern Lagoon)	new Surface water Lagoon	EPA.North Keny: Surface Water Quarterly EDA: North Keny: Surface Water monthly	29-MBP-12 27-Apt-12	Tomas O Sullivan	suspanded splids	clear	ND	12 2	0.02	1.2	<1	224	< 10
27	Surface water: SWML-E1(Northern Lagoon)	new Surface water Lagoon	EPA: North Kerry: Surface water Quarterly	30-May-12	Tim Supple	ouspended solida	clear	ND	10 1	0.05	7,4	<1	262	< 10
28	Surface water: SWML-E1(Northern Lagoon)	new Surface water Lagoon	EPA: North kerry: Surface Water monthly	15-Jun-12	Andrew Scanion		Cloudy	ND						
29	Surface water: SWML-E1(Northern Lagoon)	new Surface water Lagoon	EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanion		Clear	ND	\$ 3	0.11		- 10 B		-
30	Surface water: SWML-E1(Northern Lagoon)	new surface water I	EPA: North Kerry: Surface Water Quarterly	23-Aug-12	Tim Supple		Clears/cloudy Elightly Cloudy	ND	10 10	0.03	7.b	<1	14/	< 10
32	Surface water: SWML-E1(Nothern Lagoon)	new surface water i	EPA: North kerry: Surface Water monthly	24-0d-12	Tim Supple		Sil cloudy	ND				1		1
33	Surface water: SWML-E1(Northern Lagoon)	new surface water I	EPA: North kerry: Surface water annual	21-Nov-12	Andrew Scanion		Cloudy	ND	10.0	2.87	7.5	> 24	273	80
34	Surface water: SWML-E1(Northern Lagoon)	new surface water I	EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanion		Slightly Cloudy	ND	8 - 3	3.25				-
31														
97	Surface Water sampling point: W1	biological station	EPA: North kerry: Surface Water monthly	18-Jan-12	Andrew Scanion		Slight brown colour	ND	1	-	7		101	-
98	Surface Water sampling point: W1	biological station	EPA: North kerry: Surface Water monthly	21-Feb-12	Andrew Scanion		Clear	ND		< 0.02				1
88	Surface Water sampling point: W1	biological station	EPA:North kerry: Surface water Quarterly	29-Mar-12	Tómas Ó Sullivan	ACTIVATION ACTIVATION OF	clear	ND	8	< 0.02	7.1	<1	129	10
100	Surface Water sampling point: W1	biological station	EPA: North kerry: Surface Water monthly	27-Apt-12	Tómas Ó Suilivan	suspended solids	coloured light brown	N.D		0.00			440	10
102	Surface Water sampling point. W1	biological station	EPA: North Keny: Surface Water Quarterly	15-Jun-12	Andrew Scanion		Clear	ND	8 8	< 0.02	0.0	<1 /	140	< 10
103	Surface Water sampling point: W1	biological station	EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanion		Slight Brown Colour	ND	13 2					1
104	Surface Water sampling point: W1	Bloiogical station	EPA:North kerry: Surface water Quarterly	23-Aug-12	Michael O Sullivan	Blo st.	clear/coloured	ND	8 8	0.02	6.9	<1	86	44
105	Surface Water sampling point: W1	Biological station	General Landfill: Surface water	14-Sep-12	Tim Supple				<u> </u>	* 0.02				
107	Surface Water sampling point. W1	Binioglogi station	EPA' North kerry: Surface Water monthly	1/-Sep-12 27-Sep-12	Carbline Markey Andrew Scanlon		Clear	ND	8 8	< 0.02	0.0	5		
108	Surface Water sampling point: W1	Biological station	EPA: North kerry: Surface Water monthly	24-Oct-12	Tim Supple		Cloudy	ND	12 9	< 0.02		8	-	
109	Surface Water sampling point: W1	Biological station	EPA: North kerry: Surrface water annual	21-Nov-12	Andrew Scanion		Clear	ND	13 3	< 0.02	7	1	90	24
110	Surface Water sampling point: W1	Blological station	EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanion		Clear	ND	100	0.00				
114	Surace water samping point. Wi	Biological station	EPR. Notor Kery, Suitade Water mononly	U4-Jair-10	THR Supple	2	Ciedi	NU	5 8	0.02		2		1 1
115	Surface water: W2(O'Brennan's Br. R.Lee)		General Landfil: Surface water	14-Sep-12	Tim Supple	O'Brennan's Br	-	0.00	3 2	0.04				
116	Surface water: W2(O'Brennan's Br. R.Lee)		EPA: North kerry: Surface Water monthly	27-Sep-12	Andrew Scanion	1000000000	Clear	ND						
117	Surface water: W2(O'Brennan's Br. R.Lee)		EPA: North kerry: Surface Water monthly	24-Oct-12	Tim Supple		Clear	ND	+	< 0.02			110	+
119	Surface water. W2(O'Brennan's Br. R.Lee)	1	EPA: North kerry: Surrface water annual	21-Nov-12	Andrew Scanion		Clear	ND	1 1	0.02	7.2	<1	121	25
120	Surface water: W2(O'Brennan's Br. R.Lee)	8 8	EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanion		Clear	ND	3 3					A Start
124					Description 11						22		-	
120	Biological Station F2	6	General Landfill: Surface Water	17-SE0-12 19-Se0-12	Claire Mc Caffrey				1-1	< 0.02	5		57	+
127	Biological Station G1	1	General Landfill: Surface water	18-Sep-12	Claire Mc Caffrey					< 0.02	6.4		58	
128	Biological Station G2	£	General Landfill: Surface water	18-Sep-12	Claire Mc Caffrey		()		8 8	< 0.02	6.7	· · · · · · · · · · · · · · · · · · ·	65	
129	Biological Station N1		General Landfil: Surface water	18-Sep-12	claire Mc Caffrey			-	1	< 0.02	6.4		67	+
131		1							1				1	1
180	Surface water: SW-1	previously e1	EPA: North kerry: Surface Water monthly	18-Jan-12	Tómas Ó Suillvan		Slight brown colour	ND		1	6.8		80	
181	Surface water. SW-1	previously e1	EPA: North kerry: Surface Water monthly	21-Feb-12	Andrew Scanion		Clear	ND			-	3		1
182	Surface water, SW-1	previously e1	EPA: North Kerry: Surface Water Quarterly EDA: North Kerry: Surface Water provider	29-Mar-12 27-Apr-12	Tomas O Sullvan	succended childs	si coloured	ND	+	< 0.02	7.4	<1	113	20
184	Surface water. SW-1	previously e1	EPA:North kerry: Surface water Quarterly	30-May-12	Tim Supple	ouspended outlus	Slightly coloured/clear	N.D	12 1	< 0.02	7.5	<1	129	10
185	Surface water, SW-1	previously e1	EPA: North kerry: Surface Water monthly	15-Jun-12	Andrew Scanion		Clear	ND						
186	Surface water. SW-1	()	EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanion		Slight Brown Colour	ND					~	
18/	Surface water, SW-1	R	EPA: North Kerry: Surface Water Guarterly EDA: North Kerry: Surface Water monthly	23-AUG-12 27-Sep-12	Andrew Scanlor	-	Clear/c0i0ured	ND	18 - 9	< 0.02	0.9	-1.1	80	68
189	Surface water, SW-1	1	EPA: North Kerry: Surface Water monthly	24-Oct-12	Tim Supple	1	Brownish/riverlike	ND	1	1	i		1	
190	Surface water: SW-1	8	EPA: North kerry: Surrface water annual	21-Nov-12	Andrew Scanion		Slight Brown Colour	ND	12 1	0.11	6.2	1.2	45	37
191	Surface water. SW-1	6 S	EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanion		Clear	ND	3 3		1		- 1970 - S	
194		0												+
237	Surface water: SW-2		EPA: North kerry: Surface Water monthly	18-Jan-12	Tómas Ó Sullivan		Slight brown colour	N.D	1		4	8	109	
238	Surface water: SW-2	8 8	EPA: North kerry: Surface Water monthly	21-Feb-12	Andrew Scanion		Brown Colour	ND	3 3	0.02				
239	Surface water. SW-2		EPA:North keny: Surface water Quarterly	29-Mar-12	Tómas Ó Sullvan	No sample			No Flow					
240	Surface water: SW-2 Surface water: SW-2		EPA: North Keny: Surface water monthly EPA:North Keny: Surface water Ocartery	2/-Apr-12 30-May-12	Tim Supple	Suspended Solids	coloured light prown	peary	No Fire					
242	Surface water: SW-2	1	EPA: North Kerry: Surface Water monthly	15-Jun-12	Andrew Scanion	bil the souther	Brown Colour	ND						
243	Surface water: SW-2		EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanion	2	Slight Brown Colour	ND	13 2	5 2		2		

