DUNSINK LANDFILL
ANNUAL ENVIRONMENTAL REPORT 2009

REPORTING PERIOD: JANUARY TO DECEMBER 2009

WASTE LICENCE REGISTER NO. W0127-01

FINGAL COUNTY COUNCIL
COUNTY HALL
MAIN STREET
SWORDS
COUNTY DUBLIN

Fingal County Council

Comhairle Contae Fhine Gall

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1.0 INTRODUCTION.

The Environmental Protection Agency (EPA) granted a waste licence (register no. 127-1) to Fingal Council in respect of the above facility on 9th January 2004. From July 2006 the register number was changed to W0127-01. This licence is for the closure and restoration of areas previously landfilled. Under its terms, the Council is required to restore and remediate the facility, to install infrastructure to monitor and manage landfill gas and leachate emissions, and to cap previously filled areas using inert materials. These works are to be completed within three years of the date of grant of the licence. In accordance with the requirements of condition 11.6 of the Waste Licence, an Annual Environmental Report (AER) for the facility must be submitted to the Environmental Protection Agency.

1.1. REPORTING PERIOD.

The reporting period for the AER is 1st January to 31st December 2009. This is the sixth AER for the facility as required by the waste licence.

1.2. FACILITY LOCATION.

Fingal County Council has responsibility for the management and operation of the facility. The facility is located at:

Dunsink Landfill,
Dunsink Lane,
Finglas,
County Dublin.
Tel. (01) 8119070

Access to the landfill is now from the Forest Road end of Dunsink Lane only, Irish National Grid 238886 (Northings) 311766 (Eastings). Figure 1 presents a map of the facility and the surrounding locations.

1.3. ENVIRONMENTAL POLICY FOR DUNSINK LANDFILL.

- Comply with the terms of waste licence 127-1 and all other relevant legislation and codes of practice.
- Strive for continuous improvement in the running of the facility; in order to minimise the effects of the landfill on the environment.
- Create better awareness and training for all staff involved in the running of the landfill.

Develop a good relationship with local residents around Dunsink for the betterment of the surrounding area.

FIGURE 1: DUNSINK LANDFILL SITE LOCATION AND SITE ACCESS

2.0. SITE DESCRIPTION.

Dunsink Landfill is situated in Finglas, County Dublin (National Grid Reference 239500E, 310500N). It is bound by Dunsink Lane to the south, Rathoath Road to the east, the M50 motorway to the Northwest and Cappagh Hospital to the North. It is approximately 61ha. The most elevated ground measured this year lies at 100m on the western side of the site. The base of the landfill varies but is estimated to average between 65-70ms.

The landfill opened in 1976. Approximately 4,400,000 tonnes of waste is estimated to have been deposited at the facility to June 1996. The landfill subsequently phased to closure, culminating in the closure of the civic amenity in 2003. A landfill gas utilisation plant was installed on site in 1996.

An original application for a waste licence was submitted to the Environmental Protection Agency in September 1999. An amendment to the original application was sought in February 2003. A Proposed Decision was issued in August 2003. Waste Licence 127-1 was issued in January 2004.

2.1. LICENCED WASTE ACTIVITIES AT THE FACILITY.

On January 9th 2004 Fingal County Council was licensed to carry out the following waste activities at Dunsink Landfill, Finglas, County Dublin subject to twelve conditions.

Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Act 1996.

Class 4 Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons:

This activity is limited to:

- The provision and use of a leachate lagoon to temporarily store leachate generated in the landfill, prior to discharge to the public foul sewer; and
- The provision and use of a surface water attenuation pond to control the quality and quantity of the surface water run off from the site.

Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Act 1996.

Class 2 Recycling or reclamation of organic substances, which are not used as solvents (including composting and other biological transformation processes):
This activity is limited to the composting of green waste, the recycling / reclamation of cardboard, paper and waste oil at the facility.

Class 3 Recycling or reclamation of metals and metal compounds:
This activity is limited to the recycling of ferrous / non-ferrous metals and white goods.

Class 4 Recycling or reclamation of other inorganic materials:
This activity is limited to the recycling or reclamation of subsoil and topsoil (for the restoration of the site) and dry recyclables at the bring centre.

Class 9 Use of any waste principally as a fuel or other means to generate energy:
This activity is limited to the utilisation of landfill gas for the generation of electricity.

Class 11 The use of waste obtained from any activity referred to in a preceding paragraph of this Schedule:
This activity is limited to the use of suitable subsoil and topsoil and composted material for the restoration programme.
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:
This activity is limited to the storage of recyclable waste prior to recovery off site and the storage of soil on site for the restoration programme.

Classes 2 and 3 as licensed waste recovery activities, under the Fourth Schedule of the Waste Management Act 1996 are not currently undertaken at the facility.
The Capping Report stated that the area in the centre of the site around the old civic amenity tipping area (Zone C) should be capped in accordance with the specifications given in condition 4.3 of the licence. This zone was the subject of a proposal put to and agreed by *The Agency* FCC-127-1-2005-015. The capping of Zone C commenced in early September 2005 and was completed in late October 2006, see Figure 2. Only localised dressing of topsoil in areas of Zone C occurred in 2007.

3.0 EMISSIONS AND INTERPRETATION OF MONITORING RESULTS.

3.1. GROUNDWATER

There are eight groundwater stations listed in Schedule D.1 of the waste licence. BH28 listed in Table D.1.1 of the licence was not installed however; BH27 was added to the monitoring infrastructure under agreement with the *Environmental Protection Agency*. Borehole monitoring recorded leachate characteristics from BH29 suggesting that it was a potential migration pathway to groundwater for leachate. It was therefore decommissioned on 14th March 2005, upon agreement with *The Agency*. Two additional groundwater stations were added to the sampling programme upon agreement with *The Agency*, these were installed on Dunsink Observatory land between the 14th and 16th March 2005. BH18 was destroyed during slope stability work in August 2006 and was replaced as BH18_R on 7th September 2006. The grid references for these are shown in Table 3.1. The sample locations are illustrated in Figure 3.1

Condition 6.4.1 requires the licensee to submit to the EPA for its agreement, groundwater monitoring trigger levels in accordance with the requirements of Directive 1999/31/EC for one upgradient and two downgradient monitoring Boreholes. This analysis was conducted and trigger levels were proposed to the EPA in February 2005 (Reference: FCC-127-1-2005-006), Appendix I. These were reviewed at the end of 2006, along with an analysis of control and trigger levels for BH33 & BH34. A proposal has been sent to *The Agency* on foot of this review for their approval.

Groundwater Borehole Monitoring Location	Eastings	Northings	Classification
BH3	310665	239505	Deep Groundwater
BH4	310650	239490	Shallow Groundwater
BH16	311340	239085	Deep Groundwater
BH18_R	311180	239115	Deep Groundwater
BH27	310030	238720	Deep Groundwater
BH28	Not Installed		
BH29	310155	239095	Deep Groundwater
BH31	311765	238820	Shallow Groundwater
BH32	311770	238800	Deep Groundwater
BH33	310735	238724	Deep Groundwater
BH34	310719	238725	Shallow Groundwater

TABLE 3.1: GROUNDWATER MONITORING LOCATIONS.

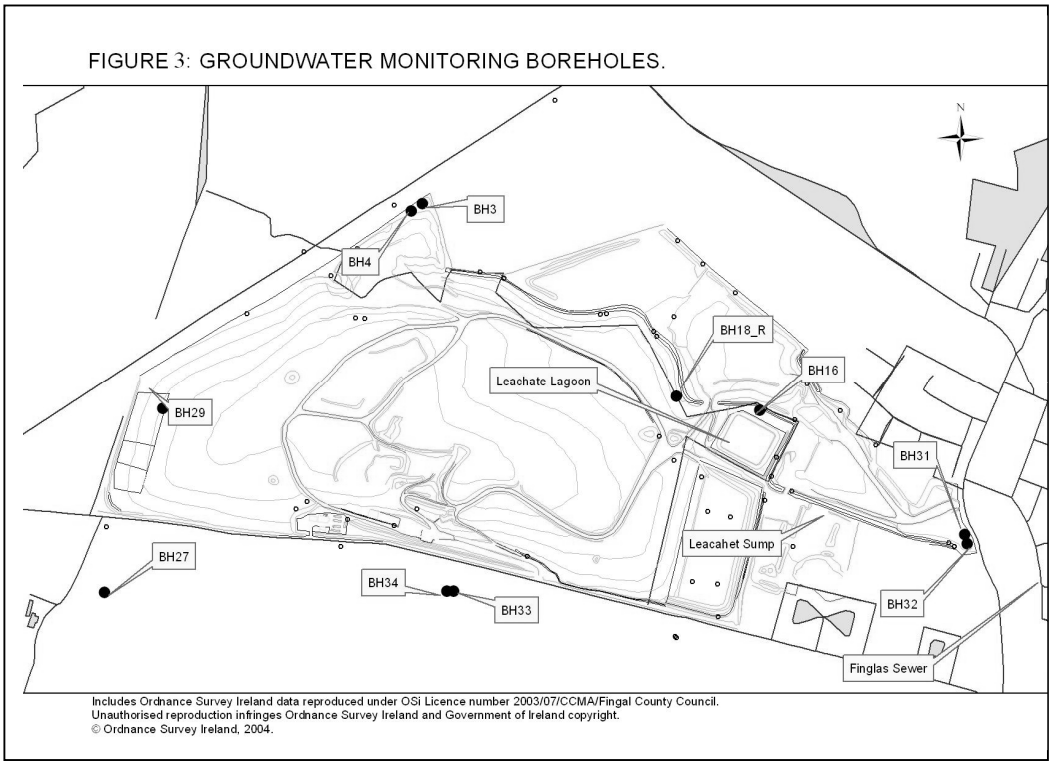

Figure 2: GROUNDWATER MONITORING BOREHOLES.

Detailed analysis reports are contained in Appendix I. The results obtained have been compared to the Interim Guideline Values of EPA document "Towards Setting Guideline Values for the Protection of Groundwater Ireland", 2003 and proposed trigger levels. The following analysis was completed in 2009 (Table 3.2).

Groundwater Borehole Monitoring Location	Q1 Jan-March	Q2 April- June	Q3 July-September	Q4 October - December
BH3	Sampled	Sampled	Sampled	Sampled
BH4	Sampled	Sampled	Sampled	Sampled
BH16	Sampled	Sampled	Sampled	Sampled
BH18_R	Sampled	Sampled	Sampled	Sampled
BH27	Sampled	Sampled	Sampled	Sampled
BH28	Not Installed			
BH29	Decommissioned 14th March 2005			
BH31	Sampled	Sampled	Sampled	Sampled
BH32	Sampled	Sampled	Sampled	Sampled
BH33	Sampled	Sampled	Sampled	Sampled
BH34	Sampled	Sampled	Sampled	Sampled

TABLE 3.2: GROUNDWATER SAMPLING PROGRAMME 2009.

Methodology
Refer to Schedule D.5 of WL 127-1.

Groundwater Monitoring Quality - Findings (See Appendix I)

Q1 January - March 2009 – Sampling dated 18th February 2009
Results from groundwater sampling undertaken during Quarter 1 indicated good groundwater quality at BH27, BH31, BH32, BH33 and BH34. Elevated levels of ammoniacal nitrogen above the IGV, control values and trigger values were recorded at BH3, BH4 and BH16.

Results at all remaining boreholes were below their respective control and trigger levels during this quarter.

Q2 April - June 2009- Sampling dated 28th May 2009
Results from groundwater sampling during the 2nd quarter of 2009 indicated good groundwater quality at BH16, BH31, BH32, BH33 and BH34. Elevated levels of conductivity above the IGV, control values and trigger values for respective boreholes were recorded at BH3 and BH4. Elevated levels of ammoniacal nitrogen were recorded at BH18R while slightly elevated levels of conductivity were recorded at BH27.

Results at all remaining boreholes were below their respective control and trigger levels during this quarter.

Q3 July – September 2009- Sampling dated 27th August 2009
Results from the annual round of groundwater sampling during August 2009, indicated moderate quality groundwater beneath the landfill site and environs. Elevated levels of total organic carbon in excess of IGVs, control and trigger levels were recorded at all groundwater locations. As this was the first occasion that TOC levels were recorded at elevated levels at all monitoring locations it was considered anomalous.

Elevated levels of conductivity, chloride and total organic carbon were recorded at BH3 and BH4 in excess of IGVs, control and trigger levels. Elevated levels of sodium were also recorded at both locations in excess of the control and trigger levels but below the IGVs. Elevated levels of sulphate were recorded at BH4 in excess of IGVs.

Elevated levels of fluoride and total organic carbon were recorded at BH18R in excess of the IGVs, control and trigger levels. A number of other parameters (conductivity, ammoniacal nitrogen, chloride and magnesium) were also recorded at BH18R in excess of IGVs but below control and trigger levels. Results at BH18R have consistently recorded slightly contaminated water quality since its installation. BH18R is located on the landfill side of the northern leachate interceptor drain.

