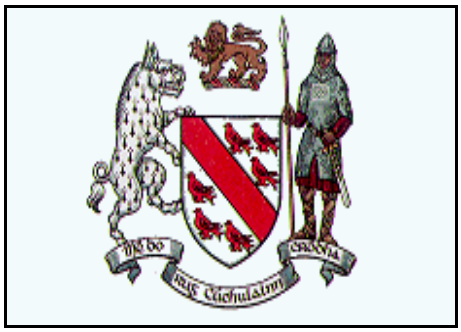

ANNUAL ENVIRONMENTAL REPORT

January - December 2010

For

Dundalk Landfill Site

Co. Louth

Waste Licence Reference W0034-02

By

Dundalk Town Council

To

Environmental Protection Agency

DUNDALK LANDFILL & CIVIC WASTE FACILITY SITE (W0034-02)

ANNUAL ENVIRONMENTAL REPORT

JANUARY – DECEMBER 2010

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1.0 INTRODUCTION

This Annual Environmental Report (AER) has been prepared to meet the requirements of Waste Licence W0034-02 for Dundalk Landfill.

The site is owned by Dundalk Town Council and is located at Newry Road, Dundalk. It is situated on the northern bank of the Castletown River in an area of intertidal mudflats. The northern boundary of the site adjoins low lying and poorly drained agricultural lands. Residential and industrial properties adjoin the western boundary of the site.

Dundalk Landfill Site has been in operation since 1980. In 2000 Dundalk Town Council submitted an application to the Environmental Protection Agency (EPA) for the continued operation of the landfill site, as required by the Waste Management (Licensing) Regulations 1997. The landfill site ceased to accept waste in October 2002.

In March 2005, the EPA granted the Council a revised Waste Licence (registration number W0034-02) for the facility, in accordance with the Third and Fourth Schedule of the Waste Management Act, 1996-2003.

A hydrogeological study[1] was undertaken in accordance with Condition 4.14 of the Waste Licence W0034-01 in 2004 to develop a leachate management system at the site. The report recommended that the Best Practicable Environmental Option for the remediation of Dundalk landfill is the capping of the landfill with a low permeability liner augmented by monitored natural attenuation. Groundwater remediation of the Quaternary gravel aquifer impacted by Dundalk landfill leachate is reliant on both the landfill capping intervention and on monitored in-situ natural attenuation processes. Discharge into the Northern Stream will reduce following capping of the site owing the reduction of the leachate head within the waste.

The landfill site was restored in 2006. Works include installation of capping layer, provision of storm water drainage, leachate collection trench, provision of gas collection system, provision of gas flare, grading of site to provide for future football pitches and the provision of access road.

A leachate collection trench has been constructed on the southern slope of the landfill. The trench is lined on the estuary side of the trench and also to a level of 3.65mOD on the landfill side of the trench. The trench is connected to the foul sewer running along the western boundary of the site.

[1] Proposal for leachate management, July 2004. RPS MCOS.

Gas abstraction system provided on site includes for a Gas collection layer under the impermeable layer of capping material which provides a path of least resistance to the 47 No boreholes laid out on a grid system over the main body of the site. The boreholes are connected via 63mm. diameter pipework to a 250mm diameter main gas collection pipe which transfers the gas collected, under suction, provided by compressor, and to the 500 m^3 enclosed Flare Unit. A SCADA system and Programmable Logic Controller produces data which is available by download weekly or by telephone from council offices. The boreholes in the area of historical fill adjoining the rear of Hardy's Grainstore have also been attached to the active gas collection system.

1.1 REPORT PERIOD

The reporting period of this report refers to January to December 2010. The landfill site ceased to accept waste in October 2002. A Civic Waste Facility is currently in operation at the facility.

2.0 WASTE ACTIVITIES CARRIED OUT AT THE FACILITY

Waste is no longer accepted at the landfill facility except for restoration purposes. The maximum tonnage of waste to be accepted at the Civic Waste Facility is 20,000 tonnes per annum in accordance with Table A1 of the Waste Licence.

The waste intake at the CWF and MRF is limited to 20,000 tonnes per annum of municipal waste and construction & demolition waste. The licence also allows composting of biodegradable waste and green waste to 4,000 tonnes per annum.

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

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.

Licensed waste recovery activities, in accordance with the Fourth Schedule of the Waste Management Act, 1996, are restricted to those listed as follows:

Class 2. Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
Class 3. Recycling or reclamation of metals and metal compounds.
Class 4. Recycling or reclamation of other inorganic materials.
Class 10. The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
Class 11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
Class 13. Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

3.0 QUANTITY AND COMPOSITION OF WASTE RECEIVED AND DISPOSED OF DURING THE REPORTING PERIOD AND EACH PREVIOUS YEAR.

3.1 LANDFILL

Dundalk Landfill Site was in operation for the acceptance of waste for disposal from 1980 until 2002. The site ceased to accept waste for disposal in October 2002 and waste was only brought on site for restoration purposes after this date. Waste data figures are derived from estimates and weighbridge readings. These figures are shown in Table 3.1.

Table 3.1 Waste Quantities Accepted (Tonnes) at Landfill[2]

Waste Types	1997	1998	1999	2000	2001	2002	2003	2004
Total	37,060	37,560	38,000	36,000	32,000	32,420	27,417	3,018

3.2 CIVIC WASTE FACILITY

The Civic Waste Facility (CWF) is open;

- Monday - Friday 9.30am - 6.00pm
- Saturday 9.00am - 3.00pm

In accordance with Condition 5 of the waste licence only those waste types and quantities listed in Schedule A shall be disposed of at the facility unless prior agreement from the Agency has been obtained. The maximum annual tonnage of individual waste categories for acceptance to the site is listed in Schedule A of the Waste Licence.

The following are accepted at the CWF;

- paper
- glass
- plastics
- clothing
- greenery
- wood
- aluminium cans
- domestic appliances
- batteries
- electrical appliances
- Scrap metal.
- Waste Engine Oil

[2] 1997-2001 figures based on estimates.

- Waste Cooking Oil

The quantity of waste received during the reporting period at the Civic Amenity Facility (CWF) is 10,834 tonnes. The figures are taken from EPA Landfill and IWMF Survey, Part 3 and Part 4 2010, EPA composting survey 2010 and PRTR Report 2010 which are provided in Appendix A and B.

In total 1,037 tonnes of waste was accepted for disposal at the CWF. This consisted of:

- 60 tonnes arising from members of the public
- Street Cleanings (977 tonnes). Water is decanted from Street Cleanings at Dundalk CWF prior to disposal at Whiteriver Landfill Site.

Building Rubble (1,778 tonnes) accepted at Dundalk CWF was also sent to Whiteriver Landfill Site were it was recovered. The remaining waste was recovered on or off site as listed in Table 3.2. 2,827 tonnes of garden and park waste from municipal sources (landscapers, householders etc.) was composted onsite. 1,450 tonnes of compost was produced in 2010. Compost analysis has been undertaken and is detailed in Section 5.12.

Table 3.2 Waste Quantities Accepted for Disposal and Recovery (Tonnes) at CWF[3]

Material Type	EWC Codes		Tonnage	Name of Destination Facility(ies), or Collector(s) If Directly Exported	Disposal Or Recovery "D" or "R" or "Both"
Mixed residual waste	20 03 01		60	Whiteriver landfill w0060-02	D
garden	20 02 01	Garden and park waste from municipal sources (landscapers, householders etc.)	2,827	Dundalk town council W0034-02V & W Recycling mh2001/90d	R
cardboard packaging	15 01 01		1,978	Peute Europe nl 6000076	R
newspaper and magazines	20 01 01		220	Peute Europe nl 6000076	R
glass packaging	15 01 07		606	Glasson N.I l-n06/08	R
Metals	0		177	Tinnelly N.I wmex22/01	R
plastic packaging	15 01 02		719	Shabra Plastic IRL mn-080022-01	R
textiles, non-packaging	20 01 11		20	Cookstown N.I wmex01/11	R
wood packaging	15 01 03	Waste accepted onsite in 2010 that was not composted was sent off site and recycled	433	Finsa IRL t0022-2	R
wood non-packaging	20 01 38		1,020	Finsa IRL t0022-2	R
lead acid batteries and accumulators	16 06 01*	non-portable (automotive and industrial)	4	Returnbatt IRL mh2001/61c	R

[3] EPA Landfill and IWMF Survey, Part 3, Part 4 2010, EPA composting survey 2010, PRTR 2010.

Material Type	EWC Codes		Tonnage	Name of Destination Facility(ies), or Collector(s) If Directly Exported	Disposal Or Recovery "D" or "R" or "Both"
Other (e.g. alkaline) batteries and accumulators	16 06 04	portable	1	Returnbatt IRL mh2001/61c	R
Waste mineral oils	13 xx xx	lubrication, vehicle, machine, etc.	5	Enva IRL mh2001/107c	R
Waste cooking or vegetable oils	20 01 25		6	Enva IRL mh2001/107c	R
Waste paint and varnish (including containers)	08 01 12		3	Enva IRL mh2001/107c	Both
Building Rubble	17 01 07		1,778	Whiteriver landfill w0060-02	R
Street Cleanings	20 03 03		977	Whiteriver landfill w0060-02	D
Total			**10,834**		

4.0 SUMMARY REPORT ON EMISSIONS

4.1 EMISSIONS TO SEWER

4.1.1 Discharge Point (From Landfill Site)

A leachate collection trench has been constructed on the southern slope of the landfill. The trench is lined on the estuary side of the trench and also to a level of 3.65mOD on the landfill side of the trench. The trench is connected to the foul sewer running along the western boundary of the site. A flow monitoring has been installed in this trench. Zero flow has been measured to date.

4.1.2 Discharge Point (from CWF)

In accordance with The PRTR Regulations releases of pollutants and off site transfers of waste by facilities operating in relevant industrial sectors are to be reported by the EPA to the European E-PRTR website where the facility exceeds specified thresholds. This has been completed for Dundalk landfill site. The PRTR reporting and landfill gas survey are included in Appendix B.

S1 is the sewer discharge monitoring location at manhole No 2, adjacent to weighbridge. This monitors run-off from the Civic Waste Facility and Material Recovery Facility and discharge from the composting facility. The estimated flow to sewer from this area is 11,300 m^3. Reportable emissions for this location as per PRTR requirement are;

- Chlorides (as Cl)
- Nitrogen oxides (NOx/NO2)
- Ammonia (NH3)

4.2 EMISSIONS TO GROUNDWATER AND SURFACE WATER

There are no direct emissions to groundwater or surface water. A water balance calculation has been completed for Dundalk landfill site and is presented in Appendix C. The site is unlined and an area of approximately 79,000 m^2 has been capped. There is no active leachate extraction system on the site. Infiltrations in restored areas are in the range of 2-10% of effective rainfall. This equate to 1,061 m^3 to 5,304 m^3 of leachate produced.

4.3 COMPOSTING AND BIOFILTER EMISSIONS

Compost analysis and biofilter emission monitoring has been undertaken during the reporting period. These are discussed in section 5.13 and 5.14.

4.3.1 FLARE EMISSIONS

A 600m^3 flare has been installed at Dundalk Landfill Site. Based on model predications and information from the landfill gas flare the estimated net emission of methane from the flare combustion process and both surface and lateral emissions from the landfill body is 119,187 kg/year (Table 4.1). Other reportable emission was for Carbon dioxide (CO_2).

Table 4.1 Net Methane Emission

Quantities of Methane Flared and / or Utilised	T (Total) kg/Year
Total estimated methane generation (as per site model)	351100.0
Methane flared	231913.0
Methane utilised in engine/s	0.0
Net Methane Emission	**119187.0**

Flue gas monitoring of flare emissions was undertaken in June 2010. The results of the flare test show that all Waste Licence parameters listed in Waste Licence W0034- 02 are within the limits specified in schedule C.6. These findings show that efficient combustion in taking place within the combustion chamber of the Dundalk Town Council flare and in general, is operating under the original manufacturers specification. This report is provided in Appendix D

5.0 SUMMARY OF RESULTS AND INTERPRETATIONS OF ENVIRONMENTAL MONITORING, INCLUDING LOCATION PLAN OF ALL MONITORING LOCATIONS

5.1 MONITORING LOCATIONS

Monitoring is carried out at locations and frequencies as specified in Schedules D of the waste licence. Monitoring points are labelled and permanent access to all monitoring points is maintained. The following parameters form the major part of Dundalk Urban District Council's monitoring programme;

- Groundwater Quality
- Groundwater Levels
- Surface Water Quality
- Leachate Quality
- Leachate Levels
- Landfill Gas

All ditches and drains around the perimeter of the facility are kept clear to allow for surface water monitoring points to be maintained.

All monitoring points are detailed in Drawing Monitoring Locations as shown in Appendix E.

5.2 LEACHATE QUALITY

Leachate quality can vary during the lifetime of landfill sites depending on the phase of decomposition of the waste. Leachate results for the reporting period are presented in Appendix F and some of the characteristic parameters of the leachate are listed in Table 5.1

Raw leachate results have been compared to "Typical Leachate Composition of 30 Samples from UK/Irish Landfills accepting mainly Domestic Waste" (Landfill Operational Practices). As can be seen from the Table 5.2 all of the parameters are below the maximum concentration.

Table 5.1 Raw Leachate Concentrations

Parameters	Units	No. of Samples	Minimum	Maximum	Mean	Standard Deviation
Alkalinity	mg/l CaCO3					
Aluminium	µg/l	4	23.4	738.1	212	351
Ammonia	mg/l N	15	0.47	509.45	108	125
B.O.D.	mg/l O2	16	4.2	60.1	19	14
Boron	µg/l	4	1086.9	2099.6	1415	468
Cadmium	µg/l					
Calcium	mg/l Ca	4	138.39	234.08	175	44
C.O.D.	mg/l O2	16	72	660	215	185
Chloride	mg/l Cl	16	62	478	203	137
Chromium	µg/l	4	2.8	12.1	9	4
Conductivity	µS/cm @ 25	16	1803	8270	3731	2035
Copper	µg/l	4	2.3	6.2	4	2
Cyanide	mg/l CN					
Depth	m	12	2.9	8.9	5	2
D.O.	% Saturation					
Fluoride	mg/l	2	0.15	0.16	0	0
Iron	µg/l	4	24610.8	30325.1	26974	2405
Lead	µg/l	3	1.1	4.1	2	2
Magnesium	mg/l Mg	4	58.55	83.86	67	12
Manganese	µg/l	4	627.3	936.7	784	127
Mercury	µg/l					
Nickel	µg/l	4	4	52.6	19	23
o-Phosphate	mg/l P	9	0.03	2.37	1	1
pH	0	16	6.7	7.1	7	0
Potassium	mg/l	4	66.39	257.56	120	92
Residue on Evaporation	0					
Sodium	mg/l	4	92.42	360.75	165	130
Sulphate	mg/l SO4	3	6.6	10.9	9	2
Temp	°C	12	8.2	15.5	12	2
Time Sampled	0	12	10.45	12.2	11	1
T.O.C.	mg/l					
T.O.N	mg/l N	1	0.09	0.09	0	#DIV/0!
Total S Solids	mg/l					
Zinc	µg/l	4	19.3	70.2	34	24

Table 5.2 Raw Leachate Concentrations

	Dundalk Landfill Site		From 30 Samples from UK/Irish Landfills Accepting Domestic Waste Results in mg/l		
Parameter	Min.Conc	Max.Conc	Min.Conc	Max.Conc	Mean
Ammonia (mg/N)	0.05	112.55	<0.2	1700	491
BOD	7.4	41	4.5	>4800	>834
COD	80	842	<10	33,700	3078
Chloride (mg/l)	90	655	27	3410	1256
Iron (µg/l)*	5416.5	33120.5	0.4	664	54.4
Potassium (mg/l)	40.31	370.32	2.7	1480	491
Sodium (mg/l)	97.54	535.8	12	3000	904
TON (mg/l N)	0.11	0.12	/	/	/
Conductivity (µS/cm)	2580	9910	503	19,200	7789
pH (pH units)	6.7	7.2	6.4	8.0	7.2

Leachate levels monitoring is undertaken at five locations on site (Table 5.3). L7 readings are not leachate levels but bottom of well (dry). The Hydrogeological report found that a leachate and groundwater mound was present within the landfill areas centred in L7 area. This monitoring point is to be reviewed to check if borehole is blocked.

Table 5.3 Leachate Levels mOD

Date	L1	L2	L4	L6	L7[4]
12/01/2010	2.22	1.39	2.15	4.28	*5.16*
05/02/2010	2.37	1.38	2.06	4.38	*5.23*
18/03/2010	2.30	1.42	2.11	4.36	*5.14*
12/04/2010	2.00	1.45	2.13	4.37	*5.34*
11/05//2010	2.12	1.38	2.20	4.28	*5.22*
17/06/2010	2.18	1.36	2.19	4.11	*5.14*
23/07/2010	2.25	1.42	2.14	4.39	*5.12*
11/08/2010	2.15	1.44	2.30	4.40	*5.10*
10/09/2010	2.27	1.51	2.29	4.36	*5.11*
06/10/2010	2.30	1.46	2.34	4.42	*5.20*
08/11/2010	2.30	1.44	2.41	4.47	*5.25*
03/12/2010	2.26	1.42	2.45	4.48	*5.21*
10/01/2011	2.15	1.47	2.46	4.44	*5.26*
07/02/2011	2.01	1.44	2.44	4.36	*5.24*
11/03/2011	1.93	1.48	2.41	4.66	*5.34*

[4] Note these are not leachate levels but bottom of well (DRY)

5.3 GROUNDWATER

As required under the Waste Licence, groundwater monitoring has been undertaken at the borehole locations as set out in Table D1.1 of the waste licence. Schedule D of the waste licence requires the monitoring of certain parameters on either a monthly, quarterly or annual basis; the frequencies of the monitoring of groundwater parameters are shown in Table 5.4 below.

Table 5.4 Groundwater Parameters Monitoring Frequencies

Monthly	Quarterly	Annually		
Groundwater Level	Visual Inspection/Odour	Aluminium	Manganese	Total Alkalinity
Ammoniacal Nitrogen	Dissolved Oxygen	Boron	Nickel	Orthophosphate
Chloride	pH	Cadmium	Potassium	TON
Electrical Conductivity	Temperature	Calcium	Sodium	Residue on Evaporation
	TOC	Chromium	Zinc	List I/II Organic
		Copper	Cyanide	
		Iron	Fluoride	
		Lead	Mercury	
		Magnesium	Sulphate	

A hydrogeological study was undertaken in accordance with Condition 4.14 of the Waste Licence W0034-01 in 2004 to develop a leachate management system at the site. The report recommended that the Best Practicable Environmental Option for the remediation of Dundalk landfill is the capping of the landfill with a low permeability liner augmented by monitored natural attenuation. Groundwater remediation of the Quaternary gravel aquifer impacted by Dundalk landfill leachate is reliant on both the landfill capping intervention and on monitored in-situ natural attenuation processes. Discharge into the Northern Stream will reduce following capping of the site owing the reduction of the leachate head within the waste.

The landfill site was restored in 2006. Works include installation of capping layer, provision of storm water drainage, leachate collection trench, provision of gas collection system, provision of gas flare, and grading of site.

A leachate collection trench has been constructed on the southern slope of the landfill. The trench is lined on the estuary side of the trench and also to a level of 3.65mOD on the landfill side of the trench. The trench is connected to the foul sewer running along the western boundary of the site. A flow monitoring has been installed in this trench. Zero flow has been measured to date.

The main groundwater flow path is generally towards the estuary, which is located to the south of the site. Groundwater monitoring has been undertaken at boreholes WM1, WM4, WM5, WM6, WM8, WM9 and WM10. Groundwater monitoring results are provided in full within Appendix G. These results are also presented graphically.

Groundwater was assessed against;

Groundwater: the European Communities (Drinking Water) (No. 2) Regulations 2007 parametric value (DWR) and Interim Guideline Value (IGV) Towards Setting Guideline Values for the Protection of Ground Water in Ireland.

The following substances defined by the European communities (Drinking Water) (No. 2) Regulations 2007 were monitored in April and are referred to in the report.

Total pesticides means the sum of all individual pesticides detected and quantified in the course of the monitoring procedure. The DWR is 0.50µg/l. (Only those pesticides which are likely to be present in a given supply require to be monitored - organic insecticides, organic herbicides, organic fungicides, organic nematocides, organic acaricides, organic algicides, organic rodenticides, organic slimicides , related products (*inter alia*, growth regulators and their relevant metabolites, degradation and reaction products).

Polycyclic aromatic hydrocarbons are the sum of concentrations of specified compounds. The DWR is 0.10ug/l. The specified compounds are benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(1,2,3-cd)pyrene.
Total trihalomethanes are the sum of concentrations of specified compounds. The DWR is 100ug/l. The specified compounds are: chloroform, bromoform, dibrom-ochloromethane and bromodichloromethane

Parameters that are indicative of possible leachate contamination include Ammoniacal-N, Conductivity, Iron, Chloride and heavy metals.

5.4 BASELINE DATA

Monitoring was carried out up-gradient of the site in order to obtain an overview of the baseline monitoring water quality of the surrounding groundwater. This allows for a baseline to be established from which the actual impact caused by the site on the down-gradient groundwater can be assessed. WM1 is the up-gradient monitoring point. Monitoring is undertaken on a monthly, quarterly and annual basis.

5.4.1 Monthly Parameters

Electrical Conductivity in WM1 was above the IGV of 1000µScm and DWR of 2500 µScm throughout the monitoring period. All Ammonia concentrations recordings were below the IGV 0.15mg/l and the DWR of 0.30mg/l except in February (22.13 mg/l) and December (0.63mg/l). The concentrations in WM1 were <0.03mg/l at times during the monitoring period. Chloride concentrations were above the IGV (30mg/l) and the DWR (250mg/l) throughout the monitoring period. The highest chloride reading recorded was 2,871 mg/l in February.

5.4.2 Quarterly Parameters

Dissolved Oxygen (DO) levels ranges from 12% to 51%. WM1 exhibits TOC values ranging from 1.7mg/l to 95.3 mg/l.

5.4.3 Annually

Cyanide is below the IGV (0.01mg/l) and DWR (50µg/l) with a reading of <0.05mg/l. Fluoride has a reading of 0.190mg/l which is below the DWR (0.8mg/l0 and the IGV (1mg/l). Mercury (<0.1µg/l) is below the IGV (0.001mg/l) and the DWR (1µg/l). Sulphate is below the IGV (200mg/l) and the DWR (250mg/l) with a reading of >100 mg/l. Ortho-phosphate is below the IGV of 0.03mg/l with a recording of < 0.02 mg/l. Total Alkalinity shows no abnormal change with a reading of 380 mg/l. TON shows no abnormal change with a value of 0.84 mg/l for WM1. Residue on Evaporation recorded 1,956 mg/l in WM1 in April.

Metals consist of Aluminium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium and Zinc. These parameters were measured in April and were all below the relevant IGV and/or DWR except for Magnesium, Potassium and Sodium.

Magnesium exceeds the IGV of 50mg/l in WM1 with a reading of 54.62mg/l. Potassium exceeds the IGV of 5mg/l with a result of 22.34 mg/l and Sodium is above the IGV (150mg/l) and DWR (200mg/l) with a value of 410.56 mg/l.

Analysis for Polycyclic Aromatic Hydrocarbons (Total 16 EPA PAHs) was carried out in WM1 in April and recorded <0.1µg/l and is below the DWR of 0.1µg/l for PAH. All other parameters measured were less than the lower level of detection.

Phenols levels were <0.015µg/l which is the lower limit of detection for the methodology used for Phenols. This is below the IGV of 0.5µg/l.

Pesticide and Herbicides analysis was carried out in WM1 in April. Pesticide levels were <0.01µg/l which is the lower limit of detection for the methodology used. The total pesticides

could be above or below the IGV 0.5µg/l. Herbicides levels were less than the lower level of detection.

Total-Trihalomethanes (THM) is the sum of Dichloromethane, Chloroform, Bromodichloromethane and Bromoform. Dichloromethane, Bromodichloromethane and Bromoform were below the lower detection limit for the analytical methodology used (<0.1 µg /l), however Chloroform (0.1 µg/l) was detected. However it does not exceed the DWR of 12µg/l. THM is below the DWR of 100 µg/l total trihalomethanes.

Volatiles and semi volatiles parameters were either below the IGV or less than the detection limit for those comparable. Chloroform was detected at a concentration of 0.1µg/l; however it does not exceed the IGV of 12µg/l.

The detection limit of 0.1µg/l is higher than the IGV for a number of parameters.

The remaining parameters were below the detection limit (0.1ug/l) for the analytical methodology used.

5.5 DOWN-GRADIENT DATA

The impact on the groundwater from leachate generated within the landfill can be identified from Boreholes WM4, WM5, WM6, WM8, WM9 and WM10. WM4 and WM8 are located in the gravel aquifer.

5.5.1 Monthly Parameters

Results from downstream indicate elevated levels of Ammonia in the majority of boreholes. The highest Ammonia level recorded was 6469.53 mg/l in WM8 in August. Elevated levels of Ammonia are indicative of leachate contamination. Electrical Conductivity exceeds the DWR of 2,500µScm in all boreholes. The highest level was recorded in WM6 (32,700µS/cm). Chloride levels also exceeded the DWR throughout the monitoring period. The highest Chloride concentration recorded was 5,212mg/l in WM4. It should be noted that saline water intrusion may contribute to the high levels of Chloride and Electrical Conductivity recorded down-stream of the site as seawater can contain Chloride levels up to 20,000mg/l.

5.5.2 Quarterly Parameters

TOC values provide a measure of organic contamination of the water, the higher the content the more oxygen is consumed. Organic contamination results in an increase in the growth of micro-organisms. TOC results show spike in concentrations in a number of boreholes. This also increased in the upstream borehole but not to the same concentrations. DO ranges from 12% to 57%.

5.5.3 Annually

Cyanide is below the IGV (0.01mg/l) and DWR (50µg/l) with a reading of <0.05mg/l. Fluoride readings are below the DWR (0.8mg/l) and the IGV (1mg/l). Mercury (<0.1µg/l) is below the IGV (0.001mg/l) and the DWR (1µg/l). Sulphate readings are below the IGV (200mg/l) and the DWR (250mg/l) except at WM4 with a reading of >300mg/l. Ortho-phosphate is above the IGV of 0.03mg/l with a recording of 0.05mg/l to 0.62mg/l. Total Alkalinity shows no abnormal change with a reading of 653 mg/l to 920 mg/l. TON shows no abnormal change with a value of <0.08 to 2.14 mg/l. Residue on Evaporation recorded reading of 1723 mg/l to 6979 mg/l in downstream boreholes in April.

Metals /Non metals consist of Aluminium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium and Zinc. These parameters were measured in April and were all below the relevant IGV and/or DWR except for Boron, Calcium, Iron, Magnesium, Manganese, Potassium, Sodium and Zinc. These results are included in Appendix G.

Annual analysis for List I and II substances were undertaken at WM6 and WM8 downstream of the site and are included in Appendix G.

Polycyclic Aromatic Hydrocarbons (total 16 EPA PAHs) in the two boreholes recorded of <0.1µg/l and are below the DWR of 0.1µg/l for PAH. All other parameters measured were less than the lower level of detection except Fluoranthene (0.0146 µg/l) and Pyrene (0.0275µg/l in WM8.

Phenols levels were lower than the limit of detection for the methodology used (<0.015 µg/l) and are lower than the appropriate IGV of 0.5µg/l.

Pesticide and Herbicides analyses were carried out in WM6 and WM8 in April. Pesticide levels were <0.01µg/l which is the lower limit of detection for the methodology used. The total pesticides could be above or below the IGV 0.5µg/l. Herbicides levels were less than the lower level of detection except for Chloridazion (0.0948 µg/l) and Diuron (0.0492 µg/l) which is below the IGV of 25 µg/l for Diuron. There is no IGV set for Chloridazion.

Total-Trihalomethanes (THM) is the sum of Dichloromethane, Chloroform, Bromodichloromethane and Bromoform. All levels were below the lower detection limit for the analytical methodology used (<0.1µg/l) and are below the DWR of 100µg/l total trihalomethanes.

Volatiles and semi volatiles parameters were either below the IGV or less than the detection limit for those comparable. Chlorobenzene, Isopropylbenzene, m,p-Xylene, Naphthalene , n-

Propylbenzene, o-Xylene, sec-Butylbenzene and tert-Butylbenzene were all detected above the detection limit of 0.1µg/l. Those which exceed IGV for those comparable are Chlorobenzene (2.1 µg/l), and Naphthalene (1.0 µg/l) which is equal to the IGV of 1 µg/l. The parameters detected above the detection limit of 0.1µg/l and those which exceed the IGV are all located in WM8.

The detection limit of 0.1µg/l is higher than the IGV for a number of parameters.

5.6 REMEDIATION

The results show that groundwater is being impacted by the landfill site. A hydrogeological study was undertaken and the recommended Best Practicable Environmental Option for the remediation of Dundalk landfill was the capping of the landfill with a low permeability liner augmented by monitored natural attenuation. The hydrogeological study predicated a range of concentrations in groundwater (along boundary with estuary) after 10 years from the completion of the landfill. Capping was completed in 2006. A review of monitoring results shows some improvement in groundwater and surface water quality over time since capping was completed. This will continue to be monitored for longer term trends to assess the extent of the natural attenuation of the site.

In the 'Predicted Environmental Risk Assessment' represented by the Dundalk landfill to the Quaternary Gravel Aquifer and the Castletown Estuary after 10 years from the completion of the landfill capping it is predicted that the concentration range for Ammoniacal Nitrogen will be between 67mg/l and 71mg/l in groundwater (along boundary with estuary). In WM4 and WM10 the concentrations are below the maximum predicted concentration range. WM5 is below the maximum in all but one occasion in 2010. WM6 WM8 exceeds the maximum predicted concentration range for Ammoniacal Nitrogen for the majority of the year.

5.7 SURFACE WATER

The results contained in this report are assessed against the Surface Water Quality Standards (SWQS) laid out in the European Communities Quality of Surface Water Intended for the Abstraction of Drinking Water Regulations 1989, (EC Abstraction of Drinking Water Regulations) for surface water assessment and Dangerous Substances Regulations, 2001.