	٨	в	0	E	G	н	1	1 1	K	1	M	N	0	P
244	Curtage water PIN 2	8	EDA North Kome Purface water Ouartedu	22 Aug 12	Tim Cuppio	4.6	alaztiaaloutad	ND	-15	0.02	4.0		45	124
244	Surface water, SVV-2	3	EPA. Notor Keny, Surface water Quarterly	20-Mug-12	tim Supple		cieal/colouieu	ND	5 5	0.03	4.3		40	101
240	Surface water: SVV-2	6 6	EPA: North Kerry: Surface Water monthly	27-Sep-12	Andrew Scanion		Brown Colour	ND	5 6		<i>6</i> - 2			8 3
246	Surface water: SW-2		EPA: North kerry: Surface Water monthly	24-Oct-12	Tim Supple		Brownish/riverlike	ND						
247	Surface water: SW-2	5	EPA: North kerry: Surrface water annual	21-Nov-12	Andrew Scanion		Brown Colour	ND	8 - S	0.05	3.8	<1	69	149
248	Surface water: SW-2	8 8	EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanion		Brown Colour	ND	8 8		11 12			A
251		8 ()		2 2			3	1. C	8 8		Q. 9	S		8
252				2				8	S 2		Q 2	22		
381											-			
454	Purthes water PMILE 20Meeters (apone ordist)	new Joursky 3 Jacons	EDA: North Komy Curtase Water monthly	19, 156, 10	Andrew Coppion		olouds:	ND					250	
455	Sunace water, SvviviL-2(vvestern Lagoon outer)	previously 2 lagoon	CPA, Wordt Keiry, Sundoe Water mononly	10-04(P12	Andrew Scariot		cioudy	N.D	S 5		1 K (209	<u> </u>
400	Surrace water. SvvmL-2(vvestern Lagoon outlet)	previously 2 lagoon	EPA. Notor Kerry, Surrace Water monority	21-FED-12	Andrew Scanlon		Cloudy	ND	00 - 11	0.02				
450	Surface water: SWML-2(Western Lagoon outlet)	previously 2 lagoon	EPA:North kerry: Surface water Quarterly	29-Mar-12	Tim Supple		si coloured/cloudy	ND		< 0.02	8.2	5.4	236	23
457	Surface water: SWML-2(Western Lagoon outlet)	previously 2 lagoon	EPA: North kerry: Surface Water monthly	27-Apr-12	Tómas Ó Sullvan	suspended solids and NH4	clear	N.D	8 - 8	0.02	S war S	- cara - 8	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1 at 1
458	Surface water: SWML-2(Western Lagoon outlet)	previously 2 lagoon	EPA:North kerry: Surface water Quarterly	30-May-12	Tómas Ó Sullvan	Taken From Lagoon	clear	N.D	8 8	< 0.02	8.1	2.2	278	16
459	Surface water: SWML-2(Western Lagoon outlet)	previously 2 lagoon	EPA: North kerry: Surface Water monthly	15-Jun-12	Andrew Scanion		Slight Sediment	ND	8 8	0.02	g	8	_	6
460	Surface water: SWML-2/Western Lappon outlet)	previousiv 2 Jappon	EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanion		Clear	ND	S 23	0.02	2 2	2		
481	Surface water: SWMI -2/Western Lanoon outlets	1	EDA:North kerry: Surface water Quarterly	23-Aur-12	Michael O Sullivan	Taken from Lancon not flowing	Cinudy	ND	2 2	0.02	8	24	198	10
480	Surface water CMIRE Dilliontern (ageon ordini)	8 6	EDA: Made kome Current Mater monthly	07 Can 10	Andrew Concion	rance non cagoon not not not not	Clight Codimont	ND	2 3	0.02				
480	Sundoe water, Swimp-2(weatern Lagoon outer)	3 3	CPA, Noter Kerry, Suitable Water monthly	27-369-12	Paralew Scaliforn		Sign Seument	10	8 3	0.00	8 8	2	?	
40.5	Surface water: SyvML-2(western cagoon outer)	6S	CPA. Notor Kerry, Surrace water mononly	24-00-12	tim Suppe	2	Cloudy	NU	S 3	< 0.02				-
404	Surface water: SWML-2(Western Lagoon outlet)		EPA: North Kerry: Surrace water annual	21-N0V-12	Andrew Scanion		Slightly Cloudy	ND		< 0.02	5.8	<1	199	19
465	Surface water: SWML-2(Western Lagoon outlet)	6	EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanion		Clear	ND	Q &	< 0.02	1 <u>.</u> 8	3		18. S
468		8 8		S				18 - 11	3 - <i>3</i>		6 3			18 - S
469	HARDER FOR THE PROPERTY OF THE													
505	Surface water: SWML-3	1. d	General Landfill: Surface water	06-Jan-12	Iona Mc Gioln		2	10	3	0.04	1 S			1
506	Surface water: SWML-3		EPA: North kerry: Surface Water monthly	18-Jan-12	Andrew Scanion		Cloudy	N.D	1		7.1		260	
507	Surface water SWML-3	8	EPA: North kerry: Surface Water monthly	21-Feb-12	Andrew Scapion	2	Cicuity	ND	8 0	0.02	0			k
500	Surface water Could 3	3 2	EDA North korn: Surface water monelly	20.1474 12	Tim Supple	No campia	Sidual		00.000	5.02	3	3		<u> </u>
500	Surface water: SWML-S		EDA: North kerne Contract Water woodherly	25-Wdi-12	Tamas C Contra	nu sample	alare		10 100		-			-
800	Sunace water: SWML-3		EPA, North Kerry, Sunace Water monthly	21-Apt-12	Tomas O Sunivan	suspended solids and NH4	crear	N.D.		l			/	<u>+</u>
510	Surface water: SWML-3	<u>.</u>	EPA:North kerry: Surface water Quarterly	30-May-12	Tomas O Sullvan	Dry No Sample	2005 - C	12 St.	2 8	10000	3. S	3		1
511	Surface water: SWML-3	8 8	EPA: North kerry: Surface Water monthly	15-Jun-12	Andrew Scanion	Slow Flow	Clear	ND	\$ 8	0.02	§ 3	3		8 3
512	Surface water: SWML-3		EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanion		Clear	ND		0.02				
513	Surface water: SWML-3	1	EPA:North kerry: Surface water Quarteriv	23-Aug-12	Michael O Sullivan		clear	ND	10.00	0.04	7.6	<1	292	< 10
514	Surface water: SWML-3	1	EPA: North kerry: Surface Water monthly	27-Seo-12	Andrew Scanion		Clear	ND	1 1	< 0.02				
515	Curringe water CMML 3	8 8	EDA: North kerry: Surface Water monthly	24.0d-12	Tim Cupple	No Comple	Sec. Sec.		8 - O		a			
510	Surface water, Swimps	3	EPA, Wordt Kerry, Sundoe Water monally	24-001-12	Andrew Cepples	No Sample not nowing	Class	10	8 3	0.02			000	07
510	Surface Water: SWML-3		EPA: North Kerry: Surnace water annual	21-NOV-12	Andrew Scanion		Clear	NU	3 3	0.03	1.3	<1	202	21
01/	Surface water: SWML-3		EPA: North Kerry: Surface Water monthly	10-Dec-12	Andrew Scanion		Clear	ND		< 0.02			/	
520		1		12	1		2	10	Q Q.		1 <u>.</u> 5			12 S
521		8 8		8 3			100	8	5 8		S 3			A 3
560	Surface water: SWML-4	previously 4	General Landfill: Surface water	18-Jan-12	Andrew Scanlon	Not Flowing			low for s					
561	Surface water: SWML-4	previously 4	EPA:North kerry: Surface water Quarterly	29-Mar-12	Tim Supple	No sample	3	1 (C	no flow		1 11			1
582	Surface water: SWMI -4	previously 4	EPA: North kerry: Surface Water monthly	27-Apr-12	Tomas Ó Sullvan	No Sample/ dtv)		P	no flow			1		
582	Surface water SWML 4	previously 4	EDA North kerry: Surface water Owartedy	30-May-12	Tomas Ó Sullvan	Dry No Sample	2	8	no fice		11 (3			
500	Currace water, OWNE, 4	previously 4	EDA: North kerry: Curtace Water adartery	15 km 12	Andrew Coppion	Not Einsten, No Comple	Clear	400	no four		<u>i</u>	2	?	
304	Sunde water, SWML-4	previously 4	EPA, North Kerry, Surade Water monutily	10-JUII-12	Andrew Scanion	Not Flowing - No Sample	Glear	NU	no now.		1. S			
585	SUITACE WATER: SWIML-4	previously 4	EPA: North Kerry: Surface Water monthly	02-301-12	Andrew Scanion		Glear	NU						<u> </u>
566	Surface water: SWML-4		General Landfill: Surface water	23-Aug-12	Tim Supple	No sample— not flowing		16	Sugal	1	ŭ - 3	S		12 3
567	Surface water: SWML-4	8 8	General Landfill: Surface water	27-Sep-12	Andrew Scanion	Not Flowing - No Sample	2	18	no flow		§ 3	8		
568	Surface water: SWML-4		EPA: North kerry: Surface Water monthly	24-Oct-12	Tim Supple	No Sample not flowing								
569	Surface water: SWML-4	6 S	EPA: North kerry: Surrface water annual	21-Nov-12	Andrew Scanion	allen in the	Clear	ND	6 3	0.02	6.8	<1	172	10
570	Surface water: SWML-4	· · · · · · · · · · · · · · · · · · ·	General Landfill: Surface water	10-Dec-12	Andrew Scanlon	No Sample	r		2 2					
572		8 6					2		2 0		1 0			
574		2		<u> </u>					8 3		<u>8</u>		?	6 3
074	Contract of the Children of		Control I an affit Control on the	10 100 10		Net Flender	6	8			S 5	- <u>_</u>		<u>6</u>
602	Surface water: SWML-5		General Landhii: Sunade Water	18-Jan-12	Andrew Scanion	NOT Flowing			W TOD ION				/	
603	Surface water: SWML-5		EPA: North Kerry, Surface Water monthly	21-rep-12	Andrew Scanion		Clear	ND	Sugar		9. E	8		R
604	Surface water: SWML-5	8 <u> </u>	EPA:North kerry: Surface water Quarterly	29-Mar-12	Tim Supple	No sample	8	3	no flow		§ 3	2		8
605	Surface water: SWML-5		EPA: North kerry: Surface Water monthly	27-Apr-12	Tómas Ó Sullvan	suspended solids	clear	N.D						
606	Surface water: SWML-5	1. A	EPA:North kerry: Surface water Quarterly	30-May-12	Tómas Ó Sullvan	Dry No Sample	2	iii aana	no flow		1 S			1
607	Surface water: SWML-5	í í	EPA: North kerry: Surface Water monthly	15-Jun-12	Andrew Scanlon	Slow Flow	Clear	ND				i i		T
608	Surface water: SWML-5	8	EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanlon		Clear	ND	8 0		Q (1			6
800	Surface water: SWMI -5	3	General Landfill: Surface water	23-Aug-12	Tim Supple	No sample pot flowing		1	no flow		1	2		t
810	Surface water SWML-5	-	EDA: North kerry: Surface Water monthly	27-Sep-12	Andrew Scapion	the second second	Clear	ND	and the second		-			t
814	Current units Child 5		EDA: Moth kamp Curran White month	24.04.40	Tim Curele	No Cample, and Seules	vical	100	1				/	<u>+</u>
011	Sunace water, Stymuso		EPA: Notin Keny, Sunace syater monthly	24-00-12	tim Supple	No sample not nowing		1	2 S				400	1 10
012	SUFIACE WATER: SWIME-5	8 <u> </u>	EPAL NORTH KEITY: Surmace water annual	21-NOV-12	Andrew Scarlion	ç	Clear	NU	5 6	0.04	1.5	<1	185	15
613	Surface water: SWML-5		EPA: North Kerry: Surface Water monthly	10-090-12	Andrew Scanion		clear	ND					/	<u> </u>
616		<u>1 </u>	42 32	8			3	1.C.	1. 2		3	2		3 3
618												1		
666	Surface water: SWML-10(Eastern Lagoon outlet)	NE lagoon	EPA: North kerry: Surface Water monthly	18-Jan-12	Tómas Ó Sullvan		Cloudy	N.D	\$ \$		7.6		211	8
667	Surface water: SWML-10(Eastern Lagoon outlet)	NE lagoon	EPA: North kerry: Surface Water monthly	21-Feb-12	Andrew Scanion		Cloudy	ND	<u> 1</u>	< 0.02	1 (i		_	1
668	Surface water, SWML-10(Eastern Lagoon outlet)	NE lagoon	EPA:North kerry: Surface water Quarterly	29-Mar-12	Tim Supple		sl cloudy/coloured	ND	1 1	< 0.02	8.3	1.8	254	25
669	Surface water: SWML-10(Eastern Lagoon outlet)	NE (agoon	EPA: North kerry: Surface Water monthly	27-Apr-12	Tómas Ó Sullvan	suspended solids	cloudy	ND	3 3	0.08	1			<u> </u>
870	Surface water: SWMI -10(Eastern Lapon outlet)	NE lagoon	EPA: North kerry: Surface water Quarterly	30-May-12	Tómas Ó Sullvan	Taken From Lanoon	clear	ND	2 3	< 0.02	8	<1	302	25
874	Surface water: SWML-10/Eastern Lanson aution	NE Isooon	EDA: North karry: Surface Water monthly	15 100 50	Androis Connige	Taken Tront Englern	Class	NO	8 9	0.4	. × .	12410		~~
872	Currane water, Child (Castern Laguori Curren)	NE Ingoon	Constal and the surface reader and the	10-041-12 02.1-m.10	Tim Custole	th cond Mill COD of	Glear	80		0.00	72		017	<u> </u>
012	Surrace water: SWML-10(Eastern Lagoon outlet)	NE lagoon	General Landhir: Surface water	22-Jun-12	Tim Supple	ph.cone NH4 COD Ci		2 (A)-1	6 V	0.02	/.0	52	217	43
0/3	Surrace water: SWML-10(Eastern Lagoon outlet)	NE lagoon	EPA: North Kerry: Surface Water monthly	02-Jul-12	Andrew Scanion		Sightly Cloudy	ND	5 8		9			
674	Surface water: SWML-10(Eastern Lagoon outlet)	3	EPA:North kerry: Surface water Quarterly	23-Aug-12	Tim Supple		cloudy	ND	8. 8	< 0.02	7.4	1.1	235	21
675	Surface water: SWML-10(Eastern Lagoon outlet)		EPA: North kerry: Surface Water monthly	27-Sep-12	Andrew Scanion		Cloudy	ND	8 8	< 0.02	Q 8	23		
676	Surface water: SWML-10(Eastern Lagoon outlet)		EPA: North kerry: Surface Water monthly	24-Oct-12	Tim Supple		SL cloudy	ND		0.04				
677	Surface water: SWML-10(Eastern Lagoon outlet)	5	EPA: North kerry: Surnace water annual	21-Nov-12	Andrew Scanion		Cloudy/Sediment	ND	35 - 78	0.33	7.6	2.6	205	105
678	Surface water, SWML-10(Eastern Lagoon outlet)		EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanlon		Cloudy/Sediment	ND	10 de		A 100 10 10			
679	Surface water SWMI -10/Eastern Lancon outlet:		EPA: North kerry: Surface Water monthly	04-130-13	Tim Supple		Cipudy/Ditty	ND	-	0.14		I		t
BP1	entrate mater office rejeasers bageon outer)		and a rearrant many. Sourcess manage allottenty	CH SALL IS	tion scopped		on and the state		10 10		\$ ×			<u>+</u>
890				2				6	6 6		2	1		+
7002	Outras union Others at		275 A. Mardin Roman Condition Statistics in the	10.0	Tes Curreits	-)	algebra	100	8 9		9 8	4		
123	Surface water. SWML-11	previously 11	EPA: North Kerry, Surface Water monthly	15-L/80-11	Tim Supple		cidudy	ND	-				/	4
724	Surface water: SWML-11		EPA: North kerry: Surface Water monthly	02-Jul-12	Andrew Scanion		Slightly Cloudy	ND	5 8					
725	Surface water. SWML-11		EPA: North kerry: Surface water Quarterly	23-Aug-12	Michael O Sullivan		clear/sl/coloured	slimustylearth		0.02	7.1	<1	234	21
726	Surface water: SWML-11	2 2	General Landfill: Surface water	27-Sep-12	Andrew Scanion	Not Flowing - No Sample	2	12	no flow		8 3			12 1
727	Surface water, SWML-11	i i i i i i i i i i i i i i i i i i i	EPA: North kerry: Surface Water monthly	24-Oct-12	Tim Supple	No Sample not flowing	2	E.	2-24-33		1 (i	8		1
728	Surface water. SWML-11	1	EPA: North kerry: Surrface water annual	21-Nov-12	Andrew Scanlon		Clody/Sediment	ND		0.31	7.6	2.7	208	105
729	Surface water SWML-11	2	EPA: North kerry: Surface Water monthly	10-Dec-12	Andrew Scanlon		Cloudy/Sediment	ND	3 3		3 2			
1.20	Contracts transf. Citemer 1		are received using, sufface trater monally	10 00012	There are a construction		oroma procentient		1					<u>لــــــــــــــــــــــــــــــــــــ</u>