Elevated levels of conductivity and chloride were recorded at BH27 in excess of the IGVs but below control and trigger levels.

Elevated levels of manganese were recorded at BH32 in excess of IGVs, control and trigger levels. Elevated levels of chloride were also recorded in excess of control and trigger levels but below IGVs. Slightly elevated levels of magnesium were recorded at BH33 in excess of the control value for this borehole.

List I/List II Analysis of Groundwaters

In accordance with the requirements of Waste Licence W0127-01, a number of monitoring boreholes were also analysed for concentrations of List I/List II dangerous substances e.g. volatile and semi volatile organic compounds as well as pesticides. Samples for organic and pesticide analysis were collected from BH3, BH4, BH31, BH32, BH33 and BH34.

All VOCs, SVOCs and pesticides were recorded below their respective laboratory detection limits during the annual sampling round of 2009.

Q4 October - December 2009- Sampling dated 8th December 2009

Results from groundwater sampling during the 4th quarter of 2009 indicated generally good groundwater quality at BH31, BH32 and BH34. Elevated levels of ammoniacal nitrogen were recorded at BH3, BH16, BH18R and BH33 in excess of their respective control and trigger level. Elevated levels of conductivity in excess of IGVs were recorded at BH3, BH4, BH18R and BH27.

Results at all remaining boreholes were below their respective control and trigger levels during this quarter.

Groundwater Levels

Groundwater levels were recorded from each borehole during each quarter and the results are displayed in Table 3.3.

Groundwater Borehole Monitoring Location	Q1 2009	Q2 2009	Q3 2009	Q4 2009
BH3	3.35	3.49	3.46	3.00
BH4 Shallow	3.31	3.34	3.5	3.25
BH16	0.37	0.8	0.67	0.00
BH18R	5.56	5.60	5.70	5.34
BH27	1.81	2.35	3.54	1.56
BH31 Shallow	3.35	3.69	3.80	4.54
BH32	0.75	0.93	1.00	1.74
BH33	1.67	3.45	3.12	2.30
BH34 Shallow	1.4	1.87	2.49	0.98

TABLE 3.3: GROUNDWATER BOREHOLES WATER LEVELS

Groundwater – Discussion

A hydrogeological Assessment of the facility was forwarded to the Agency in November 2004 (FCC-127-1-2004-065). It determined an up gradient / down gradient trending of groundwater from West-North-West to East-South-East beneath the landfill and surrounds. This pattern is generally consistent with the regional drainage pattern.

Results from groundwater sampling during 2009 indicated generally good quality groundwater beneath the landfill site and environs though some boreholes recorded slightly elevated levels of ammoniacal nitrogen and/or conductivity during the year. Results at BH3 and BH4 throughout the year indicated a deterioration in groundwater quality north of the site. Works related to the widening of the M50 are suspected to have impacted groundwater locally.

Bedrock Groundwater Quality

Results during 2009 indicated generally good groundwater quality in bedrock monitoring wells south and east of the site as evidenced by consistently low ammoniacal nitrogen results at BH27, BH32 and BH33. North of the site elevated levels of ammoniacal nitrogen were recorded at BH3 during Q1 and Q4 2009. Conductivity was also elevated throughout the year. Results from BH16 and BH18_R, located closer to the centre of the landfill, also recorded moderately elevated levels of ammoniacal nitrogen during Q1 and Q4.

Overburden Groundwater Quality

Shallow groundwater at BH 4 upgradient of the site was of moderate quality during 2009 with elevated levels of ammoniacal nitrogen recorded during Q1 and Q4. Conductivity was elevated throughout the year. Groundwater quality east and south of the facility at BH31 and BH34 was good with all parameters consistently below the relevant limit values.

Using ammoniacal nitrogen as a guide to trends in groundwater quality, a pattern of improved groundwater quality is discernable from 2005 onwards.

Conclusion & Annual Assessment

The annual assessment of groundwater quality suggests that with the exception of issues suspected to be related to now completed M50 widening works to the north of the site, there is a general continuation in the trend of groundwater quality improvement at Dunsink Landfill. The landfill however, still appears to be having a slight impact on deep groundwater quality close to the waste body itself as evidenced by results at BH16 and BH18R.

3.2. SURFACE WATER

Schedule D.1 of the waste licence requires the monitoring of surface water at six locations (SW1, SW2, SW4, SW7, SW9 & SW10). Three sampling points are required for biological sampling (KS1, KS2 and KS3) and an additional station at the settlement pond and outlet points was added as a fourth monitoring location in 2008 (See Table 3.4 and Figure 3).

SW 11 was incorporated as an additional sampling location under instruction from *The Agency* following Q1 Monitoring Report 2004. A Biological Sampling Assessment was undertaken on 27th August 2009. Surface water sampling points were established at the discharge from the wheelwash to the open channel WWSW1 and from the open channel to the Scribblestown Stream WWSW2. SW1 is located downstream of the facility and sampling at this point monitors the effect of the facility on water quality. SW1 is located some distance downstream of the facility and a breakers yard lies adjacent to the stream and illegal dumping occurs between the facility and SW1. A case was put to *The Agency* to move SW1 further upstream to avoid these potential sources of surface water contamination and provide a truer picture of the effect of the facility on surface water quality. During the annual audit of the licence *The Agency* agreed and from 15th August 2005 a new downstream monitoring point, SW17, was used instead of SW1. SW4 was replaced on 27/2/2006 by SW18 as the upstream sampling point as agreed with *The Agency* (127-1/AK11EM).

Surface Water Monitoring Location	Eastings	Northings
SW1	311800	238460
SW2	311380	238980
SW4	310480	239365
SW7	311120	239220
SW9	310885	238795
SW10	311350	239100
SW11*	311360	238915
SW12**	310424	239410
SW13**	310829	239356
SW14**	311173	239277
SW15**	311417	239069
SW16**	311410	238926
SW17***	311687	238826
SW18****	310464	239394
KS1*****	310781	239373
KS2*****	311145	239242
KS3*****	311739	238812
WWSW1******	311616	238921
WWSW2******	311644	238835

* Additional sampling location for monitoring programme.
** Enhanced monitoring programme undertaken 30th July 2004.
*** New downstream sampling point agreed during EPA audit August 2005.
**** New upstream sampling point agreed with *The Agency*.
***** Biological Sampling Programme.
****** Sampling points at discharge from wheelwash to open channel and from open channel to Scribblestown Stream. Only sampled when clay is imported onto the Landfill.

TABLE 3.4: SURFACE WATER MONITORING LOCATIONS 2008.

FIGURE 4: SURFACE WATER MONITORING LOCATIONS.

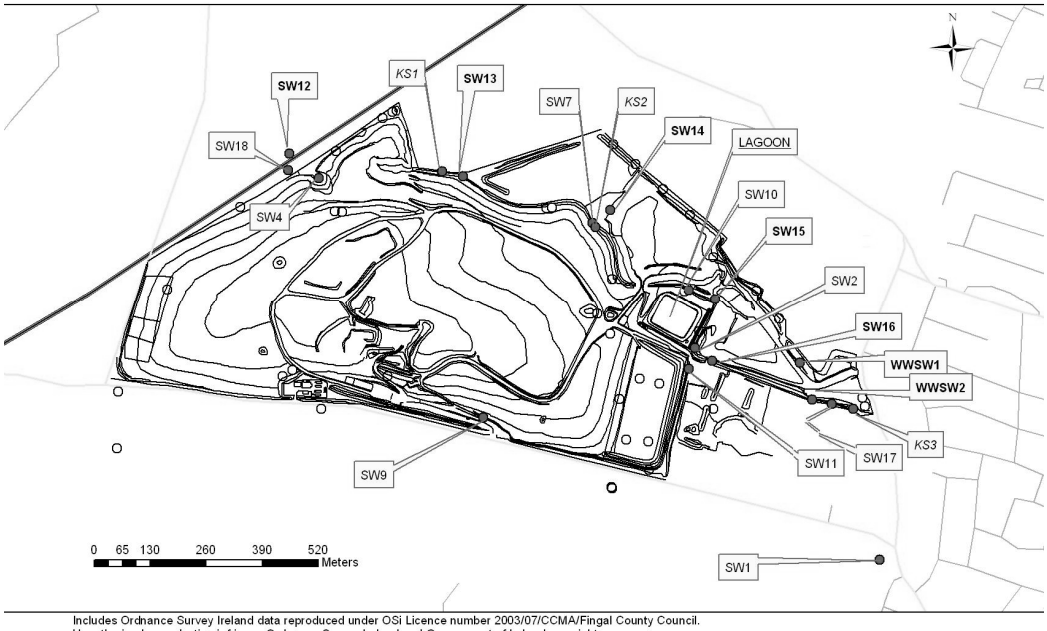

Figure 3: SURFACE WATER MONITORING LOCATIONS 2009**.**

See Table 3.5 for analysis completed in 2009.

Methodology
Refer to Schedule D.5 of waste licence 127-1

Surface Water Monitoring Quality - Findings (See Appendix II)
Surface water quality was monitored in the drainage network within the landfill and it's immediate environs throughout 2009. All the surface water sampling locations stipulated in the waste licence were sampled throughout 2009 with the exception of SW18 which was inaccessible during Q2 and Q3(Table 3.5). The results of the biological sampling programme are discussed later in the report.

The water quality results have been compared to SI 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988 (Appendix II). It should be noted that the limit of detection in laboratories used for analysis of Ammoniacal Nitrogen is generally 0.2mg/l. The standard for Salmonid rivers for Non-Ionised Ammonia is >0.02 mg/l. The results for this parameter, do not lend themselves, given the resolution of the test, to comparison with the standard. The standard for Total Ammonium (Ionised Ammonia) is > 1mg/l the conversion factor for Ammoniacal Nitrogen to Total Ammonium is 1.28.

Surface Water Monitoring Location	Q1	Q2	Q3	Q4	Weekly Visual[1]	Monthly	Annual	Once-Off
SW2	Y	Y	Y	Y	Y	N	Y	N
SW4	N	N	N	N	N	N	N	N
SW7	Y	Y	Y	Y	Y	N	Y	N
SW9	Y	Y	Y	Y	Y	N	Y	N
SW10	Y	Y	Y	Y	Y	N	Y	N
SW11*	Y	Y	Y	Y	Y	N	Y	N
SW12**	N	N	N	N	N	N	N	N
SW13**	N	N	N	N	N	N	N	N
SW14**	N	N	N	N	N	N	N	N
SW15**	N	N	N	N	N	N	N	N
SW16**	N	N	N	N	N	N	N	N
SW17****	Y	Y	Y	Y	Y	N	Y	N
SW18****	Y	N	N	Y	Y	N	Y	N
KS1*****	N	N	Y	N	N	N	N	N
KS2*****	N	N	Y	N	N	N	N	N
KS3*****	N	N	Y	N	N	N	N	N
WWSW1******	N	N	N	N	N	N	N	N
WWSW2******	N	N	N	N	N	N	N	N

* Additional sampling location for monitoring programme.
** Enhanced monitoring programme undertaken 30th July 2004.
*** New downstream sampling point agreed during EPA audit August 2005.
**** New upstream sampling point agreed with *The Agency*.
***** Biological Sampling Programme.
****** Sampling points at discharge from wheelwash to open channel and from open channel to Scribblestown Stream when wheelwash becomes operational. Sampling at the two wheelwash locations ceased in November 2007 and will continue only on a needs be basis.
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TABLE 3.5: SURFACE WATER MONITORING PROGRAMME 2009.

The Environmental Protection Agency's document "Parameters of Water Quality – Interpretation and Standards" details concentrations of total ammonia NH4 in fresh water which contain an unionised ammonia concentration of 0.02 mg/l at their given pH and temperature. Unionised ammonia is the component of total ammonia which at "the value of 0.02 mg/l is a long term toxic effect level for fish both salmonid and cyprinid. Lethal levels are about ten times greater".

Using this data, concentrations of ammoniacal nitrogen determined during sampling in 2009 indicated that the concentrations of unionized ammonia at all locations sampled during 2009 would have been below 0.02mg/l throughout the year with the exception of SW17 during Q3 2009 .

Q1 January - March 2009 – Sampling dated 18th February 2009

Surface water results indicated generally good water quality during Q1 2009 with the exception of slightly elevated total suspended solids at SW9 and SW17.

Q2 April - June 2009- Sampling dated 28th May 2009

Surface water results indicated generally good water quality during Q2 2009 with the exception of slightly elevated total suspended solids at SW9. There was no access to sampling location SW18 due to M50 widening works. All monitoring locations

recorded all parameters below the recommended Salmonid limits. Slightly elevated levels of ammoniacal nitrogen, though below the salmonid limit, were recorded at SW17.