The frequencies of the monitoring of surface water parameters are shown in Table 5.5.

Table 5.5 Surface Water Parameters Monitoring Frequencies

Monthly	Quarterly	Annually	
Ammoniacal Nitrogen	BOD	Aluminium	Manganese
Chloride	COD	Boron	Nickel
Electrical Conductivity	Dissolved Oxygen	Cadmium	Potassium
	pH	Calcium	Sodium
	Total Suspended Solids	Chromium	Zinc
	Temperature	Copper	Mercury
	TON	Iron	Sulphate
		Lead	Alkalinity
		Magnesium	Orthophosphate

Samples SW1 to SW4 are taken along the course of the drainage ditch, which adjoins the northern boundaries of the landfill. Monitoring points SW5 to SW9 are located in the estuary. SW5 and SW6 are adjacent to the landfill, whilst SW7 and SW8 are upstream and SW9 downstream of the site.

5.7.1 Monthly Parameters

Monthly chemical analyses of surface water are summarised in Appendix H. The results indicate elevated levels of Ammoniacal-N, the highest concentration recorded in the stream was 39.40 mg/l in SW2 and in the estuary was 1.16 mg/l in SW9. Elevated levels of Electrical Conductivity, and Chloride recorded at SW5 to SW9 maybe due to the presence of estuarine water.

5.7.2 Quarterly Parameters

The pH values range from 7.3 to 8.5 in all surface water locations which are between the SWQS of 5.5 to 9.

The results indicate elevated levels of BOD and COD, the highest concentration recorded in the stream was 36.4 mg/l in SW4 and in the estuary was 4 mg/l in SW8 for BOD and for COD the stream was 294 mg/l in SW4 and in the estuary was 697 mg/l in SW9.

Total Suspended Solids exceed the SWQS in all surface water monitoring locations, the highest concentration recorded in the stream was 139mg/l in SW1 and in the estuary was 60mg/l in SW9.

The Total Organic Nitrogen (TON) showed no abnormal change throughout 2010, the highest concentration recorded in the stream was 2.88 mg/l in SW4 and in the estuary was 2.85mg/l in SW8.

The majority of parameters assessed show that levels of contamination increase between sampling points SW1 and SW4, which are located along the drainage ditch running along the north of the site. It can be seen that elevated levels of Ammonia, COD and BOD have been recorded at the various monitoring locations along the drainage ditch. These results are presented graphical in Appendix H.

5.8 REMEDIATION

The results show that surface water is being impacted by the landfill site. In the hydrogeological study an Ammoniacal Nitrogen contaminant discharge was estimated at 70mg/l after capping (after 10 years), predicting a long term concentration of 0.26mg/l in the estuary. The results show the highest Ammoniacal Nitrogen concentration value for the stream is in SW1 at 31.451mg/l in November. The highest concentration for the estuary is in SW9 at 1.16 mg/l in December 2010 which is downstream of the site. SW5 and SW6 are adjacent to the site. Ammoniacal Nitrogen ranged from 0.11 to 1.03mg/l in SW5 and 0.4 to 1.05 mg/l in SW6.

5.9 SEWER DISCHARGES

S1 is the sewer discharge monitoring location at manhole No 2, adjacent to weighbridge. This monitors run-off from the Civic Waste Facility and Material Recovery Facility and discharge from the composting facility. S1A is located within the site before the discharge reaches the public sewer at S1 and monitoring this location will highlight the discharge concentrations from only the site.

The Waste Licence in Schedule D requires the monitoring of the BOD, COD, Ammonia, Suspended Solids, Sulphates, pH and Temperature on a quarterly basis.

Table 5.6 illustrates the parameters that were monitored in S1. S1A and S2 were not sampled during this monitoring period. S1 exceeded the ELV for BOD and COD in July. S1 results can be found in full in Appendix H.

Table 5.6 Parameters Monitored in S1

Parameter	Jan	April	July	Oct	Emission Limit Value (ELV)	
					S1: Civic Waste Facility Grab Sample (mg/l)	S2: Leachate from Landfill Grab Sample (mg/)
BOD	32.6	184.2	1098	102	750	2000
COD	163	536	4545	459	1000	9000
Suspended Solids	144	114	860	110	1000	2000
Sulphate	32.1	30.5	40.6	nm	300	400
pH	7.4	7.2	7.0	7.2	6-9	6-9
Temperature	32.1	30.5	40.6	12.1	40°C	40°C

5.10 PERIMETER GAS MONITORING AND LANDFILL GAS EXTRACTION

Schedule D of the licence requires the licensee to conduct monthly monitoring of gas levels on the perimeter and in the waste of the landfill site. The gas is monitored using a GA2000 infra-red monitoring device. The monitoring locations are shown on Table 5.7 and shown in Drawing in Appendix E (External Gas Monitoring Points).

Table 5.7 Landfill Gas Monitoring Locations

Landfill Gas Wells within Waste and Boundary Locations	GW1 to GW47 inclusive (as shown on Drawing No. 004 of the Restoration Plan for 34-1 (Nov 2002) agreed by the Agency)
Piezometers Boundary Locations	G1, G2, G3, G4, G5, G6, G7, G8, G9, G10, G16, G17, GM1, GM2, GM3, GM4, GM5, GM6, GM7, GM8, GM24

Landfill gas around the periphery of the site is indicated by piezometers as shown in Table 5.7 above. GM7 and GM8 are no longer monitored.

A landfill gas trench has been installed to the west of the active landfill site to intercept the potential pathway of the gas migrating from the current active landfill site. Piezometers GM5 to GM7, G4 to G10 are to the west of the landfill gas trench.

A permanent gas extraction system has been installed at the facility during 2005. This includes a gas collection layer and 47 landfill gas extraction wells laid out on a grid system over the main body of the site. The wells are connected via 63mm diameter pipework to a 250mm diameter main gas collection pipe. A 500m^3 enclosed Flare Unit and SCADA system

has been installed. The boreholes in the area of historical fill have also been attached to the active gas collection system. Records of field balancing are maintained.

Monthly monitoring of periphery piezometers around Dundalk Landfill site have indicated exceedances of licence requirements of Methane greater than or equal to 1.0% v/v in G6, G8, G10 and G20 in the months January to August. The highest reading was 2.8% v/v in G10 in January and May.

Monthly monitoring of periphery piezometers around Dundalk Landfill site have indicated exceedances of licence requirements of Carbon Dioxide greater than or equal to 1.5% v/v in G6,G10, G17, G20, GM2 and GM24 in the months January to August. The highest reading was 2.3% v/v in G20 in March. There were no exceedances for Methane or Carbon Dioxide for the months September to December 2010.

Subsequent monitoring of adjacent premises and houses using Flame Ionization Detector has not shown any raised methane levels. Landfill gas results for 2010 are included in Appendix I.

5.11 ESTUARINE SOIL SAMPLES

Sediment sampling was undertaken at five locations in the estuary in June 2010. These results are presented in Table 5.8. These results have been compared to the Dutch Target values and intervention values for soil remediation soil/sediment. The results are below the Target Value for all parameters except Zinc, Nickel and Copper at locations SW7 and SW8. The results are below the intervention value. No Targets Values are given for Manganese or Cyanide. Cyanide levels are below the lower detection limit for the analytical method used. SW7 and SW8 are located upstream of the site.

Table 5.8 Sediment Results

Date Sampled	17/06/10	17/06/10	17/06/10	17/06/10	17/06/10		
Parameter (mg/kg dry wt)	SW5	SW6	SW7	SW8	SW9	Target Value (Dutch)	Inter - vention Value (Dutch)
% Dry Weight	30.3	36.3	32.3	25.3	38.8		
Cadmium	0.618	0.519	0.589	1.15	0.36	0.8	1.2
Copper	31.5	27.8	31.6	44.6	24.1	36	190
Chromium	36.2	35.3	40.3	39.5	28.5	100	380
Lead	34.3	29.5	32.9	39	30.7	85	530
Manganese	458	403	773	667	428		
Mercury	<0.14	<0.14	<0.14	<0.14	<0.14	0.3	10
Zinc	168	141	170	240	118	140	720

Date Sampled	17/06/10	17/06/10	17/06/10	17/06/10	17/06/10		
Parameter (mg/kg dry wt)	SW5	SW6	SW7	SW8	SW9	Target Value (Dutch)	Inter - vention Value (Dutch)
Nickel	29.4	29.1	36	38.3	23.6	35	
Total cyanide mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0		

5.12 DUST MONITORING

Dust monitoring was carried out three times in the year. Table 5.9 details the results of the three dust monitors installed on site. The waste licence requires dust deposition limits to be no more than **350** mg/m^2/day.

Table 5.9 Dust Monitoring Results

Sampling Period	Dust Monitor 1	Dust Monitor 2	Dust Monitor 3
01/06/2010 30/06/2010	105.6	Blank-	81.5
30/06/2010 30/07/2010	1499.7	18.3	140.9
22/11/2010 21/12/2010	34.76	35.34	8.3

From Table 5.9 it can be seen that all dust deposition levels in all periods are below the limits except in DG1, which exceeds the licence requirements in June – July. It not thought that these exceedances are a result of operations at the CWF. No complaints were received nor was problem with dust noted during this period.

5.13 COMPOSTING MONITORING

V & W recycling compost hedge grass & hedge cuttings from Civic Amenity users. 2,827 tonnes was received for composting in 2010. Compost testing was undertaken by Bord na Mona Ltd and is provided in Appendix J. Samples are taken from 5 separate locations and depths within the compost pile to ensure a representative composite sample can be achieved. The sampling of compost takes place from the static pile before the screening process and hence does not take account of the filtering process. Compost is also stored on site for 6 months (held over winter).

The three samples of compost were sent for analysis. The samples of compost were checked for compliance against Schedule F of Waste Licence W0034-02.

- 18th March 2010

Sample complied with Schedule F, Maturity tests. The results show that the compost if fully stable. Contaminants > 2mm were detected (metal). Trace elements complied with Class 2 for Lead and Chromium. Remaining elements are Class 1. Sample also complied with the pathogen test.

- 27th October 2010

Sample complied with Schedule F, Maturity tests. The results show that the compost if fully stable. Contaminants > 2mm were detected (stones and glass). Trace elements complied with Class 1. Sample also complied with the pathogen test.

- 15th December 2010

Sample complied with Schedule F, Maturity tests. The results show that the compost if fully stable. Contaminants > 2mm were detected (stones). Trace elements complied with Class 1. Sample also complied with the pathogen test.

As stated above the sampling of compost takes place from the static pile before the screening process and hence does not take account of the filtering process. Contaminants are removed on site by a screening process undertaken by V&W Recycling, whereby the compost is passed through a rotating drum type sieve prior to bagging. Heavier material is returned to the process.

5.14 BIOFILTER MONITORING

Composting is undertaken in a proprietary vacuum aerated static pile system complete with Biofilters, supplied by Celtic Composting Systems of Cork. Biofilter monitoring has also been undertaking in accordance with Schedule D of the licence.

5.14.1 Bed Media

Moisture content, pH, Ammonia and Total viable counts were analysed for the bed media gases and are provided in Appendix J. There are no limits in waste licence for these parameters.

5.14.2 Inlet and Outlet Gas

Ammonia, Hydrogen sulphide and Mercaptans were measured on inlet and outlet gases and the results are provided in Appendix J. These are below the emission limit in C5.

5.15 METEOROLOGICAL MONITORING

Temperature and rainfall readings are taken from Dublin Airport.

Table 5.10 Summary of Meteorological Monitoring for the Reporting Period

Total rainfall in millimetres for Dublin Airport													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2010	45.2	36.7	54.8	26.7	38.0	50.3	78.5	48.0	104.3	30.8	100.0	58.1	671.4
mean	69.5	50.4	53.5	51.1	54.8	55.8	50.0	71.1	66.4	70.1	64.3	75.8	732.7

Mean temperature in degrees C. for Dublin Airport													
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
2010	1.7	2.3	4.9	7.7	9.6	14.1	16.0	13.9	13.1	10.1	5.2	-0.1	8.2
mean	5.0	5.0	6.3	7.9	10.5	13.4	15.1	14.9	13.1	10.6	7.0	5.9	9.6

6.0 RESOURCE AND ENERGY CONSUMPTION SUMMARY

Consumption of resources for the reporting period is shown in Table 6.1 below.

Table 6.1 Consumption of Resources

Parameters	CWF	Landfill Site	Unit
Electricity	3250	14,349	kWh
Water	2,900		m^3

7.0 DEVELOPMENT / INFRASTRUCTURAL WORKS IN PLACE AND PLANNED, TO PROCESS WASTE QUANTITIES PROJECTED FOR THE FOLLOWING YEAR (INCLUDING PLANT OPERATING CAPACITY, PROVISION OF ADEQUATE STANDBY CAPACITY AND PROVISION OF CONTINGENCY, BACKUP AND SPARES IN THE CASE OF BREAKDOWN).

There is no additional development /infrastructural works planned for 2011 in the CWF and landfill site.

7.1 PLANTS AND METHODS

The current plant on site comprises of;

- Compactor – The current compactor is used to bale recyclable materials
- Hopper – The hopper is used to accept recyclables.
- Conveyer Belt – The conveyer belt is used to sort materials
- Wood Shredder – The wood shredder is used to shred wood received at the Civic Waste Facility.

All machines have a 50% back-up capacity and V & W Recycling also have access to spares as required.

7.2 PROPRIETARY VACUUM AERATED STATIC PILE SYSTEM

The licence also allows composting of biodegradable waste and green waste to 4,000 tonnes per annum. A Proprietary Vacuum Aerated Static Pile System has been installed. No food waste is utilised through the composting system. Celtic Composting systems biofilters (2) were specified to have capacity of 8,000 tonnes of compost, thus providing 100% spare capacity in the event of breakdown.

8.0 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS FOR THE FORTHCOMING YEAR

The following developments works (Environmental Objectives and Targets) will be carried out in 2011.

1. Reduce impact of the steam on the northern stream and Castletown estuary.

2. DTC will engage experts in the field of energy recovery. The proposal is to investigate the feasibility of using the landfill gas to

    - Recharge electric vehicles for use by DTC works department. This energy recovery may reduce DTC fuel costs and the carbon footprint and provide a lead by example to the Dundalk community.
    - Provide power for use by the compost making facility.

9.0 REPORT ON THE PROGRESS TOWARDS ACHIEVEMENT OF THE ENVIRONMENTAL OBJECTIVES AND TARGETS CONTAINED IN THE PREVIOUS YEARS REPORT

Progress towards the achievement of the two environmental objectives and targets contained in the previous years report are listed below:

1. Dundalk Town Council are proposing, on a trial basis, to allow an archery club access to the capped landfill area.

The decision was taken not to allow the club onto the landfill during 2010 for the following reasons.

- Following the last inspection it was decided not to allow any grass cutting in 2010 to encourage flora growth and to improve the natural habitat and encourage bio-diversity. In this way it may be possible determine the best areas for promoting natural habitat and locate the club activities to other areas less well suited.
- The site boundaries are secure and closed to the public, if public access was to be granted there are a number of manifolds on site that would need to be made more secure in the interests of health and safety. This has significant financial implications and a review on this matter will be taken during 2011, it may be possible to carry out these works on a staged basis over 2-3 years.

2. Following the last years EPA inspection additional gas monitoring points at well heads were requested, this in conjunction with the monitoring at the manifolds will give a better indication of the landfill gas production and help determine if there is any problems/blockages with the gas pipes leading from the wells to the manifolds; thus identifying any repairs that may need to be carried out. The monitoring points have been installed and monitoring is taking place with a view to identifying and carry out any repairs to the gas lines later this year.

- The gas monitoring points were installed and monitoring is taking place, this monitoring has not revealed any significant problems with the gas lines, however the work done is a useful monitoring tool and continued monitoring is ongoing to identify any future areas of attention that may arise.

10.0 TANK, DRUM, PIPELINE AND BUND TESTING AND INSPECTION REPORT

The use of specialist Oil tanks was approved by EPA and installed as part of the extension to the Civic Amenity Site in 2004/2005, provided these tanks were protected from vehicular impact. This was done by the provision of railings and the tanks are then set in additional recesses. There are no other bunds on site. No other inspections are undertaken.

11.0 FULL TITLE AND A WRITTEN SUMMARY OF ANY PROCEDURES DEVELOPED BY THE LICENSEE IN THE YEAR, WHICH RELATES TO THE FACILITY OPERATION

The Environmental Management System and Environmental Management Plan were reviewed and updated in 2006 to include the procedures for the Civic Waste Facility and the closure of the Landfill site. No new procedures were developed in 2011.

12.0 REPORT ON INCIDENTS AND COMPLAINTS SUMMARIES

No complaints were received from the public and no incidents were reported. A site audit was carried out at the facility in August 2010. A summary is provided in Table 12.1.

Table 12.1 Summary of Non Compliances and Audit Observations Noted During Audits/Landfill Site Inspections Undertaken During the Reporting Period by EPA

Inspection Date and Reference	Summary of Audit Findings	Actions Taken to Address the Observations
16/08/10 **Issue date:** **25/08/10** **Reference No:** **(W0034-02/02/10/AR06EM**	**Non Compliances** None **Audit Observations** 1. CWF Waste Records. 2. Service Records for the landfill gas enclosed flare 3. Gas Monitor Meter 4. Landfill Gas Monitoring Results. 5. Register of Monitoring Station. 6. Landfill Aftercare Manual 7. Enclosed Flare Operation. 8. Enclosed Flare Maintenance	1 V&W will maintain a record of compost amounts generated 2 Service Records For the Landfill Gas Enclosed Flare The quarterly service is currently carried out be Biogas, they were contacted after the audit and requested to supply the service records; those records have been received and are on file. Future records will also be maintained. 3 Gas Monitoring Meter Following the audit CSL were contacted regarding service/calibration intervals. The recommendation from CSL is that a full service should be carried out at two year intervals and calibration checks every six months. This has now been arranged with CSL. 4 Landfill Gas Monitoring Results A report will be prepared and submitted to the EPA by the 30/09/2010. This report was completed and forwarded to EPA recommending that extraction be extended to a couple of the monitoring points. More recent monitoring has indicated that these gas levels have reduced. As such this work was put on hold and monitoring has established that there are no exceedences at this time. If further exceedences are uncovered then

Inspection Date and Reference	Summary of Audit Findings	Actions Taken to Address the Observations
		this work will be done. 5 Register of Monitoring Stations. Work is ongoing to prepare this register; this will be completed and submitted to the EPA by 31/12/2010. 6 Landfill Aftercare Manual The landfill aftercare manual shall be prepared and maintained for inspection at the facility office by 31/12/2010. 7 Enclosed Flare Operation The flare and operating systems will be maintained to achieve a minimum burn temperature of 1000°C. 8 Enclosed Flare Maintenance. Irish Biotech Systems have attended the flare and discovered that the sampling pump was not working correctly, this has since been replaced.

13.0 REVIEW OF NUISANCE CONTROLS

13.1 DUST CONTROL

There was a breach of the dust deposition limit in 2010. Daily wind directions are taken and during episodes of high winds no movement of compost is undertaken. In addition operational activities to 'wet down' materials are in place.

13.2 LITTER

The landfill site was closed in October 2002 and therefore there is no wind blown litter arising from the landfill site. V & W Recycling (operators) of CWF do regular litter picks on blown paper waste etc and regular site clean up.

13.3 ODOURS

The landfill site was closed in October 2002 and therefore the potential for odours has been reduced. The permanent capping and installation of an active extraction system reduces the occurrence of odour from landfill gas.

The doors to the waste processing building are kept closed where possible, the biofilters minimize the odours from the composting process in the CWF.

Odour is checked on a daily basis by V & W Recycling. DTC also have monthly odour checks across the site using the Mark 1 nose sniff test. No abnormalities were noted

13.4 PEST CONTROL (VERMIN)

Pest control is undertaken by V & W Recycling. Bait traps are checked on a 2-3 weekly basis.

13.5 NOISE

Noise monitoring has been undertaken in June 2010. A copy of the noise monitoring report can be found in Appendix K. The noise measurements taken around the site are dominated by traffic movements on the local roads and the bypass. There is audible noise from the landfill at location 1 (vehicles entering/leaving the site, with some general activity) and some activity audible at location 3, although this is difficult to distinguish from the commercial units adjacent to the site. It is further noted that at both of these locations; although some activity was audible; the predominant noise source was traffic movements on the local roads, which have impacted the higher noise levels in the report. The night-time measurements are heavily influenced from traffic with no audible noise from the site.

14.0 VOLUME OF LEACHATE PRODUCED AND VOLUME OF LEACHATE TRANSPORTED DISCHARGED OFF SITE

A leachate drainage ditch has been constructed along the southern boundary of the landfill, laid to a nominal invert of 3.65 m (this being the level of the highest tide recorded in Dundalk). The base of the trench is lined with bentonite matting over which a 150 mm diameter perforated pipe is placed and the trench is then backfilled with clean stone. Any leachate/runoff entering the trench drains to the perforated pipe and from there drains via a manhole/ monitoring point to the foul sewer.

The trench is connected to the foul sewer running along the western boundary of the site. A flow monitoring has been installed in this trench. Zero flow has been measured to date.

15.0 REPORTS ON FINANCIAL PROVISION MADE UNDER THIS LICENCE, MANAGEMENT AND STAFFING STRUCTURE OF THE FACILITY, AND A PROGRAMME FOR PUBLIC

The management and staffing structure for the facility is as follows;

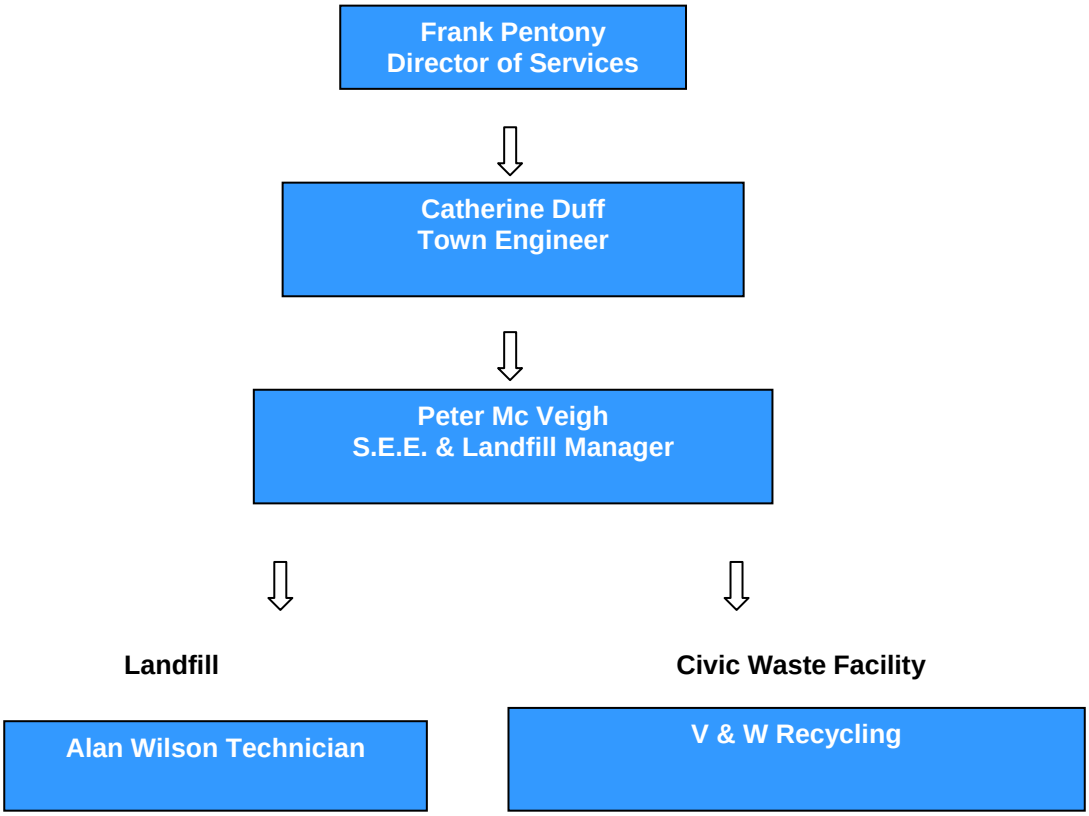


Figure 15.1 Management Structure at Dundalk Landfill Site

15.1 STAFFING STRUCTURE

The CWF is being operated by third party on behalf of Dundalk Town Council. There is currently 14 staff members employed at the CWF site. This consists of:

- managers
- supervisors
- general operatives

The public information programme is provided in the Environmental Management System for the site.

16.0 ANNUAL BUDGET AND SITE RUNNING COSTS.

The civic amenity facility is operated by third party (V & W Recycling) on behalf of Dundalk Town Council. A €2.00 entrance charge is applicable to all users of the site except for the disposal of electrical goods.

The budget for 2011 for landfill site is €50,000.

APPENDIX A

EPA LANDFILL AND IWMF SURVEY, PART 3 2010

NATIONAL WASTE REPORT 2010 SURVEY

PART 2. WASTES COMPOSTED ONSITE IN 2010

Waste Description	EWC Code	Quantity accepted from ROI (TONNES)	Quantity accepted from abroad (TONNES)
MUNICIPAL WASTE:			
Brown bin waste (kitchen/garden) separately collected from **households**	20 01 08		
Kitchen and canteen waste separately collected from **commercial** sources (hotels, canteens, commercial etc)	20 01 08		
Garden and park waste from municipal sources (landscapers, householders etc.)	20 02 01	2,827.00	
Paper and cardboard from municipal sources e.g. office paper, newspaper	20 01 01		
Paper packaging and cardboard packaging e.g., paper bags, wrapping paper	15 01 01		
Wood waste from municipal sources	20 01 38		
Wood packaging e.g., crates, cartons, cheese boxes, fruit trays	15 01 03		
Edible oil and fat	20 01 25		
Waste from markets	20 03 02		
Septic tank sludge	20 03 04		
<<Enter waste description here>>	SELECT		
WASTES FROM WASTE MANAGEMENT FACILITIES:			
Organic fines from mechanical treatment of municipal waste	19 12 12		
Sludges from treatment of urban waste water	19 08 05		
Sludges from water clarification	19 09 02		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING:			
Poultry litter	02 01 06		
Pig manure	02 01 06		
Cattle manure	02 01 06		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
WASTE FROM THE FOOD PROCESSING INDUSTRY:			
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
WASTE FROM OTHER INDUSTRIES:			
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
OTHER - If you compost any waste other than the headings mentioned above, please use the blank rows below.			
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		

If you have waste activities on site (other than composting) please fill in Part 3 of this survey.

Please provide details regarding the end use of the compost produced onsite, including name of landfill if used for daily cover or engineering.	

NATIONAL WASTE REPORT 2010 SURVEY

PART 3. OTHER WASTE

****COMPLETE THIS SHEET IF YOU ACCEPTED WASTE FOR ACTIVITIES OTHER THAN COMPOSTING AND FOR DETAILS OF WASTE REMOVED OFF-SITE IN 2010****

Table 1
WASTE ACCEPTED ONSITE IN 2010 THAT WAS NOT COMPOSTED

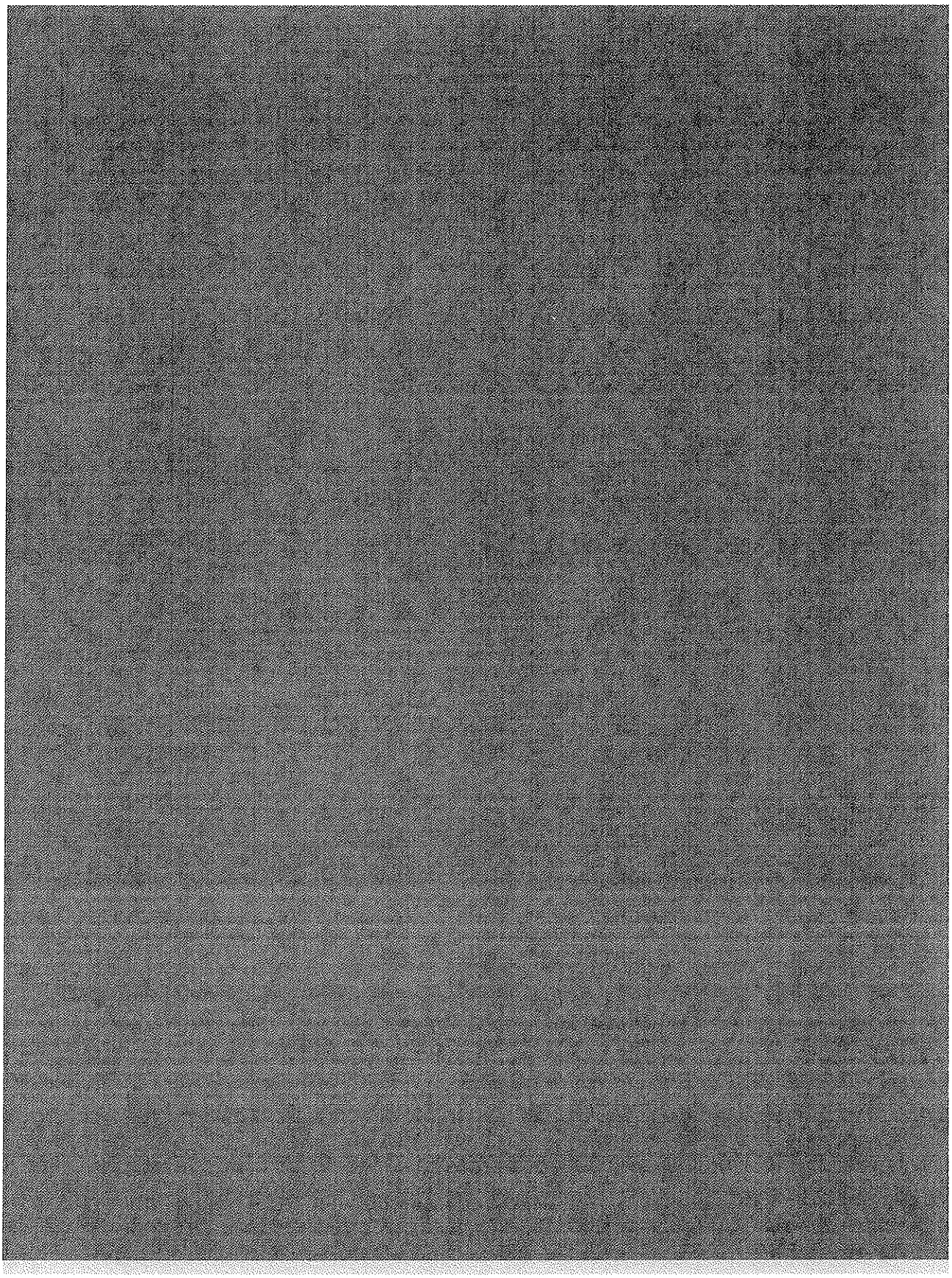
(Provide details on all wastes accepted at the facility)

Waste Description	EWC Code	Quantity accepted from ROI (TONNES)	Quantity accepted from abroad (TONNES)	Waste Processing Operation - provide a brief description of how you process this waste stream
<<Example 1>> Wood pallets	*15 01 03*	*45.00*	*0.00*	*Chipped*
untreated wood packaging	15 01 03	433.00	0.00	Chipped
<<Insert waste description here>>				
<<Insert waste description here>>				
<<Insert waste description here>>				
<<Insert waste description here>>				

Table 2
WASTE REMOVED OFFSITE IN 2010

(Provide details on all wastes sent off site for recovery or disposal). Details on compost produced should be in Part 2 only. Please be very specific on the waste descriptions.