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11 Res of M.H. (surface water along by cell 12)		General Landfilt: Surface water	19-Jun-12	11	11.9																									
12 Resol W.H. (surface water along by cell 12)		Gereral Landfilt: Surface water	23-Jun-12	12	10.9	8.8		15.5																						
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23 Surate water SWML-E (Northern Lagoon)	new Surface water Lapoon	EFR: Note Kery: Surface Water monthly	16-Jan 12	23			5	9				-							l	-			1			+	-			└ ──
24 Suraze water, SWML-E (Northern Lapoon) 25 Surface water, DAVAL E Streatment I second	new Surface water Lapoon	CHX NOTI KETY: Sufface Water monthly Fill Notice Ketty: Sufface Water monthly	21612	24	15.5	10.4	12	7.6		I				-		I		I	I	-	<u> </u>		+		+	+				—
20 Suraz met. SAML C (WOREN 13000)	THE STAR BALL AND	Chromonery, all all line with	2788-12 1240-12	20	10.0	10.1	3	3.0	-	<u> </u>		-	-	+				I		+			+	-	-	-	-			t
27 Sufac user SML C (Moten 2000)	nam Safara actor www.	FOLLING AND ADDRESS AND ADDRESS AND ADDRESS AD	2010-12	20	14.2	10.0	3	14.4	+	+	+	-	+	+				+	<u> </u>	+		+	+	-	+	+	+			t
28 Sufae user SML E Nothen I sooni	new Surface water Labora	EPA: Noti kery: Surfax-Wate moth	5.10-12	28	19.4	0.0	11	19.6	+	+	+	1	+	+		<u> </u>		+	<u> </u>	+			+	-	+	+	+			└ ──
29 Surface water SMM -E (Northern Lacon)	new Surface water J zown	EPA: Noth Keny: Surface Water monthly	02-36-12	29			8	1	1	1	1		1			1	1	1	l	1		-	1	-	1	1	1			—
30 Sufax water SWM_E1Nothen Lapon	new surface water l	EPAJiorith Keny: Surface water Quarterly	23-Aup-12	30	5.6	9.2	2	16.6										<u> </u>					-		1	+				
31 Sufaxe water SWML-Et(Northern Lagoon)	nen suface nateri	ERA: North Keny: Surface Water monthly	27-Sep 12	31			8.5	12.5																						
32 Sufaxe water: SWML-Et(Northern Lagoon)	nen suface nater i	EPA: Noth kery: Surface Water monthly	24-06-12	32			19	11.4																						
33 Sufax water SWML-EI(Northern Lagoon)	NEW REFERENCE	EFA: Noth kery: Surface water annual	2110112	33	15.4	9.6	30	7	4.05		0.023	0.017	1.555	13.5	0.98	39.2	0.01	2.301	1.304	0.65		3.94	0.85	< 0.025	< 0.009	111	4.01	5.7	0.018	
34 Sufaxe water SWML-Et(Northern Lagoon)	nen suface nater i	EPA: North kery: Surface Water monthly	10-060-12	34			11																							
37				37							_													_						
42	and a state of the			42			-			-				-					L	-			-							—
97 Surace water sampling point. W1	TOROCASE OF	EVAL NOT KETY: SUFER WAR FORDI	15-25-12	87			2	0.0		-				+					<u> </u>	-		-	-	-		+				L
30 Safate Hate saliphingois. W1	historicities	Eastern Service Service Internet	2010010	80	23.1	11.1	2	7.0	-	-			-	+						-			-	-	-	+				<u> </u>
100 Safara Ridar camilton oldr 181	historialities	FOR Weth later fortage little model	1744-12	100	20.1	11.1	1	81			-		-	-				-				-	-	-		+				<u> </u>
101 Surface Nater sampling costs. W1	biokotalstation	EPA1koth kery: Surface water Quarterly	30-Way-12	101	22.1	9.8	1	12.4	+	-	+			+ - 1						-			+	-	+	+				<u> </u>
102 Suface Nater sampling costs: W1	bitkokaistelun	EPA: Noth keny: Surface Water monthly	5.0.12	102			<1		-	-	-								<u> </u>				-		-	+				
103 Surface Water sampling contri. W1	biokocal station	EPA: Noth keny: Surface Water monthly	02-J0F12	103			4		-		-		-	-									-	-	-	+				
104 Surface Water sampling point: W1	Bological station	EPAtion kery: Surface water Quarterly	23-Aug-12	104	15.6	10.5	2	13.5																		1				
105 Surface Water sampling point: W1	Bological station	General Landfil: Surface water	14-Gep 12	105		9.7		12.2																						
108 Surface Water sampling point: W1		Gereral Landfilt: Surface water	17-8ep 12	106		9.9	4	11.8																			< 0.02		0.017	3.5
107 Surace Water sampling point: W1	Bological station	EPA: Noth kery: Surface Water monthly	27 Sep 12	107			2	10.4			_													_						
108 Surace Nater samplingpoint. W1	Bological Station	EPA: North Kerry: Surface Water monthly	24-05-12	108			30.5	10.3	- 0.6		- 0.00	0.000			4.00		- 0.04	4.040	0.000	- 0.5			0.40	- 0.000	- 0.000			- 0	0.000	-
10 Surace water samplingport, with	5000135200	EVEN NOTI REPL'SUITACE NOTE ATTACA	2140412 43.0mm12	109	16.7	11.7	3	1.2	< 0.5		< 0.02	0.005	< 1.1	11.1	1.02	5.2	< 0.01	1.219	0.682	< 0.5		2	0.18	< 0.025	< 0.009	15	0.8	<2	0.008	<u> </u>
10 Safate water sampling point. W1	Souga sate	CHA NATIVELY, STATE WAR NOT	10080-12 N. Ins. O	111			1							+ - 1		<u> </u>	<u> </u>		<u> </u>	-		_	-			<u> </u>				—
114	ologia sala	Cric Markey, datase water hanay	WAR'S	114	· · · · · · · · · · · · · · · · · · ·			<u> </u>	-	-		-	-	+ -						-			-	-	-	+				<u> </u>
115 Surface water W2/OSterwarts Bt. R.L.et		General Land TL Surface water	14-Sep 12	115		9.8		13.5	-		-		-					-					-	-		+				
118 Surface water: W2(OBremarts Br. RLee)		ERA: North Keny: Surface Water monthly	27-849-12	116			3.5	10.9	-		-												-	-		-				
117 Surface water: W2(OBremarts Br. R.Lee)		ERA: North Kery: Surface Water monthly	24-06-12	117			<1	11.4																						
118 Surface water: W3(OBiervan's Br. R.L.ee)		General Land III: Surface water	17-6ep-12	118		10	1	12.2																			2.23		0.02	4.5
118 Surface water: W2(OBremarts Br. R.L.et)		EFA: North keny: Sunface water annual	21 Nov 12	119	18.1	11.6	1	8	1.98		< 0.02	0.007	< 1.1	11.6	0.46	8.7	< 0.01	0.987	< 0.2	< 0.5		3.01	0.024	< 0.025	< 0.009	24	3.8	5.3	0.012	1
120 Surface water: W2(OBrenvaris Br. R.L.et)		EFA: North Keny: Surface Water monthly	10-Dec-12	120			<1			L										-		_		_		-				<u> </u>
12 Dised day 17		Council on the Defense of the	Citra C	124						<u> </u>				+					<u> </u>	-						+	- 0.00		0.040	
120 000003 62001 11 129 2000000 110000 11		Concell and Determine	11102012	120	12.6	10.0	3	11.9	-	<u> </u>	+	-	-							+		-	+		-	-	< 0.02		0.019	4.5
127 Relation Status C1		General and Brancouster	18/049-12	127	13.0	10.3	8	<u> </u>	+	+	+	-	+	+		<u> </u>		+	<u> </u>	+			+		+	+	< 0.02		0.032	4.5
128 Selected Station C2	1	General Land III: Surface water	18/Sep-12	128		10	5	1	1	1	1	1	1			1	1	1	<u> </u>	1		+	+	1	1	1	< 0.02		0.015	4.5
129 Bekopit al Station NI		General Landfil: Surface water	18-849-12	129		10.2	9	1		1								1		1						1	< 0.02		0.038	3.5
130				130																										
131				131																										
180 Surface water: SW-1	peviously ef	EFA: North Kerry: Surface Water monthly	16-Jan 12	180			3	8.7																						
181 Surface water, SW-1	peviously ef	EFA: North Keny: Surface Water monthly	2178-12	181			2	7.4		I			-			L	L	L		-		_	-			-				L
162 Surface water: SW-1	pevously e1	EPA3kofb kery: Surface water Quarterly	2948-12	182	16.5	10.9	<1	8.7																_						L
104 States when OK A	pevi06/je1	EVA. NOTI MELY, SUFFICE WARE NOTIFY FOLLOW LANCE STREET, Suffice water Constants	2140-12	184	15.2	10.5	<1	13.6	1	l	+	-	+	+		1	1	I	-	+		-	+	-	1	1	-			t
104 Dates arise 28.5	periody el	Environmenter and and an environmenter	Sint?	195	10.2	2.1		10.0	+		+			+		<u> </u>	<u> </u>		<u> </u>	-			+		+	+				└ ──
18 Surface water, SW-1	heavediet	EFA: Noth Keny, Surface Water northin	02-30-12	186			2	1	1	+	1	-	-			1	-	+	-	1		-	-	-	1	1	1			t
187 Surface water, SW-1		EPAtionth Nerv: Surface water Charterly	23-Aup-12	187	12.6	8.2	1	14.6	1	1		1						1		1		-	1	1	1	1	1			1
100 Surface water, SW-1		EFA: North Keny: Surface Water monthly	27-Sep 12	188			2.5	11																						
188 Surface water, SW-1		EFA: North Keny: Surface Water monthly	24-06-12	189			3.5	10.3																						
190 Surface water, SW-1		EPA: Noth kery: Suntace water annual	21 Nov 12	190	9.4	10.9	2	8.4	< 0.5		< 0.02	0.003	< 1.1	6.9	0.96	2.4	< 0.01	< 0.8	0.482	< 0.5		0.97	0.049	< 0.025	0.029	8	0.83	< 2	0.008	
191 Surface water, SW-1		EFA: North Keny: Surface Water monthly	10-060-12	191			<1																							
8				194																										1
18				195																		_								
201 Surges water, SW-2		EFR: North Kerry: Surface Water monthly	15-26-12	237			2	8.8		I			-					L		-		_	-	-		-	-			I
200 Surgite water, SW-2		CHK, NOTO KETY, SUFEX: WHEI NOTEN Fill them kety: Sufex: When noten	216912	238			5	7.5		 	+		+			I	I	I	I	-			+		+	+				—
200 Outline Mater, 200-0		Environmenty, all all half (using)	2788-12 11.4er/1	240		10.4	C1	7.0	+	<u> </u>	+	-	+			 		<u> </u>	l	+	<u> </u>		+		+	+	-			├ ──
241 Sarbas spin 58.2		Excitation and a second	3140-12	241		10.4		1.4	-	+	-	1	-			-	-	+	<u> </u>	+		-	+	-	-	+	+			t
242 Surface water, SW-2	1	EFA: North Keny: Surface Water monthly	15-J0-12	242			14	1	1	1	1	1	1			<u> </u>	1	1		1		-	+	-	1	1	1			I
243 Surface water, SW-2	1	EFA: North Kerry: Surface Water monthly	02-06-12	243			3	1	1	1	1	1	1			1	1			1		-	1		1	1	1			
				-								•					•		•	•			-			·				