Q3 July – September 2009- Sampling dated 27th August 2009

Surface water results of samples collected on 27th August 2009 indicated generally good water quality with the exception of SW17. Elevated levels of ammoniacal nitrogen, total oxidised nitrogen, potassium, sulphate and a low level of dissolved oxygen were recorded at SW17. There was again no access to sampling location SW18 due to M50 widening works.

Q4 October - December 2009- Sampling dated 8th December 2009

Surface water results indicated generally good water quality at most locations during Q4 2009 with the exception of slightly elevated total suspended solids at SW17 (41 mg/l) and SW18 (144 mg/l). Slightly elevated temperature SW9 (11 degrees celsius) and ammoniacal nitrogen (0.63 mg/l) was recorded at SW9.

Monthly Wheelwash Sampling

Monthly sampling ceased in November 2007 as it was agreed with *the Agency* that future sampling of WWSW1 and WWSW2 will occur on a needs be basis.

Conclusion & Annual Assessment

The 2009 annual assessment suggests that there was a continuation in the overall trend of improvement in surface water quality at Dunsink Landfill during 2009 though results during Q3 2009 at surface water monitoring locations east of the site indicated a local deterioration in this area. An additional assessment of surface water and biological water quality completed on foot of this issue indicated that waste from horses and a tributary of the Scribblestown emanating from the adjoining residential area may have caused this issue.

In general the surface water sampling indicated good water quality over the 4 quarters of the year. New leachate pumping infrastructure (pumps, sump and leachate valve configuration) was commissioned in June 2005. Leachate interceptor drains are established to the West and South of the Lagoon, to intercept leachate seepages from the landfill. It is believed that these initiatives have been responsible for the general improvement in water quality at the facility.

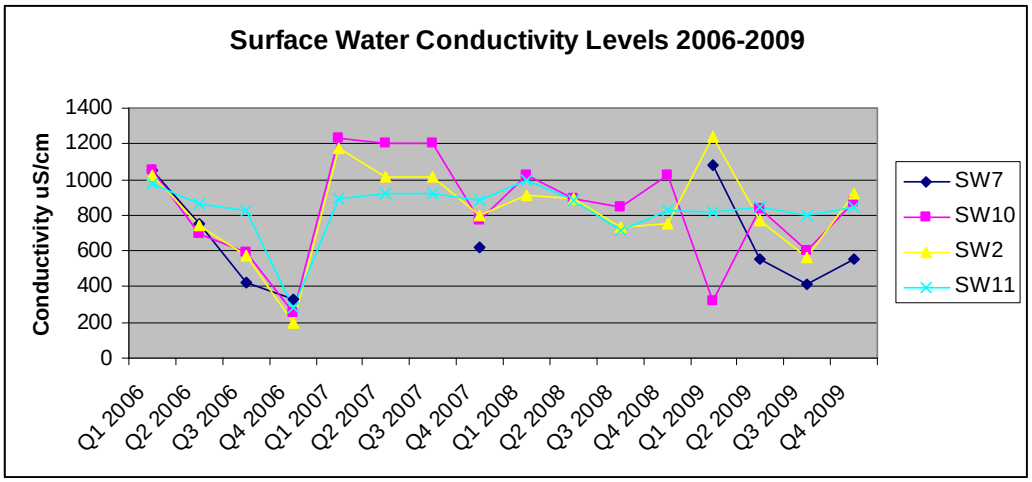

Figure 3.1: CONDUCTIVITY DATA TRENDS THROUGH 2006 to 2009 AT SURFACE WATER MONITORING LOCATIONS SW 7, 10, 2 & 11.

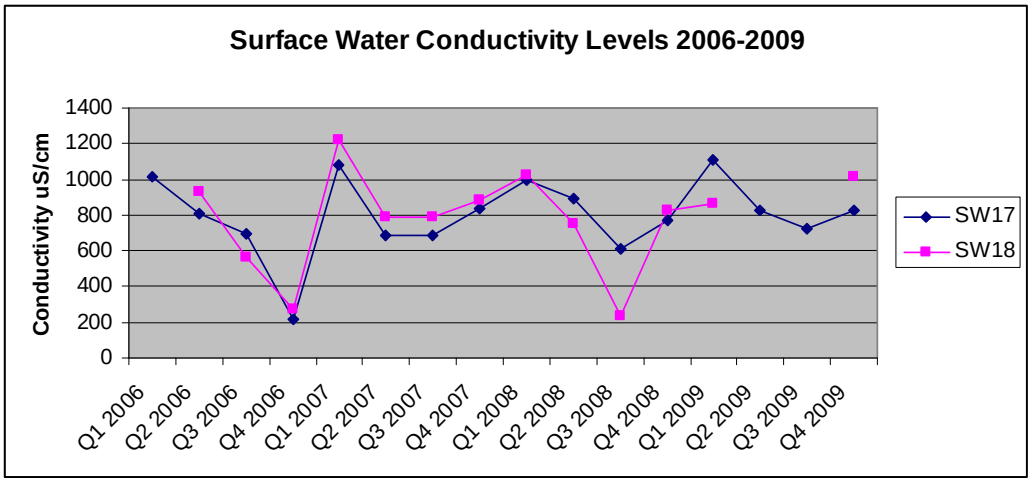

Figure 3.2: CONDUCTIVITY DATA TRENDS THROUGH 2006 to 2009 AT SURFACE WATER MONITORING LOCATIONS SW18 & 17.

3.3. LEACHATE

Schedule D of the waste licence requires the monitoring of leachate at the station "north-east lagoon", Table 3.6. A monitoring station which facilitates the obtaining of representative grab and / or continuous samples in accordance with condition 8.4 is provided at the sump.

Leachate Monitoring Location	Eastings	Northings
Northeast Lagoon	311323	239031
Sump	311417	238895

TABLE 3.6: LEACHATE MONITORING LOCATION 2009.

Table D.5.1 of Schedule D of the waste licence sets down the parameters and frequency for leachate monitoring. Table 3.7 below outlines the sampling programme for leachate undertaken in 2008.

Leachate Monitoring Location	Q1	Q2	Q3	Q4	Annual
North East Lagoon	Sampled	Sampled	Sampled	Sampled	Sampled
Sump	Sampled	Sampled	Sampled	Sampled	Sampled

TABLE 3.7: LEACHATE MONITORING PROGRAMME 2008.

Leachate - Methodology
Refer to Schedule D.5 of waste licence 127-1

Leachate Monitoring - Findings (See Appendix II)

Q1 January - March 2009 – Sampling dated 18th February 2009
Results from leachate sampling at lagoon on 18th February 2009 recorded pH of 8.52, conductivity of 1325µS and Dissolved Methane levels of 0.002mg/l.

Results from leachate sampling at leachate sump on 18th February 2009 recorded pH of 7.46, conductivity of 3210µS and Dissolved Methane levels of 0.467 mg/l.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane (sampled in December) in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are not exceeded for leachate in the lagoon, however, the results indicate that emission limit values for dissolved methane are exceeded at the leachate sump. This incident was notified to the Environmental Protection Agency (Reference W0127-01 Version 10-2009).

Q2 April - June 2009- Sampling dated 28th May 2009
Results from leachate sampling at lagoon during May recorded pH of 8.51, conductivity of 1134 µS/cm and Dissolved Methane levels of 0.043 mg/l.

Results from leachate sampling at leachate sump on 28th May 2009 recorded pH of 8.03, conductivity of 3020 µS/cm and Dissolved Methane levels of 0.009 mg/l.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane (Sampled in August) in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are compliant for leachate in the sump and lagoon.

Q3 July – September 2009- Sampling dated 27th August 2009

Results from leachate sampling at lagoon on 27th August 2009 recorded pH of 9.09, conductivity of 1,129 µS/cm and dissolved methane levels of 0.019 mg/l. Results for other parameters tested as part of the annual suite of parameters for leachate indicated elevated levels of ammoniacal nitrogen (0.21 mg/l), chloride (236.1 mg/l), potassium (78.09 mg/l) and orthophosphate (0.62 mg/l) amongst others.

Results from leachate sampling at leachate sump on 27th August 2009 recorded pH of 7.29, conductivity of 3,450 µS/cm and Dissolved Methane levels of 0.019 mg/l. Elevated levels of ammoniacal nitrogen (130.79 mg/l), chloride (394.9 mg/l), potassium (102 mg/l), sodium (216.9 mg/l), manganese (1.471 mg/l), nickel (0.028 mg/l) and orthophosphate (0.14 mg/l) were recorded. These results are typical of leachate from a municipal landfill.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are not exceeded for leachate in the lagoon, or for leachate in the sump.

Q4 October - December 2009- Sampling dated 8th December 2009

Results from leachate sampling at lagoon on 8th December 2009 recorded pH of 8.51, conductivity of 1134 µS/cm and Dissolved Methane levels of <0.001 mg/l.

Results from leachate sampling at leachate sump on 8th December 2009 recorded pH of 8.03, conductivity of 3020 µS/cm and Dissolved Methane levels of <0.001 mg/l.

Table C.6. of the waste licence dictates that Emission Limits for Dissolved Methane (sampled in August) in Leachate Being Discharged to Sewer as 0.14mg/l. The results indicate that emission limit values for dissolved methane are not exceeded for leachate in the lagoon, or for leachate in the sump.

Leachate – Discussion.

The results from quarterly visual inspections and annual monitoring of metals for the leachate lagoon and sump are typical of leachate quality. The lagoon is naturally lower for many parameters due to the diluting effect of rainwater and passive aeration associated with the fall of leachate into the lagoon.

The issue of dissolved methane in the leachate remains of concern. Dublin City Council continue to be informed of this issue and have in consultation with Fingal County Council made recommendations which have been forwarded to *The Agency* (Ref: FCC-W0127-01-2006-029). Under this proposal, weekly monitoring of methane, carbon dioxide and oxygen is being carried out at the headspace of the sump and the point of discharge to public sewer in Finglas. The results are being sent to the Agency through weekly notifications and are also being compiled for Dublin City Council.

3.3.1. Continuous monitoring of Dissolved Methane in Leachate

Continuous monitoring of dissolved methane at the sump commenced during Q1 2006. Table C.6.of the waste licence dictates that Emission Limits for Dissolved Methane in Leachate Being Discharged to Sewer as 0.14mg/l.

A dissolved methane probe was installed in the leachate sump during the last quarter of 2005. It was not connected to a datalogger until the second quarter of 2006 and

when results emerged the probe was deemed to be faulty. A warranty replacement was installed during the last quarter of 2006.

Continuous monitoring of dissolved methane has been in operation from 3rd October 2006 to present.

3.3.2 Results from Continuous monitoring of Dissolved Methane in Leachate

Reporting of continuous monitoring of dissolved methane throughout 2009 was as per protocols specified in condition 6.3.3.1.

Q1 January- March 2009

(a) No 24 hour mean value shall exceed the ELV;

79 of 79 or 100% of 24hr means exceeded the 0.14mg/l ELV.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

3835 of 3842 or 99.82% of all 30 minute mean values taken continuously over the quarter for methane exceeded 1.2 times the 0.14mg/l ELV or 0.168 mg/l.

(c) No 30-minute mean value shall exceed twice the emission limit value.

The Dissolved Methane Probe is configured to measure to 0.254 mg/l only and this limit is used as a surrogate figure for 0.28mg/l or twice the emission limit value.

3791 of 3842 or 98.67% of 30 minute mean values taken continuously over this quarter exceeded twice the 0.14mg/l ELV.

Q2 April - June 2009

(a) No 24 hour mean value shall exceed the ELV;

No data was available during this quarter due to a technical failure of the Methane Probe.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

No data was available during this quarter due to a technical failure of the Methane Probe.

(c) No 30-minute mean value shall exceed twice the emission limit value.

The dissolved Methane Probe is configured to measure to 0.254 mg/l only and this limit is used as a surrogate figure for 0.28mg/l or twice the emission limit value.

No data was available during this quarter due to a technical failure of the Methane Probe.

Q3 July- September 2009
This quarter reporting is as per protocols specified in condition 6.3.3.1.

(a) No 24 hour mean value shall exceed the ELV;

56 of 56 or 100% of 24hr means exceeded the 0.14mg/l ELV.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

2642 of 2642 or 100% of all 30 minute mean values taken continuously over the quarter for Methane exceeded 1.2 times the 0.14mg/l ELV.

(c) No 30-minute mean value shall exceed twice the emission limit value.

The dissolved Methane Probe is configured to measure to 0.254 mg/l only and this limit is used as a surrogate figure for 0.28mg/l or twice the emission limit value.

2642 of 2642 or 100% of 30 minute mean values taken continuously over this quarter exceeded twice the 0.14mg/l ELV.