Waste Description	Quantity (TONNES)	FULL name & address of offsite facility to which waste was sent, also permit or licence number.	Additional information
<<Example 1>> Chipped wood pallets	*45.00*	*Wood Company Ltd, Address ABC, Reg. No. 123*	*Used as a fuel in on-site boiler*
<<Example 2>> Contaminated brown bin waste unsuitable for composting	*2.00*	*Landfill ABC, Address ABC, Reg No. 123*	*Disposed to engineered landfill*
untreated wood packaging	433.00	finsa, co clare t0022-2	recycled
<<Insert waste description here>>			
<<Insert waste description here>>			
<<Insert waste description here>>			



NATIONAL WASTE REPORT 2010 SURVEY

PART ONE - GENERAL COMPANY INFORMATION

****PLEASE COMPLETE ALL SECTIONS****

1	Year to which Data Applies:	Calendar Year 2010
2	Company Name:	DUNDALK TOWN COUNCIL
3	*Trade Names*	
4	*Facility Address(es)*	
	Address 1:	DUNDALK LANDFILL & CIVIC WASTE FACILITY
	Address 2:	NEWRY ROAD
	Address 3:	DUNDALK.
	Address 4:	CO. LOUTH
5	Addresses for correspondence if different to above:	DUNDALK TOWN COUNCIL, TOWN HALL, CROWE ST. DUNDALK, CO. LOUTH
6	Contact Name:	PETER MCVEIGH
7	Postion held within company:	LANDFILL MANAGER
8	Telephone Numbers (Landline & Mobile):	042 93322756, 0860437922
9	E-mail:	peter.mcveigh@dundalktown.ie

Please enter the name of the person who will answer any queries about the information submitted.

Waste Activities Onsite

10	Were any wastes accepted at the landfill facility in 2010 for onsite recovery?	No	If YES, please specify the waste types recovered:	

11	Is there a civic amenity facility onsite?	Yes	If YES, please detail these wastes on Part 3 of this Survey
12	Is there a composting facility onsite?	Yes	If YES, please complete Part 4 of this Survey
			Also, please state whether the compost produced in 2010 meets the EPA stability standard: Yes
13	Is the compost facility approved by the Department of Agriculture, Fisheries and Food to compost animal by-products?	NO	
14	Remaining consented disposal capacity of the landfill (tonnes):	CLOSED	
15	Are there any other waste activities or infrastructure on-site? (e.g. baling, biostabilisation, waste transfer station etc. but excluding landfill related activities such as gas flaring, leachate treatment)	PLEASE SELECT	If YES, please describe:
16	Is the landfill closed?	Yes	If YES, please advise date of closure:
17	EPA Waste Licence Number:	W0034-02	

NATIONAL WASTE REPORT 2010 SURVEY

PART 3 - Household Waste Accepted at Civic Amentity Site in 2010

Enter information into white cells only.
Information on non-household waste is requested to ensure that respondents consider and apply a household/non-household split. It is not mandatory.
Please note that the information provided on this sheet may be subject to verification by audit.

If there is any waste from the civic amenity site that is recovered or disposed of at the landfill, remember to input the relevant data into Part 2, Section B of this survey.

					DISPOSAL OR RECOVERY		
Material type	**Suggested EWC codes**		**Household waste**	**Non-household waste**	**Name of destination facility(ies), or collector(s) if directly exported**	**"D" or "R" or "Both"**	**Commentary (if needed)**
(If you must depart from this list, please provide details on a separate sheet)	**(overwrite as appropriate)**	**Notes**	**(tonnes)**	**(tonnes)**	**(please provide licence/permit number)**	**(if a mixture of both, please provide an explanation)**	
Mixed residual waste	20 03 01		60		whiteriver landfill w0060-02	D	
Organic waste (food and garden)						SELECT	
if segregated, provide specific information on food and garden waste							
food	*20 01 08*					SELECT	
garden	*20 02 01*		2,827		dundalk town council W0034-02V & W	R	
Mixed dry recyclables	20 03 01					SELECT	
Cardboard, newspaper and other paper						SELECT	
if segregated, provide the breakdown of cardboard and paper in the rows below							
cardboard packaging	*15 01 01*		*1,978*		Peute Europe nl 6000076	R	
cardboard non-packaging	*20 01 01*					SELECT	
paper packaging	*15 01 01*					SELECT	
paper non-packaging	*20 01 01*					SELECT	
newspaper and magazines	*20 01 01*		*220*		Peute Europe nl 6000076	R	
Glass						SELECT	
if segregated, provide the breakdown of glass in the next two rows							
glass packaging	*15 01 07*		606		Glasson N.I l-n06/08	R	
glass non-packaging	*20 01 02*					SELECT	
Metals			177		Tinnelly N.I wmex22/01	R	
if segregated, provide the breakdown of metals in the next four rows							
aluminium cans (packaging)	*15 01 04*					SELECT	
steel cans (packaging)	*15 01 04*					SELECT	
other metals (non-packaging)	*20 01 40*					SELECT	
Plastic						SELECT	
if segregated, provide the breakdown of plastic waste in the next two rows							
plastic packaging	*15 01 02*		719		Shabra Plastic IRL mn-080022-01	R	
plastic non-packaging	*20 01 39*					SELECT	
Composite packaging (e.g. tetrapaks)	15 01 05						
Textiles						SELECT	
if segregated, provide the breakdown of textiles in the next two rows							
textiles, packaging	15 01 09					SELECT	
textiles, non-packaging	20 01 11		20		Cookstown N.I wmex01/11	R	
Wood						SELECT	
if segregated, provide the breakdown of wood waste in the next four rows							
wood packaging	15 01 03		433		Finsa IRL t0022-2	R	
wood non-packaging	20 01 38		1,020		Finsa IRL t0022-2	R	
mixed, uncontaminated wood packaging and non-packaging	15 01 03; 20 01 38					SELECT	
wood, treated, hazardous	20 01 37*					SELECT	
Batteries		*Portable batteries weigh <2kg, are sealed, are not exclusively designed to propel an electrical vehicle, and are not intended to be used for automotive starter, lighting or ignition power.*				SELECT	

lead acid batteries and accumulators	16 06 01*	portable				SELECT	
		non-portable (automotive and industrial)	4		Returnbatt IRL mh2001/61	R	
Ni-Cd batteries and accumulators	16 06 02*	portable				SELECT	
		non-portable (automotive and industrial)				SELECT	
Other (e.g. alkaline) batteries and accumulators	16 06 04	portable	1		Returnbatt IRL mh2001/61	R	
		non-portable (automotive and industrial)				SELECT	
Waste mineral oils	13 xx xx	*lubrication, vehicle, machine, etc.*	4.5		Enva IRL mh2001/107c	R	
Oil filters (vehicles)						SELECT	
Oil containers (mineral oil) - plastic + metal						SELECT	
Waste cooking or vegetable oils	20 01 25		5.9		Enva IRL mh2001/107c	R	
Waste paint and varnish (including containers)	08 01 12		3		Enva IRL mh2001/107c	Both	<Overwrite here with commentary>
Tyres	16 01 03					SELECT	
WEEE taken off-site by charities *(e.g. mobile phones)*	various	*EPA will compile tonnages of WEEE collected by WEEE Ireland or ERP from civic amenity sites from the compliance schemes and therefore this tonnage should not be reported here*					
Plasterboard (gypsum-based construction materials)	17 08 02					SELECT	
Household hazardous waste (medicines, pesticides etc.)	various					SELECT	
Bulky waste *(provide detailed information in table below)*	20 03 07	*e.g. furniture, mattresses, mixed bulky waste*					
Building Rubble	17 01 07		1778		whiteriver landfill w0060-02	R	
< other categories not included above>	<enter EWC code>					SELECT	
<other categories not included above>	<enter EWC code>					SELECT	
<other categories not included above>	<enter EWC code>					SELECT	

Bulky waste types - *Detailed Information*	**Use a row for the waste types typically accepted in each relevant bulky waste skip or container at your facility** e.g. furniture skip, wood skip etc. <insert description here> <insert description here> <insert description here> <insert description here> <insert description here> <insert description here>

NATIONAL WASTE REPORT 2010 SURVEY

PART 4 - WASTES COMPOSTED ONSITE IN 2010

Enter information into white cells only.

Please note that the information provided on this sheet may be subject to verification by audit.

If there is any waste from the composting facility that is recovered or disposed of at the landfill, remember to also input the relevant data into Part 2, Section B of this survey.

Waste Description	EWC Code	Quantity accepted from ROI (TONNES)	Quantity accepted from abroad (TONNES)
MUNICIPAL WASTE:			
Brown bin waste (kitchen/garden) separately collected from households	20 01 08		
Kitchen and canteen waste separately collected from commercial sources (hotels, canteens, commercial etc)	20 01 08		
Garden and park waste from municipal sources (landscapers, householders etc.)	20 02 01	2,827.00	
Paper and cardboard from municipal sources e.g. office paper, newspaper	20 01 01		
Paper packaging and cardboard packaging e.g., paper bags, wrapping paper	15 01 01		
Wood waste from municipal sources	20 01 38		
Wood packaging e.g., crates, cartons, cheese boxes, fruit trays	15 01 03		
Edible oil and fat	20 01 25		
Waste from markets	20 03 02		
Septic tank sludge	20 03 04		
<<Enter waste description here>>	SELECT		
WASTES FROM WASTE MANAGEMENT FACILITIES:			
Organic fines from mechanical treatment of municipal waste	19 12 12		
Sludges from treatment of urban waste water	19 08 05		
Sludges from water clarification	19 09 02		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING:			
Poultry litter	02 01 06		
Pig manure	02 01 06		
Cattle manure	02 01 06		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
WASTE FROM THE FOOD PROCESSING INDUSTRY:			
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
WASTE FROM OTHER INDUSTRIES:			
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
OTHER - If you compost any waste other than the headings mentioned above, please use the blank rows below.			
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		
<<Enter waste description here>>	SELECT		

Please provide details regarding the end use of the compost produced onsite, including name of landfill if used for daily cover or engineering.	for use by local authority for use in parks, roadside plantings.Resident associations for use in estate vegetation management and general public private use

APPENDIX B

PRTR REPORTING, LANDFILL GAS REPORT

	to be filled in by licensee		calculated by spreadsheet	

Flare No. 1

Flare type ?	Biogas BG2468	If "other" enter flare description here	
Is the flare an open or enclosed flare ?	Enclosed	Rated flare capacity ?	600 m3/hr
Month /year comissioned ?	January 2004		
Month decomissioned if decomissioned in 2010 ?	Select		
What is the function of the flare ?	Extraction from capped area	If "other" enter flare function here	

Monthly	Method M/C/E	Runtime days/month	Runtime hrs/day	Downtime hrs	Total runtime hrs/month	Average Inlet Pressure (mbg)	Average Flow Rate (m^3/hr)	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
January	C	24	22.0	5.0	523	-6	150	28.00	10.00	8.00	98.0	21,527	14,775
February	C	24	21.0	6.0	498	-6	150	28.00	10.00	8.00	98.0	20,498	14,069
March	C	26	22.0	6.0	566	-6	175	28.00	12.00	7.50	98.0	27,179	18,655
April	C	26	22.0	6.0	566	-7	175	28.00	12.00	8.00	98.0	27,179	18,636
May	C	27	23.0	5.0	616	-7	175	28.00	12.00	9.00	98.0	29,580	20,283
June	C	28	23.0	2.0	642	-6	200	28.00	12.00	9.00	98.0	35,233	24,183
July	C	28	23.0	3.0	641	-6	225	28.00	11.00	8.00	98.0	39,575	27,163
August	C	28	23.0	3.0	641	-7	200	28.00	10.00	9.00	98.0	35,178	24,121
September	C	28	21.0	5.0	583	-6	200	27.00	12.00	8.50	98.0	30,852	21,176
October	C	27	21.0	5.0	562	-6	175	28.00	13.00	4.00	98.0	26,987	18,523
November	C	26	20.0	6.0	514	-6	175	28.00	15.00	5.50	98.0	24,682	16,941
December	C	24	20.0	6.0	474	-6	150	28.00	12.00	4.00	98.0	19,510	13,391
Total					6,826							337,981	231,915

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

Yearly	Method M/C/E	Runtime days/year	Runtime hrs/day	Downtime hrs	Total runtime hrs/year	Average Inlet Pressure (mbg)	Average Flow Rate m^3/hr	Average CH_4 %v/v	Average CO_2 %v/v	Average O_2 %v/v	Combustion efficiency (%)	Total CH_4 m^3	Total CH_4 kgs
2010					0						98.0	0	0

| PRTR# : W0034 | Facility Name : Dundalk Landfill & Civic Waste Facility | Filename : W0034_2010.xls | Return Year : 2010 |

Environmental Protection Agency

Guidance to completing the PRTR workbook

AER Returns Workbook

Version 1.1.11

REFERENCE YEAR	2010

1. FACILITY IDENTIFICATION

Parent Company Name	Dundalk Town Council
Facility Name	Dundalk Landfill & Civic Waste Facility
PRTR Identification Number	W0034
Licence Number	W0034-02

Waste or IPPC Classes of Activity

No.	class_name
4.2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes).
3.11	Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.
3.13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.
4.10	The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system.
4.11	Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.
4.13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.
4.3	Recycling or reclamation of metals and metal compounds.
4.4	Recycling or reclamation of other inorganic materials.

Address 1	Newry Road
Address 2	Dundalk
Address 3	Co. Louth
Address 4	
Country	Ireland
Coordinates of Location	-6.39622 54.0147
River Basin District	GBNIIENB
NACE Code	3832
Main Economic Activity	Recovery of sorted materials
AER Returns Contact Name	Peter McVeigh
AER Returns Contact Email Address	peter.mcveigh@dundalktown.ie
AER Returns Contact Position	
AER Returns Contact Telephone Number	042 9392936/ 087 7700031
AER Returns Contact Mobile Phone Number	
AER Returns Contact Fax Number	
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0

User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

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

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

4.1 RELEASES TO AIR

Link to previous years emissions data

| PRTR# W0034 | Facility Name Dundalk Landfill & Civic Waste Facility | Filename W0034_2010.xls | Return Year 2010 | 08/04/2011 11:24

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0
01	Methane (CH4)	C	OTH		231913.0	351100.0	23100.0	96087.0
03	Carbon dioxide (CO2)	C	OTH		195077.0	296632.0	23487.0	78068.0

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO AIR					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD				QUANTITY		
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0
					0.0	0.0	0.0	0.0
02	**Carbon monoxide (CO)**	C	OTH		8596.0	12983.0	997.0	3390.0

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

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

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

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

Additional Data Requested from Landfill operators

For the purposes of the National Inventory on Greenhouse Gases, landfill operators are requested to provide summary data on landfill gas (Methane) flared or utilised on their facilities to accompany the figures for total methane generated. Operators should only report their Net methane (CH4) emission to the environment under T(total) KG/yr for Section A: Sector specific PRTR pollutants above. Please complete the table below:

Landfill: Dundalk Landfill & Civic Waste Facility

Please enter summary data on the quantities of methane flared and / or utilised	**T (Total) kg/Year**	**M/C/E**	**Method Used**		**Facility Total Capacity m3 per hour**	
			Method Code	**Designation or Description**		
Total estimated methane generation (as per site model)	351100.0	C	oth	calculated from gas sim lite	N/A	
Methane flared	231913.0	C	oth	calculated from gas sim lite	600.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	119187.0	C	oth	calculated from gas sim lite	N/A	

4.3 RELEASES TO WASTEWATER OR SEWER

Link to previous years emissions data

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0
79	Chlorides (as Cl)	E	ESTIMATE		457.0	457.0	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	E	ESTIMATE		4.1	4.1	0.0	0.0
06	Ammonia (NH3)	E	ESTIMATE		166.0	166.0	0.0	0.0

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

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

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER					Please enter all quantities in this section in KGs			
POLLUTANT		METHOD			QUANTITY			
			Method Used					
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

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

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR# : W0034 | Facility Name : Dundalk Landfill & Civic Waste Facility | Filename : W0034_2010.xls | Return Year : 2010 |

08/04/2011 11:24

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Please enter all quantities on this sheet in Tonnes

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	20 03 03	No	977.0	street-cleaning residues	D1	M	Weighed	Onsite in Ireland	V&W,WCP/MH/2001/90C	DUNDALK CIVIC AMENITY SITE,NEWRY ROAD,DUNDALK,,,IRELAND		
Within the Country	**20 01 99**	**No**	1838.0	other fractions not otherwise specified	D1	M	Weighed	Onsite in Ireland	V&W,WCP/MH/2001/90C	CIVIC AMENITY SITE,NEWRY ROAD,DUNDALK,,,IRELAND		

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

APPENDIX C

WATER BALANCE CALCULATION

MONTHLY WATER BALANCE CALCULATION 2010

Year	Active Phase	Active Area $A(m^2)$	Waste Input t/month	Rainfall mm	Active Area Infilitration $AR(A)(m^3)$	Temp Restored area	Temp Restored area(Temp) $RCA(m^2)$	Restored area(Temp) infiltration IRCA(m3)	Permanently Restored area	Restored area $RCA(m^2)$	Total Water	Cumulative Water	Absorptive Capacity aW(m3)	Cumulative Absorptive Capacity	Cumulative Leachate	Leachate produced Lo(m3)
2011	Closed		0.00	671.4	0				79000	5304	5304	5304	0.00	0.00	5304	5304
Total			**0.00**	**671.4**	**0**			**0**		**5304**			**0**			**5304**

Assumptions

IRCA=	Temporarily capped/restored area infiltration of rainfall estimated %	30%	%
	Permanent capped/restored area infiltration of rainfall estimated % (2-10%)	10%	%
Absorptive Capacity=	waste density of 0.8 tonnes/m3. Estimated absorptive capacity (water per tonne waste before leachate is produced) t/m3	0.06	t/m3
Restored Area	Area	79,000	m^2
Rainfall	Rainfall taken from Ardee weather station.	671.4	mm

APPENDIX D

FLARE EMISSION REPORT

Monitoring of Flare Emissions at Dundalk Landfill - June 2010

DOCUMENT CONTROL SHEET

Client	Dundalk Town Council					
Project Title	Monitoring of Flare Emissions at Dundalk Town Landfill					
Document Title	Survey Report: June 2010					
Document No.	MDE0998Rp0001					
This Document Comprises	DCS	TOC	Text	List of Tables	List of Figures	No. of Appendices
	1	1	4	1	0	1

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
D01	Draft	Ronan Murphy	Caitriona Reilly	Paul Chadwick	Dublin Environment	01/07/2010
F01	Final	Ronan Murphy	Caitriona Reilly	Paul Chadwick	Dublin Environment	02/07/2010
F02	Final	Ronan Murphy	Caitriona Reilly	Paul Chadwick	Dublin Environment	14/04/2011

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LIST OF TABLES

1 INTRODUCTION

This report presents the results of the flare monitoring undertaken at Dundalk Town Council Landfill in accordance with Schedule D.6 of Waste Licence No. W0034-02.

Dundalk Town Council commissioned RPS Group to monitor emissions to atmosphere from a 1600 m^3 Biogas flare unit at Dundalk Town Council Landfill, Dundalk, County Louth. The flare system is used to burn off landfill gas emitted from the decaying landfill waste and was sampled for emissions of flue gas parameters mainly:

- Nitrogen Oxide (NO_X)
- Carbon Monoxide (CO)
- Sulphur Dioxide (SO_2)

2 MONITORING

Suitably qualified personnel from RPS Group conducted the monitoring on the flare unit on 11th June 2010. The sampling and analytical methodologies employed are outlined below.

2.1 FLUE GAS ANALYSIS

Flue gas emissions were measured using a Testo 350 XL Flue Gas Analyzer. This is a specialised flue gas analysis system fully equipped with electrochemical sensors. The Flue Gas Analyser measures the following parameters:

- Carbon Monoxide (CO)
- Nitrogen Oxides (NO_x)
- Sulphur Dioxide (SO_2)

Sampling rounds were conducted over a 20-minute period in order to the flare temperature to be optimised.

3 RESULTS

3.1 FLUE GAS ANALYSIS

The results of flue gas emissions monitoring from the Biogas flare unit at Dundalk Town Council Landfill are presented in Table 3.1 below and compared with the emission limit values outlined in Schedule C.6 of the Waste Licence:

Table 3.1 Results of Flue Gas Monitoring from the Flare Unit

Parameter	Units	Emission Value[1]	Emission Limit[2]
Nitrogen Oxides (NO_x) as NO_2	(mg/Nm^3)	3	150
Carbon Monoxide (CO)	(mg/Nm^3)	4	Na
Sulphur Dioxide (SO_2)	(mg/Nm^3)	1	Na

Note: 1 Normalised to 273K, 101.3 kPa and $\%O_2$ reference of 3
Note: 2 As stated in Schedule C.5. of Waste Licence W0060-02

4 CONCLUSIONS

The level determined for all parameters were below the relevant emission limit values as stated in Schedule C.6 of Waste Licence W0034-02.

The findings of the flare test show that all Waste Licence parameters listed in Waste Licence W0034-02 are within the limits specified in schedule C.6. These findings show that efficient combustion in taking place within the combustion chamber of the Dundalk Town Council flare and in general, is operating under the original manufacturers specification.

Appendix A - Survey Details

Location

Dundalk Landfill & Civic Waste Facility,
Newry Road,
Dundalk,
County Louth

Personnel Present

Ronan Murphy – Environmental Consultant RPS

Date and Time

11th June 2010

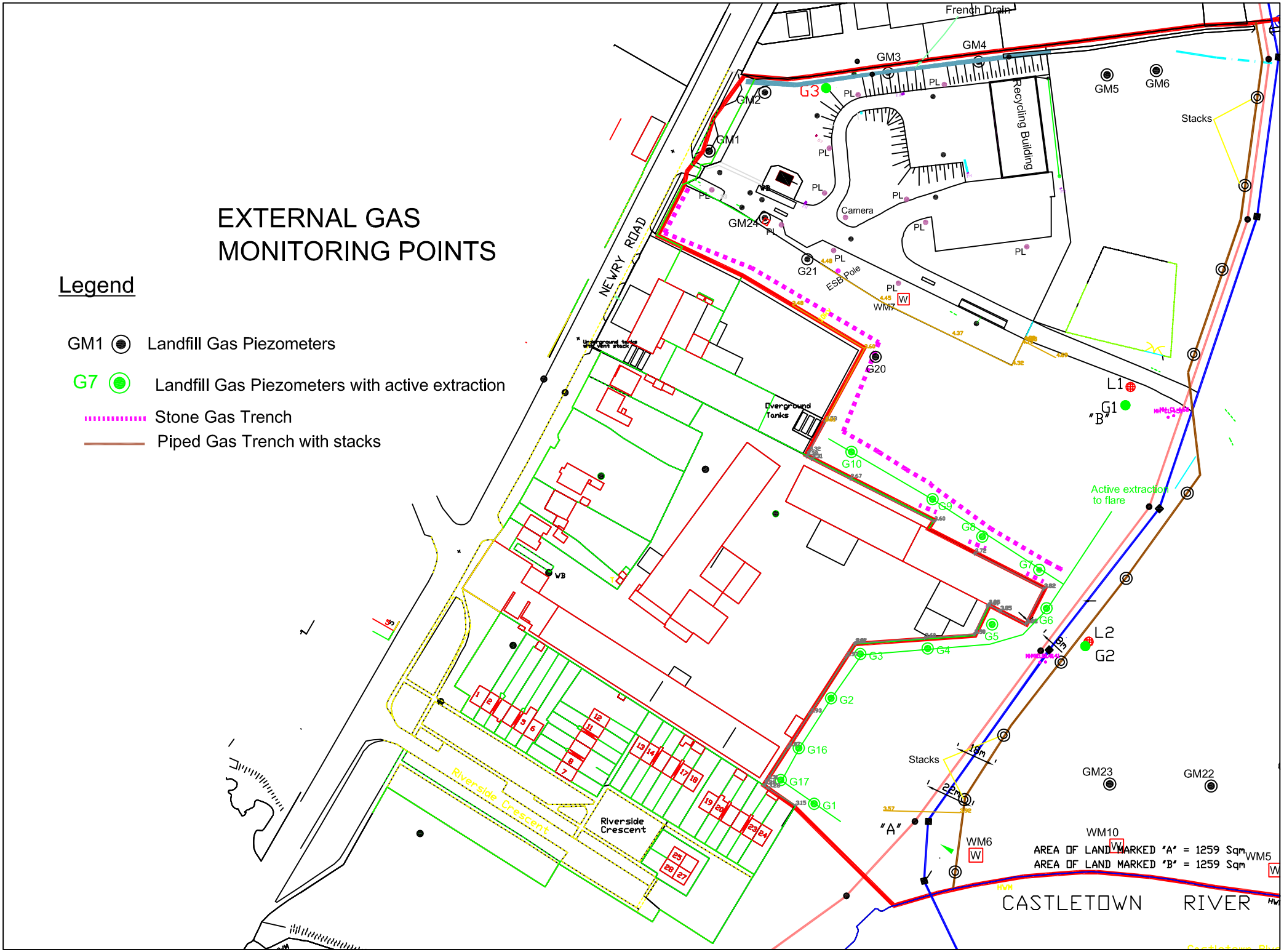
10:30 – 11:30

Equipment

Testo 350XL Flue Gas Analyser

APPENDIX E

MONITORING POINTS DRAWING


EXTERNAL GAS
MONITORING POINTS
Legend
GM1 Landfill Gas Piezometers
G7 Landfill Gas Piezometers with active extraction
Stone Gas Trench
Piped Gas Trench with stacks
French Drain
GM4
GM3
GM2
GM1
G3
GM5
GM6
Stacks
Recycling Building
PL
WB
Camera
GM24
G21
ESB Pole
WM7
NEWRY ROAD
G20
L1
G1
"B"
Overground Tanks
G10
G9
G8
G7
G6
G5
G4
G3
G2
G16
G17
G1
Active extraction to flare
L2
G2
Riverside Crescent
Stacks
15m
2m
GM23
GM22
"A"
WM6
WM10
WM5
AREA OF LAND MARKED 'A' = 1259 Sqm
AREA OF LAND MARKED 'B' = 1259 Sqm
CASTLETOWN RIVER
HWM

In Complince with
Condition No. 11.5.1.

Legend

- SW1 — Surface Water Monitoring.
- GM1 — Landfill Gas Piezometers.
- WM2 W — Groundwater Monitoring Wells.
- bh — Leachate/Groundwater Boreholes.
- G — Landfill Gas Piezometers.