Appendix 6 – Leachate Monitoring Lab Results

			Odour	Ammonium	Hd	BOD (5day)	Conductivity @ 20 oC	Chemical Oxygen Demand	Chloride	Dissolved Oxygen	Temperature	Potassium	Cadmium	Boron	Chromium	Sodium	iron	Calcium	zinc	Nickel	Lead	Arsenic	Magnesium	manganese	Copper	Mercury	Total Oxidis ed Nitrogen(TON)	Sulphate	Molybdate Reactive Phosphorous	Total Cyanide ^M	Fluoride
				NH4		02		02	CI	02		К	Cd	В	Cr	Na	Ee	Ca	Zn	Ni	Pb	As	Ma	Mn	Cu	Нα	NO3	SO4	Р	Cn	F
																														Varies	Varies
Location	Sample Date	Sampled By	Descriptive	mg/l	pH units	mg/l	µS/cm	mg/l	mg/l	mg/l	Degree s C	mg/l	ug/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l	mg/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	ug/l
Leachate: LD-1	29-Mar-12	Tim Supple	phenolic			-					11.6																		$ \rightarrow $!	I
Leachate: LD-1	30-May-12	Tómas O Sullivan	N.D								13																			'	L
Leachate: LD-1	23-Aug-12	Michael O Sullivan	sl.phenolic								12.5																			'	L
Leachate: LD-1	21-Nov-12	Andrew Scanlon	ND	20.08	6.5	1.5	347	32	26.1	<1	12.3	12.15	< 0.02	0.06	1.121	25.4	4.7	17.9	0.01	1.351	0.537	3.44	3.22	0.77	< 0.025	0.045	3.28	4.2	0.013	< 0.025	< 200
Leachate: LD-2	29-Mar-12	Tim Supple	sl phenolic								10.1																				
Leachate: LD-2	30-May-12	Tómas Ó Sullivan	earthy								14																			_	
Leachate: LD-2	23-Aug-12	Michael O Sullivan	ND								13																				
Leachate: LD-2	21-Nov-12	Andrew Scanlon	ND	27.08	7.5	1.2	682	47	48.5	<1	12.2	25.18	< 0.02	0.117	1.955	40	3.1	65.1	0.01	2.432	< 0.2	3.23	6.49	0.91	< 0.025	0.294	12.88	< 2	0.018	< 0.025	< 200
Leachate: LD-3	29-Mar-12	Tim Supple	ND/earthy								9.4																				
Leachate: LD-3	30-May-12	Tómas Ó Sullivan	sulphur/musty								13																				
Leachate: LD-3	23-Aug-12	Michael O Sullivan	ND								14.5																			_	
Leachate: LD-3	21-Nov-12	Andrew Scanlon	ND	193.76	7.8	9.8	2510	181	207.9	<1	8.8	100.84	0.091	0.479	8.283	188.9	2.7	91.3	0.01	13.567	0.207	3.7	22.21	4.35	< 0.025	0.045	14.66	81.2	0.086	< 0.025	< 200
Leachate: LL 1	18-Jan-12	Tómas O'Sullivan	Leachate smell	2.97	7.2	58	3320	318	332.5	< 2	12.1	133	0.034	0.77	16	259	24.5	84	0.04	27	1.48		32.17	3.51	< 0.025	0.611	12.19	23.3	0.173	< 0.025	< 200
Leachate: LL 1	29-Mar-12	Tim Supple	phenolic								12.9																				
Leachate: LL 1	30-May-12	Tómas Ó Sullivan	foul/leachy								16																				
Leachate: LL 1	23-Aug-12	Michael O Sullivan	phenolic								16.8																				
Leachate: LL 1	21-Nov-12	Andrew Scanlon	Strong Leachate Smell	361.25	7.5	840	4280	1700	380.1	<1	10.5	217.1	0.129	0.999	69.746	354.4	9.2	124.9	0.09	37.389	2.88	21.61	55.36	3.61	< 0.025	0.055	6.8	< 2	1.044	0.052	< 200
Leachate: LL 2	29-Mar-12	Tim Supple	phenolic								14.4																				
Leachate: LL 2	30-May-12	Tómas Ó Sullivan	dark brown								16.5																				
Leachate: LL 2	23-Aug-12	Tim Supple	phenolic								18																				
Leachate: LL 2	21-Nov-12	Andrew Scanlon	Slight Leachate Smell	26.78	8	12.3	2020	231	178.3	8.2	6.5	92.2	< 0.02	0.574	17.809	155.5	3.6	41.4	0.02	20.21	1.242	6.33	18.78	0.86	< 0.025	0.072	0.32	23.2	0.588	< 0.025	< 200
Leachate: LL 3	29-Mar-12	Tim Supple	musty								11.6																			,	1
Leachate: LL 3	30-May-12	Tómas Ó Sullivan	earthy								15																				
Leachate: LL 3	23-Aug-12	Tim Supple	earthy								16.5																				
Leachate: LL 3	21-Nov-12	Andrew Scanlon	Earthy	0.6	7.5	6.1	174	72	14.3	6.1	7	19.8	0.099	0.016	< 1.1	5.9	0.57	21	0.04	1.545	2.985	0.75	1.83	0.075	< 0.025	0.018	0.66	2.3	1.094	< 0.025	< 200