Q4 October- December 2009
This quarter reporting is as per protocols specified in condition 6.3.3.1.
(a) No 24 hour mean value shall exceed the ELV;

100% of 24hr mean values exceeded the 0.14mg/l ELV.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

100% of all 30 minute mean values taken continuously over an annual period exceeded 1.2 times the emission limit value.

(c) No 30-minute mean value exceeded twice the emission limit value.

The dissolved Methane Probe is configured to measure to .254 mg/l only and this limit is used as a surrogate figure for 0.28mg/l or twice the emission limit value.

100% of the 30-minute mean values taken continuously over this quarter exceeded twice the 0.14mg/l ELV.

3.3.3. Discussion of Results from Continuous Sampling of Dissolved Methane
The results indicate that the ELV is exceeded almost continuously at high levels. No data was available during Quarter 3 2009. As mentioned in section 3.3 Dublin City Council have been informed of this issue and have in consultation with Fingal County Council made recommendations which have been forwarded to *The Agency* (Ref: FCC-W0127-01-2006-029). Under this proposal, weekly monitoring of Methane, Carbon dioxide and Oxygen is being carried out at the headspace of the sump and the

point of discharge to public sewer in Finglas (See Figure 3). The results are being sent to *The Agency* through weekly notifications and are also being compiled for Dublin City Council.

3.4 NOISE.

No noise survey was undertaken at Dunsink Landfill in 2009. This was addressed in Licence Audit Report for 2008 from the Agency W1027-01/08/AR08EM , observation No.5, on Environmental Monitoring.

3.5. DUST

No dust monitoring surveys were carried out at Dunsink Landfill in 2008**.** This was addressed in Licence Audit Report for 2008 from the Agency W1027-01/08/AR08EM , observation No.5, on Environmental Monitoring.

3.6. PM_{10} MONITORING

The Agency in correspondence referenced 127-1/GEN01EM stated that "The Agency, in accordance with Condition 8.2, does not require monitoring of PM_{10} as listed in Table D.3.1 of the waste licence unless otherwise instructed by the Agency."

3.7. BIOLOGICAL ASSESSMENT OF THE SCRIBBLESTOWN STREAM

A biological assessment of the Scribblestown Stream was undertaken at KS1, KS2 & KS3 (Figure 3 / Tables 3.4 & 3.5) on the 27th August 2009.

Biological Assessment of Scribblestown Stream – Methodology.

Freshwater ecological assessments were conducted at three sites on the Scribblestown stream in the vicinity of Dunsink landfill site, Dunsink, Co Dublin.

These assessments comprised the following investigations:

- Survey of macroinvertebrate fauna using kick sampling, sweep net, stone and vegetation washing methods at two sites on the Scribblestown stream in the vicinity of Dunsink landfill to produce Q-index values in addition to species diversity indices for each site .
- Aquatic macrophytes survey recording vegetation and describing habitats at each site.
- Recording of standard physico chemical parameters at each site. These include pH, oxygen (% saturation and mg/l) and conductivity (µS/cm).

Macroinvertebrates

One macroinvertebrate sample was taken at each location, KS1, KS2 and KS3. Samples were collected by kick sampling at riffle sites or sweep sampling at slow flowing vegetated areas as appropriate. Kick sampling involves disturbing sediment/ vegetation etc for 2 minutes upstream of a standard sweep net (1mm mesh, 250mm width). Sweep sampling involved sweeping through vegetation/ substrate.

Macroinvertebrates were collected and stored in 70% industrial methylated spirits and returned to the laboratory for identification and counting.

Discussion

The overall macroinvertebrate community shows Scribblestown stream to be exposed to pollution. No rare macroinvertebrates species or species of conservation concern were recorded.

According to the Council Directive (2006/44/EC) on the quality of freshwater needing protection or improvement in order to support fish life, dissolved oxygen levels should be above 7 mg/l at all times and it is imperative that values remain above 9 mg/l at least 50% of the time (EC, 2006). In August 2009, dissolved oxygen levels were similar at all three sites ranging from 8.9mg/l to 10.1mg/l. Conductivity values at KS1 were significantly higher than at the other two sites which is similar to previous rounds. The pH values are of a range between 7.44 to 8.1 which is within the typical pH range of between 6 and 9. Temperature values varied slightly at all three locations (14.2 C to 16.6 C) and is likely to be caused by level of direct sunlight on the water body.

Comparison to Previous Surveys.

In August 2009, the Q-value rating for **KS1** was **Q2-3** (moderate pollution) representing **no significant change** to the score from 2007 and 2008.

- The presence of filamentous algae, high numbers of *Asellus aquatics* and Tubificidae indicated organic pollution.
- The sampling location recorded a higher conductivity level than the other sampling sites, although not above natural levels.
- Shannon – Weiner index 1.72, which is similar to the 2008 sampling round.

The Q-value rating at **KS2** was **Q2-3** (moderate pollution) which indicated a **slight deterioration** in water quality conditions from 2008 (Q3). It was interpreted that the reason for the slight decrease was high numbers of Tubificidae which did not occur in high levels in 2008.

- The physico-chemical parameters were all within their relevant standard and at similar levels to previous rounds.
- Shannon – Weiner index 1.87 which is an increase on the 2008 sampling round.

The Q-value rating at **KS3** was **Q2** (serious pollution) which represented a **significant deterioration** in water quality. Between 2005 and 2008 the Q-value rating was Q3. The main reason for the decrease in the score was the high proportion of Tubificidae (48%) and *Asellus aquatics* (20%) which are both very tolerant of organic pollution. In addition the river channel downstream of the sampling location was clogged with vegetation, indicative of excessive nutrients.

- DO was slightly less than in the other sampling locations.
- Shannon – Weiner index 1.62 which was an increase on the 2008 sampling round.

This assessment is based on the key components of the results namely Q values, indicator species and oxygen levels.

In summary, KS1 and KS2 were assigned a Q-value of 2-3 which corresponds with Class C i.e. Moderately Polluted. KS3 was assigned a Q-value of Q2 (Class D) for water quality which corresponds to Class C i.e. Seriously Polluted.

3.7.1 Additional Assessment

On foot of the results of this assessment and the indications of deterioration of water quality at the Scribblestown, a second investigation of biological quality was completed on 3rd December 2009. Five locations were selected on the Scribblestown Stream and associated tributaries to derive Q-value and Small Stream Risk Scores of the sampling points with a view to determining the source of the degradation of water quality recorded in August. These locations are shown on Figure 3.

The investigation concluded as follows;

- Results for KS2 and KS3 for December 2009 improved from the August 2009 sampling rounds. In particular, KS3 was upgraded from Q2 seriously polluted to Q2-3 moderately polluted.
- In August 2009 a high proportion of Group E Tubificidae worms was recorded at KS3. These worms are known as sludge worms and are generally associated with sewage. Horses roam freely on the site and in August 2009 horses were noted grazing adjacent to KS2 - in December a horse was tied up

adjacent to KS3. It is probable that these horses drink from the stream or graze adjacent it and it likely that their waste material enters the water. This waste material could cause a decrease in water quality and result in Tubificidae being present in high concentrations.

- A tributary of the Scribblestown, "Unnamed Stream 2", was also identified as a further possible source of the decrease in water quality, in addition to the horses. In December 2009, this stream was found to have a Q-value rating of Q2 (serious pollution). The inputs from the Unnamed Stream 2 may have contributed to the decrease in water quality at KS3.

3.8. LANDFILL GAS

3.8.1. Landfill Gas Facility Monitoring.

Since the 4th Quarter (Q4) of 2006 measurements of landfill gas were carried out at twenty four locations at the perimeter of the landfill (See Figure 4 and Table 3.8).

During November 2007 (Q4) in agreement with the *Agency*, weekly gas monitoring decreased to six monitoring locations (G35 to G40) and the leachate sump and sewer, with the monthly monitoring round still consisting of all accessible gas monitoring locations (24 locations).

Gas levels were monitored using an LMSxi landfill gas analyser. The boreholes were monitored for Methane (CH_4), Carbon dioxide (CO_2), Oxygen (O_2), temperature and atmospheric pressure.

Landfill Gas Monitoring – Methodology.

Refer to Schedule D.2. of waste licence 127-1.

Landfill Gas - Proximity of Buildings and Developments to the Site.

There are a number of buildings and developments on site, which are identified in the risk analysis of the site from landfill gas, which have potential to expose receptors to risk from landfill gas (See Figure 4). These include the former Irish Power Systems (IPS) compound (now FCC) at the southern boundary to the site along Dunsink lane. The Equipment yard and shed (which will also house the site offices) is close to the southern boundary of the site, immediately east of the IPS compound.
There are a number of buildings and developments close to the site which have potential to expose receptors to risk from landfill gas. Cappagh Hospital is located to the north of the landfill boundary. Dunsoghly estate lies to the east of Cappagh Hospital and north east of the landfill boundary. A halting site is established along the south-east boundary of the landfill (Figure 4).

South of Dunsink Lane, which marks the southern boundary of the site, there are a number of developments. From west to east these include; Elm Green Golf Course, Dunsink Observatory and a series of unauthorised halting sites (Figure 4).

FIGURE 7: LANDFILL GAS MONITORING BOREHOLES AT DUNSINK.

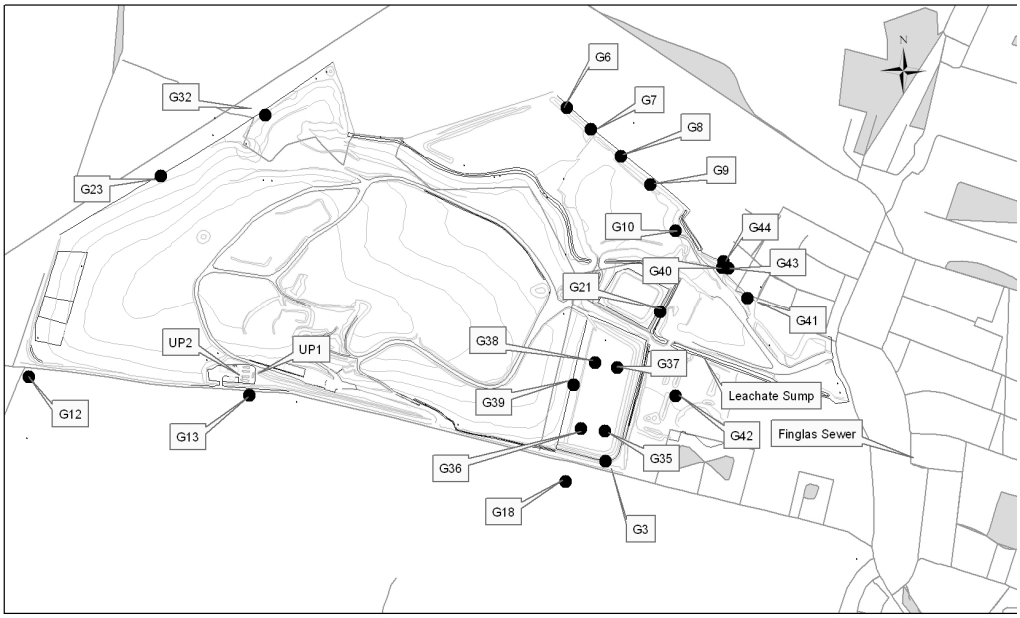

Figure 4: Landfill Gas Borehole Monitoring Locations.

Historical Monitoring (1998-2000).

The landfill gas-monitoring programme during the period 1998-2000 involved thirty-four landfill gas-monitoring boreholes.

Monitoring during this period indicated consistent and elevated levels of Methane at landfill gas monitoring boreholes G30 west of the "sports grounds", G25 and G26 immediately north of the IPS compound. The borehole logs for G25 and G26 indicate that these are within the waste body.

Landfill gas monitoring during this period, indicates a more widespread pattern for carbon dioxide trigger level exceedance. Elevated levels were recorded at G1, G2, G30 ("sports grounds"), G4, G6 & G9 (northern boundary of the site); G11 and G32 (M50); G14 & G15 (Dunsink Observatory); G25, G26 & G27 (IPS compound area) and G33 (within waste body).

Landfill Gas Monitoring Locations.	Monitoring Frequency	Eastings	Northings
G3**	Weekly	311270	238670
G6**	Weekly	311180	239425
G7**	Weekly	311230	239375
G8**	Weekly	311300	239320
G9**	Weekly	311360	239260
G10**	Weekly	311410	239170
G12	Monthly	310040	238850
G13	Monthly	310560	238795
G18	Monthly	311150	238630
G21	Monthly	311380	238990
G23	Monthly	310325	239265
G32	Monthly	310540	239420
G35	Weekly	311265	238740
G36	Weekly	311210	238740
G37	Weekly	311290	238875
G38	Weekly	311245	238880
G39	Weekly	311195	238835
G40	Weekly	311520	239090
G41**	Weekly	311580	239020
G42**	Weekly	311410	238805
G43**	Weekly	311524	239088
G44**	Weekly	311516	239100
IPS inlet	Weekly	310515	238849
Leachate Sump	Weekly	311417	238895
Finglas Manhole*	Weekly	311909	238733

**** (Changed to monthly monitoring during november 2007)**

TABLE 3.8: LANDFILL GAS MONITORING LOCATIONS AND PROGRAMME 2007.