Grid references of monitoring points

MONITORING POINTS	EASTING	NORTHING
Groundwater Boreholes		
BH1	305164	308459
BH2	305132	308354
BH3	305031	308598
BH4	305449	308294
BH5	305331	308441
BH6	305495	308458
BH7	305344	308524
Leachate Boreholes		
L1	305164	308461
L2	305138	308355
L4	305449	308394
L5	305331	308441
L6	305494	308458
L7	305343	308524
Surface Water Monitoring Locations		
SW1	305037	308606
SW2	305305	308640
SW3	305420	308551
SW4	305628	308499
SW5	305534	308201
SW6	305366	308250
SW7	304917	308164
SW8	304164	308456
SW9	305781	307718
Landfill Gas		
GM1	304979	308569
GM2	305016	308591
GM3	305058	308599
GM4	305099	308605

Continued

MONITORING POINTS	EASTING	NORTHING
Landfill Gas		
GM5	305142	308610
GM6	305178	308613
GM7	305229	308616
GM8	305273	308621
GM9	305296	308548
GM10	305385	308494
GM11	305424	308511
GM12	305462	308492
GM12A	305546	308471
GM13	305531	308431
GM14	305513	308393
GM15	305493	308355
GM16	305475	308317
GM17	305411	308298
GM18	305368	308301
GM19	305326	308300
GM20	305285	308295
GM21	305242	308293
GM22	305200	308290
GM23	305157	308290
GM24	305009	308536
G1	305021	308286
G2	305034	308327
G3	305044	308343
G4	305076	308348
G5	305109	308362
G6	305128	308369
G7	305123	308385
G8	305099	308399
G9	305083	308413
G10	305030	308449
G16	305024	308310
G17	305011	308292
G20	305053	308479
G21	305032	308516
Groundwater Monitoring Wells.		
W1	305263	308990
W2	305504	308710
W3	305581	308359
W4	305509	308253
W5	305229	308250
W6	305097	308257
W7	305066	308502
W8	305412	308257
W9	305292	308253
W10	305159	308261

License No. Louthccma9802

COMHAIRLE BHAILE DUN DEALGAN
DUNDALK TOWN COUNCIL
Phone (042) 9335700 Fax (042) 9335701
TOWN ENGINEER:- C. DUFF

PROJECT:- Landfill Site Newry Road.
E.P.A. LICENCE No.WL 34-2

TITLE:- Location Map

JOB NO:-	DRN.NO:-
NO.2	1
SCALE:- 1 / 2500	DATE:- 14/06/05

PATH:- N:Landfill\Landfill drawings\Monitoring Locations.dwg
DRAWING BY:- P Mulligan

DRN. No. REVISION

NO	DATE	DETAILS

APPENDIX F

LEACHATE RESULTS

Dundalk Landfill Site

LEACHATE QUALITY

Monitoring Point:		LH1																
		RESULTS																
		Date																
PARAMETERS	Units	16-Jan-07	26-Apr-07	10-Jul-07	26-Sep-07	16-Oct-07	17-Jan-08	15-Apr-08	30-Jul-08	28-Oct-08	27-Jan-09	29-Apr-09	23-Jul-09	28-Oct-09	19-Jan-10	20-Apr-10	28-Jul-10	26-Oct-10
Alkalinity	mg/l CaCO3																	
Aluminium	µg/l		1179.9					<50				<50				49.6		
Ammonia	mg/l N	128.71	132.04	120.07		125.9	122.2	106.79	114.43	>80	112.55	1.54	102.7	107.92	1.75	154	103.42	109.52
B.O.D.	mg/l O2	11.3	21.9	17.8		5.7	8.8	8.5	25	23.1		8.4	7.4	12.7	11.6	6.7	4.2	7.7
Boron	µg/l		2075.6					1302.1				1595.1	1961.2			1140		
Cadmium	µg/l		<0.10					<0.10				<0.1	0.1			<0.1		
Calcium	mg/l Ca		188.79					169.78				167.32	191.32			183.58		
C.O.D.	mg/l O2	145	170	206		116	125	132	147	238		80	102	145	73	124	116	105
Chloride	mg/l Cl	138	130	174		151	148	160	221	216	176	170	171	154	144	139	166	180
Chromium	µg/l		35.4					36				23	30.1			11.1		
Conductivity	µS/cm @ 25	2810	2920	2810		2690	2580	2500	2740	2760	2770	2610	2580	2660	2590	2960	2500	2720
Copper	µg/l		13.4					16				1.2	3.3			2.6		
Cyanide	mg/l CN		<0.05					<0.05						nm				nm
Depth	m		3.6	3.4		3.7	3.2			2.6	5.5				3.2	3.1	4.2	
D.O.	% Saturation										nm							
Fluoride	mg/l		<0.150					<0.150					<0.150			<0.150		
Iron	µg/l		26158.8					21960.8				11227.3	33120.5			30325.1		
Lead	µg/l		10.1					<1				<1	<1			1.1		
Magnesium	mg/l Mg		92.43					60.71				60.21	56.47			58.55		
Manganese	µg/l		579.1					529				578.3	604.7			627.3		
Mercury	µg/l		<0.10					0.2				<0.1	<0.1			<0.1		
Nickel			89.7					32.9				11	28.5			5.4		
o-Phosphate	mg/l P		0.02					<0.02				0.3	0.18	<0.02	<0.02	<0.02	<0.02	<0.02
pH		6.8	6.9	6.8		6.8	6.8	6.9	6.7	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.7	6.8
Potassium	mg/l		75.34					62.77				62.43	74.57			66.39		
Residue on Evaporation																		
Sodium	mg/l		136.02					74.29				97.54	124.03			106.98		
Sulphate	mg/l SO4		16.4					<2.0				<2.0	<2.0			6.6		
Temp	°C	7	12	15	nm	14	12	nm	12.9	11	10	15.8	14.8	nm	8.2	9.4	nm	13.1
Time Sampled		11	11	11.05	10	10.4	11	11	11.3	11.2	11	11	11.3	nt	10.5	10.5	10.45	11:00
T.O.C.	mg/l										35.5							
T.O.N	mg/l N	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	<0.05		0.11	0.12	<0.08	<0.08	<0.08	<0.08	<0.08
Total S Solids	mg/l																	
Zinc	µg/l		179.9					25.5				5.2	21			20.7		

Dundalk Landfill Site

LEACHATE QUALITY

Monitoring Point:		LH2																
		RESULTS																
		Date																
PARAMETERS	Units	16-Jan-07	26-Apr-07	10-Jul-07	26-Sep-07	16-Oct-07	17-Jan-08	15-Apr-08	30-Jul-08	28-Oct-08	27-Jan-09	29-Apr-09	23-Jul-09	28-Oct-09	19-Jan-10	20-Apr-10	28-Jul-10	26-Oct-10
Alkalinity	mg/l CaCO3																	
Aluminium	µg/l		557.9					36.8				<50				23.4		
Ammonia	mg/l N	140.46	181.33	60.85		136.46	47.65	206.54	181.92	89.61	107.71	1.79	5.04	91.17	48.07	111.95	80.95	85.94
B.O.D.	mg/l O2	31.1	25.2	35.4		117.2	16.3	17.4	21.3	18.5		35.4	5.1	6.4	60.1	28.1	7.5	5.1
Boron	µg/l		2122.1					2402.4				2335.2	241.1			1335.4		
Cadmium	µg/l		<0.10					<0.10				<0.1	<0.1			<0.1		
Calcium	mg/l Ca		221.31					185.29				180.22	99.57			234.08		
C.O.D.	mg/l O2	175	236	111		220	96	247	186	128		180	13	121	72	148	108	76
Chloride	mg/l Cl	145	223	67		193	64	236	197	115	113	170	15	83	62	114	98	85
Chromium	µg/l		40.1					64.6				19.8	4			9		
Conductivity	µS/cm @ 25	3120	3930	1927		3360	1693	4180	3700	2450	2790	3310	680	2260	1803	3020	2260	2250
Copper	µg/l		8.8					10				3.3	4.7			2.3		
Cyanide	mg/l CN		<0.05					<0.05						nm				nm
Depth	m		3.5	3.6		4	3			2.4	1				2.9	2.9	4	
D.O.	% Saturation										nm							
Fluoride	mg/l		<0.150					<0.150					0.19			0.16		
Iron	µg/l		28870.8					30812.8				4909.2	867.4			24610.8		
Lead	µg/l		6.5					3.1				<1	<1			1.8		
Magnesium	mg/l Mg		114.35					105.51				87.71	14.66			67.31		
Manganese	µg/l		1121.2					877.3				668.2	130.9			767.7		
Mercury	µg/l		<0.10					<0.10				<0.1	<0.1			<0.1		
Nickel			54.7					48.2				18	4.7			14.3		
o-Phosphate	mg/l P		0.09					0.07				0.54	0.02	0.02	<0.02	<0.02	<0.02	0.03
pH		6.7	7	6.8		7	6.8	7	6.9	6.8	6.9	6.9	7.2	6.9	6.9	6.9	6.8	6.9
Potassium	mg/l		144.38					157.26				106.62	14.34			73.89		
Residue on Evaporation																		
Sodium	mg/l		195.37					218.71				142.74	16.09			101.24		
Sulphate	mg/l SO4		8.5					14.8				10.1	86.2			10.9		
Temp	°C	7	12	15	nm	14	12	nm	12	11	9	16	14.8	nm	8.9	9.5	nm	13.3
Time Sampled		11.3	11.25	11.25	10.2	11.05	11.3	11.2	11.5	12.05	11.2	11.2	11.45	nt	11.2	11.2	11.05	11:25
T.O.C.	mg/l										33.1							
T.O.N	mg/l N	<0.5	<0.05	0.48		0.26	1.23	<0.05	<0.05	0.54		0.46	0.45	<0.08	<0.08	<0.08	<0.08	0.09
Total S Solids	mg/l																	
Zinc	µg/l		38.1					27				33.6	15.6			27.5		

Dundalk Landfill Site

LEACHATE QUALITY

Monitoring Point:		LH4																
		RESULTS																
		Date																
PARAMETERS	Units	16-Jan-07	26-Apr-07	10-Jul-07	26-Sep-07	16-Oct-07	17-Jan-08	15-Apr-08	30-Jul-08	28-Oct-08	27-Jan-09	29-Apr-09	23-Jul-09	28-Oct-09	19-Jan-10	20-Apr-10	28-Jul-10	26-Oct-10
Alkalinity	mg/l CaCO3																	
Aluminium	µg/l		2267.6					338.4				<50				35.7		
Ammonia	mg/l N	190.9	180.51	311.08		205.04	165.13	196.42	194.38	242.41	1.41	1.22	1.78	131.19	1.58	118.86	169.97	124.6
B.O.D.	mg/l O2	<30	39	<40		23	11.4	11.1	15.5	6.3		10.3	13.4	14.1	16.3	15.9	16	15.4
Boron	µg/l		1761.7					1737.5				2298.4	2888.4			1086.9		
Cadmium	µg/l		0.5					<0.10				<0.1	<0.1			<0.1		
Calcium	mg/l Ca		160.23					143.45				140.09	162.01			143.63		
C.O.D.	mg/l O2	332	629	600		447	175	210	212	209		170	190	156	145	147	209	109
Chloride	mg/l Cl	208	305	715		271	157	229	330	240	199	205	169	98	179	95	255	118
Chromium	µg/l		28					43.8				23.4	28			2.8		
Conductivity	µS/cm @ 25	3830	3830	6270		4380	3090	3720	3870	4480	4310	3800	3620	2590	3450	2820	3490	2660
Copper	µg/l		20.4					14.8				2.4	13.4			6.2		
Cyanide	mg/l CN		<0.05					<0.05						nm				nm
Depth	m		9.1	9.4		8.6	6			8.5	8.5				8.9	7.9	4	
D.O.	% Saturation										nm							
Fluoride	mg/l		<0.150					<0.150					<0.150			0.15		
Iron	µg/l		8312.6					20914.2				5416.5	30127.9			26317.3		
Lead	µg/l		14.5					7.8				<1	3			<1		
Magnesium	mg/l Mg		87.65					79.47				86.67	93.1			59.14		
Manganese	µg/l		782.1					793.2				780.6	860.7			805		
Mercury	µg/l		<0.10					0.2				<0.1	<0.1			<0.1		
Nickel			33					37.2				13.2	29.9			4		
o-Phosphate	mg/l P		0.05					0.17				1.6	0.94	0.1	0.14	1.14	0.09	0.09
pH		6.9	7	7.1		7.1	6.8	7	6.9	7	6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.8
Potassium	mg/l		156.66					147.02				151.94	149.12			82.74		
Residue on Evaporation																		
Sodium	mg/l		236.8					202.64				172.92	179.3			92.42		
Sulphate	mg/l SO4		20.1					9.1				<2.0	<2.0			<2.0		
Temp	°C	6	12	16	nm	15	12	nm	14.2	14	14	16.4	15.9	nm	12.8	12	nm	13.7
Time Sampled		12.05	12.1	12	10.4	11.4	12.05	11.5	12.35	12.3	11.45	11.45	12.4	nt	11.5	11.55	11.15	12:20
T.O.C.	mg/l										45.3							
T.O.N	mg/l N	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<0.05	<0.05		<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Total S Solids	mg/l																	
Zinc	µg/l		164					68.2				4.7	64.9			19.3		

Dundalk Landfill Site

LEACHATE QUALITY

Monitoring Point:		LH6																
		RESULTS																
		Date																
PARAMETERS	Units	16-Jan-07	26-Apr-07	10-Jul-07	26-Sep-07	16-Oct-07	17-Jan-08	15-Apr-08	30-Jul-08	28-Oct-08	27-Jan-09	29-Apr-09	23-Jul-09	28-Oct-09	19-Jan-10	20-Apr-10	28-Jul-10	26-Oct-10
Alkalinity	mg/l CaCO3																	
Aluminium	µg/l		3368.1					913.5				<500				738.1		
Ammonia	mg/l N	455.22	198.19	282.08		602.54	482.76	490.38	708.87	707.34	0.05	<0.03	98.25	4.49	1.15	509.45	0.47	<0.03
B.O.D.	mg/l O2	<100	213.9	81.2		69.5	53.8	75.6	211.2	35.6		<40	41	139.5	22	35.9	27.5	28.4
Boron	µg/l		738.3					2936.9				5898.8	667			2099.6		
Cadmium	µg/l		<0.10					<0.10				<1	<0.1			<0.1		
Calcium	mg/l Ca		245.08					119.02				115.4	227.8			138.39		
C.O.D.	mg/l O2	626	1035	587		1130	616	947	1035	818		842	541	703	336	660	486	529
Chloride	mg/l Cl	359	181	255		481	386	588	635	676	442	655	90	500	243	451	445	478
Chromium	µg/l		24.6					86.6				55.3	19.3			12.1		
Conductivity	µS/cm @ 25	6120	3650	5050		8990	6230	8070	8800	9220	7610	9910	2670	8100	4240	8270	6980	7680
Copper	µg/l		51.8					16.6				<10	8.8			5.2		
Cyanide	mg/l CN		<0.05					<0.05										nm
Depth	m		4.2	4.9		9.5	8.6			7.5	8				8.1	7.5	3.5	
D.O.	% Saturation										nm							
Fluoride	mg/l		<0.150					<0.150					0.18			<0.150		
Iron	µg/l		29436.3					14047.6				10645	32103.5			26643.2		
Lead	µg/l		17.3					8				<10	6.3			4.1		
Magnesium	mg/l Mg		77.31					106.44				119.1	50.8			83.86		
Manganese	µg/l		982.4					805.5				632.9	4635.2			936.7		
Mercury	µg/l		<0.10					0.3				0.2	<0.1			<0.1		
Nickel			129.3					111.9				105.1	48.8			52.6		
o-Phosphate	mg/l P		3.79					2.3				3.32	2.01	2.95	1.52	2.08	2.37	2.17
pH		6.9	7.1	7.1		7.2	7	7.2	7.1	7.1	7	7.2	6.7	7.1	6.8	7	7.1	7
Potassium	mg/l		85.34					332.98				370.32	40.31			257.56		
Residue on Evaporation																		
Sodium	mg/l		213.63					497.95				535.8	175.45			360.75		
Sulphate	mg/l SO4		33.3					18.3				7.4	20.4			8.6		
Temp	°C	7	11	15	nm	16	14	nm	16.6	17	16	16.5	15.9	nm	15.1	15.5	nm	13.4
Time Sampled		12.35	12.3	12.3	11	12	12.3	12.3	12.15	12.5	11.55	12.1	12.25	nt	12.15	12.2	11.35	12:20
T.O.C.	mg/l										134.5							
T.O.N	mg/l N	<0.05	<0.05	<0.05		0.08	<0.05	<0.05	<0.05	<0.05		0.11	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Total S Solids	mg/l																	
Zinc	µg/l		1418.6					320.1				<10	141.7			70.2		

Dundalk Landfill Site

LEACHATE QUALITY

Monitoring Point:		**LH7**																
		RESULTS																
		Date																
PARAMETERS	**Units**	**16-Jan-07**	**26-Apr-07**	**10-Jul-07**	**26-Sep-07**	**16-Oct-07**	**17-Jan-08**	**15-Apr-08**	**30-Jul-08**	**28-Oct-08**	**27-Jan-09**	**29-Apr-09**	**23-Jul-09**	**28-Oct-09**	**19-Jan-10**	**20-Apr-10**	**28-Jul-10**	**26-Oct-10**
Alkalinity	**mg/l CaCO3**																	
Aluminium	**µg/l**		<500															
Ammonia	**mg/l N**	760.33	650.86	485.12		629.83	183.6											
B.O.D.	**mg/l O2**	<50	48.4	<50		45.2	183.6											
Boron	**µg/l**		4193.2															
Cadmium	**µg/l**		<1															
Calcium	**mg/l Ca**		135.75															
C.O.D.	**mg/l O2**	718	889	736		930	1049											
Chloride	**mg/l Cl**	798	950	1192		1092	499											
Chromium	**µg/l**		121.6															
Conductivity	**µS/cm @ 25**	11060	11140	10340		12280	7510											
Copper	**µg/l**		20.2															
Cyanide	**mg/l CN**		<0.05															
Depth	**m**		9.9	5.7		7.8	7.2											
D.O.	**% Saturation**																	
Fluoride	**mg/l**		<0.150															
Iron	**µg/l**		3972															
Lead	**µg/l**		<10															
Magnesium	**mg/l Mg**		189.23															
Manganese	**µg/l**		478.2															
Mercury	**µg/l**		0.2															
Nickel			135.9															
o-Phosphate	**mg/l P**		0.54															
pH		7.3	7.2	7.2		7.3	7.6											
Potassium	**mg/l**		560.01															
Residue on Evaporation																		
Sodium	**mg/l**		954.75															
Sulphate	**mg/l SO4**		99.3															
Temp	**°C**	7	12	16	nm	25	29											
Time Sampled		13	12.5	12.55	11.2	12.15	12.55											
T.O.C.	**mg/l**																	
T.O.N	**mg/l N**	<0.05	<0.05	12.98		0.05	123.49											
Total S Solids	**mg/l**																	
Zinc	**µg/l**		113.1															

	Dundalk Landfill Site					
	LEACHATE QUALITY					
PARAMETERS						
		No. of Samples	Minimum	Maximum	Mean	Standard Deviation
	Units					
Alkalinity	mg/l CaCO3	0	0	0	#DIV/0!	#DIV/0!
Aluminium	µg/l	4	23.4	738.1	212	351
Ammonia	mg/l N	16	0.47	509.45	108	125
B.O.D.	mg/l O2	16	4.2	60.1	19	14
Boron	µg/l	12	1086.9	2099.6	1415	468
Cadmium	µg/l	12				
Calcium	mg/l Ca	12	138.39	234.08	175	44
C.O.D.	mg/l O2	16	72	660	215	185
Chloride	mg/l Cl	16	62	478	203	137
Chromium	µg/l	12	2.8	12.1	9	4
Conductivity	µS/cm @ 25	16	1803	8270	3731	2035
Copper	µg/l	12	2.3	6.2	4	2
Cyanide	mg/l CN	12				
Depth	m	16	2.9	8.9	5	2
D.O.	% Saturation	12				
Fluoride	mg/l	12	0.15	0.16	0	0
Iron	µg/l	12	24610.8	30325.1	26974	2405
Lead	µg/l	12	1.1	4.1	2	2
Magnesium	mg/l Mg	12	58.55	83.86	67	12
Manganese	µg/l	12	627.3	936.7	784	127
Mercury	µg/l	12				
Nickel	µg/l	12	4	52.6	19	23
o-Phosphate	mg/l P	16	0.03	2.37	1	1
pH	0	16	6.7	7.1	7	0
Potassium	mg/l	12	66.39	257.56	120	92
Residue on Evaporation	0	12				
Sodium	mg/l	12	92.42	360.75	165	130
Sulphate	mg/l SO4	12	6.6	10.9	9	2
Temp	°C	16	8.2	15.5	12	2
Time Sampled	0	16	10.45	12.2	11	1
T.O.C.	mg/l	12				
T.O.N	mg/l N	16	0.09	0.09	0	#DIV/0!
Total S Solids	mg/l	12				
Zinc	µg/l	12	19.3	70.2	34	24

Dundalk Landfill Site

DISCHARGE TO SEWER

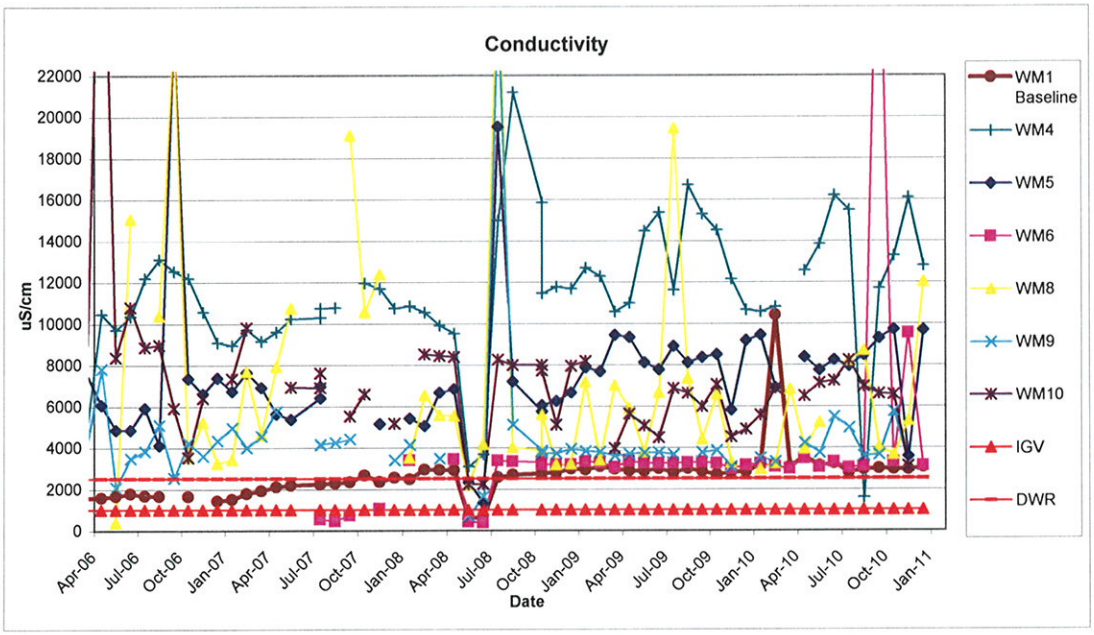
S1

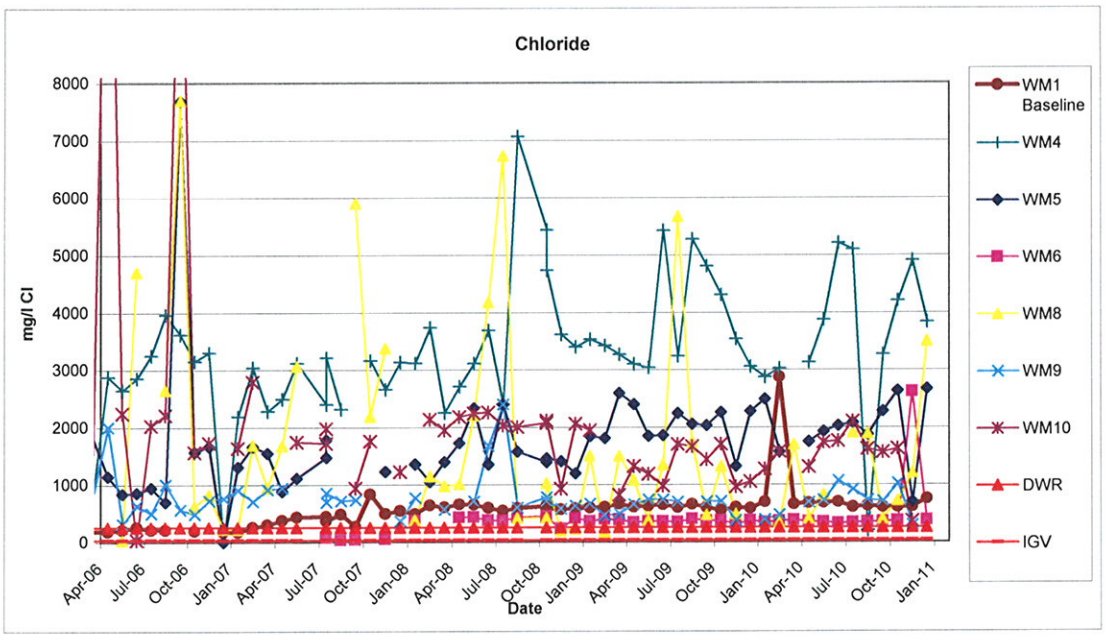
RESULTS

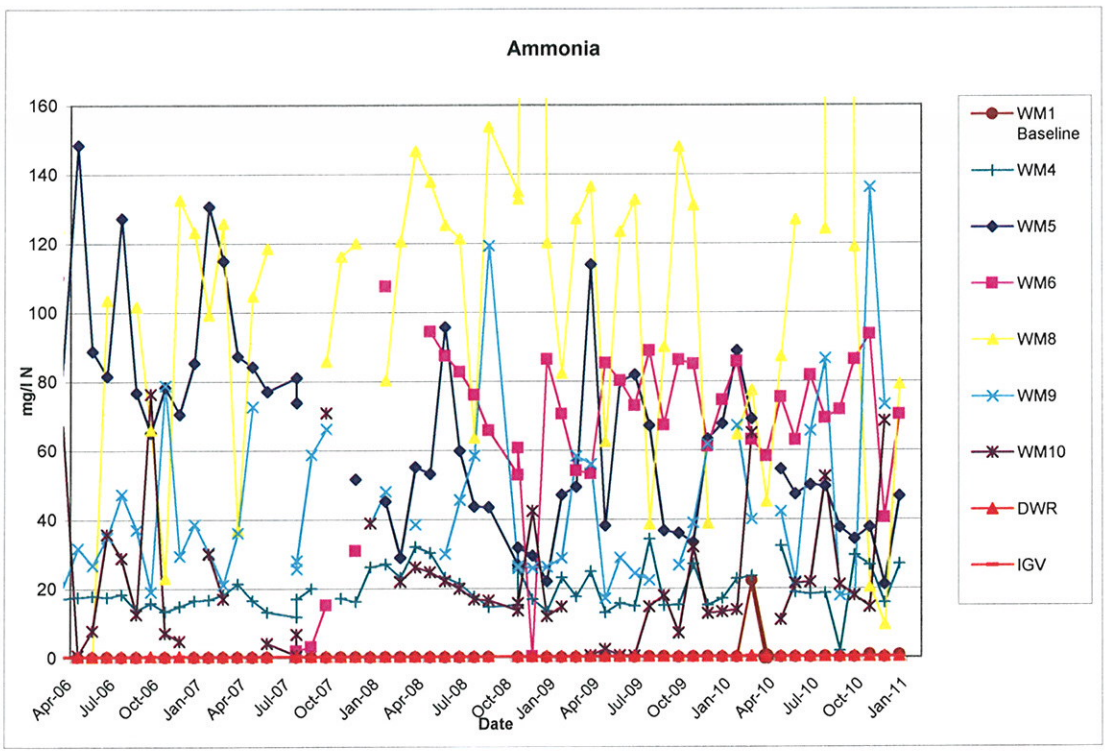
Monitoring Point:																					
		Date																			
PARAMETERS	Units	28-Oct-08	27-Jan-09	25-Mar-09	29-Apr-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	20-Apr-10	19-May-10	16-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3				nm								420								
Aluminium	µg/l				254.4								379.9								
Ammonia	mg/l N	11.74	20.38	48.8	48.37	39.6	0.03	51.72	4.73	51.37	68.25	31.03	25.45	52.30	61.24	0.97	35.25	46.28	47.87	19.38	28.59
B.O.D.	mg/l O2	45.5	330.8		20.6	25.1			8085.0			32.6	184.2			1098.0			102.0		
Boron	µg/l				744.0																
Cadmium	µg/l				0.7								0.1								
Calcium	mg/l Ca				148.11								128.64								
C.O.D.	mg/l O2	114	1289		109	164			14040			163	536			4545			459		
Chloride	mg/l Cl	31	83	189	48	73	17	97	1233	62	83	67	63	49	151	290	50	78	116	99	90
Chromium	µg/l				14.0								3.0								
Conductivity	µS/cm @ 25	652	1254	2050	1541	1931	243	1304	6330	1717	2050	1352	1392	1634	2430	3730	1168	1689	1839	1493	1642
Copper	µg/l				10.8								11.6								
Cyanide	mg/l CN																				
Depth	m																				
D.O.	% Saturation	nm	nm		<10	40			nm			nm	35			nm			nm		
Fluoride	mg/l																				
Iron	µg/l				3859.0								3169.5								
Lead	µg/l				9.0								7.3								
Magnesium	mg/l Mg				40.73								25.34								
Manganese	µg/l				634.4								653.2								
Mercury	µg/l				<0.1								<0.1								
Nickel					9.1								5.3								
o-Phosphate	mg/l P				0.35								1.55								
pH		7.2	7.3		7.2	7.6			6.4			7.4	7.2			7.0			7.2		
Potassium	mg/l				35.71								49.48								
Residue on Evaporation																					
Sodium	mg/l				49.76								35.67								
Sulphate	mg/l SO4				35.5					20.1	6.8	32.1	30.5			40.6					
Temp	°C	12	9		14.2	16.5			nm			8	10.7			nm			12.1		
Time Sampled		14.1	13	12.2		13.05	14.55	11.3	nt	nt	14.10	12.4	14.15	9.25	14.05	14.10	nt	13.40	12:40	nm	13:30
T.O.C.	mg/l																				
T.O.N	mg/l N	1.81	1.7		3.11	0.18			1.56			1.33	0.14			<0.08			2.52		
Total S Solids	mg/l	174	740		40	112			nm			144	114			860			110		
Zinc	µg/l				60.4								44.8								