Appendix 6 – Ground Water Monitoring Lab Results

				Ammonium	Hď	Conductivity @ 20 oC	Chloride	Dis solv ed Oxygen	Temperature	Potassium	Total Organic Carbon Colour	Cadmium	poron	Chromium	Sodium	iron	Calcium	zinc	Nickel	Lead	Magnesium	manganese	Capper	Mercury	Arsenic	Hardness Alkalinity	Total Oxidised Nitrogen(TON)	Sulphate	Molybdate Reactive Phosphorous	Semi-Volatile Carbon (SVOC) ^M	Volatile Organic carbon (VOC) ^{vv} Carbon Disulinhide	Total Cyanide ⁴⁴	Fluoride (old units)	Dry Residues	Total Dissolved Solids Turbidity
				NH4			CI	02		к	C Hz	Cd	В	Cr	Na	Fe	Ca	Zn	Ni	Pb	Mg	Mn	Cu	Hg	As	CaCO CaCO 3 3	NO3	SO4	Ρ	SVOC	VOC VC	C Cn	F	7	DS SiO2
				0.223	5 10	1000	187.5				-	5	0.75	50	200				15	10				1		-	50		0.03	-		0.05		-	-
				-	4.5		-	1	_		-	-	-	-					-	-				-		-	-			-	-	-	-	-	
Location	Date e	ampi Time	Sampled By	mg/l	pH units	µS/cm	mg/l	mg/l	es C	mg/l	mg/l Haz	∍ ug/l	mg/l	ug/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l	mg/l	mg/l	ug/l	ug/l	mg/l mg/l	mg/l	mg/l	mg/l	ug/l	ug/l ug	1 mg/l	ug/l	mg/l r	ng/I T.U.'s
Groundwater :Borehole No 1	18-Aug-10 1	3:52	Andrew Scanlon	< 0.0	2 5.7	154	32	1.2	10.6	4.50	3.5	0.40	0.040	40.0	00.0	0.04	40.0	0.04	40.0		5.00	0.50	0.005				44.05	6.4	0.40			-			
Groundwater :Borehole No 1 Groundwater :Borehole No 1	29-Mar-12 1	3:55 0:40	Tómas Ó Sullivan	< 0.09	2 5.8	177	35.6	3.2	10.2	1.58	20.7	0.12	< 0.1	3.1	36.3	0.98	13.3	0.04	7.0	11.0	9.2	2.58	< 0.025	< 0.1	5	30	14.25	5.4	0.12			< 0.00	5 < 200	J 4810	
Groundwater :Borehole No 1	30-May-12 1	0:10	Tim Supple	< 0.0	2 5.7	172	31.3	2.7	10.2		13.6 150	0.01														46							-		1980
Groundwater :Borehole No 1 Groundwater :Borehole No 1	23-Aug-12 1 22-Nov-12 0	1:00 9:30	Tim Supple Andrew Scanlon	0.03	6.9 2 6.7	184 219	24.5	2.4	11.1 9.4	2.44	33 526 19.2 139	0.56	0.009	29.3	11.8	23.6	34.9	0.09	39.2	52.3	5.1	1.36	0.058	0.012	2.92	72 107 116	8.68	12.6	0.15	< 20	11.2 11	2 < 0.00	5 < 200	0 6206 1	358 3200
																																		-	-
Groundwater :Borehole No 2 Groundwater :Borehole No 2	18-Jan-12 1 29-Mar-12 1	1:57	Tómas Ó Sullivan	0.04	6.8	321	49.8	10.1	9.5	0.93	16.8	0.08	0.067	< 1.1	21.9	1.17	25.6	0.03	1.3	1.6	6.43	0.34	< 0.025	0.11	12	107	2.05	< 2	0.009			< 0.00	5 < 200) 230	——
Groundwater :Borehole No 2	30-May-12 1	1:15	Tómas Ó Sullivan	< 0.0	2 6.5	292	63.7	9.5	12.7		6.2 55	0.01	~ 0.1	5.00	02.1	0.10	20.0	0.00	~ 1		0.00	0.00	< 0.020		~~	84							-		9.11
Groundwater :Borehole No 2 Groundwater :Borehole No 2	23-Aug-12 1	1:30	Tim Supple	< 0.0	2 6.5	297	53.3	8.5	11.8	0.95	10 45	0.14	0.004	211	27	0.70	14	0.02	2.6	11	5.56	0.62	< 0.025	0.052	< 0.5	62 24		-2	0.011	< 20	< 10 2		5 < 200	0 227	12.3
Groundwater :Borehole No 2	10-Jan-13 1	6:20	Tim Supple	< 0.0	2 3.5	200	01.0	0.0	3.4	0.05	0.7 128	0.14	0.004	81.1	21	0.73	14	0.02	0.0	1.1	3.50	0.02	< 0.025	0.032	< 0.5	03 24	2.46	~2	0.011	< 20	< 10 3.	0.00	5 < 200	231	20.0
Croundwater (Berehele No.2	10 lon 12 1	0.45	Támas Ó Sullivas	0.53	6.0	242	22.4	26	0.5	2.26	21.5	.00	0.055	.1.1	10.1	0.07	20	0.02	27	12	10.47	0.00	- 0.025	0.12		150	2.12	2.0	0.008		. 10	.0.0	5 . 20	0 216	
Groundwater :Borehole No 3	29-Mar-12 0	9:40	Tim Supple	0.04	6.6	310	17.5	6.8	9.2	1.62	18.3	0.02	< 0.1	< 1.1	24.7	6.42	22.4	0.03	<1	2.0	12.47	2.27	< 0.025	0.12	4	159	2.13	2.0	0.008	< 1	< 10	< 0.00	5 < 200	5 210	
Groundwater :Borehole No 3	30-May-12 1	1:45	Tómas Ó Sullivan	0.02	6.7	368	18.6	4.2	12.4		20 297															152								\mp	51.4
Groundwater :Borehole No 3 Groundwater :Borehole No 3	23-Aug-12 1 22-Nov-12 0	9:41	Andrew Scanlon	0.05	6.5	276	19.6	4.1	14.7 8.8	1.46	21.3 59	< 0.0	2 0.012	< 1.1	21.3	1.81	19.4	0.02	1.7	1.8	17.43	1.91	< 0.025	0.336	1.23	3 122 132	< 0.02	< 2	0.008	< 20	< 10 3.	2 < 0.00	5 < 200	J 194	189 11.3
Groundwater :Borehole No 4 Groundwater :Borehole No 4	18-Jan-12 1 29-Mar-12 1	4:40 1:15	Tómas Ó Sullivan Tómas Ó Sullivan	8.55	6.7	190	17.9	2.8	8.3 9.5	1.35	32.6	0.13	< 0.1	1.2	9.5	13.23	23.6	0.05	51.1 36.0	2.6	1.49	0.65	0.04	< 0.1	< 2	80	3.02	< 2	0.027	< 1	11.6	< 0.00	5 < 200) 203	
Groundwater :Borehole No 4	02-Apr-12 1	5:20	Andrew Scanlon	0.03						1.01	10.6	0.07	< 0.1	< 1.1	14.4	0.78	10.2	0.02	5.8	< 2	10.08	3.27	< 0.025										-		
Groundwater :Borehole No 4 Groundwater :Borehole No 4	02-Apr-12 1	5:30 5:40	Andrew Scanlon	0.02						1	8.2	0.05	< 0.1	< 1.1	14.6	1.45	11.3	< 0.02	6.2	< 2	10.42	3.57	< 0.025											++	——
Groundwater :Borehole No 4	02-Apr-12 1	5:50	Andrew Scanlon	0.02						1.02	9.1	< 0.0	5 < 0.1	< 1.1	14.7	2	12.3	< 0.02	5.7	< 2	10.45	3.65	< 0.025										-		
Groundwater :Borehole No 4 Groundwater :Borehole No 4	02-Apr-12 1	6:00 6:10	Andrew Scanlon	0.02						1	8.2	< 0.05	5 < 0.1	< 1.1	14.5	1.46	12.2	< 0.02	5.5	< 2	10.44	3.55	< 0.025				-							+	——
Groundwater :Borehole No 4	02-Apr-12 1	6:20	Andrew Scanlon	0.03						1.03	12.7	0.09	< 0.1	< 1.1	13.8	2.87	9.1	0.02	6.1	6.0	11.11	3.68	< 0.025										-		
Groundwater :Borehole No 4	30-May-12 1	1:25	Tim Supple	0.02	5.9	209	18.7	1.4	10		9.2 80				_		_									59									12
Groundwater :Borehole No 4	21-Nov-12 1	4:35	Andrew Scanlon	0.02	6	187	19.5	1.5	9.6	1	10.2 34	< 0.0	2 0.004	< 1.1	14.6	0.84	9.2	0.02	7.2	0.4	10.12	4.03	< 0.025	0.111	< 0.5	90 80	0.2	< 2	< 0.005			< 0.00	.5 < 200	J 140	137 4.76
Croundwater (Berehele No F	10 100 12 1	2-50	Támas Ó Sullivas	1 40	6.4	240	20.2	4.0	10.1	1.25	21.1	0.04	0.000	2.2	10.4	24.64	25.0	0.04	0.0	5.2	0.70	7.40	- 0.025	-0.1			1.00	2.2	0.008	. 1	11.2	.0.0	5 . 20		
Groundwater :Borehole No 5	29-Mar-12 1	1:10	Tim Supple	1.14	6.1	249	36	4.0	10.1	1.8	20.3	< 2	< 0.1	2.2	20.9	27.67	10.8	0.04	< 1	< 2	2.12	1.52	< 0.025	< 0.1	2		1.99	2.3	0.008	< 1	11.2	< 0.00	5 < 200	5 559	
Groundwater :Borehole No 5	30-May-12 1	2:30	Tómas Ó Sullivan	1.02	6.1	248	30.1	2.7	10.7		11.6 182	0														54								+	637
Groundwater :Borehole No 5	21-Nov-12 1	5:25	Andrew Scanlon	1.29	6.2	279	27.4	2.2	14.5	1.12	14.3 147	6 < 0.0	2 0.002	3.9	17.8	61.6	5.4	0.02	6.9	2.7	2.1	0.40	< 0.025	0.013	9.54	25 76	< 0.02	4.1	0.036			< 0.00	.5 < 200) 624 :	209 228
Croundwater (Berehele No.6	10 lon 12 1	2.25	Andrew Cooplan	.00	2 6 2	124	22.6	<i>e E</i>	0.7	0.72		0.08	0.002		12.0	0.29	6.2	0.1	0.2	2.2	5.04	0.20	- 0.025	-0.1		24	2.20	2.2	0.006			.0.0	5 . 20	0 112	
Groundwater :Borehole No 6	29-Mar-12 1	0:00	Tómas Ó Sullivan	0.023	2 0.2	141	22.0	6.3	9.7	1.01	5.9	0.08	< 0.1	< 2	14.6	< 0.04	5.5	0.06	4.0	< 2	6.42	0.20	< 0.025	< 0.1	< 2	34	2.39	2.3	0.000			< 0.00	5 < 200	J 112	
Groundwater :Borehole No 6	30-May-12 1	0:40	Tim Supple	< 0.0	2 6	156	22.3	5.1	10.8		5 35															45								+	5.09
Groundwater :Borehole No 6 Groundwater :Borehole No 6	23-Aug-12 1 22-Nov-12 1	0:02	Andrew Scanlon	< 0.02	2 5.7	140	22.1	4.8	9.5	0.82	5.1 35	0.06	0.004	< 1.1	14.7	0.21	5.4	0.02	4.6	1.0	6.63	0.24	< 0.025	< 0.009	< 0.5	45 35	3.33	2.3	0.01			< 0.00	5 < 200	0 104	97 6.67
0	40.10.10		Time 6 a.m.	-			40.5		0.5				0.77					0.77	4.5		0.51	0.71	0.000						0.077			-	-		
Groundwater :Dennis O'Mahony Groundwater :Dennis O'Mahony	18-Jan-12 1 29-Mar-12 1	5:54 1:30	Tómas Ó Sullivan Tómas Ó Sullivan	< 0.02	2 5.7	89	13.6	4.2	8.9	< 0.5	11.2	0.09	0.005	< 1.1	8.2	0.53	6.3	0.02	1.6	1.1	2.91	0.21	0.035	< 0.1		27	0.39	< 2	0.006			< 0.00	5 < 200	5 68	
Groundwater :Dennis O'Mahony	30-May-12 1	1:55	Tim Supple	0.05	5.6	109	13.1	2.3	12.6		5.7 80															33								+	7.16
Groundwater :Dennis O'Mahony Groundwater :Dennis O'Mahony	23-Aug-12 1: 21-Nov-12 1:	4:53	Andrew Scanlon	0.04	5.7	67	9.3	4.3	13.9	< 0.5	9.1 123	0.05	0.004	< 1.1	6.7	0.91	4.9	0.03	2.6	2.7	2.08	0.15	0.067	0.04	1.04	35 26 20	1.89	<2	0.007			< 0.00	5 < 200	3 72	68 6,12
Groundwater :Gerry Sugrue Groundwater :Gerry Sugrue	18-Jan-12 1 29-Mar-12 1	4:27	Andrew Scanlon Tim Supple	< 0.0	2 5.8	158	25.3	8.5 9.2	9	0.67	6.3	0.09	0.008	< 1.1	12.1	0.03	9.1	0.1	5.2	3.1	6.8	0.04	0.16	< 0.1		28	11.25	5.1	0.006			< 0.00	5 < 200	J 113	+-
Groundwater :Gerry Sugrue	30-May-12 1	3:30	Tómas Ó Sullivan	< 0.0	2 5.7	193	23.3	6.4	14.3		4.6 < 5															65									0.32
Groundwater :Gerry Sugrue	23-Aug-12 1	6:15	Tim Supple	< 0.0	2 6.2	197	23.1	7	16.1	0.79	9.2 <5	0.05	0.009	<11	12	0.12	14 9	0.12	5.1	3.4	77	0.03	0.14	0.345	< 0.5	74 68 42	14.05	5.8	0.006	I		< 0.00	5 < 201	148	0.75
Groundwater :Gerry Sugrue	10-Jan-13 1	6:50	Tim Supple	0.01	0.1	1.00	20.0	0.0		5.75		0.00	0.000	2.01		0.10	14.0	0.10	0.1	0.4	1	0.00	0.14	0.040			10.63	0.0	0.000	1		- 0.00	200		