Locations of Trigger Level Exceedences

Landfill gas monitoring during 2008, indicated a widespread pattern of exceedence of trigger levels for carbon dioxide. Consistent and elevated levels were recorded at G35, G36, G37 & G38 in the "sports grounds". Consistent and elevated levels were recorded at G6, G9, G10, G12, G40, G43 & G44 at the boundary with Cappagh Hospital {Appendix III}). Locations of trigger level exceedence for methane from historical and current monitoring include the "sports grounds" area and the IPS compound area. The borehole logs for the area around the IPS compound indicate waste in the region of 2.5m to 3m below the surface.

During 2009 this pattern has continued for the most part. During Quarter 1 2009, elevated levels of methane were recorded at G37 and G39 on several occasions. No significant levels of methane were recorded at any other monitoring borehole location during the 1st Quarter. During the monthly monitoring rounds, locations G9, G10, G43 and G44 continued to record elevated levels of carbon dioxide, with G6, G23 and G42 recording elevated levels of carbon dioxide from time to time.

During Quarter 2 2009, elevated levels of carbon dioxide were regularly recorded at a number of the sportsfield boreholes including G37, G38 and G39. Elevated levels of carbon dioxide were also regularly recorded at G40. During the monthly monitoring rounds, locations G10, G43, G44 and the sewer continued to record elevated levels of

carbon dioxide, with G6 and G35 also recording elevated levels of carbon dioxide from time to time.

During Quarter 3 2009, elevated levels of carbon dioxide were regularly recorded at a number of the sportsfield boreholes including G37, G38 and G39. Elevated levels of carbon dioxide were regularly recorded at G40 and the sewer monitoring location. Elevated levels of carbon dioxide were recorded at G6, G9, G10 and G35 occasionally. Slightly elevated levels of methane were recorded at G37 on 18th September 2009 but no other significant concentration of methane was recorded during the 3rd Quarter of 2009.

During Quarter 4 2009, elevated levels of carbon dioxide were recorded at a number of the sportsfield boreholes including G37, G38 and G39. Elevated levels of carbon dioxide were also regularly recorded at G40 and the sewer monitoring location. Elevated levels of carbon dioxide were recorded at G10 and G35 occasionally. Slightly elevated levels of methane were recorded at G37 on 12th November 2009 (2.0% v/v), on 18th December 2009 (3.7% v/v) and 23rd December 2009 (6.2% v/v). Slightly elevated methane of 1.3% v/v was recorded at the leachate sump on 23rd December 2009. No other significant concentrations of methane were recorded during the 4th Quarter of 2009.

Landfill Gas Monitoring – Discussion.

A review of the landfill gas sampling network and programme was undertaken during Q3 (July-September) 2004 in response to potential landfill gas migration issues. The review included an analysis of potential receptors and results of a spike-monitoring programme. The review culminated in the alteration of the landfill gas monitoring infrastructure and monitoring programme from that stated in Schedule D and G of the waste licence during 2005. This involved the recruitment of old landfill gas monitoring wells and the addition of three new monitoring wells (G40-G42) into the monitoring infrastructure during 2005 and five new monitoring locations during 2006 (IPS compound, G43, G44, Leachate Sump and Finglas Sewer) (See Figure 4).

The locations for elevated levels of landfill gas emissions of methane at this time included the **"**sports grounds" area, and the northern boundary to the site, the boundary towards Dunsoghly estate and the offices of the IPS compound area.

A venting trench was proposed and agreed by the Agency for the remediation of landfill gas migration on the "sports-ground". These works went to public tender and the venting trench was commissioned during Q2 2005. A landfill gas spike monitoring report conducted in September 2004 suggested that the Scribblestown Stream may well be acting as an effective natural barrier/vent to landfill gas migration towards Cappagh Hospital and the Northern Boundary of the site and implies that these areas are not at risk. During 2006 with the extension of the gas extraction network at Dunsink, considerable reductions in levels of methane and carbon dioxide were noted in the sports fields boreholes throughout 2007. However, elevated methane and carbon dioxide levels above the trigger values were recorded once in Quarter 3 of 2008 and then consistently through Quarter 4. Borehole G37 in the "sportsfield" recorded the most elevations while Boreholes G35 and G36 recorded no excceedances in this reporting period. Borehole G38 recorded elevated levels of

Carbon Dioxide on a number of occasions in the second half of 2008. A proposal to carry out a series of excavations in the areas of G37 and G38 to detect any local methane sources and follow-up monitoring was accepted by the Agency (FCC-127-1-2009-004). The offices of the IPS compound area are continuously monitored for elevated levels of methane and carbon dioxide.

Two additional boreholes were placed between G40 and Dunsoghly Estate (G43 and G44). Since installation no methane was recorded at either of these boreholes. Nevertheless, G40 itself continued to register methane above trigger level throughout 2007, although methane levels decreased in 2008 and no methane was recorded at G40 during 2009.

Landfill Gas Monitoring – Conclusion.
Landfill gas monitoring at Dunsink Landfill during 2009 indicated a further improvement on results of previous years however there remains an issue at the identified methane and carbon dioxide hotspot at the "sports field" area. The Dunsoghly area continues to be monitored closely. Slightly elevated methane was also recorded at the leachate sump during the 4th quarter of 2009. DCC continue to be notified of the results and mitigation measures will be proposed in the event that there is any further deterioration in results during 2010.

3.8.2. Landfill Gas Utilisation Plant Monitoring Equipment and Sampling points
Weekly monitoring at the inlet and continuous monitoring at the outlet commenced during Q1 2006. It was agreed by the Agency that reporting of incidents under this system could be done through the quarterly and annual environmental reports.

Inlet to Landfill Gas Utilisation Plant
A gas sampling system to include chilling and filtration for the protection of the portable infrared analyser was installed. This facilitates weekly monitoring of methane, carbon dioxide and oxygen using an LMSXi landfill gas analyser, which is used for borehole monitoring. It also provides a sampling location for annual monitoring of Total Sulphur, Total Chlorine and Total Fluorine. The results from the weekly sampling at the inlet are reported in the weekly landfill gas monitoring round sheets. See Appendix III.

Process Parameters.
On 8th December 2009 combustion temperature at Engine 1 was recorded as 498^{o}C.

Outlet from Landfill Gas Utilisation Plant.
Carbon monoxide and Nitrogen oxides are monitored continuously. Continuous monitors on the outlets of the two gas engines were installed. The analysers are proven to be effective on other landfill gas utilisation plants. An appropriate data management system has been installed. This provides for data logging and data storage.

Additionally, a gas sampling system to allow for annual monitoring of total VOCs as carbon, total non-methane VOCs and Particulates, Hydrochloric acid and Hydrogen fluoride, and, quarterly monitoring of nitrogen oxides has been installed.

Emission limit values for Landfill Gas Plant

The emission point reference numbers are proposed to be
UP1 Utilisation Plant Input 1
UP2 Utilisation Plant Output Engine 1
UP3 Utilisation Plant Output Engine 2

The analysers are able to measure and report at a sufficient resolution to register the emission limit for Carbon monoxide (CO) (1400mg/m^3).

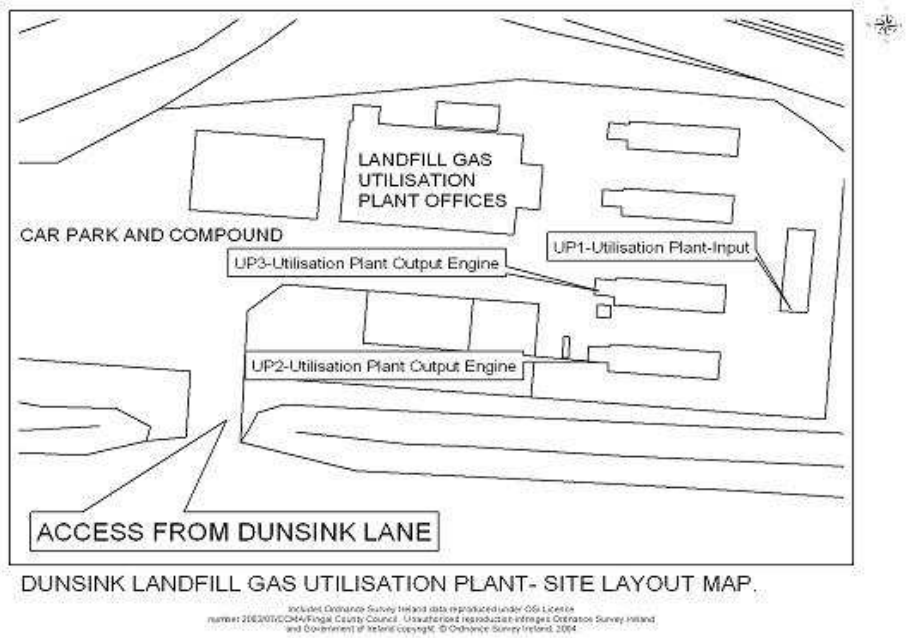

Figure 4.1 Dunsink Landfill Gas Utilisation Plant.

3.8.3 Results from Continuous sampling of parameters at outlets Landfill Gas Combustion Plant.

Continuous monitoring of outlet parameters at the Landfill Gas Combustion Plant was undertaken throughout 2009. The source of these emissions is the engines identified as UP2 (Engine #1) and UP3 (Engine #2). UP3, Engine #2 was removed during April 2006 (see Figure 4.1 above).

Limit values as per Schedule C.5 of the governing waste licence 127-1 are outlined in the table below;

Parameter	Utilisation Plant Emission Limit Value
Nitrogen oxides (No_x)	500mg/m^3
CO	1400mg/m^3

TABLE 3.8.1: EMISSION LIMIT VALUES FOR CONTINUOUSLY MONITORED PARAMETERS AT OUTLETS FROM UTILISATION PLANT.

Note 1: Dry gas referenced to 5% oxygen by volume for utilisation plants.

As per condition 1.6 b) of the waste licence 127-1, and Schedule C.5, specifying the Emission Limits Values (ELV) for Landfill Gas Plant (see Table 4.1 above) the following incidents occurred during quarter 2 at the IPS compound in Dunsink.

Condition 6.3.2. has been complied with in full as of 27-09-2006; "The concentration limits …..shall be based on gas volumes under standard conditions of:-

In the case of landfill gas combustion plant:
Temperature 273K, pressure 101.3kPa, dry gas; 5% oxygen".

The additional modules were placed on the monitoring system this quarter to ensure that this condition is complied with in full on 27-09-2006. The results from this date comply with Condition 6.3.2.

Throughout 2009 reporting of continuous landfill gas monitoring was as per protocols specified in condition 6.3.3.1.

1st Quarter 2009

(a) No 24 hour mean value shall exceed the ELV;

No 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and No 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon dioxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engines number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon dioxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded the 500mg/m3 ELV at engine number 1.

2nd Quarter 2009

(a) No 24 hour mean value shall exceed the ELV;

No 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and 13 no 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

335 no 30 minute mean values or 8% of samples taken continuously over this quarter for Carbon monoxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engines number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon monoxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded the 500mg/m3 ELV at engine number 1.

3rd Quarter 2009

(a) No 24 hour mean value shall exceed the ELV;

No 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and 75 no 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

2861 no 30 minute mean values or 32% of samples taken continuously over this quarter for Carbon monoxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engines number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon monoxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded the 500mg/m3 ELV at engine number 1.

4th Quarter 2009

(a) No 24 hour mean value shall exceed the ELV;

No 24 hour means exceeded 500 mg/m3 for Nitrogen Oxides and 36 no 24 hour mean exceeded 1400 mg/m3 for Carbon monoxide at engine number 1.

(b) 97% of all 30 minute mean values taken continuously over an annual period shall not exceed 1.2 times the emission limit value.

10 no 30 minute mean values or 0.01% of samples taken continuously over this quarter for Carbon monoxide exceeded 1.2 times the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded 1.2 times the 500mg/m3 ELV at engines number 1.

(c) No 30-minute mean value shall exceed twice the emission limit value.

No 30 minute mean values taken continuously over this quarter for Carbon monoxide exceeded twice the 1400mg/m3 ELV at engine number 1. No 30 minute mean values taken continuously over this quarter for Nitrogen Oxides exceeded the 500mg/m3 ELV at engine number 1.

Summary of Continuous Sampling of Landfill Gas

The results from continuous sampling of parameters from outlets at landfill combustion plant throughout 2009 presented a general picture of compliance with emission limit values apart from 30 minute mean values for carbon monoxide during Q3 and Q4. Following servicing of the Exhaust Gas Emissions Analyser on 21/10/2009 no subsequent 24 hour means exceeded the ELV for Carbon monoxide at engine number 1.