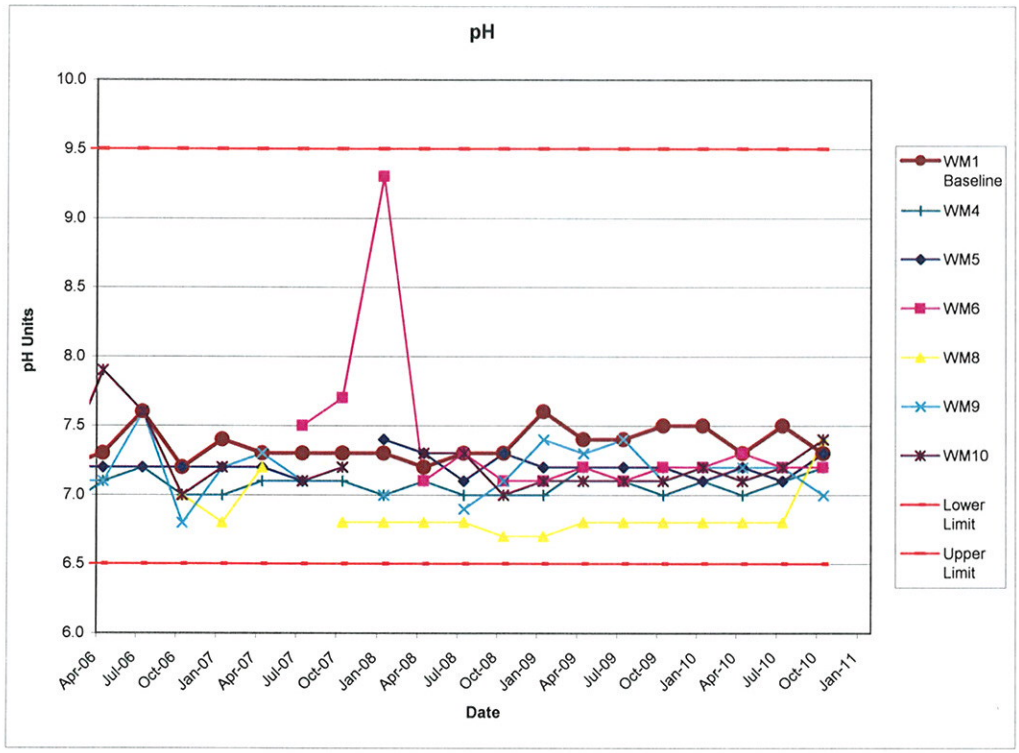
APPENDIX G

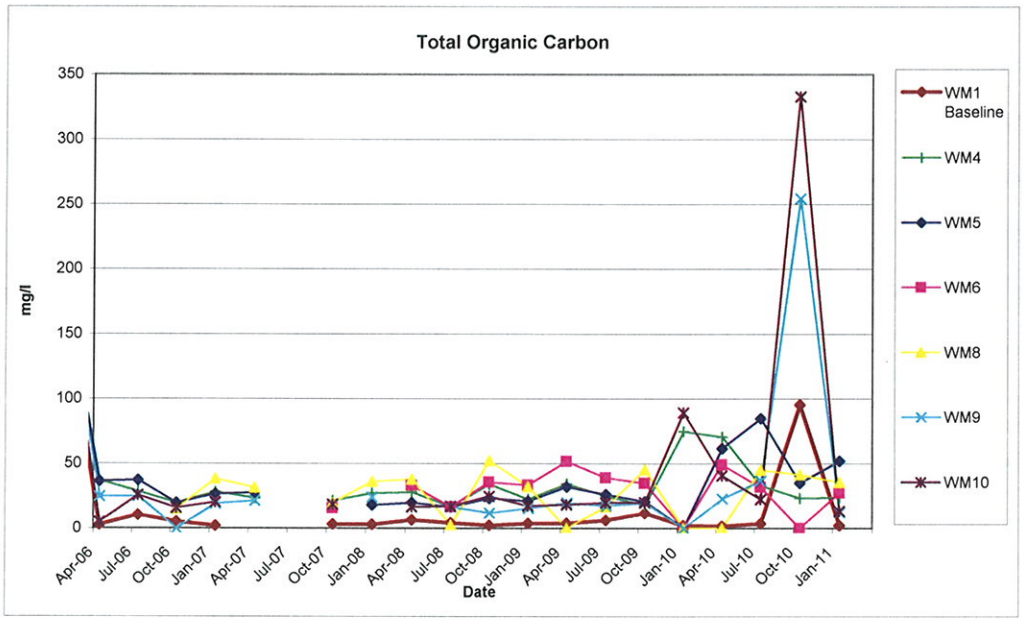
GROUNDWATER RESULTS

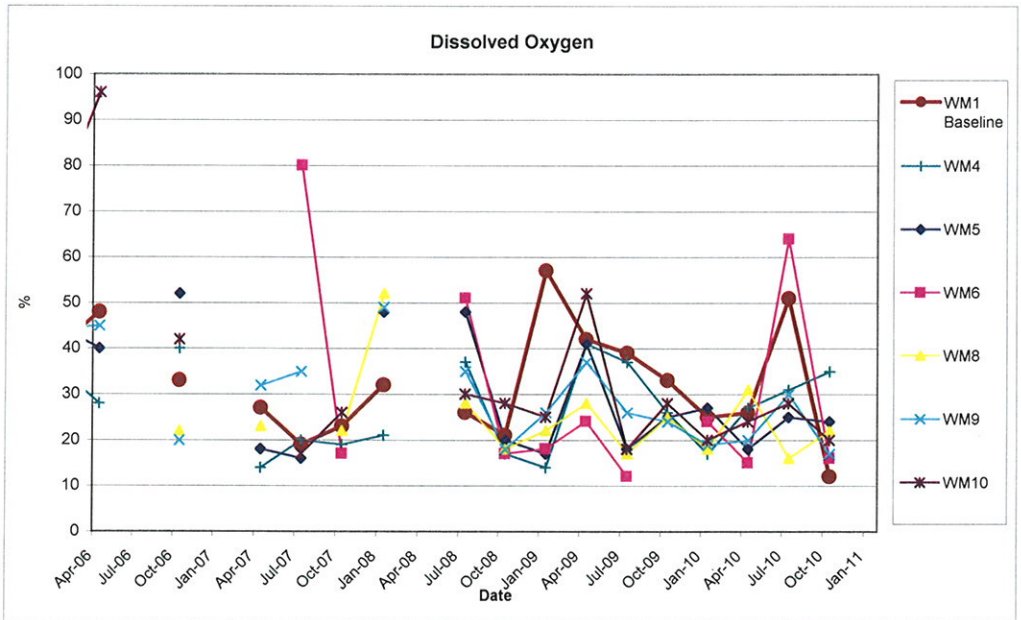

Conductivity
uS/cm
22000
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Date
WM1 Baseline
WM4
WM5
WM6
WM8
WM9
WM10
IGV
DWR


Chloride
mg/l Cl
8000
7000
6000
5000
4000
3000
2000
1000
0
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Date
WM1 Baseline
WM4
WM5
WM6
WM8
WM9
WM10
DWR
IGV


Ammonia
mg/l N
160
140
120
100
80
60
40
20
0
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Date
WM1 Baseline
WM4
WM5
WM6
WM8
WM9
WM10
DWR
IGV


pH
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
pH Units
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Date
WM1 Baseline
WM4
WM5
WM6
WM8
WM9
WM10
Lower Limit
Upper Limit


Total Organic Carbon
350
300
250
200
150
100
50
0
mg/l
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Date
WM1 Baseline
WM4
WM5
WM6
WM8
WM9
WM10


Dissolved Oxygen
100
90
80
70
60
50
40
30
20
10
0
%
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Date
WM1 Baseline
WM4
WM5
WM6
WM8
WM9
WM10

Dundalk Landfill Site

GROUNDWATER QUALITY

Monitoring Point: **WM1**

PARAMETERS	Units	RESULTS Date											
		19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3				380						400		
Aluminium	µg/l				<10						<5		
Ammonia	mg/l N	0.03	22.13	<0.03	0.04	<0.03	<0.03	0.18	0.03	<0.03	0.7	<0.03	0.63
B.O.D.	mg/l O2												
Boron	µg/l				349.5						382.6		
Cadmium	µg/l				<0.1						<0.1		
Calcium	mg/l Ca				144.68						141.42		
C.O.D.	mg/l O2												
Chloride	mg/l Cl	696	2871	658	678	684	697	609	629	607	608	612	750
Chromium	µg/l				<1						1.1		
Conductivity	µS/cm @ 25	3190	10420	3070	3570	3130	3250	2810	2950	3000	2960	2950	3060
Copper	µg/l				1.4						0.7		
Cyanide	mg/l CN				<0.05						<0.05		
Depth	m	2.8			5.5	5.0	5.4	2.5			nm		
D.O.	% Saturation	25			26			51			12		
Fluoride	mg/l				0.19						<0.150		
Iron	µg/l				<10						17		
Lead	µg/l				<1						2.3		
Magnesium	mg/l Mg				54.62						63.86		
Manganese	µg/l				6.8						57.1		
Mercury	µg/l				<0.1						<0.05		
Nickel	µg/l				<1						<0.5		
o-Phosphate	mg/l P				<0.02						0.02		
pH		7.5			7.3			7.3			7.3		
Potassium	mg/l				22.34						24.51		
Residue on Evaporation					1956						1749		
Sodium	mg/l				410.56						449.18		
Sulphate	mg/l SO4				>100						189.6		
Temp	°C	9.9			11.3			15.0			13.7		
Time Sampled		11.45	9.3	16.05	11	8.45	8.50	11.00	nt	8.45	12:10	nm	9.55
T.O.C.	mg/l	2.3			1.7			3.8			95.3		
T.O.N	mg/l N				0.84						1.74		
Total S Solids	mg/l												
Zinc	µg/l				1.7						3.9		

Dundalk Landfill Site

GROUNDWATER QUALITY

Monitoring Point: **WM4**

PARAMETERS	Units	RESULTS																		
		Date																		
		23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3										720						810		
Aluminium	µg/l						<50				<10						26.5		
Ammonia	mg/l N	34.3	14.99	15.14	27.00	15.10	17.01	22.82	23.53		32.25	18.84	18.29	18.62	1.82	29.58	26.73	15.85	27.08
B.O.D.	mg/l O2																		
Boron	µg/l						1275.4				1458.6						1884		
Cadmium	µg/l						<0.1				<0.1						<1		
Calcium	mg/l Ca						145.43				203.11						235.2		
C.O.D.	mg/l O2																		
Chloride	mg/l Cl	3241	5276	4811	4311	3542	3057	2874	3025		3127	3877	5212	5098	200	3266	4211	4913	3833
Chromium	µg/l						12.2				3						8.9		
Conductivity	µS/cm @ 25	11640	16720	15310	14540	12155	10680	10580	10820		12580	13860	16200	15490	1608	11710	13290	16100	12810
Copper	µg/l						23.4				1.7						<5		
Cyanide	mg/l CN						<0.05				<0.05						<0.05		
Depth	m			4.5				4.3						4.1			nm		
D.O.	% Saturation	37			26		26	17			27			31			35		
Fluoride	mg/l						0.350				0.3						<0.150		
Iron	µg/l						2466.0				2684						1628.3		
Lead	µg/l						<1				<1						<5		
Magnesium	mg/l Mg						223.62				237.77						316.39		
Manganese	µg/l						801.3				1013.4						695.8		
Mercury	µg/l						<0.1				<0.1						<0.05		
Nickel	µg/l						5.3				3.9						<5		
o-Phosphate	mg/l P						0.71				0.62						0.45		
pH		7.1			7.0		7.1	7.1			7			7			7.2		
Potassium	mg/l						111.16				121.86						159.43		
Residue on Evaporation							6565				6979						8939		
Sodium	mg/l						1775.87				1887.62						2645.79		
Sulphate	mg/l SO4						>200				>300						443.3		
Temp	°C	15.4			14.1		11.6	10.6			11.8			16			13.5		
Time Sampled		11.4	12	14	nt	nt	12.35	14	11.4		14.1	11.2	10.28	11.2	nt	10.2	13:55	nm	10:20
T.O.C.	mg/l	24.9			17.6		nm	74.6			70.5			33.1			23.3		
T.O.N	mg/l N						<0.08				<0.08						0.47		
Total S Solids	mg/l																		
Zinc	µg/l						14.2				2.5						20.8		

	Dundalk Landfill Site																		
	GROUNDWATER QUALITY																		
Monitoring Point:	WM5																		
		RESULTS																	
		Date																	
PARAMETERS	Units	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											690						925		
Aluminium	µg/l							<50				<10						6.4		
Ammonia	mg/l N	67.1	36.68	35.95	33.28	33.28	63.21	67.68	88.83	69.1		54.45	47.23	49.9	49.56	37.61	34.3	37.68	21.14	46.63
B.O.D.	mg/l O2																			
Boron	µg/l							1475.8				1558.2						1858.9		
Cadmium	µg/l							<0.1				<0.1						<1		
Calcium	mg/l Ca							145.55				163.79						193.61		
C.O.D.	mg/l O2																			
Chloride	mg/l Cl	2242	2052	2033	2263	2263	1320	2276	2490	1569		1749	1924	2029	2077	1869	2278	2636	700	2669
Chromium	µg/l							15.9				3.9						5.3		
Conductivity	µS/cm @ 25	8920	8130	8370	8510	8510	5820	9190	9460	6900		8390	7760	8250	7950	8480	9300	9720	3580	9690
Copper	µg/l							18.4				1.7						<5		
Cyanide	mg/l CN							<0.05				<0.05						<0.05		
Depth	m			5.3					4.7						4.5			nm		
D.O.	% Saturation	18			25	25		35	27			18			25			24		
Fluoride	mg/l							<0.150				<0.150						<0.150		
Iron	µg/l							3390.4				347.3						94.3		
Lead	µg/l							<1				<1						<5		
Magnesium	mg/l Mg							197.26				164.84						223.53		
Manganese	µg/l							682.0				216.3						211.1		
Mercury	µg/l							<0.1				<0.1						<0.05		
Nickel	µg/l							6.1				3						<5		
o-Phosphate	mg/l P							0.72				0.1						0.04		
pH		7.2			7.2	7.2		7.1	7.1			7.2			7.2			7.3		
Potassium	mg/l							107.13				95.9						114.16		
Residue on Evaporation								5343				4563						5792		
Sodium	mg/l							1400.86				1164.98						1825.73		
Sulphate	mg/l SO4							256.7				147.8						78.7		
Temp	°C	13.8			14.4	14.4		12.1	11.1			12			16			14.6		
Time Sampled		13.55	12.35	16.25	nt	nt	nt	14.40	12.1	15		12.15	13.4	nt	11.45	nt	12.15	13:30	nm	12:30
T.O.C.	mg/l	26			20.7	20.7		nm	>100			61.5			84.7			35		
T.O.N	mg/l N							0.48				1.05						2.16		
Total S Solids	mg/l																			
Zinc	µg/l							9.7				3.1						23.2		

Dundalk Landfill Site

GROUNDWATER QUALITY

Monitoring Point: WM6

PARAMETERS	Units	RESULTS																		
		Date																		
		28-May-09	25-Jun-09	23-Jul-09	26-Aug-09		28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3												653							
Aluminium	µg/l												<10							
Ammonia	mg/l N	80.10	72.86	88.81	67.21		84.93	61.00	74.43	85.62	62.93	58.11	75.3	62.84	69.23	71.66	86.23	93.55	40.34	70.27
B.O.D.	mg/l O2																			
Boron	µg/l												1534.2							
Cadmium	µg/l												<0.1							
Calcium	mg/l Ca												135.73							
C.O.D.	mg/l O2																			
Chloride	mg/l Cl	354	358	345	402		373	314	374	340	362	377	350	343	336	344	351	366	2615	377
Chromium	µg/l												2.6							
Conductivity	µS/cm @ 25	3260	3240	3260	3280		3250	2980	3150	3230	3080	2980	3480	3060	3030	3110	32700	3300	9540	3120
Copper	µg/l												5.3							
Cyanide	mg/l CN												<0.05							
Depth	m									4.8					4.6					
D.O.	% Saturation			12			28			24			15		64			16		
Fluoride	mg/l												0.33							
Iron	µg/l												3858.1							
Lead	µg/l												<1							
Magnesium	mg/l Mg												75.55							
Manganese	µg/l												444.8							
Mercury	µg/l												<0.1							
Nickel	µg/l												9.4							
o-Phosphate	mg/l P												0.05							
pH				7.1			7.2			7.2			7.3		7.3			7.2		
Potassium	mg/l												106.96							
Residue on Evaporation													1723							
Sodium	mg/l												295.33							
Sulphate	mg/l SO4												16.8							
Temp	°C			14			14.2			10.4			12.4		16			13.9		
Time Sampled		11.00	9.45	13.2	11.5		nt	nt	14.40	12.3	14.25	16.2	12.4	13.05	12	nt	12.3	12:50	nm	12:00
T.O.C.	mg/l			38.8			34.8			>100			49		31.7			>100		
T.O.N	mg/l N												2.14							
Total S Solids	mg/l																			
Zinc	µg/l												3.5							

Dundalk Landfill Site
GROUNDWATER QUALITY

Monitoring Point:		WM8																	
		RESULTS																	
		Date																	
PARAMETERS	Units	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3										920								
Aluminium	µg/l										60.8								
Ammonia	mg/l N	38.49	89.91	147.92	130.96	38.70		64.52	77.29	44.97	87.1	126.72		124.1	6469.53	118.87	20.24	9.31	79.12
B.O.D.	mg/l O2																		
Boron	µg/l										1531.8								
Cadmium	µg/l										0.3								
Calcium	mg/l Ca										240.81								
C.O.D.	mg/l O2																		
Chloride	mg/l Cl	5667	1737	475	1314	484		259	332	1700	407	823		1899	1887	403	720	1207	3494
Chromium	µg/l										3.3								
Conductivity	µS/cm @ 25	19440	7350	4400	6580	3270		2970	3260	6830	3960	5220		8220	8710	4010	3670	5310	12020
Copper	µg/l										12.6								
Cyanide	mg/l CN										<0.05								
Depth	m			4.1				3.6						3.5					
D.O.	% Saturation	17			25			18			31			16			22		
Fluoride	mg/l										<0.150								
Iron	µg/l										13526								
Lead	µg/l										2.7								
Magnesium	mg/l Mg										84.67								
Manganese	µg/l										2574								
Mercury	µg/l										<0.1								
Nickel	µg/l										19.6								
o-Phosphate	mg/l P										0.38								
pH		6.8			6.8			6.8			6.8			6.7			7.4		
Potassium	mg/l										74.82								
Residue on Evaporation											2223								
Sodium	mg/l										287.94								
Sulphate	mg/l SO4										87.2								
Temp	°C	14.3			14.9			10.7			12.7			17			15.2		
Time Sampled		14.4	13.15	16.55	nt	nt		12.55	15.3	16.35	13	14.1		12.15	nt	12.45	13:05	nm	13:00
T.O.C.	mg/l	16.5			45.0			>100			nm			44.9			41.4		
T.O.N	mg/l N										0.93								
Total S Solids	mg/l																		
Zinc	µg/l										40.8								

Dundalk Landfill Site

GROUNDWATER QUALITY

Monitoring Point: **WM9**

PARAMETERS	Units	RESULTS Date																	
		23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3										693								
Aluminium	µg/l										29.6								
Ammonia	mg/l N	22.37			38.96	61.66		67.22	40.04		42.2	21.87	65.67	86.53	17.85	18.16	136.21	73.26	
B.O.D.	mg/l O2																		
Boron	µg/l										942.1								
Cadmium	µg/l										<0.1								
Calcium	mg/l Ca										108.89								
C.O.D.	mg/l O2																		
Chloride	mg/l Cl	703			711	378		392	474		689	732	1071	917	734	714	1027	296	
Chromium	µg/l										<1								
Conductivity	µS/cm @ 25	3700			3880	3090		3530	3340		4250	3770	5520	4970	3610	3680	5760	3140	
Copper	µg/l										16.3								
Cyanide	mg/l CN										<0.05								
Depth	m							4.2						4					
D.O.	% Saturation	26			24			19			20			30			17		
Fluoride	mg/l										0.2								
Iron	µg/l										2808.7								
Lead	µg/l										1.4								
Magnesium	mg/l Mg										81.3								
Manganese	µg/l										852.7								
Mercury	µg/l										<0.1								
Nickel	µg/l										16.8								
o-Phosphate	mg/l P										0.07								
pH		7.4			7.1			7.2			7.2			7			7		
Potassium	mg/l										60.7								
Residue on Evaporation											2202								
Sodium	mg/l										532.22								
Sulphate	mg/l SO4										96.7								
Temp	°C	16.3			15.8			11.7		nm	13.8			16			14.6		
Time Sampled		14.15			nt	nt		13.15	15.15	nt	13.25	13.55	12.5	12.45			13:20	nm	
T.O.C.	mg/l	17.4			19.4			>100			23			36.7			254.4		
T.O.N	mg/l N										0.18								
Total S Solids	mg/l																		
Zinc	µg/l										20.2								

Dundalk Landfill Site

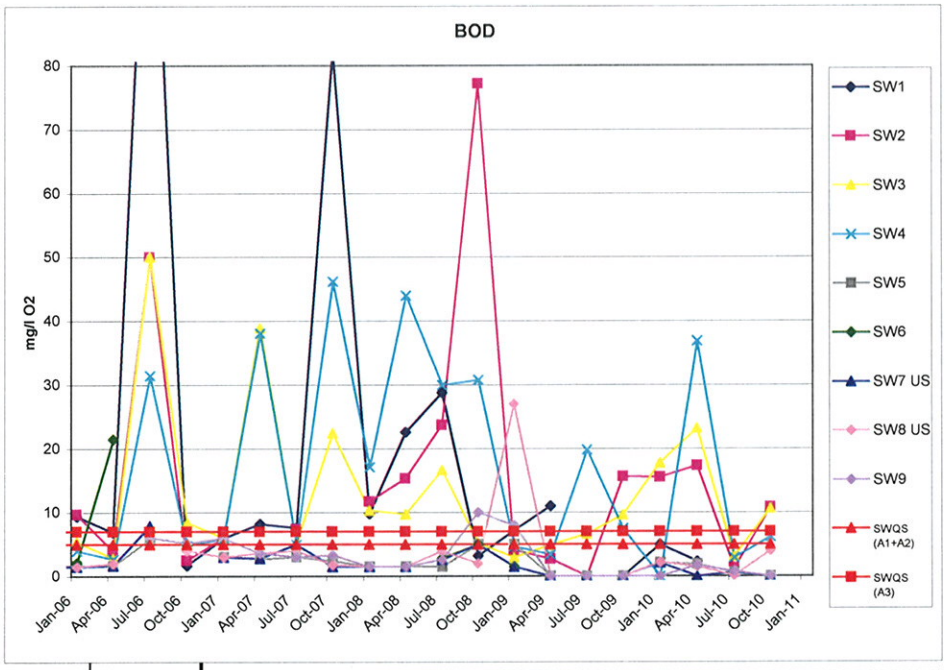
GROUNDWATER QUALITY

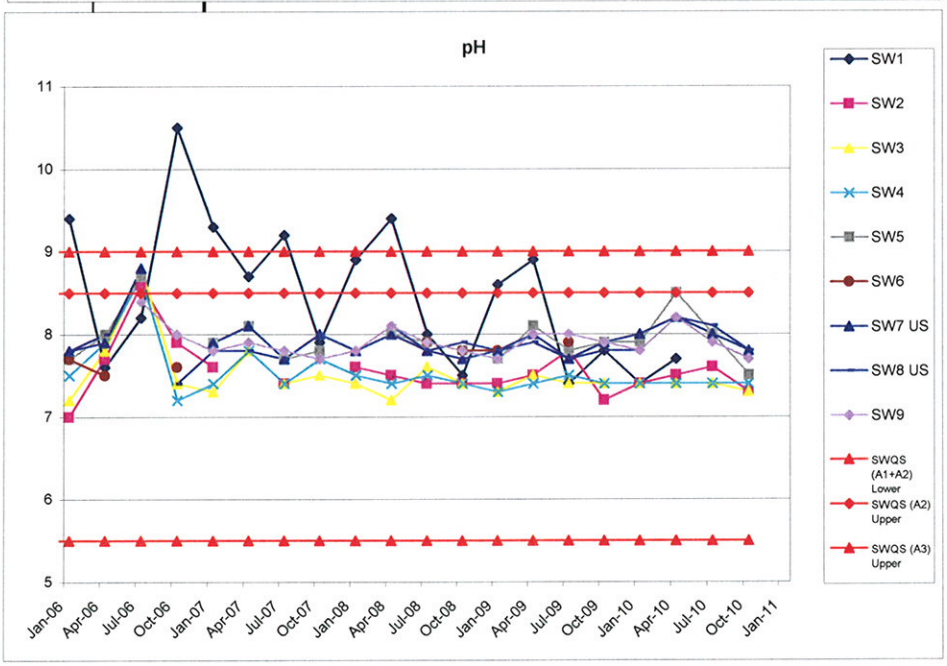
Monitoring Point:		WM10																
		RESULTS																
		Date																
PARAMETERS	Units	23-Jul-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3									695								
Aluminium	µg/l									13.5								
Ammonia	mg/l N	14.64	7	31.97	12.69	13.12	13.66	65.04		10.85	21.4	21.75	52.28	21.02	17.84	14.55	68.46	
B.O.D.	mg/l O2																	
Boron	µg/l									1262.8								
Cadmium	µg/l									<0.1								
Calcium	mg/l Ca									141.57								
C.O.D.	mg/l O2																	
Chloride	mg/l Cl	1704	1438	1703	964	1054	1269	1573		1310	1737	1761	2097	1618	1567	1628	361	
Chromium	µg/l									1.4								
Conductivity	µS/cm @ 25	6880	6000	7060	4530	4890	5570	6880		6500	7130	7250	8230	6970	6620	6580	3110	
Copper	µg/l									10								
Cyanide	mg/l CN									<0.05								
Depth	m		5.2				5.1			5	5.3	5.6	4.9					
D.O.	% Saturation	18		28			20			24			28			20		
Fluoride	mg/l									0.23								
Iron	µg/l									1278.7								
Lead	µg/l									<1								
Magnesium	mg/l Mg									113.95								
Manganese	µg/l									324.4								
Mercury	µg/l									<0.1								
Nickel	µg/l									5.6								
o-Phosphate	mg/l P									0.05								
pH		7.1		7.1			7.2			7.1			7.1			7.4		
Potassium	mg/l									67.86								
Residue on Evaporation										3430								
Sodium	mg/l									917.9								
Sulphate	mg/l SO4									113.1								
Temp	°C	14.4		14.6			10.5			12			16			14.2		
Time Sampled		13.35	16.1	nt	nt	15.45	13.4	14.4		13.5	13.2	12.31	13.1	nt	13.15	13:35	nm	
T.O.C.	mg/l	19.6		20.0			89.1			40.6			22.4			333.1		
T.O.N	mg/l N									0.84								
Total S Solids	mg/l																	
Zinc	µg/l									14.5								

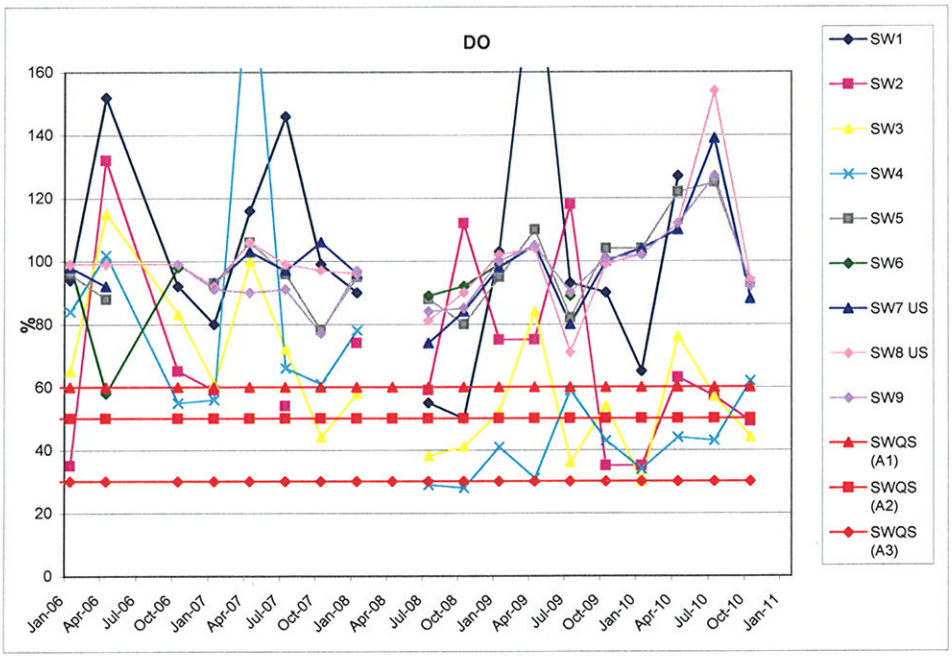
	Dundalk Landfill Site					
	GROUNDWATER QUALITY					
PARAMETERS						
		No. of Samples	Minimum	Maximum	Mean	Standard Deviation
	Units					
Alkalinity	mg/l CaCO3	9	380	925	689	270
Aluminium	µg/l	4	6.4	60.8	27	9
Ammonia	mg/l N	55	0.04	6469.53	149	738
B.O.D.	mg/l O2					
Boron	µg/l	9	349.5	1884	1276	529
Cadmium	µg/l	1	0.3	0.3	0	0
Calcium	mg/l Ca	9	108.89	240.81	171	67
C.O.D.	mg/l O2					
Chloride	mg/l Cl	56	200	5212	1481	1236
Chromium	µg/l	7	1.1	8.9	4	2
Conductivity	µS/cm @ 25	56	1608	32700	6874	5028
Copper	µg/l	7	0.7	16.3	6	3
Cyanide	mg/l CN					
Depth	m	12	3.5	5.6	5	2
D.O.	% Saturation	23	12	64	24	13
Fluoride	mg/l	4	0.19	0.33	0	0
Iron	µg/l	8	17	13526	2916	1883
Lead	µg/l	3	1.4	2.7	2	0
Magnesium	mg/l Mg	9	54.62	316.39	142	64
Manganese	µg/l	9	6.8	2574	640	384
Mercury	µg/l					
Nickel	µg/l	5	3	19.6	10	4
o-Phosphate	mg/l P	8	0.02	0.62	0	0
pH	0	23	6.7	7.5	7	4
Potassium	mg/l	9	22.34	159.43	85	36
Residue on Evaporation	0	9	1723	8939	3956	1800
Sodium	mg/l	9	287.94	2645.79	1042	518
Sulphate	mg/l SO4	7	16.8	443.3	147	69
Temp	°C	23	10.4	17	13	7
Time Sampled	0	38	9.3	16.35	13	7
T.O.C.	mg/l	17	1.7	333.1	69	56
T.O.N	mg/l N	8	0.18	2.16	1	1
Total S Solids	mg/l					
Zinc	µg/l	9	1.7	40.8	13	8