Appendix F: PRTR 2012



10/05/20

site treatment (either recovery or disposal

y or alspossa activities) ? This question is only applicable if you are an IPPC or Quarry site

4.1 RELEASES TO AIR Link to previous years emissions data

(PRTR# W000) / Facility Name - Acris Karry Landbill Site (Planama - Copy of Copy of e0001_2012.star) Ration Year - 2012 (

100500131415

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

his section in KGs
QUANTITY
and the second
(Total) KG/Year A (Accidental) KG/Year F (Fugitive) KG/Year
1332874.0 0.0 0.0
11430.0 0.0 0.0
A A A A A A A A A A A A A A A A A A A

* Select a row by struble-cloking on the Polutant Name (Column B) then slick the delate butto

SECTION 8 : REMAINING PRTR POLLUTANTS

Additional Data Requested from Landfill operators

	RELEASES TO AIR			- the second s	Please enter all quantities	in this section in KGe		
	POLLUTANT			IETHOD	No construction of the second s	Sector second sector	QUANTITY	454
		hotomad	interreption	Method Used		100000000000000		and the second s
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.	p .	0.0 0.	0.0

* Select a row by double-clicking on the Pollutant Name (Column B) then dick 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		
5 (c)	POLLUTANT		112	METHOD	accession and the second second	and the set of the set	QUANTITY	300
				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

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

For the purposes of the National Inventory on Graenhouse Gases, landfill operators are neguesited to provide summary data on landfill gas (Nethane) fared or utilised on their factilities to accompany the figures to total methane generated. Operators should only report their fact methane (CH4) enhances to the enformant rateries Totals (RGyr to Section A: Rector specific PIRTs Redutants above. Heave complete the fable below: Landfilt North Kerry Landfil Site Please enter summary data on the uantities of methane flared and / or utilised Method Used Designation or Facility Total Capacity m3 T (Total) kg/Year M/C/E Method Code Decoription per hour Total estimated methane generation (as per site LandGem Model 3.02 model 1701000 other N/A Landfill Gas Survey 2012 Landfill Gas Survey 2012 LandGem Model 3.02 180.0 (Total Flaring Capacity) 143.0 (Total Utilising Capacity) Methane flared 2645.0 M Other Methane utilised in engine/s 365481.0 C Other Net methane emission (as reported in Section A C Other 1332874.0 minus Landfill Gas Survey N/A above

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Image: Control of the contro				Quantity						Licence/Permit No of Next Destination Facility Non Haz Wester	Hat Waste Address of Net Destruction Feolity	Name and License / Permit No. and	Actual Address of Final Destination
Transfer Destination European Waste Code Hazardous Description of Waste Treatment Operation Waste Treatment Operation Location of Treatment Location of Treatment Trade Wastewater Treatment Philage_WCP-CK-09-0691- Not Kerry Landfil Multipachate of the Inteland Trade Wastewater Treatment Philage_WCP-CK-09-0691- Not Kerry Landfil Multipachater of the Inteland Trade Wastewater Treatment Philage_WCP-CK-09-0697- Not Kerry Landfil Multipachater of the Inteland Trade Wastewater Treatment Philage_WCP-CK-09-0697- Not Kerry Landfil Multipachater of the Inteland Trade Wastewater Treatment Philage_WCP-CK-09-0677- Not Kerry Landfil Multipachater of the Inteland Trade Wastewater Treatment Philage_WCP-UK-09-0677- Not Kerry Landfil Multipachater of the Inteland Trade Wastewater Treatment Philage_WCP-UK-09-0677- Not Kerry Landfil Multipachater of the Inteland Trade Waste				(Tonnes per Year)			5	Method Used		Name and Licence/Permit No of Recover/Disposer	Non Hat Waster Address of Recover/Disposer	Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	La. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
Transfer Destination Code Hazandous Description of Waste Operation MrC:E Method Used Treatment Within the Country 19 07 03 No 69063.01 19 07 02 D8 M Wegned Offstle in Ireland D Finucane Builde Trade Wastewater Treatment Within the Country 20 03 01 No 264.0 m/edit municipal waste D5 M Wegned Offstle in Ireland No Augnacureen, Agnade, Kilam Within the Country 20 03 01 No 18.0 m/edit municipal waste D5 M Wegned Offstle in Ireland KWD Recycling, W0217-01 Augnacureen, Agnade, Kilam Within the Country 20 02 01 No 47.0 biodegradate waste R3 M Wegned Offstle in Ireland Bort Na Mona, W0197-01 Kibery, Co Kidare, Ireland Within the Country 20 01 01 No 34.0 paper and cardboard packaging R3 M Wegned Offstle in Ireland Mona, W0197-01 Kibery, Co Kidare, Ireland Within the Country 20 01 01 No 51.0 paper and cardboard R3 M Wegned Offstle in Ireland Murate and Recycling, WCP-4k-08-007- Kerne, Tree, Co Within the Country 20 01 01 No 51.0 paper and cardboard R3		European Waste				Waste Treatment		100.00 - 100.000	Location of				
Within the Country 19 07 03 No Bodicate other than those mentioned in escondard other than those mentioned in escondard other than those mentioned in escondard packaging M Wegned Offstie in Ireland Trailee Wastewater Treatment Haulage.WCP-Ck-09-061 of North Kerry Landhul Aughacu.WCP-Ck-09-061 of North Kerry Ke	Transfer Destination	Code	Hazardous		Description of Waste	Operation	M/C/E	Method Used	Treatment				
Installe under the finant those mentioned in Hautage/WCP-CK-09-0051 Maitage/WCP-CK-09-0051 Maitage/WCP-CK-09-0071 Maitage/WCP-CK-09-071 Maitage/WCP-CK-09-071 Maitage/WCP-CK-09-071 Maitage/WCP-CK-09-071 Maitage/WCP-CK-09-071 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>Finucane Burke</td><td>Tralee Wastewater Treatment</td><td></td><td></td></t<>										Finucane Burke	Tralee Wastewater Treatment		
Within the Country 20 03 01 No 264.0 mixed municipal waste D5 M Weighed Onste of generatio Site, W0001 Munigraminnane, Kleiduff, Tral ex, Kerry, Teland Within the Country 20 03 01 No 18.0 mixed municipal waste R3 M Weighed Offstle in Ireland KWD Recycling, W0217-01 ey, Co Kerry, Treland Within the Country 20 02 01 No 47.0 biodegradakle waste R3 M Weighed Offstle in Ireland Bord Na Mona, W0196-01 (Green tar Recycling, W0217-01) Kiberry, Co Kidare,, Ireland Within the Country 15 01 01 No 34.0 paper and cardboard packaging R3 M Weighed Offstle in Ireland Granmire, Cork,, Ireland Within the Country 20 01 01 No 51.0 paper and cardboard R3 M Weighed Offstle in Ireland Initianal Bord Na Mona, W0196-01 (Munster, W0138 Kiberry, Cork,, Ireland Within the Country 20 01 01 No 51.0 paper and cardboard R3 M Weighed Offstle in Ireland Diton Waste and Recycling, WCP-LK-08-0077- Kerry, Ireland Diton Waste and Ra M Weighed Offstle in Ireland Diton Waste and Recycling, WCP-LK-08-0077- Kerry, Ireland Diton Waste and Ra<	Within the Country	19.07.03	No	69063.01	landfil leachate other than those mentioned in 19.07.02	DS	м	Weighed	Offsite in Ireland	Haulage,WCP-CK-09-0691- 01	Plant, The Kerrles, Tralee , Co Kerry Ireland		
Within the Country 20 0 0 0 1 No 204 0 meet municipal wase DS M Weighed Onsile of generatio Sile, Would in Augustation (Muscal Magnet Aghadoe, Kilam) Within the Country 20 0 3 01 No 18.0 mixed municipal wase R3 M Weighed Offsile in Ireland KWD Recycling, W0217-01 ey, Co Kerry, Ireland Within the Country 20 0 2 01 No 47.0 biodegradable waste R3 M Weighed Offsile in Ireland Bord Na Mona, W0198-01 Kiberry, Co Kildare,, Ireland Within the Country 15 01 01 No 34.0 paper and cardboard packaging R3 M Weighed Offsile in Ireland Grantine, Cork,, Ireland Within the Country 15 01 01 No 51.0 paper and cardboard R3 M Weighed Offsile in Ireland Initian Bord Na Mona, W0198-01 Kiberry, Co Kildare,, Ireland Within the Country 10 01 No 51.0 paper and cardboard R3 M Weighed Offsile in Ireland Dilon Waste and Recycling, The Recycling, WCP-LK-08-0077- Kernlish Take, Co Kernlish Take, Co Kernlish and Dilon Waste and Recycling, WCP-LK-08-0077- Within the Country 20 01 01 No 51.0 paper and cardboard R3 M Weighed <t< td=""><td></td><td></td><td></td><td>004.0</td><td></td><td></td><td></td><td></td><td>Construction of Construction</td><td>North Kerry Landfill</td><td>Mulngnaminnane, Kleiduff, Trai</td><td></td><td></td></t<>				004.0					Construction of Construction	North Kerry Landfill	Mulngnaminnane, Kleiduff, Trai		
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5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE | Private Wood | Facility Mene, North Harry Landle Stal | Feature and Upper of Wood | 2012.des | Return Year 2012 | Please enter all quantities on this sheet in Tonnes