3.9. METEOROLOGICAL MONITORING.

Condition 8.6 and Schedule D.6 require daily monitoring of precipitation volume, temperature (min/max), wind force and direction, evapotranspiration, humidity and atmospheric pressure. This data is obtained from Met. Eireann's Dublin Airport weather Station and the data are illustrated by month in the following tables / figures. The data is presented in the form of monthly averages which masks much of its complexity. The data is available in full tabular format at the facility offices.

3.9.1. Total Precipitation Volume by Month.

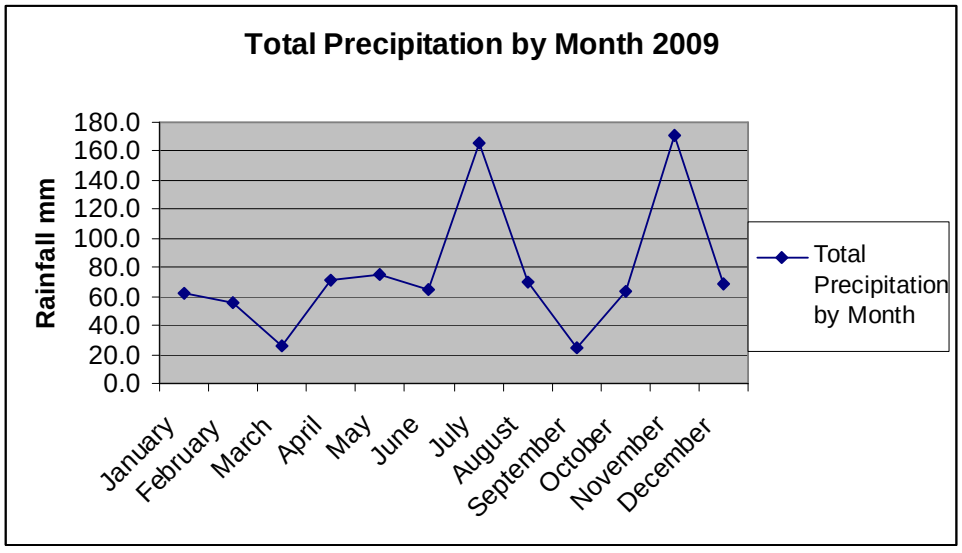

Figure 5: Total Precipitation mm by Month 2009.

3.9.2 Average Daily Temperatures (minimum /maximum) By Month 2009.

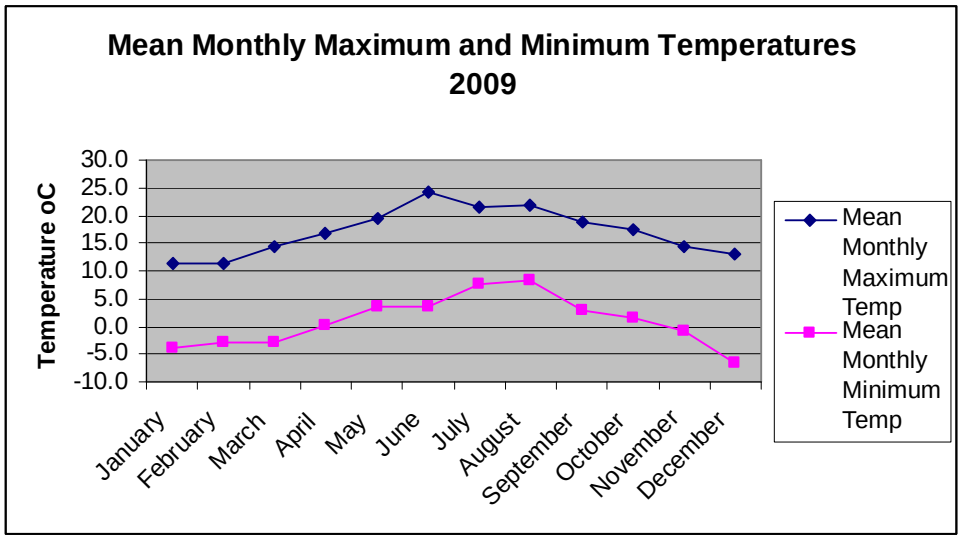

Figure 6: Average Daily Temperatures (minimum /maximum) By Month 2009.

3.9.3 Average Daily Wind speed by Month 2009.

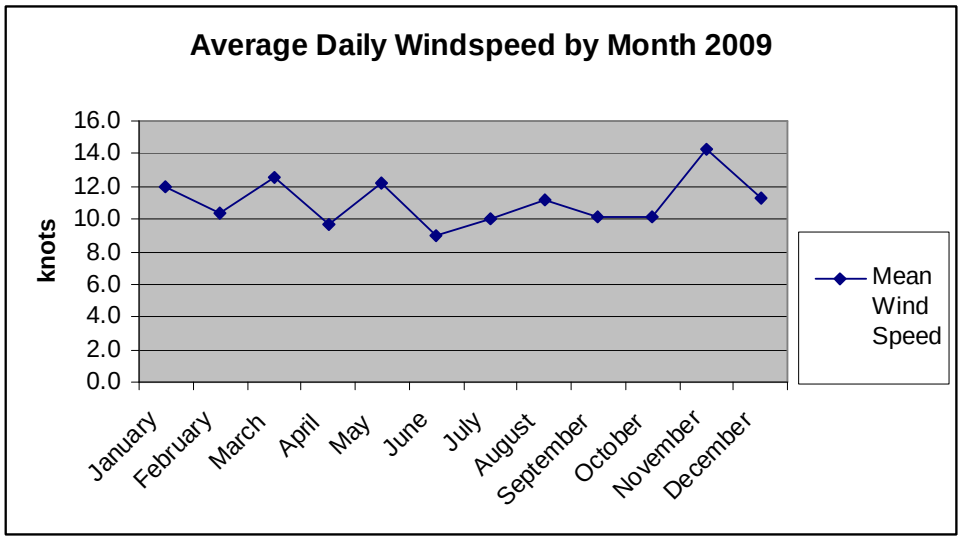

Figure 7: Average Daily Windspeed by Month 2009.

3.9.4. Average Daily Wind Speed and Direction by Month 2009.

Month	Speed (knots)	Direction (degrees)
Jan	12.0	197
Feb	10.4	234
Mar	12.6	233
Apr	9.6	167
May	12.2	192
Jun	9.0	142
Jul	10.0	223
Aug	11.1	230
Sept	10.1	206
Oct	10.2	229
Nov	14.3	225
Dec	11.3	157

TABLE 3.9: AVERAGE DAILY WIND DIRECTION BY MONTH 2009.

In summary the winds during 2009 are predominantly South Westerly in direction.

3.9.5. Average Daily Evaporation and Potential Evapotranspiration by Month 2009.

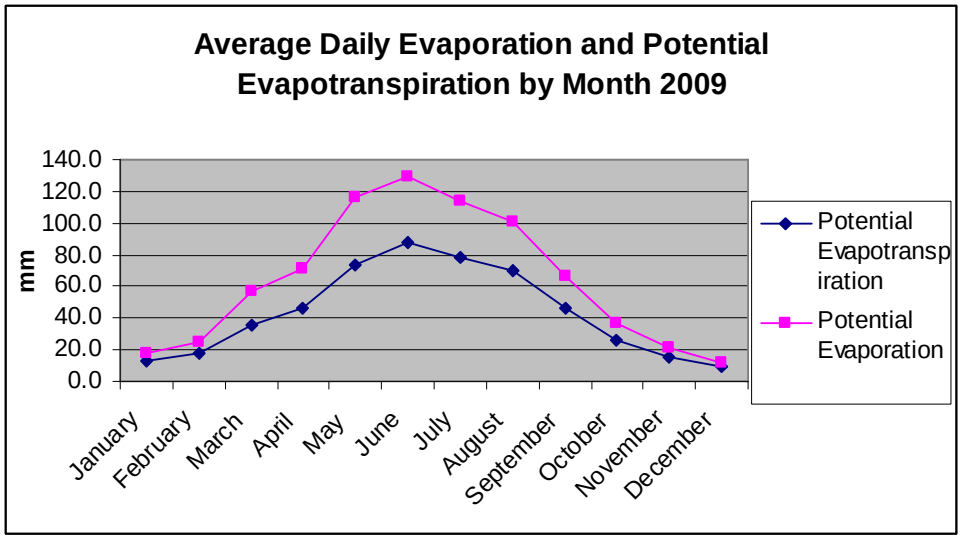

Figure 8: Average Daily Potential Evapotranspiration by Month 2009.

3.9.6. Average Daily Relative Humidity By Month 2009.

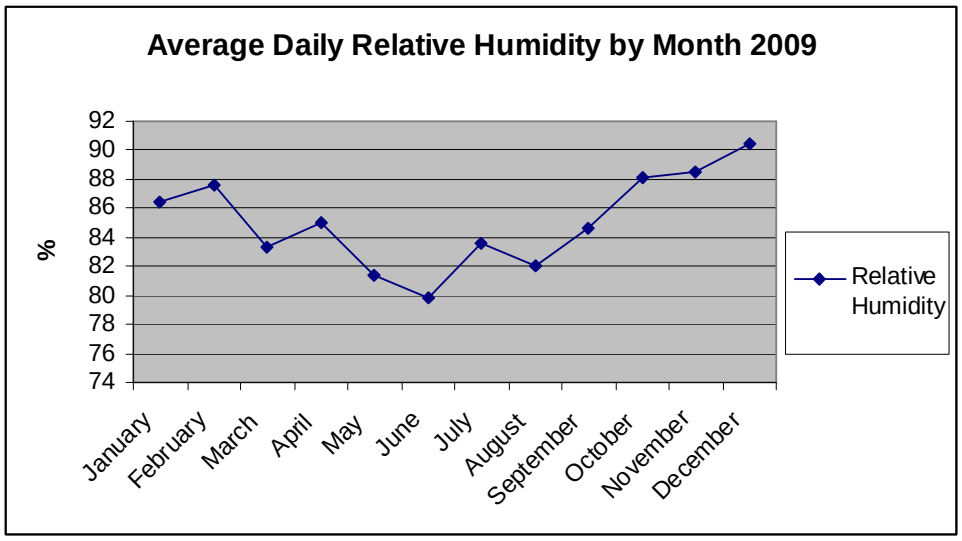

Figure 9: Average Daily Relative Humidity by Month 2009.

3.9.7. Average Daily Atmospheric Pressure By Month 2009.

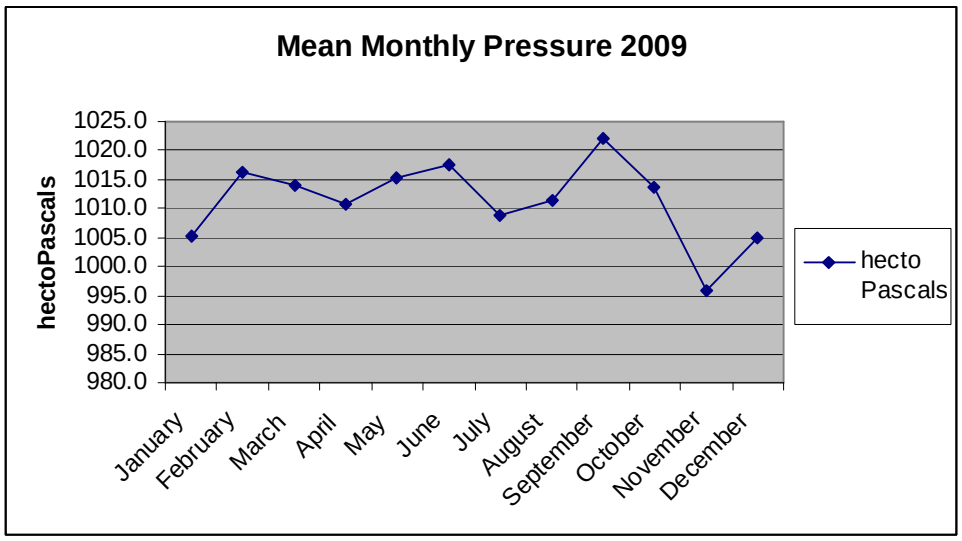

Figure 10: Average Daily Atmospheric Pressure by Month 2009.

4.0. RESOURCE AND ENERGY CONSUMPTION.

Resources consumed at Dunsink Landfill include diesel fuel, electricity and hydraulic oil. There were three main consumer entities operating on site:
(I) Fingal County Council (FCC)
(II) Contractors
(III) Irish Power Systems

(I) Fingal County Council.
The compound offices were connected to the national electricity grid in March 2005, FCC at Dunsink consumes electricity at the compound and at the pump house. FCC did not consume hydraulic oil. The main component of FCC's resource and energy consumption was electricity. (Table 4.1).