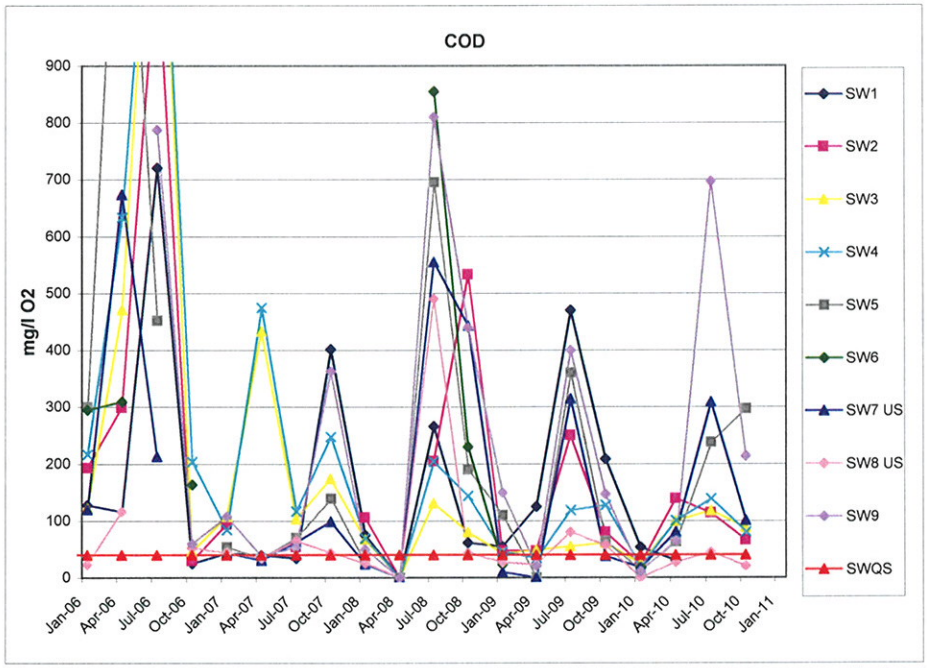
APPENDIX H

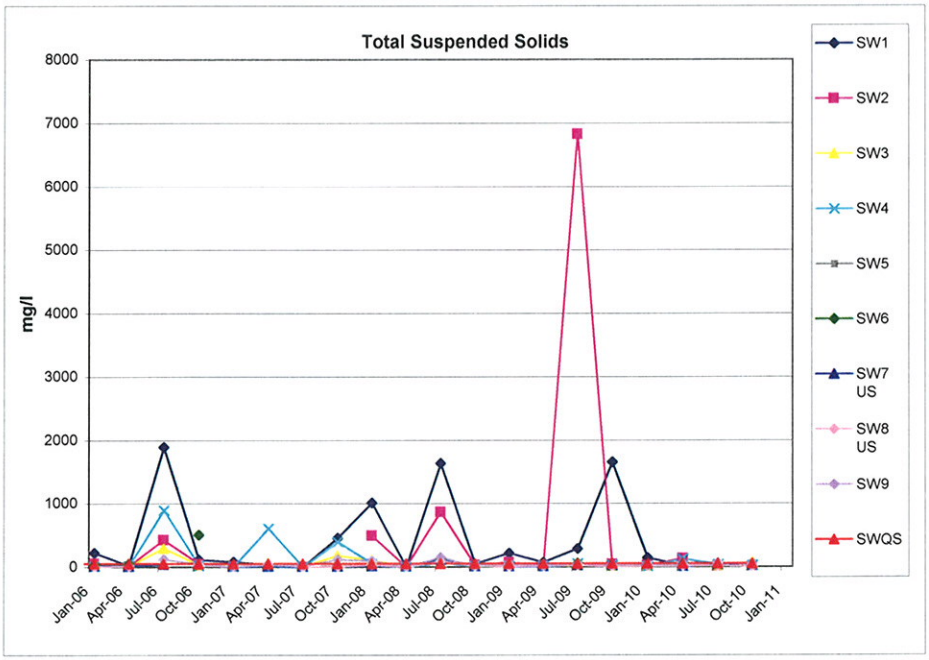
SURFACE WATER RESULTS

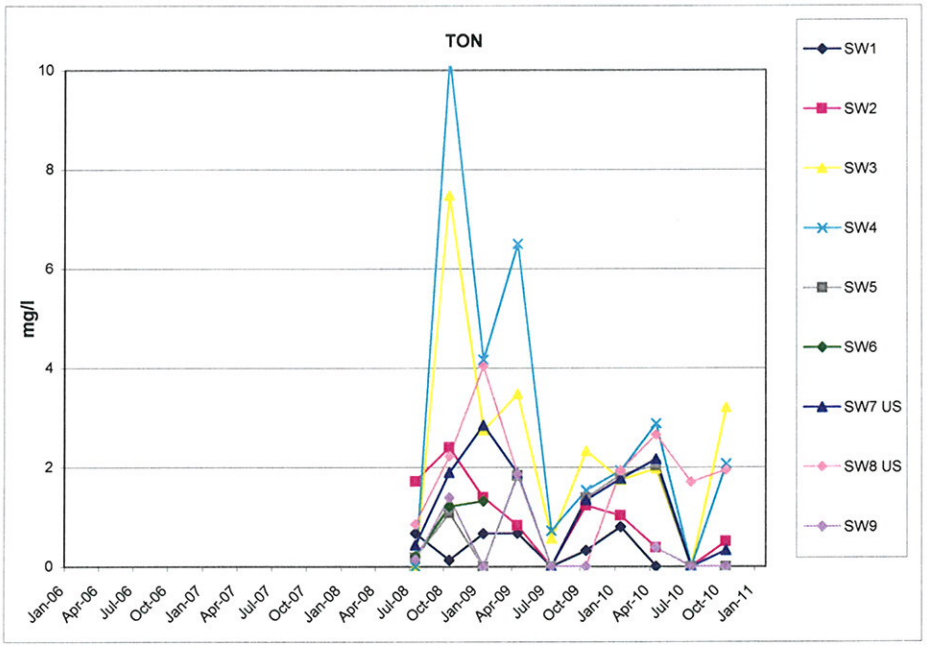

BOD
mg/l O2
0
10
20
30
40
50
60
70
80
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SW5
SW6
SW7 US
SW8 US
SW9
SWQS (A1+A2)
SWQS (A3)

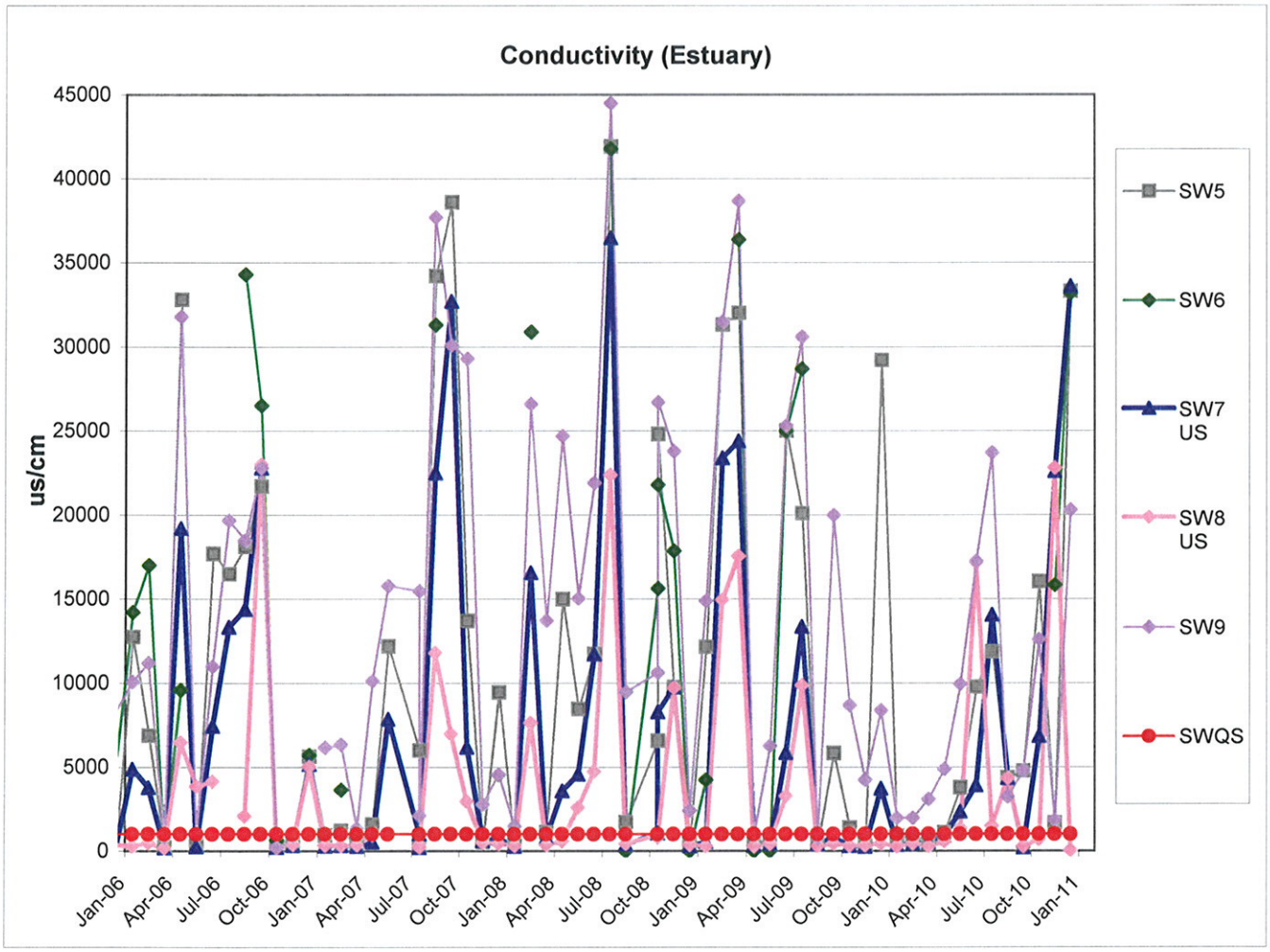

pH
5
6
7
8
9
10
11
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SW5
SW6
SW7 US
SW8 US
SW9
SWQS (A1+A2) Lower
SWQS (A2) Upper
SWQS (A3) Upper

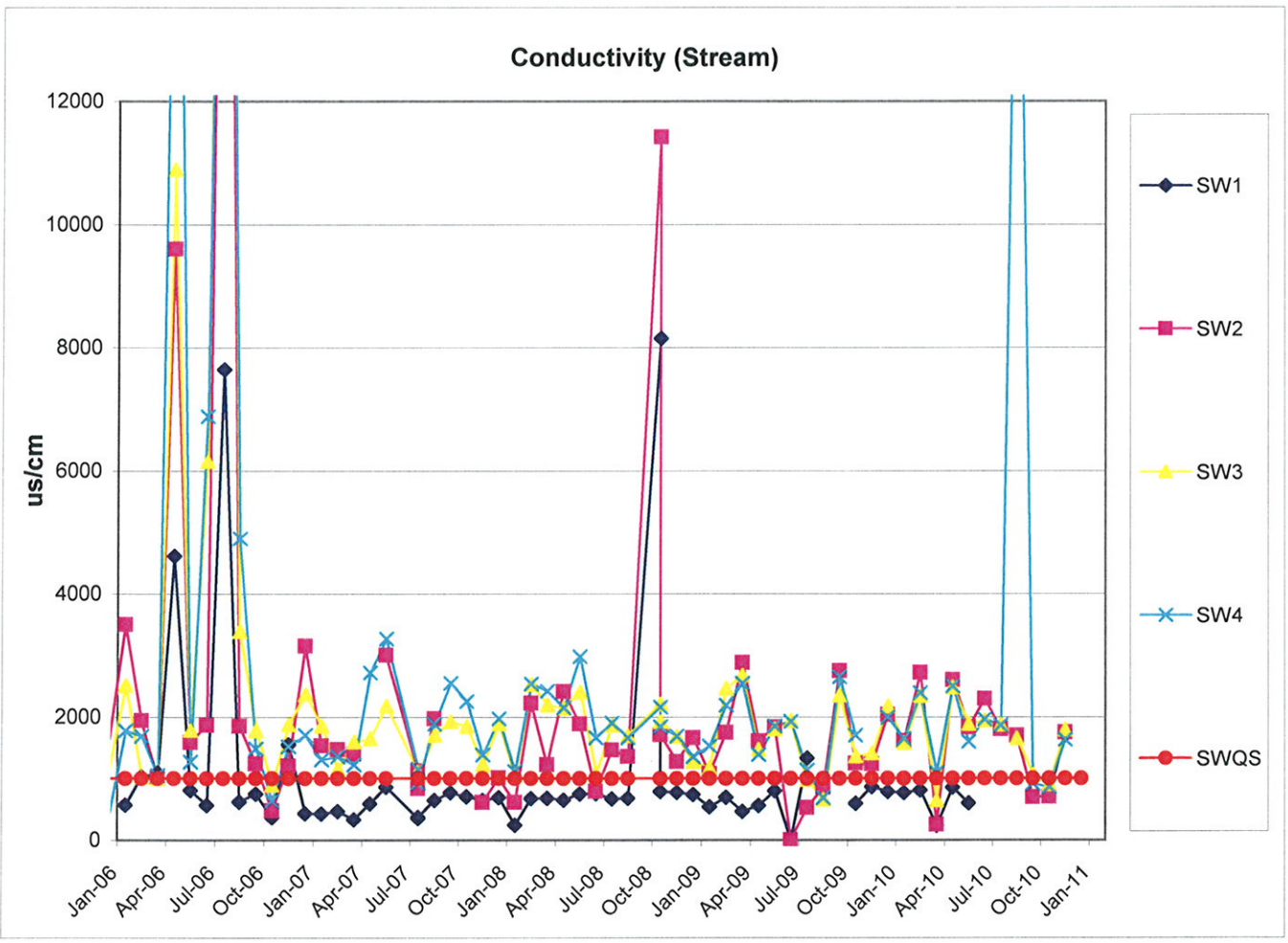

DO
%
0
20
40
60
80
100
120
140
160
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SW5
SW6
SW7 US
SW8 US
SW9
SWQS (A1)
SWQS (A2)
SWQS (A3)

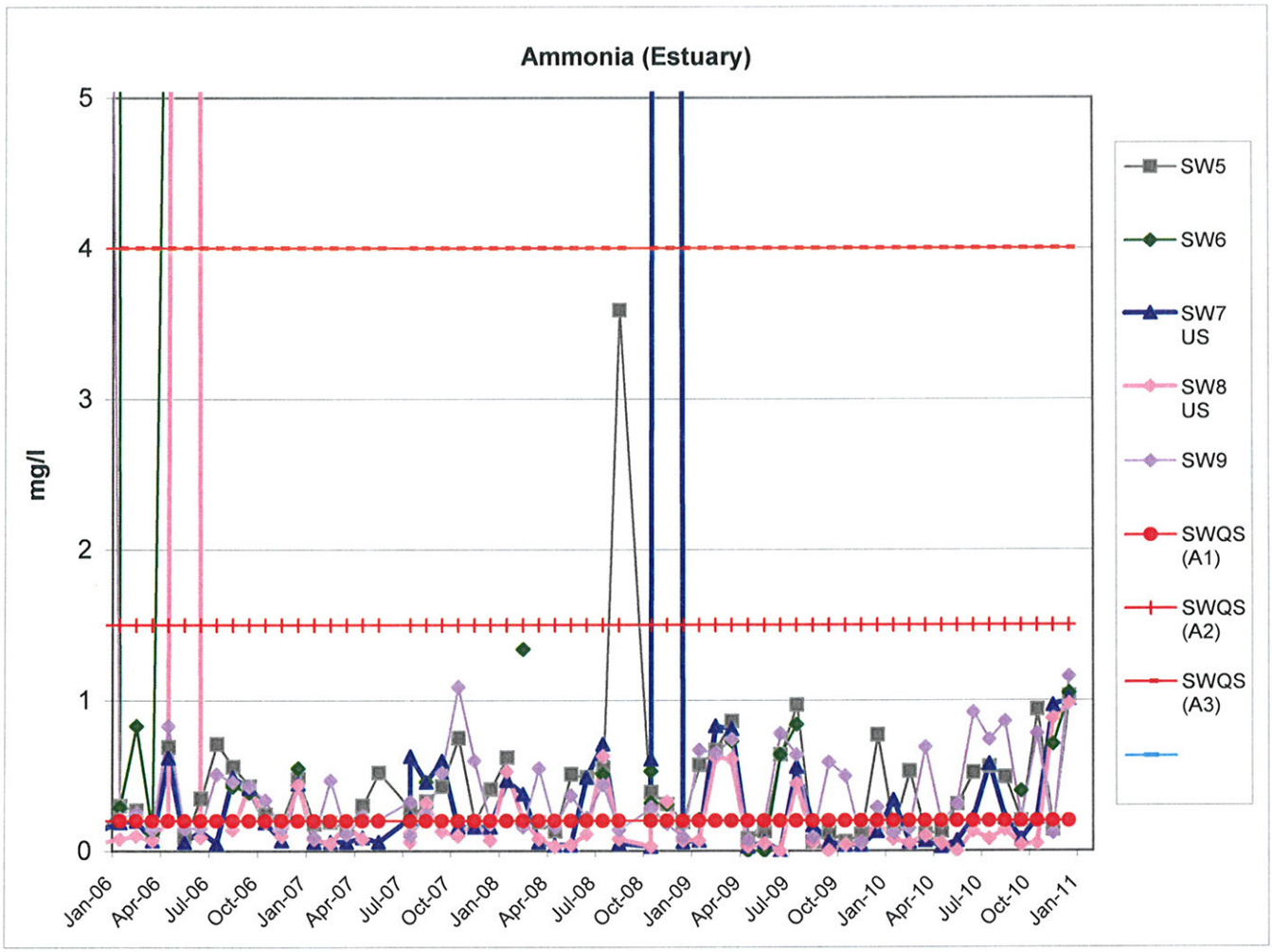

COD
mg/l O2
900
800
700
600
500
400
300
200
100
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SW5
SW6
SW7 US
SW8 US
SW9
SWQS

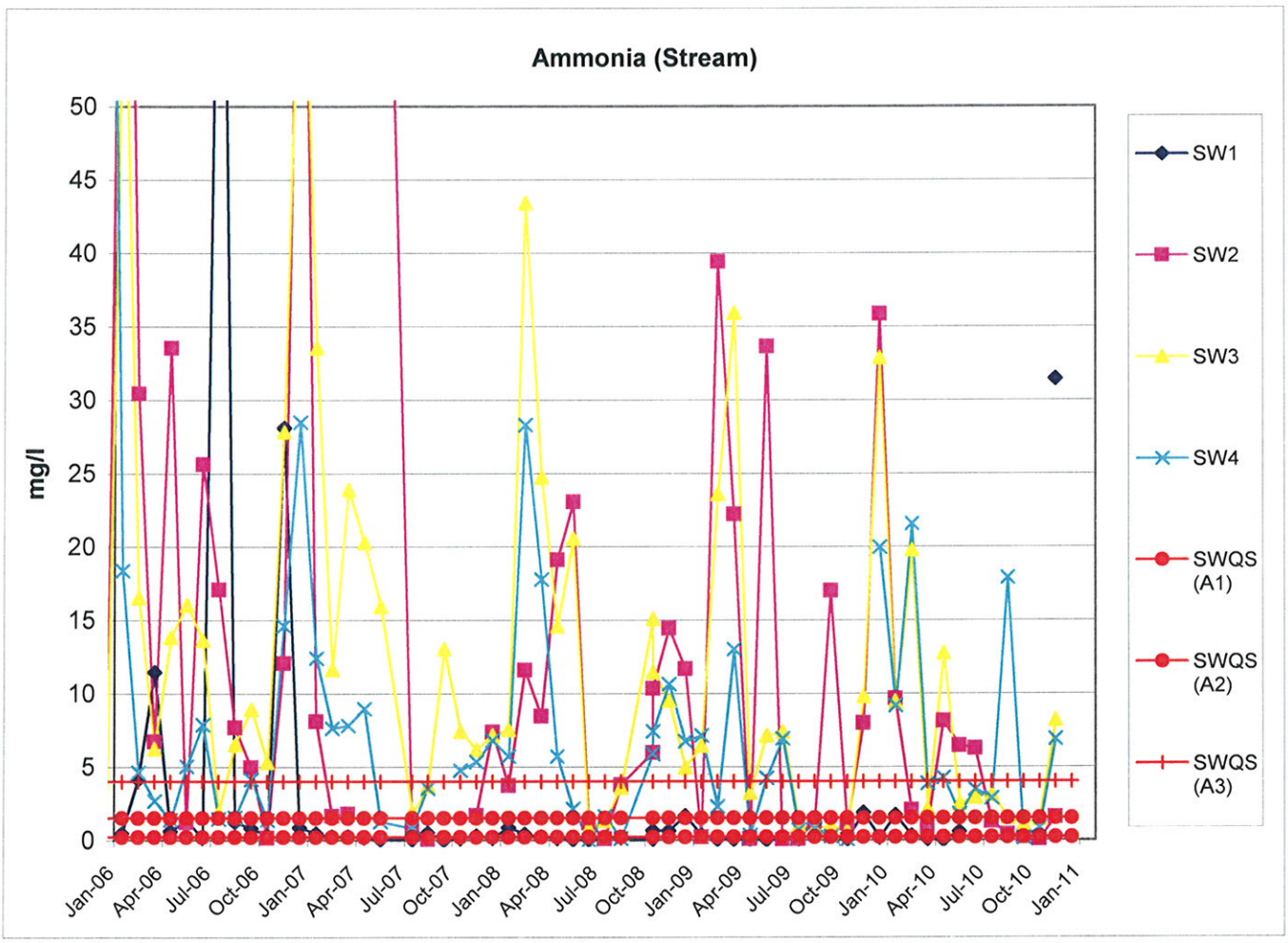

Total Suspended Solids
mg/l
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SW5
SW6
SW7 US
SW8 US
SW9
SWQS

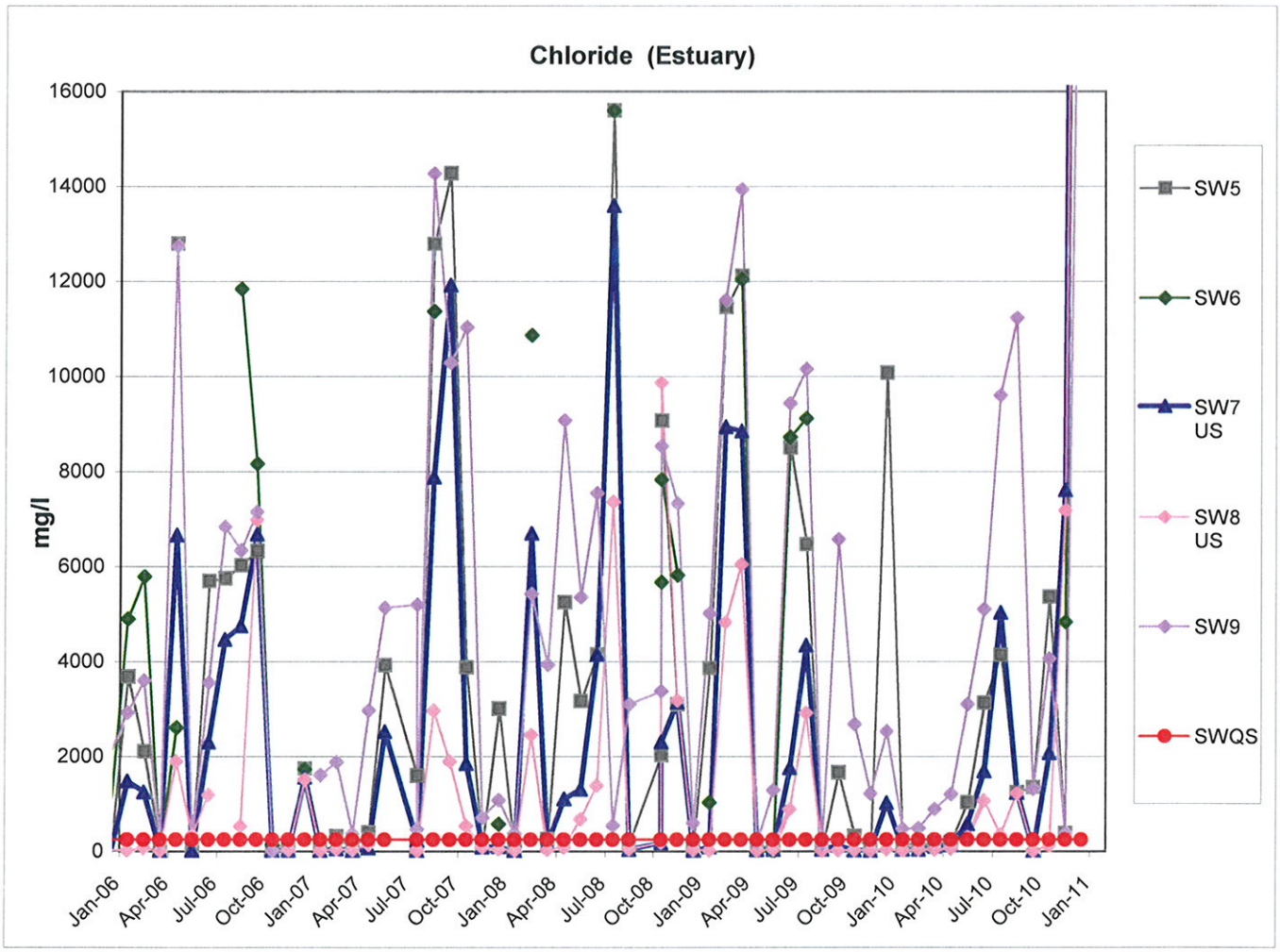

TON
mg/l
10
8
6
4
2
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SW5
SW6
SW7 US
SW8 US
SW9


Conductivity (Estuary)
us/cm
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW5
SW6
SW7 US
SW8 US
SW9
SWQS


Conductivity (Stream)
us/cm
12000
10000
8000
6000
4000
2000
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SWQS


Ammonia (Estuary)
mg/l
0
1
2
3
4
5
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW5
SW6
SW7 US
SW8 US
SW9
SWQS (A1)
SWQS (A2)
SWQS (A3)


Ammonia (Stream)
mg/l
0
5
10
15
20
25
30
35
40
45
50
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
Jul-08
Oct-08
Jan-09
Apr-09
Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SWQS (A1)
SWQS (A2)
SWQS (A3)


Chloride (Estuary)
mg/l
16000
14000
12000
10000
8000
6000
4000
2000
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
Apr-07
Jul-07
Oct-07
Jan-08
Apr-08
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Jul-09
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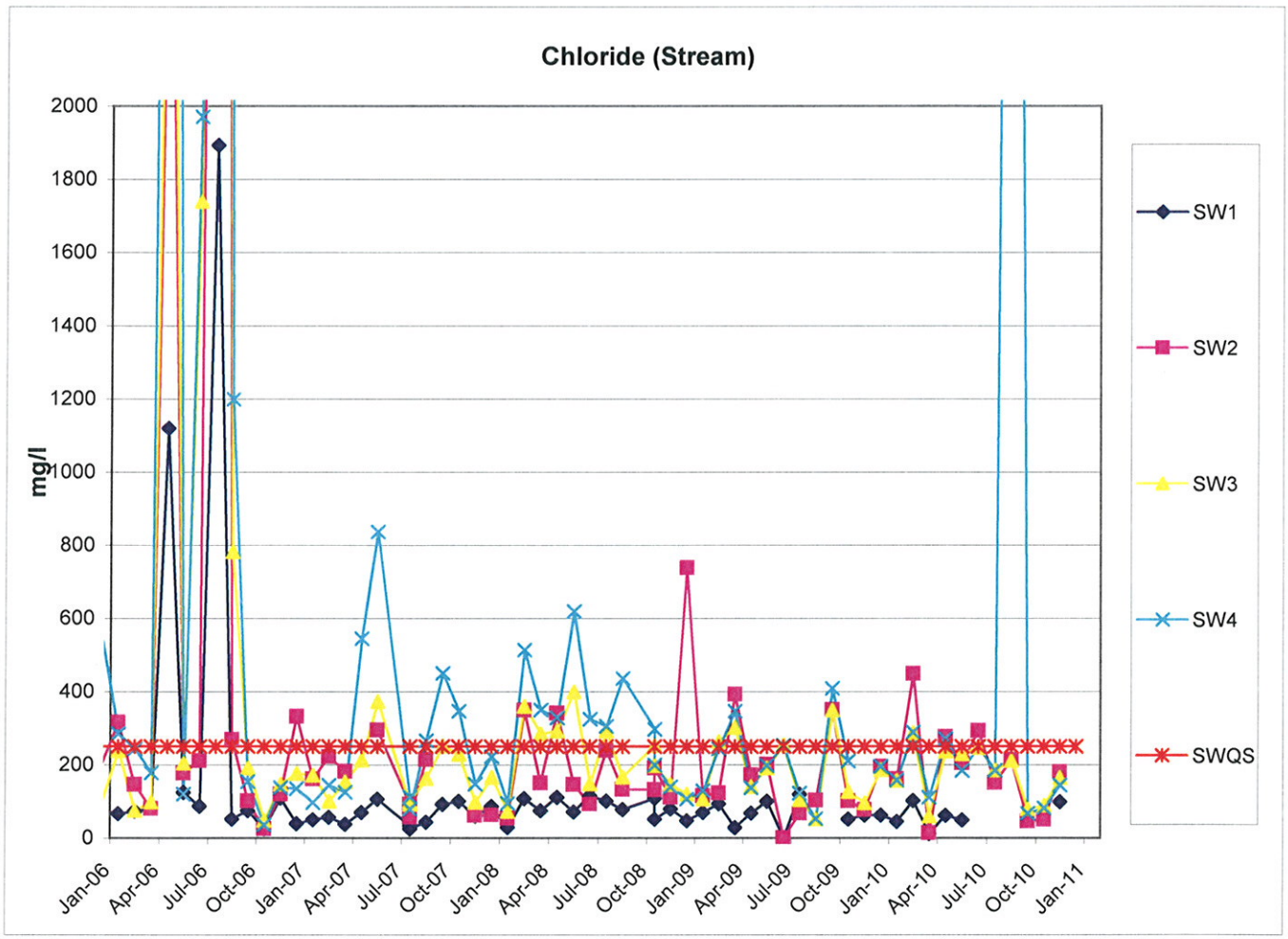
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW5
SW6
SW7 US
SW8 US
SW9
SWQS