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Appendix G: Landfill Gas Survey]



A survey of landfill sites to determine the quantity of methane flared and or recovered in utilisation plants for 2012



Please note that the closing date for reciept of completed surveys is 31/03/2013

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: <u>LFGProject@epa.ie</u>

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_2012) to: LFGProject@epa.ie to be filled in by licensee

calculated by spreadsheet

Engine No. 1													
	Engine typ	e?				Other			Je	enbacher J20	B GS		
	Month /yea	ar comissioned '	?			November	2011	•					
	Month dec	omissioned if de	ecomission	ed in 2012 ?	, ,	Select							
Monthly	Method	Runtime	Runtime	Downtime	Total runtime	Average Inlet	Average Flow	Average CH ₄	Average CO ₂	Average O ₂	Combustion	Total CH ₄	Total CH ₄
	M/C/E	days/month	hrs/day	hrs	hrs/month	Pressure (mbg)	Rate (m ³ /hr)	%v/v	%v/v	%v/v	efficiency (%)	m ³	kgs
January	М	31	24	21	723	-60	100	52.60	34.00	2.70	98.0	37,269	24,209
February	М	28	24	19	653	-58	145	50.50	34.30	1.80	98.0	46,860	30,502
March	М	31	24	36	708	-70	150	45.50	33.00	1.70	98.0	47,355	30,437
April	М	30	24	8	712	-57	135	43.50	33.00	1.30	98.0	40,976	26,700
May	М	31	24	13	731	-56	130	37.80	30.70	1.70	98.0	35,203	22,963
June	М	30	24	19	701	-44	130	39.80	32.50	1.00	98.0	35,544	23,476
July	М	31	24	20	724	-34	145	41.50	34.10	1.00	98.0	42,695	28,490
August	М	31	24	28	716	-44	140	41.00	34.10	1.00	98.0	40,276	26,601
September	М	30	24	2	718	-49	135	39.80	32.00	1.00	98.0	37,807	24,841
October	М	31	24	6	738	-40	145	45.00	36.70	1.00	98.0	47,191	31,297
November	М	30	24	31	689	-26	180	58.70	42.00	1.00	98.0	71,344	47,995
December	М	31	24	73	671	-22	180	60.00	40.00	1.00	98.0	71,019	47,970
Total					8,484							553,539	365,481

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

Yearly	Method	Runtime	Runtime	Downtime	Total runtime	Average Inlet	Average Flow	Average CH ₄	Average CO ₂	Average O ₂	Combustion	Total CH ₄	Total CH ₄
	M/C/E	days/year	hrs/day	hrs	hrs/year	Pressure (mbg)	Rate m ³ /hr	%v/v	%v/v	%v/v	efficiency (%)	m³	kgs
2012					0						98.0	0	0

to be filled in by licensee

calculated by spreadsheet

Flare No. 1													
	Flare type	?				Biogas BG24	58 🔽		Biogas 500	m3/hr modula	ar ground flare		
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Monthly	Method	Runtime	Runtime	Downtime	Total runtime	Average Inlet	Average Flow	Average CH	Average CO	Average O ₂	Combustion	Total CH4	Total CH4
monuny	M/C/F	davs/month	hrs/day	hrs	hrs/month	Pressure (mba)	Rate (m ³ /hr)	%v/v	%v/v	%v/v	efficiency (%)	m ³	kas
Januarv					0	(70070	70070	70070	98.0	0	0
February					0						98.0	0	0
March					0						98.0	0	0
April					0						98.0	0	0
May					0						98.0	0	0
June					0						98.0	0	0
July					0						98.0	0	0
August					0						98.0	0	0
September					0						98.0	0	0
October					0						98.0	0	0
November					0						98.0	0	0
December	М	3	24.0	0.0	72	-15	180	60.00	40.00	1.00	98.0	7,620	5,184
Total					72							7,620	5,184
Please note	: Only fill th	e "Yearly" ta	ble if data i	s not availab	e or cannot be ca	alculated nor est	mated on a month	nly basis					
Yearly	Method	Runtime	Runtime	Downtime	Total runtime	Average Inlet	Average Flow	Average CH ₄	Average CO ₂	Average O ₂	Combustion	Total CH ₄	Total CH ₄

Yearly	Method	Runtime	Runtime	Downtime	Total runtime	Average Inlet	Average Flow	Average CH ₄	Average CO ₂	Average O ₂	Combustion	Total CH ₄	Total CH ₄
	M/C/E	days/year	hrs/day	hrs	hrs/year	Pressure (mbg)	Rate m ³ /hr	%v/v	%v/v	%v/v	efficiency (%)	m³	kgs
2012					0						98.0	0	0

Appendix H: Fish Survey

FISH SURVEY IN THE VICINITY OF NORTH KERRY LANDFILL AT MUINGNAMINNANE, COUNTY KERRY

September 2012



Conservation Services, Tullaha, Glenflesk, Killarney, Co. Kerry Tel/Fax 064 6630130 e-mail cs@conservation-services.ie

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3 3.1 3.2 3.3 3.4	RESULTS AND DISCUSSION WESTERN STREAM NORTHERN STREAM AND GLASHOREAG RIVER EASTERN STREAM SUMMARY OF FISH DATA	6 6 7 8
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APPENDIX 1	HABITAT ASSESSMENT AND FISH DATA AT
	SAMPLING SITES

1 INTRODUCTION

As part of the ongoing monitoring of water quality in the vicinity of North Kerry Landfill site at Muingnaminnane, Conservation Services, Ecological & Environmental Consultants have been commissioned by Kerry County Council to carry out qualitative fish assessment at five locations adjacent to the landfill site. Sampling was carried out on 29 September 2012.

2 METHODOLOGY

2.1 SITE SELECTION

The fish survey was carried out at five sites specified by Kerry County Council. These sites were most recently assessed by Conservation Services in September 2012 (Conservation Services 2012). The location of the sites is shown on Map 1.

2.2 HABITAT ASSESSMENT

Habitat assessment was carried out at each of the five sites. The sites were assessed in terms of:

- Stream width and depth
- Substrate type, listing substrate fractions in order of dominance, i.e. large rocks, cobble, gravel, sand, mud etc.
- Flow type, listing percentage of riffle, glide and pool in the sampling area
- Instream vegetation, listing plant species occurring and their percentage coverage of the stream bottom at the sampling site
- Dominant bankside vegetation, listing the main species overhanging the stream
- Estimated summer cover by bankside vegetation, giving percentage shade of the sampling site
- Rating of the site as potential habitat for trout adult, nursery and spawning on a scale of Poor/Fair/Good/Very Good/Excellent. This rating assesses the

physical suitability of the habitat; the presence/absence/density of salmonids at the site will also depend on present and historical water quality and accessibility of the site to fish.

2.3 ASSESSMENT OF FISH STOCK

Timed electrofishing was carried out at sites shown on Map 1, to provide a Catch Per Unit Effort (CPUE) index of the salmonid population density. The area fished was measured to provide a minimum estimate of salmonid population density. Fish were captured using a Safari Research Surveyor pulsed direct current backpack electrofisher. Prior to handling, fish were anaesthetised in a benzocaine solution to reduce handling stress. Fork length of salmonid age was determined by length frequency distribution combined with scale reading using a high power binocular microscope. Data from all sites electrofished are presented in Appendix 1. Summary data are presented in Tables 1-3.



3 RESULTS AND DISCUSSION

Results of electrofishing are detailed in Appendix 1, summarised in Tables 1-3, and illustrated in Figs. 1-3 (Catch per Unit Effort) and 4-6 (Minimum Density). It should be noted that actual fish density will be greater than minimum density, which is based on a single electrofishing pass without stop nets. Salmonid length-frequency distributions are shown in Figs. 7 & 8.