(II) Contractors.
Contractors on site consumed diesel fuel in the operation of their plant, which comprises; mainly one JCB (Table 4.1)

(III) Bioverda Power Systems.
BPS on site consumed less diesel, electricity, lube oil and landfill gas than in previous years (Table 4.1). This reflects the downturn in landfill gas utilisation and their moving headquarters from Dunsink Landfill to Rathcoole.

Resource	**FCC**	**Contractors**	**IPS**	**Total 2009**
Electricity MWh	69*	Nil	333	399
Diesel Vehicles	3,000*	8,100*	Nil	11,100*
Diesel Pump	Nil	Nil	Nil	Nil
Hydraulic Oil	Nil	60*	Nil	60*
Lubricating Oil	Nil	200*	5675	5,875* L

***Estimates**

TABLE 4.1: SUMMARY OF RESOURCES USED ON SITE FOR THE REPORTING PERIOD.

5.0. VOLUME OF LEACHATE PRODUCED AND DISCHARGED OFF-SITE.

A flow metre measuring volumes of leachate produced from the facility or volumes of leachate discharged off-site was installed with the new pump house in June 2005. However, during 2004 efforts were made to get estimates for leachate production in Dunsink to determine the appropriate capacity of current and proposed leachate infrastructure. It was considered important in view of the daily discharge limit of 1,400m^3 imposed by the Sanitary Authority (Dublin City Council) to determine responses should this limit be breached.

5.1. METHODS FOR ESTIMATING LEACHATE PRODUCTION.

An annual water balance calculation was performed to estimate leachate production in Dunsink. This figure is compared with figures measured as discharged offsite since June 2005 (See Table 5.1).

5.1.1. Water Balance Calculations.

In calculating the water balance for Dunsink the formula used was taken from Environmental Protection Agency (EPA) guidelines (EPA 2000)[1]. Rainfall data from Dublin airport Meteorological station are used in this calculation. Data from 2009 are used in the average and scenario calculations.

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

Whereby;

ER	= effective rainfall (m).
A	= Area of cell (m^2).
LW	= Liquid waste (also includes excess water from sludges) M^3.
IRCA	= Infiltration through restored and capped areas (m^3).
l	= Surface area of lagoons (m^2).
a	=absorptive capacity of waste M^3/t.
W	= weight of waste deposited.

ER = Total Rainfall (R) minus Actual Evapotranspiration (AE).
For Dunsink landfill, following the guidance given in the EPA guidelines the ER is taken as R.
Total rainfall for Dunsink in 2009 was 9175 mm or **0.9175m**.

A= The landfill area is 154 acres or 62.3 hectares or **623000m^2**. No area is active, there has been no dumping of municipal waste for over seven years.

ER(A)=0

LW = Liquid waste is not deposited in Dunsink. **0m^3.**

IRCA = In areas that have been temporarily capped / restored an infiltration rate of 25-30% of the annual rainfall should be used. In areas which have been restored an infiltration rate of 2-10% should be applied. Given that the landfill is now restored

[1] Environmental Protection Agency (2000). Landfill Manuals; Landfill Site Design. EPA, Ireland. ISBN 1 84095 026 9.

10% will be used as the infiltration rate through restored and capped areas. 10% of ER = 0.09175. 623,000m^2 X 0.09175m.

IRCA= 57,160.25m^3
l = In Dunsink the area of the lagoon is 6000m^2, ER=0.9175.
ER(l) =5505m^3

aW = The total volume of waste has been calculated roughly, as 3.3 million m^3on the basis of volume of three phases of landfill. It has also been roughly estimated that approximately 5,000,000 tonnes of waste have been deposited in Dunsink based on figures available from 1994 for annual inputs to the site. On this basis the roughly estimated waste density is 1.5 t/m3, this is very high and maybe due to compaction by its overburden of subsoil or fill. The absorptive capacity of waste falls to negligible or none per tonne of waste before leachate is generated at densities greater than 1.2 t/m^3, **aW=0 m^3/tonne**

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

Lo = [0 + 0 + 57160 + 5505] – [0]

Lo = 62,665m^3 pa
Lo = 171m^3 /d
Lo = 7.15m^3 /hr

5.1.2. Scenario Building.

This rough estimate should be viewed in the context of varying annual rainfall over a year period. Water balance calculations should be carried out for a number of scenarios such as average monthly leachate volumes to be generated (See Table Below).

2009	Rain	Rainfall % Total	Estimated Monthly Leachate Production M^3
	mm		
January	62.1	6.8	4261
February	56.0	6.1	3822
March	26.3	2.9	1817
April	71.1	7.7	4825
May	75.5	8.3	5201
June	64.3	7.0	4386
July	165.4	18.0	11280
August	69.5	7.6	4762
September	24.1	2.6	1629
October	63.1	6.9	4324
November	171.3	18.6	11655
December	68.8	7.5	4699
Total 2009	917.5	100.0	62665

TABLE 5.1:ESTIMATES OF LEACHATE PRODUCTION: AVERAGE MONTHLY RAINFALL RECORDED AT DUBLIN AIRPORT 2009 (SOURCE: MET EIREANN).

The EPA guidelines (EPA,2000) suggest a peak flow factor of 3 to 5 times the predicted average flow rate should be used when sizing plant / pipe work. Therefore

using 2009 rain data and allowing for the now completed restoration of Dunsink, an adequate pump station should be able to handle about ($7.3m^3 * 3$) to ($7.3m^3 * 5$) or 21.9 m^3/hr to 36.5 m^3/hr during wet weather flow. During 2009, the volume of leachate discharged to public sewer was 200,329M^3 which equates to 22.86 m^3/hr.

5.1.3. Results.

Water balance calculations from EPA guidelines for Dunsink during peak wet conditions suggest that leachate production / discharge could be in the range of 525-876m^3 /day.

5.1.4. Discussion.

The results presented above are estimates only. The results from this exercise (EPA model), indicate that Dublin City Council's discharge limit of 1400 m^3 / day would not be breached and the leachate lagoon would not ordinarily be needed to deal with any excess leachate generated. The lagoon has a capacity of 26700m^3 . The pump house design facilitates pumping a maximum of 20 litres/s or 72m^3 / hr or 1728m^3 / day and the modelled leachate production is well below this.

The new pumping arrangements installed during June 2005 provides data for the volume of leachate generated at the facility (Table 5.2).

2009	Rain mm	%	Estimated Monthly Leachate Production M^3	Volume Discharged as Measured By Flow Metre
January	62.1	6.8	4261	19459
February	56.0	6.1	3822	24251
March	26.3	2.9	1817	14398
April	71.1	7.7	4825	10915
May	75.5	8.3	5201	12891
June	64.3	7.0	4386	12890
July	165.4	18.0	11280	15630
August	69.5	7.6	4762	12679
September	24.1	2.6	1629	10402
October	63.1	6.9	4324	10462
November	171.3	18.6	11655	31946
December	68.8	7.5	4699	24406
Total	917.5	100.0	62665	200,329

TABLE 5.2: ESTIMATES OF LEACHATE PRODUCTION AND VOLUMES MEASURED AS DISCHARGED FROM SITE.

The estimated monthly leachate production is significantly and substantially less that the actual volumes measure as discharged from site. There maybe a groundwater influence in leachate generation at the site which accounts for this anomaly. The EPA water balance calculation is based on rainfall contribution to leachate generation.

Since 2006 a significant rise in leachate pumped off-site has occurred and it is considered that this is partially explained by the emplacement of two major leachate interception drains at the north and south of the facility. These leachate interception drains are obviously harnessing significant amounts of leachate and contributing to the leachate load at Dunsink.

5.1.5. Conclusion.

Given all the results presented above (the varied estimates for leachate production and the actual volumes discharged offsite), it is suggested that the pump house design, in conjunction with the option to use the lagoon periodically provides sufficient capacity for dealing with the estimated leachate generated in the landfill. The completion of the restoration of the site during 2008 and 2009 has led to a reduced estimate of the amount of leachate generated by the facility through the water balance calculations. However the progress in landfill restoration has ultimately resulted in greater leachate collection and consequent increased volumes of leachate being discharged offsite. Nevertheless, the data provided by the leachate flow metre continues to vindicate the capacity designed into the leachate infrastructure.

5.2 ANNUAL WATER BALANCE CALCULATIONS AND INTERPRETATIONS.

5.2.1 INTRODUCTION.

The actual water balance calculations are outlined in detail in Section 5.1.

5.2.2. DISCUSSION AND INTERPRETATION.

It must be stated that the results are estimates only and based on many assumptions, which may or may not be correct. Furthermore; data from key variables such as depth of waste, proximity of groundwater table and effect of springs within waste body; are unavailable.

(i) Previous estimates of the wet weather flow and dry weather flows for leachate were prepared by FCC in 2003 on the basis of direct measurements. These estimates calculated Wet Weather Flow leachate volumes in the range of 1242-1656m3/day and 414m3/day during dry weather flow.

(ii) Water balance calculations are presented in Section 6.3 from EPA guidelines for Dunsink during peak wet conditions. They suggest that peak leachate production / discharge could be 876m^3 /day during wet weather and 525m^3/day during Dry Weather Flow.

(iii) During 2009, the volume of leachate discharged to public sewer was 200,329M^3 which equates to 22.86 m^3/hr. (See Table 6.1). This suggests that average leachate production/discharge over the year is 548m^3/day.

These figures must be seen in the context of the bedrock geology and aquifer status of the site. The regional view of the vicinity of the Dunsink Landfill is of a low yielding aquifer.

5.2.3. CONCLUSION.

The results from water balance calculations and from the pump house flow-metre are very different in terms of leachate modelled as generated on site and leachate volumes pumped off-site. However both sets of results validate the choice of leachate pump house design, which was based on empirical measurements of leachate flowing through the existing infrastructure (Section 6.2). The pump house design facilitates pumping a maximum of 20 litres/s or 72m^3 / hr or 1728m^3 / day. Dublin City Council allows a maximum discharge of 1400 m^3 / day. The worst case scenario for

Dunsink from wet weather flows derived from previous estimates at 1656m^3/day exceeeds this limit. In instances when the pump-house cannot pump away volumes as they are generated from the facility the system is self regulating. During Wet Weather Flow peak flows in excess of the lmit are rare and short in duration. When they do occur the automatic valve opens and closes to regulate the level of leachate in the sump and facilitate controlled discharge of leachate to public sewer or the lagoon. The lagoon has additional capacity of 26700m^3 and if empty would have capacity for 16+ days pumping to lagoon during wet weather flow. This contingency provides for scenarios whereby pumping to the public sewer would not be feasible for any reason.

The results suggest that the pump house design, in conjunction with the option to use the lagoon periodically may provide sufficient capacity for dealing with the estimated leachate generated in the landfill.

5.3. ESTIMATED ANNUAL AND CUMULATIVE QUANTITY OF INDIRECT EMISSIONS TO GROUNDWATER.

5.3.1. EMISSIONS TO GROUNDWATER-INTRODUCTION.

At present there are no estimates for annual and cumulative quantities of indirect emissions of leachate to groundwater.

Inferences are made from estimates in Sections 5.1.1 (estimates of leachate going through leachate management infrastructure during Wet Weather Flow) and 5.1.2 (estimates of leachate generated at the facility based on water balance calculations). At the outset, it must be stated that this is an exercise fraught with difficulties in that these estimates are based upon many assumptions, which may or may not be correct. Furthermore; data from key variables such depth of waste, proximity of groundwater table and effect of springs within facility; are unavailable.

Nevertheless the volumes of leachate discharged from the facility consistently and substantially exceed those estimated from water balance calculations.

DRY WEATHER FLOW.

The leachate infrastructure and discharge consents from Dublin City Council are more than adequate to deal with the volumes of leachate generated in Dunsink during dry weather flow. This suggests that there may be no indirect emissions to groundwater during Dry Weather Flow conditions.

WET WEATHER FLOW.

The leachate infrastructure system seems to be “flashy” i.e. the amount of leachate going through the system rapidly increases following rainfall events. For all but the highest peaks in wet weather flow the leachate infrastructure and discharge consents from Dublin City Council are more than adequate to deal with the volumes of leachate generated in Dunsink and there is little risk of contamination of groundwater.

In instances when the pump-house cannot pump away volumes as they are generated from the facility the system is self regulating. During Peak discharges during Wet Weather Flow are rare and short in duration, the automatic valve opens and closes to regulate the level of leachate in the sump and facilitate controlled discharge of leachate to public sewer or the lagoon.

5.3.2 BEDROCK GEOLOGY OF THE SITE AND AQUIFER STATUS.

The western half of the landfill is underlain by Waulsortian Limestones. The GSI classify the County Meath Waulsortian Limestones as L1, bedrock which is moderately productive only in local zones and this can be assumed to be the case for Dunsink.