Chloride (Stream)
mg/l
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Jan-06
Apr-06
Jul-06
Oct-06
Jan-07
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Jul-09
Oct-09
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
SW1
SW2
SW3
SW4
SWQS

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point: **SW1**

PARAMETERS	Units	Date																		
		25-Jun-09	23-Jul-09	25-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	16-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											304								
Aluminium	µg/l											192.6								
Ammonia	mg/l N		0.03			0.07	1.88	0.16	1.71	0.32	0.07	<0.03	0.58				0.24		31.45	
B.O.D.	mg/l O2		42.3			29.9			5			2.3								
Boron	µg/l																			
Cadmium	µg/l											<0.1								
Calcium	mg/l Ca											95.69								
C.O.D.	mg/l O2		470			209			54			30								
Chloride	mg/l Cl		119			51	62	62	45	102	12	61	49				47		99	
Chromium	µg/l											<1								
Conductivity	µS/cm @ 25		1334			595	864	785	769	809	236	853	600				701		1706	
Copper	µg/l											3								
Cyanide	mg/l CN																			
Depth	m																			
D.O.	% Saturation		93			90			65			127								
Fluoride	mg/l																			
Iron	µg/l											363.4								
Lead	µg/l											<1								
Magnesium	mg/l Mg											12.69								
Manganese	µg/l											68.9								
Mercury	µg/l											<0.1								
Nickel	µg/l											2.8								
o-Phosphate	mg/l P											<0.02								
pH			7.4			7.8			7.4			7.7								
Potassium	mg/l											7.54								
Residue on Evaporation																				
Sodium	mg/l											37.8								
Sulphate	mg/l SO4											67.4								
Temp	°C		16.2			14.3			6			9.4								
Time Sampled			14.5			nt	nt	13.10	10.45	10	15.3	11.1	9.15				9.15		nm	
T.O.C.	mg/l																			
T.O.N	mg/l N		<0.08			0.32			0.8			<0.08								
Total S Solids	mg/l		285			1653			139			22								
Zinc	µg/l											4.2								

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point:		SW2																	
		Date																	
PARAMETERS	Units	25-Jun-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											596								
Aluminium	µg/l											222.2								
Ammonia	mg/l N		0.08	1.24	16.98	1.09	7.96	35.86	9.64	2.04	0.91	8.1	6.43	6.25	1.26	0.39	0.21	0.05	1.57	
B.O.D.	mg/l O2		<80			15.6			15.5			17.3			13.5			10.8		
Boron	µg/l																			
Cadmium	µg/l											<0.1								
Calcium	mg/l Ca											212.7								
C.O.D.	mg/l O2		250			80			24			139			114			66		
Chloride	mg/l Cl		67	103	350	101	77	195	161	449	13	276	205	293	151	213	46	50	180	
Chromium	µg/l											1.6								
Conductivity	µS/cm @ 25		529	857	2750	1242	1231	2030	1612	2720	248	2600	1829	2280	1800	1693	696	703	1742	
Copper	µg/l											3.6								
Cyanide	mg/l CN																			
Depth	m																			
D.O.	% Saturation		118			35			35			63			57			49		
Fluoride	mg/l																			
Iron	µg/l											1560.9								
Lead	µg/l											1.3								
Magnesium	mg/l Mg											49.1								
Manganese	µg/l											368.1								
Mercury	µg/l											<0.1								
Nickel	µg/l											6.6								
o-Phosphate	mg/l P											0.07								
pH			7.8			7.2			7.4			7.5			7.6			7.3		
Potassium	mg/l											22.45								
Residue on Evaporation																				
Sodium	mg/l											216.76								
Sulphate	mg/l SO4											161.9								
Temp	°C		16.2			14.5			6			10.3			18			12		
Time Sampled			14.35	13.55	12.4	nt	nt	13.20	10.55	10.3	15.35	11.2	9.25	9.28	12.05	nt	9.25	11.15	nm	
T.O.C.	mg/l																			
T.O.N	mg/l N		<0.08			1.22			1.02			0.38			<0.08			0.5		
Total S Solids	mg/l		6830			40			18			132			15			13		
Zinc	µg/l											6.4								

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point: **SW3**

PARAMETERS	Units	Date																		
		25-Jun-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											605								
Aluminium	µg/l											122.5								
Ammonia	mg/l N	7.36	1.02	0.74		0.60	9.79	32.87	9.43	19.77	2.15	12.75	2.48	6.25	1.26	0.39	0.21	1.44	8.19	
B.O.D.	mg/l O2		6.6			9.6			17.7			23.2			13.5			10.6		
Boron	µg/l																			
Cadmium	µg/l											<0.1								
Calcium	mg/l Ca											191.26								
C.O.D.	mg/l O2		55			61			24			100			114			88		
Chloride	mg/l Cl	254	104	51		126	95	186	157	287	59	236	229	293	151	213	46	89	164	
Chromium	µg/l											1.6								
Conductivity	µS/cm @ 25	1940	981	663		1363	1410	2170	1575	2340	647	2480	1882	2290	1800	1693	696	903	1788	
Copper	µg/l											4.2								
Cyanide	mg/l CN																			
Depth	m												2.9							
D.O.	% Saturation		36			54			30			76			57			44		
Fluoride	mg/l																			
Iron	µg/l											509.2								
Lead	µg/l											<1								
Magnesium	mg/l Mg											50.29								
Manganese	µg/l											568.1								
Mercury	µg/l											<0.1								
Nickel	µg/l											7.4								
o-Phosphate	mg/l P											<0.02								
pH			7.4			7.4			7.4			7.4			7.6			7.3		
Potassium	mg/l											36.89								
Residue on Evaporation																				
Sodium	mg/l											173.22								
Sulphate	mg/l SO4											18..21								
Temp	°C		17			14.2			6.1			10.6			18			11.6		
Time Sampled		12.2	14.25	12.5		nt	nt	13.35	11.1	10.5	15.45	11.3	9.4	9.28	12.05	nt	9.25	11:25	nm	
T.O.C.	mg/l																			
T.O.N	mg/l N		0.56			2.32			1.74			1.97			<0.08			3.2		
Total S Solids	mg/l		25			12			9			40			15			70		
Zinc	µg/l											5.8								

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point: **SW4**

PARAMETERS	Units	Date																		
		25-Jun-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											520								
Aluminium	µg/l							80.8				77.3								
Ammonia	mg/l N	6.92	0.73	0.81		0.04		19.97	9.16	21.58	3.86	4.27	1.8	3.48	2.88	17.9	0.16	0.86	6.91	
B.O.D.	mg/l O2		19.8			7.5		21.1	>8.0			36.9			19.1			6.2		
Boron	µg/l																			
Cadmium	µg/l							<0.1				<0.1								
Calcium	mg/l Ca							171.8				181.37								
C.O.D.	mg/l O2		119			128		83	20			101			139			81		
Chloride	mg/l Cl	253	123	53		211		196	158	289	111	271	184	250	185	6253	67	82	144	
Chromium	µg/l							6.9				1.5								
Conductivity	µS/cm @ 25	1927	1137	691		1703		1991	1648	2390	1094	2500	1602	1965	1862	18440	915	865	1628	
Copper	µg/l							4.8				3.7								
Cyanide	mg/l CN																			
Depth	m											5	5.4							
D.O.	% Saturation		59			43		48	34			44			43			62		
Fluoride	mg/l																			
Iron	µg/l							235.5				369.2								
Lead	µg/l							<1				<1								
Magnesium	mg/l Mg							47.66				50.32								
Manganese	µg/l							1063.9				364.9								
Mercury	µg/l							<0.1				<0.1								
Nickel	µg/l							7.1				7								
o-Phosphate	mg/l P							0.03				<0.02								
pH			7.5			7.4		7.6	7.4			7.4			7.4			7.4		
Potassium	mg/l							40.91				35.17								
Residue on Evaporation																				
Sodium	mg/l							143.27				192.04								
Sulphate	mg/l SO4							118.2				88.6								
Temp	°C		17.5			13.9		5.8	6.1			11.3			18			11.4		
Time Sampled		nt	14	12.2		nt		13.55	11.25	11.15	15.55	11.45	10	10.02	12.35	nt	10	11:40	nm	
T.O.C.	mg/l																			
T.O.N	mg/l N		0.72			1.54		1.8	1.93			2.88			<0.08			2.07		
Total S Solids	mg/l		52			28		14	6			128			38			27		
Zinc	µg/l							8.7				4.9								

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point:		SW5																		
		Date																		
PARAMETERS	Units	25-Jun-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	17-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											142						130		
Aluminium	µg/l							161.7				49.7						237.9		
Ammonia	mg/l N	0.64	0.97	0.06		0.06	0.11	0.77	0.15	0.53	0.11			0.52	0.56	0.49	0.2	0.94	0.14	1.03
B.O.D.	mg/l O2		<25			<4.0		<1.5	2.1			1.9			<6.0			<20		
Boron	µg/l																			
Cadmium	µg/l							<0.1				<0.1						<1		
Calcium	mg/l Ca							239.18				51.88						155.91		
C.O.D.	mg/l O2		360			64		1058	13			63			238			297		
Chloride	mg/l Cl	8502	6469	41		324	32	10080	190	128	177	191	1036	3131	4141	1242	1352	5363	379	46731
Chromium	µg/l							16.6				<1						10.4		
Conductivity	µS/cm @ 25	25000	20100	354		1387	336	29200	902	742	756	1098	3780	9750	11860	4350	4770	16030	1668	33300
Copper	µg/l							77.8				1.9						<5		
Cyanide	mg/l CN																			
Depth	m												4.8							
D.O.	% Saturation		82			104		96	104			122			125			93		
Fluoride	mg/l																			
Iron	µg/l							654.7				246.9						569.4		
Lead	µg/l							1.2				<1						<5		
Magnesium	mg/l Mg							667.74				17.23						352.8		
Manganese	µg/l							78.9				25.8						83.7		
Mercury	µg/l							<0.1				<0.1						<0.05		
Nickel	µg/l							4.8				1.2						<5		
o-Phosphate	mg/l P							0.03				0.02						0.09		
pH			7.8			8.0		7.9	7.9			8.5			8			7.5		
Potassium	mg/l							204.34				6.57						117.66		
Residue on Evaporation																				
Sodium	mg/l							5695.71				107.03						3095.68		
Sulphate	mg/l SO4							1483.6				40.6						571		
Temp	°C		18.2			14.4		5.3	5.8			10.5			18			8.6		
Time Sampled		13.15	13.05	14.25		nt	nt	12.00	14.1	12	16.15	12.55	11.45	10.52	13.2	nt	10.4	13:50	nm	10:30
T.O.C.	mg/l																			
T.O.N	mg/l N		<0.08			1.39		<0.08	1.85			2.04			<0.08			<0.08		
Total S Solids	mg/l		32			5		49	30			10			42			60		
Zinc	µg/l							29.5				3.6						23.8		

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point:		SW6																		
		Date																		
PARAMETERS	Units	25-Jun-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	16-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3																			
Aluminium	µg/l																			
Ammonia	mg/l N	0.64	0.84														0.4		0.71	1.05
B.O.D.	mg/l O2		<40																	
Boron	µg/l																			
Cadmium	µg/l																			
Calcium	mg/l Ca																			
C.O.D.	mg/l O2		2100																	
Chloride	mg/l Cl	8724	9119														20		4838	49555
Chromium	µg/l																			
Conductivity	µS/cm @ 25	25000	28700														227		15840	33200
Copper	µg/l																			
Cyanide	mg/l CN																			
Depth	m																			
D.O.	% Saturation		89																	
Fluoride	mg/l																			
Iron	µg/l																			
Lead	µg/l																			
Magnesium	mg/l Mg																			
Manganese	µg/l																			
Mercury	µg/l																			
Nickel	µg/l																			
o-Phosphate	mg/l P																			
pH			7.9																	
Potassium	mg/l																			
Residue on Evaporation																				
Sodium	mg/l																			
Sulphate	mg/l SO4																			
Temp	°C		18																	
Time Sampled		13	13.25														11		nm	14:00
T.O.C.	mg/l																			
T.O.N	mg/l N		<0.08																	
Total S Solids	mg/l		55																	
Zinc	µg/l																			

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point		SW7																		
		Date																		
PARAMETERS	Units	25-Jun-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	16-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											135						124		
Aluminium	µg/l							133.1				42.8						121.3		
Ammonia	mg/l N	<0.03	0.56	0.17		0.04	0.04	0.13	0.34	0.06	0.07	0.03	0.07	0.22	0.58	0.22	0.08	0.22	0.97	1.01
B.O.D.	mg/l O2		<20			<2.0		<1.5	2.1			<1.5			7.8			<7		
Boron	µg/l																			
Cadmium	µg/l							<0.1				<0.1						<1		
Calcium	mg/l Ca							59.59				54.59						91.45		
C.O.D.	mg/l O2		315			38		69	18			81			309			101		
Chloride	mg/l Cl	1765	4345	51		32	16	1027	47	43	111	142	584	1693	5030	1243	18	2073	7613	49174
Chromium	µg/l							3.1				<1						<5		
Conductivity	µS/cm @ 25	5850	13370	433		325	271	3730	370	449	519	914	2360	3920	14070	4350	213	6850	22600	33600
Copper	µg/l							8.7				1.8						<5		
Cyanide	mg/l CN																			
Depth	m																			
D.O.	% Saturation		80			100		95	104			110			139			88		
Fluoride	mg/l																			
Iron	µg/l							518.1				233						476		
Lead	µg/l							<1				<1						<5		
Magnesium	mg/l Mg							73.83				14.83						145.48		
Manganese	µg/l							48.7				28						61.1		
Mercury	µg/l							<0.1				<0.1						<0.05		
Nickel	µg/l							3.0				1.1						<5		
o-Phosphate	mg/l P							0.04				0.02						0.05		
pH			7.7			7.9		7.9	8			8.2			8			7.8		
Potassium	mg/l							22.32				5.48						48.22		
Residue on Evaporation																				
Sodium	mg/l							595.76				80.74						1246.08		
Sulphate	mg/l SO4							157.2				33.8						248.6		
Temp	°C		18.2			14.4		5.1	5.9			10.2			19			8.6		
Time Sampled		14.1	12.3	13		nt	nt	12.50	13.05	14	17	13.55	12.45	11.57	13	nt	11.15	13.00	nm	11:15
T.O.C.	mg/l																			
T.O.N	mg/l N		<0.08			1.34		0.45	1.77			2.16			<0.08			0.33		
Total S Solids	mg/l		32			24		14	50			<5			45			40		
Zinc	µg/l							11.6				4.2						31.7		

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point: **SW8**

PARAMETERS	Units	Date																		
		25-Jun-09	23-Jul-09	26-Aug-09	29-Sep-09	28-Oct-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	16-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3											148								
Aluminium	µg/l											82.8								
Ammonia	mg/l N	<0.03	0.45	0.06		0.04	0.05	0.19	0.08	0.05	0.1	0.05	<0.03	0.13	0.08	0.14	0.04	0.05	0.88	0.98
B.O.D.	mg/l O2		<8.0			<3.0			2.2			1.5			<2.0			4		
Boron	µg/l																			
Cadmium	µg/l											<0.1								
Calcium	mg/l Ca											55.88								
C.O.D.	mg/l O2		80			57			<10			27			45			20		
Chloride	mg/l Cl	897	2919	20		30	19	46	20	44	46	61	296	1074	356	1228	15	120	7187	42513
Chromium	µg/l											<1								
Conductivity	µS/cm @ 25	3290	9870	299		318	333	454	288	456	295	582	1352	17180	1493	4340	276	707	22800	34
Copper	µg/l											2								
Cyanide	mg/l CN																			
Depth	m																			
D.O.	% Saturation		71			99			102			112			154			94		
Fluoride	mg/l																			
Iron	µg/l											359.4								
Lead	µg/l											<1								
Magnesium	mg/l Mg											10.35								
Manganese	µg/l											78.9								
Mercury	µg/l											<0.1								
Nickel	µg/l											1.4								
o-Phosphate	mg/l P											0.02								
pH			7.7			7.8			7.8			8.2			8.1			7.8		
Potassium	mg/l											3.73								
Residue on Evaporation																				
Sodium	mg/l											34.64								
Sulphate	mg/l SO4											22.4								
Temp	°C		18			14.6			5.9			10.8			19			8.6		
Time Sampled		14.3	12.1	13.2		nt	nt	10.55	13.45	13	16.45	13.4	12.25	11.4	13.3	nt	11.35	13:15	nm	nm
T.O.C.	mg/l																			
T.O.N	mg/l N		<0.08			1.30			1.93			2.65			1.7			1.94		
Total S Solids	mg/l		23			<5			9			13			22			7		
Zinc	µg/l											5								

Dundalk Landfill Site

SURFACE WATER QUALITY

Monitoring Point:		SW9																
		Date																
PARAMETERS	Units	23-Jul-09	26-Aug-09	29-Sep-09	26-Nov-09	17-Dec-09	19-Jan-10	24-Feb-10	30-Mar-10	20-Apr-10	19-May-10	16-Jun-10	28-Jul-10	30-Aug-10	23-Sep-10	26-Oct-10	25-Nov-10	21-Dec-10
Alkalinity	mg/l CaCO3									156								
Aluminium	µg/l									80.5								
Ammonia	mg/l N	0.64	0.09	0.59	0.06	0.29	0.12	0.15	0.69	0.19	0.31	0.92	0.74	0.86	0.22	0.78	0.12	1.16
B.O.D.	mg/l O2	<30					<1.5			1.7			<10.0			<15		
Boron	µg/l																	
Cadmium	µg/l									<0.1								
Calcium	mg/l Ca									79.66								
C.O.D.	mg/l O2	400					11			65			697			214		
Chloride	mg/l Cl	10160	163	6574	1228	2531	477	488	897	1210	3103	5100	9600	11233	1320	4061	381	24349
Chromium	µg/l									<1								
Conductivity	µS/cm @ 25	30600	810	20000	4250	8370	1969	1983	3100	4880	9930	17250	23700	3230	4780	12600	1825	20300
Copper	µg/l									2.5								
Cyanide	mg/l CN																	
Depth	m											2.9						
D.O.	% Saturation	90					102			112			127			92		
Fluoride	mg/l																	
Iron	µg/l									329								
Lead	µg/l									<1								
Magnesium	mg/l Mg									85.89								
Manganese	µg/l									50.7								
Mercury	µg/l									<0.1								
Nickel	µg/l									1.3								
o-Phosphate	mg/l P									0.03								
pH		8					7.8			8.2			7.9			7.7		
Potassium	mg/l									26.09								
Residue on Evaporation																		
Sodium	mg/l									709.49								
Sulphate	mg/l SO4									99.3								
Temp	°C	17.9					6			10.9			19			8.7		
Time Sampled		12.45	14.1	14.45	nt	11.42	13.2	12.25	16.4	13.1	12.05	11.15	13.5	nt	12	13:30	nm	10:45
T.O.C.	mg/l																	
T.O.N	mg/l N	<0.08					1.45			0.38			<0.08			<0.08		
Total S Solids	mg/l	46					25			29			60			37		
Zinc	µg/l									6.7								

	Dundalk Landfill Site					
	SURFACE WATER QUALITY					
PARAMETERS						
		No. of Samples	Minimum	Maximum	Mean	Standard Deviation
	Units					
Alkalinity	mg/l CaCO3	67	124	605	286	206
Aluminium	µg/l	67	42.8	237.9	123	71
Ammonia	mg/l N	87	0.03	31.45	3	5
B.O.D.	mg/l O2	21	1.5	36.9	10	9
Boron	µg/l					
Cadmium	µg/l					
Calcium	mg/l Ca	10	51.88	212.7	117	62
C.O.D.	mg/l O2	29	11	697	114	138
Chloride	mg/l Cl	91	12	49555	3448	9957
Chromium	µg/l	4	1.5	10.4	4	4
Conductivity	µS/cm @ 25	91	34	33600	5060	7820
Copper	µg/l	8	1.8	4.2	3	1
Cyanide	mg/l CN					
Depth	m	5	2.9	5.4	4	1
D.O.	% Saturation	30	30	154	86	35
Fluoride	mg/l					
Iron	µg/l	10	233	1560.9	502	387
Lead	µg/l	1	1.3	1.3	1	
Magnesium	mg/l Mg	10	10.35	352.8	79	105
Manganese	µg/l	10	25.8	568.1	170	191
Mercury	µg/l					
Nickel	µg/l	8	1.1	7.4	4	3
o-Phosphate	mg/l P	7	0.02	0.09	0	0
pH	0	30	7.3	8.5	8	0
Potassium	mg/l	10	3.73	117.66	31	34
Residue on Evaporation	0					
Sodium	mg/l	10	34.64	3095.68	589	960
Sulphate	mg/l SO4	9	22.4	571	148	174
Temp	°C	30	5.8	19	11	5
Time Sampled	0	63	9.15	17	12	2
T.O.C.	mg/l					
T.O.N	mg/l N	21	0.33	3.2	2	1
Total S Solids	mg/l	29	6	139	40	37
Zinc	µg/l	10	3.6	31.7	10	10

APPENDIX I

LANDFILL GAS MONITORING RESULTS

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 11:01:2010	**Time:** 12.30 pm
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** April 2010	
Monitoring Personnel: aw		**Weather:** Dry/ Cold	**Barometric pressure:** 1014mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	19.1	
G2	PIEZO		0	0.3	18.9	
G3	PIEZO		0	0.1	19.2	
G4	PIEZO		0.2	0.6	18.1	
G5	PIEZO		0.1	0.3	18.8	
G6	PIEZO		1.2	2.1	18.1	
G7	PIEZO		0.1	0.3	19.1	
G8	PIEZO		0.6	0.4	18.1	
G9	PIEZO		0	1.4	18.9	
G10	PIEZO		2.8	2	18.6	
G16	PIEZO		0	0.2	19.6	
G17	PIEZO		0	0.8	19.6	
G20	PIEZO		0.2	1.6	17.1	
G21	PIEZO		0.3	1.4	19.2	
GM1	PIEZO		0	0.6	17.8	
GM2	PIEZO		0	2	18.1	
GM3	PIEZO		0	0.2	19.1	
GM4	PIEZO		0	0.2	18.1	
GM5	PIEZO		0	0.1	18.4	
GM6	PIEZO		0	0.3	18.7	
GM24	PIEZO		0	2.1	16.8	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 11:01:2010	**Time:** 12.30 pm
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** April 20010	
Monitoring Personnel: aw		**Weather:** Dry/Warm	**Barometric pressure:** 1014mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		21.3	15.5	4.6	
HUT			21	15	0	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 09:02:2010	**Time:** 12.30 pm
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** April 2010	
Monitoring Personnel: aw		**Weather:** Dry/ Cold	**Barometric pressure:** 1028mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	18.6	
G2	PIEZO		0	0.2	18.6	
G3	PIEZO		0	0.3	18.7	
G4	PIEZO		0.4	0.4	18.4	
G5	PIEZO		0	0.2	19.1	
G6	PIEZO		2.1	1.8	17.8	
G7	PIEZO		0.1	0.2	18.7	
G8	PIEZO		1.2	0.6	18.3	
G9	PIEZO		0.2	1.2	19.2	
G10	PIEZO		2.2	1.8	19	
G16	PIEZO		0.1	0.2	19.1	
G17	PIEZO		0	1.2	19.2	
G20	PIEZO		0	1.2	18.6	
G21	PIEZO		0.7	1.2	19.6	
GM1	PIEZO		0	0.8	16.6	
GM2	PIEZO		0	1.8	17.6	
GM3	PIEZO		0.1	0.3	19.6	
GM4	PIEZO		0	0.1	18.2	
GM5	PIEZO		0	0.2	19.3	
GM6	PIEZO		0	0.1	18.2	
GM24	PIEZO		0	1.8	17.2	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM	(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 09:02:2010	**Time:** 12.30 pm

Instrument used:	**Normal Analytical Range:**	**Date Next Calibration:**
GA2000/FID		April 20010

Monitoring Personnel:	**Weather:**	**Barometric pressure:**
aw	Dry/Warm	1028mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		21.3	15.5	4.6	
HUT			21	15	0	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM (Baseline☐ Ambient☐)			
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 15:03:2010	**Time:** 12.30 pm
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** April 2010	
Monitoring Personnel: aw		**Weather:** Dry/ Cold	**Barometric pressure:** 1027mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	19.3	
G2	PIEZO		0	0.4	18.8	
G3	PIEZO		0	0	18.6	
G4	PIEZO		0.3	1.2	18.6	
G5	PIEZO		0	0.2	20.1	
G6	PIEZO		2.3	1.6	17.6	
G7	PIEZO		0	0.3	18.9	
G8	PIEZO		1.4	1.2	19.6	
G9	PIEZO		0.1	0.6	19.6	
G10	PIEZO		2.6	1.4	18.4	
G16	PIEZO		0	0	18.9	
G17	PIEZO		0	1.6	18.4	
G20	PIEZO		1.4	2.3	18.2	
G21	PIEZO		0.5	0.8	18.9	
GM1	PIEZO		0	0.6	18.4	
GM2	PIEZO		0	1.7	18.2	
GM3	PIEZO		0.2	0.2	19.4	
GM4	PIEZO		0.1	0.4	19.1	
GM5	PIEZO		0	0.2	20.2	
GM6	PIEZO		0.2	0.1	19.1	
GM24	PIEZO		0	2	18.6	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM	(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 15:03:2010	**Time:** 12.30 pm

Instrument used:	**Normal Analytical Range:**	**Date Next Calibration:**
GA2000/FID		April 20010

Monitoring Personnel:	**Weather:**	**Barometric pressure:**
aw	Dry/Warm	1027mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		26.7	12	5.4	
HUT			27	13	0	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM	(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 08:04:2010	**Time:** 2.30 pm

Instrument used:	**Normal Analytical Range:**	**Date Next Calibration:**
GA2000		April 2010

Monitoring Personnel:	**Weather:**	**Barometric pressure:**
aw	Dry/ Cold	1028mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	18.4	
G2	PIEZO		0	0.2	18.6	
G3	PIEZO		0	0.1	18.4	
G4	PIEZO		0.3	0.6	18.4	
G5	PIEZO		0	0.2	18.6	
G6	PIEZO		2.2	1.2	17.6	
G7	PIEZO		0.1	0.2	18.6	
G8	PIEZO		1.2	1.4	18.7	
G9	PIEZO		0	0.4	18.6	
G10	PIEZO		2.1	1.6	17.2	
G16	PIEZO		0	0.2	17.9	
G17	PIEZO		0.1	0.8	18.2	
G20	PIEZO		0.8	1.8	18.6	
G21	PIEZO		0.1	0.2	18.4	
GM1	PIEZO		0	0.4	18.6	
GM2	PIEZO		0	1.2	18.1	
GM3	PIEZO		0	0.2	18.4	
GM4	PIEZO		0	0.1	18.4	
GM5	PIEZO		0	0.2	18.4	
GM6	PIEZO		0.1	0.2	18.6	
GM24	PIEZO		0	0.4	18.2	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM	(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 08:04:2010	**Time:** : 2.30 pm
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** April 20010
Monitoring Personnel: aw	**Weather:** Dry/Warm	**Barometric pressure:** 1028mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		28.6	10	8.2	
HUT			29	12	0	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address**: NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference**: 1632-12	
Site Status: Closed		**Date**: 07:05:2010	**Time**: 15:30 pm
Instrument used: GA2000	**Normal Analytical Range**:	**Date Next Calibration**: May 2012	
Monitoring Personnel: aw		**Weather**: Dry/Warm	**Barometric pressure**: 1018mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	18.5	
G2	PIEZO		0	0.3	18.2	
G3	PIEZO		0	0	18.6	
G4	PIEZO		0.2	0.2	18.7	
G5	PIEZO		0.1	0.1	18.4	
G6	PIEZO		2.1	1.4	18.2	
G7	PIEZO		0.1	0	18.4	
G8	PIEZO		1.4	1.2	18.6	
G9	PIEZO		0.1	0.3	18.4	
G10	PIEZO		2.8	1.2	17.6	
G16	PIEZO		0.1	0	18.2	
G17	PIEZO		0	0.6	18.6	
G20	PIEZO		0.8	1.6	18.7	
G21	PIEZO		0	0.6	18.6	
GM1	PIEZO		0	0.2	18.2	
GM2	PIEZO		0	1	18.3	
GM3	PIEZO		0.1	0.1	18.6	
GM4	PIEZO		0.1	0.1	18.3	
GM5	PIEZO		0	0.3	17.9	
GM6	PIEZO		0	0.1	18.2	
GM24	PIEZO		0	0.3	18.7	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM	(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 07:05:2010	**Time:** 15:30 pm

Instrument used:	**Normal Analytical Range:**	**Date Next Calibration:**
GA2000/FID		May 2012

Monitoring Personnel:	**Weather:**	**Barometric pressure:**
aw	Dry/Warm	1018mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		32.2	11.2	9.8	
HUT			32	11	0	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 09:06:2010	**Time:** 11.30 am
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ Warm	**Barometric pressure:** 1008mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	18.2	
G2	PIEZO		0	0.2	18.9	
G3	PIEZO		0	0	18.2	
G4	PIEZO		0.2	0.3	18.6	
G5	PIEZO		0	0	17.9	
G6	PIEZO		2.3	1.6	18.1	
G7	PIEZO		0.1	0.2	18.1	
G8	PIEZO		1.2	0.8	18.2	
G9	PIEZO		0	0.4	18.2	
G10	PIEZO		2.6	1.4	17.8	
G16	PIEZO		0	0.1	18.6	
G17	PIEZO		0	0.8	18.4	
G20	PIEZO		0.6	1.7	17.9	
G21	PIEZO		0	0.1	18.3	
GM1	PIEZO		0	0.2	18.6	
GM2	PIEZO		0	1.1	18.4	
GM3	PIEZO		0	0.1	18.1	
GM4	PIEZO		0	0	18.1	
GM5	PIEZO		0	0.2	18.2	
GM6	PIEZO		0	0.2	18.4	
GM24	PIEZO		0	0.1	18.1	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 09:06:2010	**Time:** 11.30 am
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/Warm	**Barometric pressure:** 1008mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		34.6	10.8	11.4	
HUT			0	0	0	Error in monitoring equipment