3.1 WESTERN STREAM

A catch per unit effort (CPUE) of 1 juvenile trout per 5 minutes fishing time (minimum density 0.014 m^{-2}) was recorded at site W2, representing a small trout population. Small numbers of eels were also recorded. The results indicate a decrease in the trout population since 2005, when monitoring indicated a good population of juvenile trout.

3.2 NORTHERN STREAM AND GLASHOREAG RIVER

Results of electrofishing indicate a moderate population of juvenile brown trout and a moderate population of juvenile salmon in the Northern Stream upstream of the confluence with the Glashoreag River, with a CPUE of 4 juvenile trout and 7 juvenile salmon per 5 minutes at Site N1 (minimum density 0.064 m⁻² juvenile trout and 0.096 m⁻² juvenile salmon). A small number of adult trout (CPUE 1 per 5 minutes, minimum density 0.016 m⁻²) and a small number of eels were also recorded.

Results of electrofishing indicate a moderate population of brown trout and a good population of juvenile salmon in the Glashoreag River upstream of the confluence with the Northern Stream, with a CPUE of 2 juvenile trout, 3 adult trout and 11 juvenile salmon per 5 minutes fishing time at Site G1 (minimum density 0.016 juvenile trout m⁻², 0.022 adult trout m⁻² and 0.084 juvenile salmon

m⁻²); a small number of eels were also recorded. At Site G2, downstream of the confluence with the Northern Stream, small numbers of brown trout and good numbers of juvenile salmon were recorded, with a CPUE of 1 juvenile trout and 12 juvenile salmon per 5 minutes fishing time (minimum density 0.009 juvenile and 0.003 adult trout m⁻² and 0.109 salmon m⁻²). Results indicate little change in salmonid populations at Site G1 compared with 2005, while at Site G2 they indicate a slight decrease in juvenile trout and a significant increase in juvenile salmon since 2005.

(Note: With regard to the minimum density results, it would be expected that the proportion of the total fish population captured would be very much greater in the Northern Stream, which is 2-3m wide and up to 25cm deep, than in the main Glashoreag River, which is 5-8m wide and up to 50cm deep. Actual salmonid densities in the main channel of the Glashoreag River may be more than double the minimum densities, whereas in the Northern Stream a high proportion of the fish present are likely to have been captured in the single pass electrofishing.)

3.3 EASTERN STREAM

No fish were captured at site E2 in the Eastern Stream. As no fish were recorded at this site in 2001, and small numbers of trout were recorded in the years 2002-2005, this result does not necessarily indicate a significant change at this site.

3.4 SUMMARY OF FISH DATA

TABLE 1 SUMMARY OF FISH CATCH AT EACH SITE

Numbers caught are given for salmonids; where non-salmonid species were taken, their presence is recorded.

	0+ trout	1+ trout	2+ and older trout	0+ salmon	1+ salmon	Eels
Site W2	-	3	-	-	-	3
Site N1	2	6	2	5	7	2
Site G1		8	11	16	26	3
Site G2	1	2	1	28	8	-
Site E2	-	-	-	-	-	-

TABLE 2 SUMMARY OF SALMONID CATCH PER UNIT EFFORT AT EACH SITE

To calculate catch per unit effort, the catch figures and fishing time are combined to calculate the theoretical catch per 5 minutes fishing.

	0+ trout	1+ trout	2+ and	0+	1+	Eels
			older	salmon	salmon	
			trout			
Site W2	-	1	-	-	-	+
Site N1	1	3	1	3	4	+
Site G1	-	2	3	4	7	+
Site G2	-	1	-	9	3	-
Site E2	-	-	-	-	-	-

TABLE 3 SUMMARY OF MINIMUM SALMONID DENSITIES

Minimum density is based on single pass electrofishing without stop nets; actual density will be higher.

			Minimu	n Densiti	es per m²	
	Area fished M²	0+ trout	1+ trout	2+ and older trout	0+ salmon	1+ salmon
Site W2	210	0.000	0.014	0.000	0.000	0.000
Site N1	125	0.016	0.048	0.016	0.040	0.056
Site G1	500	0.000	0.016	0.022	0.032	0.052
Site G2	330	0.003	0.006	0.003	0.085	0.024
Site E2	130	0.000	0.000	0.000	0.000	0.000

Fig. 1 Salmonid catch per unit effort









Fig. 3 Salmon catch per unit effort

Fig. 4 Salmonid Minimum Density













Fig. 7 Trout length-frequency distribution



Fig. 8 Salmon length-frequency distribution





7 8 9 10

Fork length (cm)

 $Q_{i} = 2$

11 12

5 6

4 REFERENCES

Conservation Services (September 2005) Biological Monitoring of Surface Water Quality in the vicinity of North Kerry Landfill at Muingnaminnane, County Kerry. Unpublished Report to Kerry County Council **APPENDIX 1**

HABITAT ASSESSMENT AND FISH DATA AT SAMPLING SITES

	¥
Site Code	W2
Grid Ref u/s	Q 92605 15049
Grid Ref d/s	Q 92556 15055
Site Photograph	
Width (m)	3
Depth (cm)	40
Water clarity	Slightly coloured
Substrate	Cobble, Gravel, Large rocks, Sand
Flow Type	Riffle 65% Glide 30% Pool 5%
Instream Vegetation	None
Dominant Bankside Vegetation	Hazel, Ash, Willow
Estimated % summer Cover of Stream by Bankside Vegetation	65%
Trout Adult Habitat	Good-Fair
Trout Nursery Habitat	Good
Trout Spawning Habitat	Fair
Area fished	3m x 70m
-----------------------	------------------
Fishing time (min)	17
Fish species recorded	Brown Trout, Eel

Brown Trout	_
Fork Length (cm)	Age
9.0	
9.1	1+
9.7	

Note: One further c. 9cm trout was seen but not captured

Eel Length (cm) 23.0 25.5 33.0

Site Code	N1
Grid Reference u/s	Q 95478 19251
Grid Reference d/s	Q 95510 19233
Site Photograph	
Width (m)	2-3
Depth (cm)	5-25
Water clarity	Highly coloured
Substrate	Cobble, Large rocks, Gravel, Mud, Sand
Flow Type	Riffle 20% Glide 80%
Instream Vegetation	Bryophyta 50% Filamentous algae 5%
Dominant Bankside Vegetation	Grass, Willow, Rush, Bramble
Estimated % summer Cover of Stream by Bankside Vegetation	8%
Trout Adult Habitat	Fair
Trout Nursery Habitat	Good-Fair
Trout Spawning Habitat	Fair-Poor
Length fished	Area 2.5m x 50m

Fishing time (min)	10
Fish species recorded	Brown Trout, Salmon, Eel

Age 0+	
1+	
2+	•
	Age 0+ 1+ 2+

Eel	
Length (cm)	Age
17.5	-
34.5	

Site Code	G1
Grid Reference u/s	Q 95264 19310
Grid Reference d/s	Q 95345 19324
Site Photograph	
Width (m)	5-8
Depth (cm)	12-50
Water Clarity	Highly coloured
Substrate	Cobble, Gravel, Sand, Mud, Large Rocks (Soft mud to 12cm deep in parts u/s with thin layer of gravel where bank excavations has recently been carried out)
Flow Type	Riffle 25% Glide 75%
Instream Vegetation	Filamentous algae 25% (where undisturbed)
Dominant Bankside Vegetation	Willow (None in upstream section)
Estimated % summer Cover of Stream by Bankside Vegetation	<5%
Trout Adult Habitat	Fair - Good
Trout Nursery Habitat	Good - Very Good
Trout Spawning Habitat	Fair

Area fished	5m x 100m
Fishing time (min)	20
Fish species recorded	Brown Trout, Salmon, Eel

Brown Trout Fork Length (cm)	Age
9.8 9.9 10.7 10.9 12.4 12.6 12.7 13.3	1+
15.6 15.6 16.6 16.8 17.1 17.8 18.2	2+
19.8 21.2 21.3 21.9	2+/3+
Salmon Fork Length (cm) 5.5 5.5	Age
Salmon Fork Length (cm) 5.5 5.5 5.5 5.5 5.6 5.7 5.7 5.7 5.8 5.9 5.9 6.0 6.1 6.1 6.1 6.1 6.2 6.5 6.7	Age 0+

Salmon	
Fork Length (cm)	Age
8.1	
8.2	
8.2	
8.2	
8.3	
8.4	
8.4	
8.7	
8.9	
9.0	
9.1	
9.3	1+
9.4	
9.7	
9.8	
9.8	
9.9	
10.0	
10.3	
10.4	
10.6	
10.8	
11.3	
12.1	

Eel	
Length (cm)	Age
19.5	
25.0	
39.0	

Site Code	G2
Grid Reference u/s	Q 95807 19361
Grid Reference d/s	Q 95829 19401
Site Photograph	
Width (m)	5-7
Depth (cm)	5-30
Water Clarity	Highly coloured
Substrate	Cobble, Gravel
Flow Type	Riffle 60% Glide 40%
Instream Vegetation	Filamentous algae 35%
Dominant Bankside Vegetation	Bramble, Willow, Grass
Estimated % summer Cover of Stream by Bankside Vegetation	<5%
Trout Adult Habitat	Fair
Trout Nursery Habitat	Very Good-Good
Trout Spawning Habitat	Poor
Area fished	6m x 55m
Fishing time (min)	15

Fich	charies	recorded
1 1311	species	recorded

Brown Trout	
Fork Length (cm)	Age
7.3	0+
11.3	
11.9	1+
19.0	2+/3+

Salmon Fork Length (cm) 4.9 5.4 5.5	Age
5.6 5.7 5.7	
5.8 5.9 6.0	
6.0 6.1 6.1	0+
6.2 6.3 6.3	
6.3 6.3 6.3 6.3	
6.4 6.4 6.5	
6.6 7.0 7.3	
8.5 8.9 9.4 10.1	
10.2 10.7 10.7 10.9	1+

8	
Site Code	E2
Grid Reference u/s	Q 97088 17833
Grid Reference d/s	Q 97144 17880
Site Photograph	
Width (m)	2-3
Depth (cm)	8
Water clarity	Highly coloured
Substrate	Cobble, Gravel, Sand, Large Rocks
Flow Type	Glide 50% Riffle 50%
Instream Vegetation	Bryophyta 30%
Dominant Bankside Vegetation	Willow, Grass, Bramble
Estimated % summer Cover of Stream by Bankside Vegetation	20%
Trout Adult Habitat	Poor
Trout Nursery Habitat	Good-Fair
Trout Spawning Habitat	Fair
Length fished	2m x 65m
Fishing time (min)	10

Fish species recorded	None
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Appendix I: Air Emission Testing of Stabilised Gas Engine

This is will be forward to the Agency separately as it is not possible to copy into the back of this report.