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 14:07:2010	**Time:** 10.30 am
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ Warm	**Barometric pressure:** 996mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	18.4	
G2	PIEZO		0	0.3	18.1	
G3	PIEZO		0	0	18.1	
G4	PIEZO		0.2	0.2	18.2	
G5	PIEZO		0	0	18.2	
G6	PIEZO		1.8	1.2	17.6	
G7	PIEZO		0.1	0.4	17.9	
G8	PIEZO		1.6	0.6	17.6	
G9	PIEZO		0.2	0.4	17.9	
G10	PIEZO		2.2	1.3	18.1	
G16	PIEZO		0	0	18.2	
G17	PIEZO		0	0.6	17.9	
G20	PIEZO		0.6	1.4	18.3	
G21	PIEZO		0	1.2	17.9	
GM1	PIEZO		0	0.1	18.9	
GM2	PIEZO		0	0.2	18.2	
GM3	PIEZO		0	0.2	18.1	
GM4	PIEZO		0.3	0.2	17.9	
GM5	PIEZO		0	0.3	18.3	
GM6	PIEZO		0	0.3	18.3	
GM24	PIEZO		0	0.4	18.2	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM	(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 14:07:2010	**Time:** 10.30 am

Instrument used:	**Normal Analytical Range:**	**Date Next Calibration:**
GA2000/FID		May 2012

Monitoring Personnel:	**Weather:**	**Barometric pressure:**
aw	Dry/Warm	996mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		28.2	9.2	8.6	
HUT			0	0	0	Error in monitoring equipment

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 27:08:2010	**Time:** 14.30 am
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ warm	**Barometric pressure:** 1026mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	19.8	
G2	PIEZO		0	0.3	20.2	
G3	PIEZO		0	0.1	20.4	
G4	PIEZO		0.1	0	20.5	
G5	PIEZO		0	0	20.2	
G6	PIEZO		0.3	0.6	19.5	
G7	PIEZO		0	0.4	20.1	
G8	PIEZO		0.3	0.6	19.5	
G9	PIEZO		0	0.1	20.1	
G10	PIEZO		0.5	0.6	18.6	
G16	PIEZO		0	0.1	20.7	
G17	PIEZO		0	0.8	19.1	
G20	PIEZO		0.8	0.7	19.8	
G21	PIEZO		0	0.1	20	
GM1	PIEZO		0	1.3	18.4	
GM2	PIEZO		0	1.2	18.9	
GM3	PIEZO		0	0.8	19.8	
GM4	PIEZO		0.1	0.3	19.6	
GM5	PIEZO		0	0.2	18.7	
GM6	PIEZO		0	0.3	20.6	
GM24	PIEZO		0	0.1	20.2	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 27:08:2010	**Time:** 14.30 am
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ warm	**Barometric pressure:** 1026mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		30.1	9.4	8.6	
HUT			0	0	0	Sampler awaiting repair

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM (Baseline☐ Ambient☐)						
Site Name: DUNDALK LANDFILL				**Site Address:** NEWRY ROAD, DUNDALK		
Operator: DUNDALK TOWN COUNCIL				**National Grid Reference:** 1632-12		
Site Status: Closed				**Date:** 10:09:2010	**Time:** 11.30 am	
Instrument used: GA2000		**Normal Analytical Range:**		**Date Next Calibration:** May 2012		
Monitoring Personnel: aw				**Weather:** Dry/ cool	**Barometric pressure:** 1008mb	

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	21.5	
G2	PIEZO		0	0.1	21.3	
G3	PIEZO		0	0	21.5	
G4	PIEZO		0	0	21.5	
G5	PIEZO		0	0	21.6	
G6	PIEZO		0	0	21.3	
G7	PIEZO		0	0	21.3	
G8	PIEZO		0	0	21.3	
G9	PIEZO		0	0	21.6	
G10	PIEZO		0	0	21.6	
G16	PIEZO		0	0	21.5	
G17	PIEZO		0	1.2	19.4	
G20	PIEZO		0.7	0.7	20	
G21	PIEZO		0	0	21.4	
GM1	PIEZO		0	1.3	18.4	
GM2	PIEZO		0	1.2	19.4	
GM3	PIEZO		0	0.4	19.7	
GM4	PIEZO		0	0.2	19.6	
GM5	PIEZO		0	0.1	20.1	
GM6	PIEZO		0	0.1	20.7	
GM24	PIEZO		0	0	21.1	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 10:09:2010	**Time:** 11.30 am
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ cool	**Barometric pressure:** 1008mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		26.1	9.1	8.2	
HUT			29	10	9	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 07:10:2010	**Time:** 2:30 pm
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** May 2012
Monitoring Personnel: aw	**Weather:** Dry/ cool	**Barometric pressure:** 1011mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	21.6	
G2	PIEZO		0	0	21.6	
G3	PIEZO		0	0	21.3	
G4	PIEZO		0	0.2	20.8	
G5	PIEZO		0	0	21	
G6	PIEZO		0	0.1	21	
G7	PIEZO		0	0.1	21	
G8	PIEZO		0	0.1	21	
G9	PIEZO		0	0.1	21	
G10	PIEZO		0.1	0.2	20.9	
G16	PIEZO		0	0	21.5	
G17	PIEZO		0	1.5	18.3	
G20	PIEZO		0.7	0.2	20.5	
G21	PIEZO		0	0	21.1	
GM1	PIEZO		0	1.2	18.6	
GM2	PIEZO		0	1.2	19.2	
GM3	PIEZO		0	0.3	20.1	
GM4	PIEZO		0	0.1	20.2	
GM5	PIEZO		0	0.1	20.2	
GM6	PIEZO		0.1	0.2	20.3	
GM24	PIEZO		0.1	0.2	20.3	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 07:10:2010	**Time:** 2:30pm
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ cool	**Barometric pressure:** 1011mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		32.1	9.6	8.7	
HUT			31	10	9	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 10:11:2010	**Time:** 2:30 pm
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ cold	**Barometric pressure:** 1002mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	21.4	
G2	PIEZO		0	0	21.1	
G3	PIEZO		0	0.1	20.8	
G4	PIEZO		0	0	21	
G5	PIEZO		0	0	21.2	
G6	PIEZO		0	0.1	21.2	
G7	PIEZO		0	0.1	20.9	
G8	PIEZO		0	0.1	20.8	
G9	PIEZO		0	0	21.6	
G10	PIEZO		0.1	0.2	20.8	
G16	PIEZO		0	0	21.2	
G17	PIEZO		0	1.3	18.9	
G20	PIEZO		0.7	0.2	20.9	
G21	PIEZO		0.1	0.1	21.2	
GM1	PIEZO		0	0.8	19.8	
GM2	PIEZO		0	0.9	19.9	
GM3	PIEZO		0	0.7	20	
GM4	PIEZO		0	0.2	20.2	
GM5	PIEZO		0	0	20.6	
GM6	PIEZO		0	0.3	20.3	
GM24	PIEZO		0	0.1	19.4	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 10:11:2010	**Time:** 2:30pm
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ cold	**Barometric pressure:** 1002mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		28.6	10.4	8.6	
HUT			29	10	8	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

.

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM (Baseline☐ Ambient☐)		
Site Name: DUNDALK LANDFILL	**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL	**National Grid Reference:** 1632-12	
Site Status: Closed	**Date:** 10:12:2010	**Time:** 2:30 pm
Instrument used: GA2000	**Normal Analytical Range:**	**Date Next Calibration:** May 2012
Monitoring Personnel: aw	**Weather:** Dry/ cold	**Barometric pressure:** 1032mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
G1	PIEZO		0	0	20.7	
G2	PIEZO		0	0	20.7	
G3	PIEZO		0	0.1	19.4	
G4	PIEZO		0	0.1	19.7	
G5	PIEZO		0	0	20.9	
G6	PIEZO		0	0.1	19.8	
G7	PIEZO		0	0.1	20.4	
G8	PIEZO		0	0.1	19.6	
G9	PIEZO		0	0	19.7	
G10	PIEZO		0.1	0.2	19.8	
G16	PIEZO		0	0	19.7	
G17	PIEZO		0	1.1	19.1	
G20	PIEZO		0.7	0.2	20.4	
G21	PIEZO		0	0	20.8	
GM1	PIEZO		0	0.6	19.4	
GM2	PIEZO		0	0.7	19.2	
GM3	PIEZO		0	0.6	19.4	
GM4	PIEZO		0	0.2	19.7	
GM5	PIEZO		0	0.1	19.9	
GM6	PIEZO		0	0.1	20.1	
GM24	PIEZO		0	0.1	19.8	

LANDFILL GAS MONITORING

LANDFILL GAS MONITORING FORM		(Baseline☐ Ambient☐)	
Site Name: DUNDALK LANDFILL		**Site Address:** NEWRY ROAD, DUNDALK	
Operator: DUNDALK TOWN COUNCIL		**National Grid Reference:** 1632-12	
Site Status: Closed		**Date:** 10:12:2010	**Time:** 2:30pm
Instrument used: GA2000/FID	**Normal Analytical Range:**	**Date Next Calibration:** May 2012	
Monitoring Personnel: aw		**Weather:** Dry/ cold	**Barometric pressure:** 1032mb

Results

Sample Station Number	Borehole/ spike/other	Survey Depth	CH_4 (% v/v)	CO_2 (% v/v)	O_2 (% v/v)	Comments
FLARE	PIEZO		26.2	11.6	8.2	
HUT			27	10	7	

The following houses and commercial properties were visited and surveyed using GA2000 infra-red gas and FID analyser.

No's 2, 3, 4, 5, ,8, 9, 10, 11, 12, 15, 18,19,20, Riverside Crescent

No's 2, 3 & Newry Road

Mc Kevitts, Maxol, Yard Mace Shop, Autoglass, Peugeot Office, Lynch Mini Mix (Yard), Portway Travel Agents, Hardys (offices & Yard), Road Drains.

All levels detected using the FID where below 15 part per million (10,000ppm = 1% v/v).

APPENDIX J

COMPOSTING MONITORING AND BIOFILTER RESULTS

1 Introduction

No details of this sample are known, 1 sample was received on the 15th of December 2010, and labelled as follows:

BnM lab code	Client code
GW101201	Not known

The sample was analysed as requested by the client.

2 Results of Analysis

Compost Testing and Analysis Service

Report ref: GW 101201

Sample reference: **GW 101201**
Sample matrix: not known

Maturity Tests

Specific Oxygen Uptake Rate

Sample no	$mgO_2/gdm/h$
GW 101201	1.59

Self Heating

Sample no	°C above ambient
GW101201	22

Moisture content

Sample no	% Moisture (w/w)
GW 101201	61.3

Extractable nutrients (CAT soluble)

Sample no	pH	EC $\mu S.cm^{-1}$	NH_4-N $mg.L^{-1}$	NO_3-N $mg.L^{-1}$	PO_4-P $mg.L^{-1}$	K $mg.L^{-1}$
GW 101201	7.44	1318	3	257	10	1290

Total Plant Nutrients and Organic Matter

Sample no	Organic Matter	%C	%N	%P	%K
GW 101201	54.2	30.1	3.0	0.4	1.3

Particle Size Analysis (Dry Wt. Basis)

<1mm %	1-2mm %	2-4mm %	4-8mm %	8-16.5mm %	16.5-31.5mm %	>31.5 mm %
24	31	26	18	1	<0.01	<0.01

Contaminants (Dry Wt. Basis)

Sieve size	Stones %	Metals %	Plastic %	Glass %	Other %
<1mm	n/d	n/d	n/d	n/d	n/d
1-2mm	n/d	n/d	n/d	n/d	n/d
2-4mm	1.15	<0.01	<0.01	<0.01	<0.01
4-8mm	1.38	<0.01	<0.01	<0.01	<0.01
8-16mm	<0.01	<0.01	<0.01	<0.01	<0.01
16-31.5mm	<0.01	<0.01	<0.01	<0.01	<0.01
>31.5mm	<0.01	<0.01	<0.01	<0.01	<0.01

Heavy Metals (Dry Wt. Basis)

Sample no	Cd $mg.kg^{-1}$	Cr $mg.kg^{-1}$	Cu $mg.kg^{-1}$	Hg $mg.kg^{-1}$	Ni $mg.kg^{-1}$	Pb $mg.kg^{-1}$	Zn $mg.kg^{-1}$
GW 101201	0.641	24.3	48.8	0.06	18.1	36.7	175

Microbiological Analysis

E. Coli (cfu/g)	Salmonella (sp/25g)
40	Not Detected

Cress Germination

Cress Germination Test

Sample no	Sample Diluted with 50% peat to bring to correct EC	% Germination compared to control	Root Index Compared to control (%)	MLV compared to control (%)
GW 101201		93.3	102.6	102.5

* <80% = fail (method based on pr EN 16089)

Results of Analysis

A sample was received from V&W recylcing on the 18th of March 2010 (GW 100310). It was received in good condition. Analysis was carried out on this sample as requested by the client.

Compost Testing and Analysis Service

Report ref: GW 100310

Sample reference: GW 100310
Sample matrix: Composted source separated household waste

Maturity Tests

Specific Oxygen Uptake Rate

Sample no	$mmolO_2/kg\ OS/h$
GW 100310	0.37

Self Heating Test

Sample no	Maximum temperature reached (°C)
GW 100310	25

Plant Nutrient and Organic Matter Content

Water Soluble Nutrients

pH	EC $\propto S.cm^{-1}$	NH_4-N $mg.L^{-1}$	NO_3-N $mg.L^{-1}$	PO_4-P $mg.L^{-1}$	K $mg.L^{-1}$
7.06	2560	4	593	9	1789

Total Plant Nutrients and Carbon Content (Dry Wt. Basis)

N %	P %	K %	C %	C:N %
2.1	0.3	1.1	23.26	11.3

Heavy Metals (Dry Wt. Basis)

Copper $mg.kg^{-1}$	Zinc $mg.kg^{-1}$	Lead $mg.kg^{-1}$	Cadmium $mg.kg^{-1}$	Mercury $mg.kg^{-1}$	Nickel $mg.kg^{-1}$	Chromium $mg.kg^{-1}$
56.1	186	136	0.387	0.13	32.3	118

Physical Analysis

H_20 %
49.1

Particle Size Analysis (Dry Wt. Basis)

>31.5 mm %	16.5-31.5mm %	8-16.5mm %	4-8mm %	2-4mm %	1-2mm %	<1mm %
1	0	2	15	16	18	47

Compost Testing and Analysis Service
Interpretation of Results Sheet

Ref: IR-1

Below are detailed maximum values or desirable ranges of values for mature biowaste compost. Results are on a fresh wt. basis except where indicated.

Plant Nutrient and Organic Matter Content

Exchangeable Nutrients

pH*	SC* $\propto S.cm^{-1}$	NH4-N $mg.L^{-1}$	NO3-N $mg.L^{-1}$	P $mg.L^{-1}$	K $mg.L^{-1}$
6.9-8.3	**2000-6000**	**<1-500**	**<1-240**	**50-120**	**620-2280**

*Water soluble

Total Plant Nutrients and Carbon Content (Dry wt. Basis)

N %	P %	K %	ASH %	C:N	Mg %	Ca %
0.8-1.9	**0.4-1.1**	**0.6-1.7**	**24-51**	**≤25**	**0.18-0.78**	**1.57-5.07**

Heavy Metals (Dry Wt. Basis)

Class	Cd mg.kg-1	Cr mg.kg-1	Cu mg.kg-1	Pb mg.kg-1	Hg $mg.kg^{-1}$	Ni mg.kg-1	Zn mg.kg-1
I	0.7	100	100	100	0.5	50	200
II	1.5	150	150	150	1	175	400

Physical Analysis

H_20 %	DBD** $g.L^{-1}$	MBD $g.L^{-1}$
55-76	**120-369**	**500-820**

Contaminants (Dry Wt. Basis)

vs.L-1	$0.5.L^{-1}$ Free	$0.5\text{-}2.L^{-1}$ Low	$>2.L^{-1}$ Significant	
Foreign Material (Metal, Glass, Plastic etc)	**<0.1%** Free of foreign material	**0.1-0.5 %** Potentially free	**>0.5%** Marked quantity (Noticeable)	**>2%** Significant quantity (distinct)
Stones	**<5%** Low	**>5%** Significant		

Microbiological Analysis

Faecal Coliforms (MPN/g)	Salmonella (sp/25g)
<1000	**Absent in 25g**

**Denotes Bord na Móna suggested standard

Oxygen Uptake Rate

Bord na Móna Maturity Indicator Values (OS = organic solids)

$mmolO_2/kg$ OS/h**	Compost Process Stage
>26	Very Unstable
16-25	Unstable
11-15	Moderately Stable
5-10	Stable
<5	Completely stable

Contaminants (Dry Wt. Basis)

Sieve size	Glass %	Metals %	Plastic %	Stones %	Other %
<1mm	ND	ND	ND	ND	ND
1-2mm	ND	ND	ND	ND	ND
2-4mm	<0.01	<0.01	<0.01	<0.01	<0.01
4-8mm	<0.01	0.03	<0.01	<0.01	<0.01
8-16mm	<0.01	<0.01	<0.01	1.44	<0.01
16-31.5mm	<0.01	<0.01	<0.01	3.20	<0.01
>31.5mm	<0.01	<0.01	<0.01	<0.01	<0.01

ND not determined

Microbiological Analysis

Faecal Coliforms (CFU/g)	Salmonella (sp/25g)
<10	Not detected

1 Introduction

No details of this sample are known, 1 sample was received on the 27th of October 2010, and labelled as follows:

BnM lab code	Client code
GW101005	Not known

The sample was analysed as requested by the client.

2 Results of Analysis

Compost Testing and Analysis Service

Report ref: GW 101005

Sample reference: **GW 101005**
Sample matrix: not known

Maturity Tests

Specific Oxygen Uptake Rate

Sample no	$mgO_2/gdm/h$
GW 101005	4.18

Self Heating

Sample no	°C above ambient
GW101005	20

Moisture content

Sample no	% Moisture (w/w)
GW 101005	61.2

Extractable nutrients (CAT soluble)

Sample no	pH	EC $\mu S.cm^{-1}$	NH_4-N $mg.L^{-1}$	NO_3-N $mg.L^{-1}$	PO_4-P $mg.L^{-1}$	K $mg.L^{-1}$
GW 101005	7.94	1198	1	139	10	1207

Total Plant Nutrients and Organic Matter

Sample no	Organic Matter	%C	%N	%P	%K
GW 101005	54.6	30.4	2.7	0.3	1.0

Particle Size Analysis (Dry Wt. Basis)

<1mm %	1-2mm %	2-4mm %	4-8mm %	8-16.5mm %	16.5-31.5mm %	>31.5 mm %
31	26	21	18	4	<0.01	<0.01

Contaminants (Dry Wt. Basis)

Sieve size	Stones %	Metals %	Plastic %	Glass %	Other %
<1mm	n/d	n/d	n/d	n/d	n/d
1-2mm	n/d	n/d	n/d	n/d	n/d
2-4mm	**2.61**	<0.01	<0.01	<0.01	<0.01
4-8mm	**2.83**	<0.01	<0.01	**0.59**	<0.01
8-16mm	<0.01	<0.01	<0.01	<0.01	<0.01
16-31.5mm	<0.01	<0.01	<0.01	<0.01	<0.01
>31.5mm	<0.01	<0.01	<0.01	<0.01	<0.01

Heavy Metals (Dry Wt. Basis)

Sample no	Cd $mg.kg^{-1}$	Cr $mg.kg^{-1}$	Cu $mg.kg^{-1}$	Hg $mg.kg^{-1}$	Ni $mg.kg^{-1}$	Pb $mg.kg^{-1}$	Zn $mg.kg^{-1}$
GW 101005	0.103	54.4	36.1	0.1	16.3	29.7	176

Microbiological Analysis

E. Coli (cfu/g)	Salmonella (sp/25g)
270	Not Detected

Cress Germination

Cress Germination Test

Sample no	Sample Diluted with **50%** peat to bring to correct	% Germination compared to control	Root Index Compared to control (%)	MLV compared to control (%)
GW 101005	EC	96.7	99.6	98.9

* <80% = fail (method based on pr EN 16089)

Radish Germination

Radish Germination Test

Sample no	Sample Diluted with **50%** peat to bring to correct	% Germination compared to control	Root Index Compared to control (%)	MLV compared to control (%)
GW 101005	EC	96.7	90.2	89.9

* <80% fail (method based on pr EN 16089)

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Ref - 2009

Customer	Veronica Martin V & W Recycling Shredding Service Newry Rd Dundalk Co Louth	*Lab Report Ref. No.*	1143/006/01
		Date of Receipt	16/03/2010
		Date Testing Commenced	16/03/2010
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		*Date of Report*	25/03/2010
Customer Ref	Biofilter 1 - Wood Chip Sample 16/03/10	*Sample Type*	Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
% Moisture Content	0	Drying @ 104 C	67.6	%	
Ammonia (Solid)	114	Colorimetry	118.73	mg/Kg as N	
pH (Solid)	110	Electrometry	6.3	pH Units	
TVC's @ 22 (Solid)	141	Incubation @ 22C/ 72H	300000	no/g	
TVC's @ 37 (Solid)	141	Incubation @ 37C/ 48H	129000	no/g	

Signed : DHeslin *Date :* 25/03/10

Donna Heslin - Laboratory Manager

Acc Accredited Parameters by ISO 17025 2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results contained in this report relate only to the samples tested

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Customer	Veronica Martin V & W Recycling Shredding Service Newry Rd Dundalk Co Louth	*Lab Report Ref. No.*	1143/007/01
		Date of Receipt	23/07/2010
		Date Testing Commenced	23/07/2010
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		*Date of Report*	06/08/2010
Customer Ref	Biofilter 1 - Wood Chip Sample 23/07/10	*Sample Type*	Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
% Moisture Content	0	Drying @ 104 C	63.7	%	
Ammonia (Solid)	114	Colorimetry	170.97	mg/Kg as N	
pH (Solid)	110	Electrometry	6.5	pH Units	
TVC's @ 22 (Solid)	141	Incubation @ 22C/ 72H	350000	no/g	
TVC's @ 37 (Solid)	141	Incubation @ 37C/ 48H	320000	no/g	

Signed : _____ ***Date :*** 6/8/10

Katherine McQuillan - Technical Manager

Acc. : Accredited Parameters by ISO 17025:2005

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Results contained in this report relate only to the samples tested

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Customer	Veronica Martin V & W Recycling Shredding Service Newry Rd Dundalk Co Louth	*Lab Report Ref. No.*	1143/007/02
		Date of Receipt	23/07/2010
		Date Testing Commenced	23/07/2010
		Received or Collected	Delivered by Customer
		Condition on Receipt	Acceptable
Customer PO		*Date of Report*	06/08/2010
Customer Ref	Biofilter 2 - Wood Chip Sample 23/07/10	*Sample Type*	Other

CERTIFICATE OF ANALYSIS

Test Parameter	SOP	Analytical Technique	Result	Units	Acc.
% Moisture Content	0	Drying @ 104 C	64.4	%	
Ammonia (Solid)	114	Colorimetry	75.12	mg/Kg as N	
pH (Solid)	110	Electrometry	6.2	pH Units	
TVC's @ 22 (Solid)	141	Incubation @ 22C/ 72H	410000	no/g	
TVC's @ 37 (Solid)	141	Incubation @ 37C/ 48H	180000	no/g	

Signed : _____ ***Date :*** 6/8/10

Katherine McQuillan - Technical Manager

Acc. : Accredited Parameters by ISO 17025:2005

All organic results are analysed as received and all results are corrected for dry weight at 104 C

Results contained in this report relate only to the samples tested

Biofilter Bi-Annual Monitoring Dundalk Civic Waste Facility W0034-02

Date Checked	BY	BED						Inlet & Outlet Gasses					
		No.	Moisture Content (%)	pH	Ammonia (ppm v/v)	TVC @22 deg C	TVC @37 degC	Ammonia In	Ammonia Out	Hyd. Sulph. In	Hyd. Sulph. Out	Mercaptans In	Mercaptans Out
23/7/10	Eco Environment Services	1	63.7	6.5	170.97	350000	320000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
23/7/10	Eco Environment Services	2	64.4	6.2	75.12	410000	180000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6/7/10	VRW Reg	1	—	—	—			38	17	0	0	0	0
6/7/10	VRW Reg	2	—	—	—	—	—	44	20	0	0	0	0
25/2/11	VRW Reg	1	—	—	—	—	—	42	15	0	0	0	0
11/3/11	VRW Reg	1	67.27	7.1	267.36	4000000	350000						

Biofilter Bi-Annual Monitoring Dundalk Civic Waste Facility W0034-02

		BED						Inlet & Outlet Gasses					
Date Checked	BY	No.	Moisture Content (%)	pH	Ammonia (ppm v/v)	TVC @22 deg C	TVC @37 degC	Ammonia In	Ammonia Out	Hyd. Sulph. In	Hyd. Sulph. Out	Mercaptans In	Mercaptans Out
25/3/10	Euro Enviroment Services.	1	67.6	6.3	118.73	300000	129000						
15/9/10	W&W Rec.	1						41	17	0	0	0	0

APPENDIX K

NOISE REPORT

Environmental Noise Measurement Report

Measurement Details

Location: Dundalk Landfill Site 2010

Description:

Date of Measurement: 02/06/2010 10:21

Instrumentation Details

Sound Level Meter: Cirrus Research plc CR:800B C19087FD

Acoustic Calibrator: Cirrus Research plc CR:511E

Calibration:

Time Weighting: Fast (for Lmax and Lns)

Measurement Data

Start of Measurements: 02/06/2010 10:21

No. of Measurements: 8

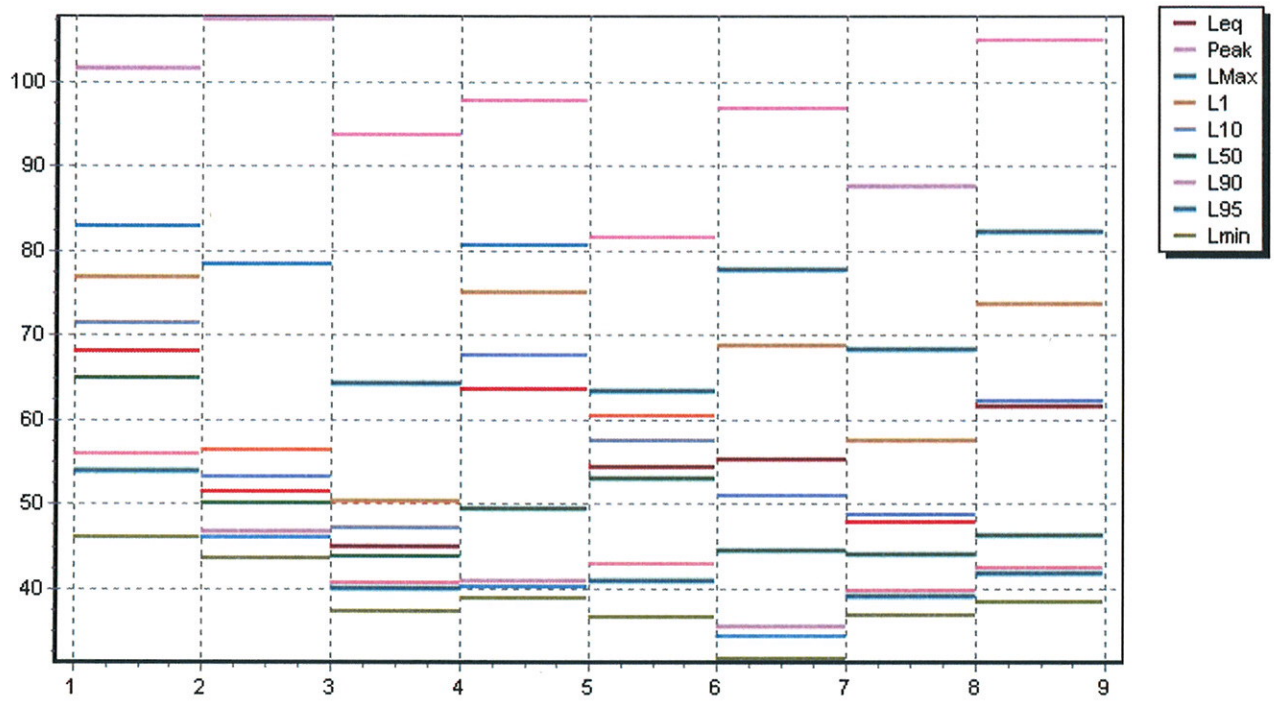
Total Duration: 02:29:38

Highest Lmax: 82.8

Lmax Exceedance Count: 0, at or above 115dB

Date	Time	Run Duration (hh:mm:ss)	Leq dB	Lmax dB	Peak dBC	L1	L10	L50	L90	L95	Lmin
02/06/2010	10:21:30	00:20:04	68.1	82.8	101.5	76.9	71.4	65.0	55.9	54.0	46.1
02/06/2010	11:27:21	00:20:48	51.4	78.4	107.3	56.4	53.3	50.1	46.7	46.0	43.5
02/06/2010	12:03:49	00:22:06	44.9	64.2	93.6	50.3	47.1	43.8	40.7	39.9	37.2
02/06/2010	12:30:38	00:21:13	63.5	80.7	97.7	74.9	67.7	49.4	41.0	40.2	38.8
02/06/2010	22:59:26	00:16:28	54.3	63.4	81.5	60.4	57.6	53.0	42.9	40.9	36.6
02/06/2010	23:18:30	00:17:35	55.3	77.8	96.7	68.8	51.0	44.4	35.6	34.5	31.7
02/06/2010	23:39:56	00:15:50	47.9	68.2	87.6	57.5	48.7	44.0	39.8	39.1	36.8
02/06/2010	23:58:20	00:15:34	61.6	82.2	104.8	73.6	62.2	46.2	42.5	41.7	38.4

Environmental Noise Measurement Report



Assessment made by:

Date: 04/06/2010