The central part of the landfill is underlain by the Tober Collen formation. The thinly bedded mudstones of the Tober Colleen formation which underlie the Calp Limestone have been classified by the GSI as Pu, bedrock which is generally unproductive due to the low permeability of the bedrock.

The eastern part of the site is underlain by basinal limestones consisting of limestone turbidites with bioclastic and calcareous mudstones. The GSI classify the County Meath Waulsortian Limestones as L1, bedrock which is moderately productive only in local zones and this can be assumed to be the case for Dunsink.

There is a minor faulting in the vicinity of the site and there is a minor fault running in a north-west south-east direction through the site.

A number of boreholes have been drilled into the bedrock on the site and a visual inspection of the drill chips from the monitoring boreholes indicated the site to be generally underlain by the soft black basinal (Calp) limestones and mudstones. These were recorded at all boreholes that were drilled to bedrock. The hardness and shade of the rock varied between boreholes between different depths within the same borehole. The Calp Limestone of County Dublin has been classified in the GSI Groundwater Protection Scheme as a L1 aquifer, bedrock which is generally moderately productive.

The monitoring well drilling programme confirmed the regional view of the vicinity of the Dunsink Landfill as generally low yielding aquifer.

5.3.3 CONCLUSION.

On the basis that
(1) The underlying geology and overburden have produced a localised classification of the aquifer as generally low yielding.
(2) Measured volumes of leachate discharged from the facility are consistently and substantially higher than those calculated through water balance calculations.
(3) The groundwater monitoring programme indicates that groundwater around the facility is generally good.;

It is considered that indirect discharges to groundwater are not significant in volumes or effect.

6.0. WORKS PROPOSED AND UNDERTAKEN AND TIMESCALE FOR THOSE PROPOSED DURING THE COMING YEAR.

6.1 WORKS UNDERTAKEN DURING 2009.

The phased handover of the landfill and surrounding areas to the Parks Department is complete as of December 2009. The Environment Department shall continue with all monitoring obligations as set out in the landfill license.

7.0. SITE SURVEY INDICATING EXISTING LEVELS OF THE FACILITY.

Fingal County Council sought approval from the Environmental Protection Agency on the 13/08/2009, (letter Ref FCC-127-1-2009-010) not to undertake a topographic survey in 2009.This was due to the fact that there was no importation of soil into the restored landfill and no subsidence was anticipated. Approval was given by the EPA on the 20/08/2009 by telephone from Mr Eamonn Merriman. Figure 11 below shows the topographic status of the landfill as established by the most recent topographic survey completed in 2007.

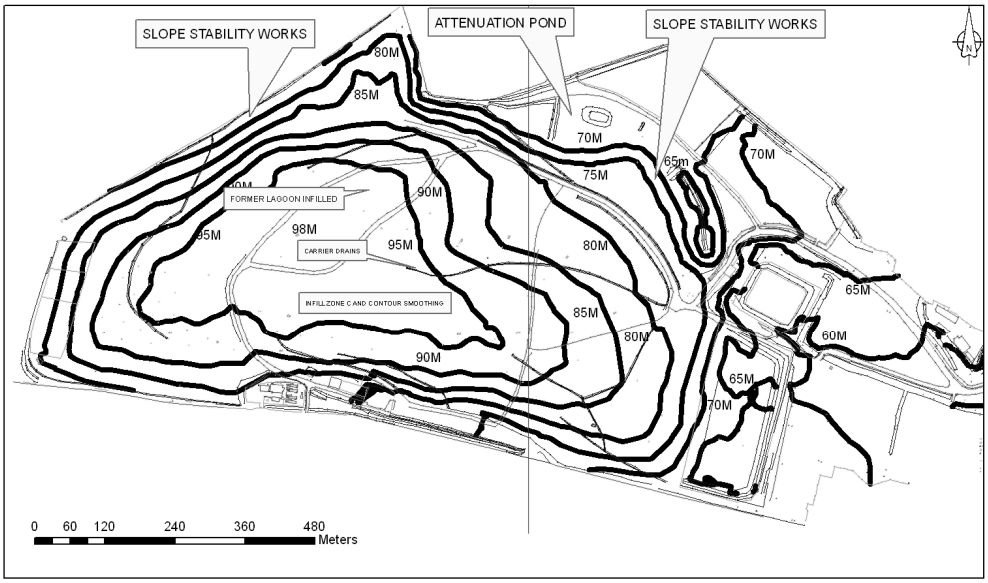

Figure 11: Simplified Topographical Map of Dunsink 2007.

8.0. ESTIMATED ANNUAL AND CUMULATIVE QUANTITY OF LANDFILL GAS EMITTED.

In early 1996 a gas collection network was first configured throughout the whole landfilled portion of Dunsink. In 1999 the collection network was replaced by a larger more extensive arrangement as per the attached drawing.

It is comprised of a high-density polyethylene (HDPE) ring main around the site with a number of branch lines, which contains manifolds that connect to individual gas extraction wells.

There are approximately eighty-five gas extraction wells currently connected to manifolds throughout the site. Some of the wellheads are buried so it is not physically possible to confirm their condition or truly assess their performance. An additional thirteen gas wells were installed in Zone A and six additional gas well were installed in Zone C during 2006.

There are ten branch lines off the main collection ring. These branches are 250mm in diameter and have multi-outlet manifolds configured to collect the gas from the wells in their vicinity. Each branch can be isolated where it connects to the main line. The manifold arrangement allows the line from the individual wells to be sampled and controlled. This has the effect of balancing the "good gas" with the bad to maintain the optimum quality to the utilisation plant.

The mainline ring is a 355mm HDPE pipe that completely encircles the landfill and finishes back at the utilisation plant compound. It has two dewatering chambers, one next to the old main landfill entrance and the other adjacent to the IPS compound, where the collected condensate is returned to the waste body via a disused extraction well, it is proposed to divert this condensate directly to the leachate collection system. This ring main can be isolated in a number of locations to permit maintenance operations and still maintain operation of the utilisation plant.

The extraction pump which feeds the remaining generator (one was removed from site during 2006) is capable of collecting three thousand cubic metres of gas per hour at a maximum suction pressure of –150mbar. It is currently delivering approximately five hundred and fifty five cubic metres per hour at a quality of 40%CH_4. In the unlikely event the engine is out of service for an extended duration, the integral flare can be run to maintain negative pressure on the landfill.

8.1. LANDFILL GAS CONSUMED BY UTILISATION PLANT 2009.

Figures for landfill gas emitted from the facility are derived from data submitted by Irish Power Systems for the utilisation plant in Dunsink. The migration issues of previous years are largely resolved and the utilisation plant controls the vast majority of the landfill gas emitted. The figures for 2009 are presented in Table 8.1.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
Landfill Gas NM3	291160	291160	291160	291160	291160	291160	291160	291160	291160	291160	291160	291160	3493920
Ch4 % Vol	44	43	45	44	44	43	45	44	44	45	43	45	44.08
Total Power Output MWhrs	502	391	504	500	483	503	522	434	438	462	468	400	5607

TABLE 8.1: LANDFILL GAS CONSUMED BY IPS UTILISATION PLANT IN DUNSINK DURING 2009.

It takes 580NM^3 and 50% methane to produce 1000kw (i.e. Deutz fuel consumption figures). Therefore to arrive at an average daily consumption of landfill gas multiply the daily KW output by 0.580 to determine average daily consumption in normal cubic metres or NM^3. Normal cubic metres means that it is measured based on standard temperature and pressure conditions.

8.2. LANDFILL GAS CONSUMED BY UTILISATION PLANT AND GENERATED BY FACILITY 1996-PRESENT.

The amount of landfill gas utilised by the plant was trending downwards but dropping less sharply in recent years than the period 2003-2005. In 2009, there was a significant increase in the gas utilisation from the previous two years. This pattern is observable through figures provided by BPS, See Table 8.2.

The rate of landfill gas generation at the facility is continuing to drop but the generation shows that the amount of gas being consumed at the facility is less than the GasSim model in 2009. In 2009 the gas engine would occasionally 'run out of gas' at viable concentrations indicating that the gas field production is decreasing at an increasing rate.

Year	Landfill Gas Generated GasSim ESTIMATES*	NM^3 Utilisation By IPS	% Utilisation
1996 (6 months)		11161752	
1997		22107415	
1998		22080797	
1999		18335789	
2000		16120027	
2001		15015114	
2002		11576321	
2003	10431540	8841878	84
2004	9993240	7051828	70
2005	9554940	5209802	55
2006	9116640	4864378	53
2007	8760000	4065525	46
2008	8564400	5216060	61
2009	8373168	3493920	42

*** gassim Figures available from 2003 Estimates Only.**

TABLE 8.2: ANNUAL LANDFILL GAS CONSUMPTION AND GENERATION IN NORMAL CUBIC METRES OR NM^3.

Annual Landfill Gas Generation and Consumption in Normal Cubic Metres or NM3.

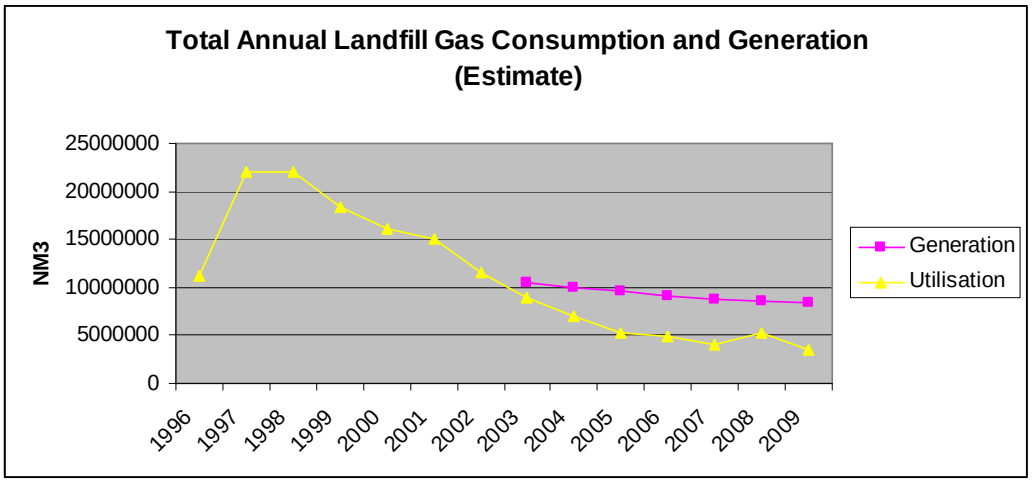

Figure 12. Annual Landfill Gas Generation and Consumption in Normal Cubic Metres or NM3.

Bioverda are reporting that supply of gas has dropped sharply. It is considered that landfill gas migration is not an overwhelming issue at Dunsink and it is suggested that these figures reflect a downward pattern over time of landfill gas emitted from the facility. The landfill gas network was extended during 2006. Given the definite pattern and direction in landfill gas generation and utilisation there appeared to be enough data to provide for the specification of an enclosed flare. The enclosed flare should cater for the needs of Landfill Gas Management in Dunsink for the next twenty years. The enclosed flare was delivered to site in December 2007 and was installed and commissioned during the first quarter of 2008 and is now operated by Fingal County Council.

9.0 REPORT ON PROGRESS TOWARDS ACHIEVEMENT OF ENVIRONMENTAL OBJECTIVES AND TARGETS CONTAINED IN PREVIOUS YEAR'S REPORT.

This is the sixth AER under this Licence. In 2008 the majority of objectives for the facility nearing completion and are now complete as of end of December 2009.

- In 2009 the Enclosed Flare was commissioned and handed over to Fingal County Council.
- The Phased Handover of the landfill and surrounding areas to the Parks Department which began in 2008 is complete as of December 2009
- Capping works are now complete with the exception of final landscaping and slope stability maintenance.
- Environmental Infrastructure Inspection, Maintenance and Monitoring were ongoing throughout 2009.

10.0 SCHEDULE OF ENVIRONMENTAL OBJECTIVES AND TARGETS 2009.

The schedule of environmental objectives is complete and has now been withdrawn from the AER.

11.0. PROCEDURES DEVELOPED RELATING TO THE FACILITY OPERATION.

11.1. INTRODUCTION.

No new SOP`s were introduced in 2009.

12.0 TANK, PIPELINE AND BUND TESTING AND INSPECTION REPORT.

As per condition 3.10.5 the following lagoon and bund tests conducted during 2007 are valid for this reporting period. Integrity testing was not due in 2009.

Lagoon.
An integrity test was conducted on the Lagoon in Dunsink during August / September 2007. The lagoon is deemed fit for the storage of leachate. A report was submitted to FCC based on the findings of the hydrostatic test, construction details and visual assessment of the lagoon. This report is available for inspection at the facility office.

An integrity test will be conducted on the lagoon during 2010.

Oil Bund IPS Compound- Dunsink.
An integrity test was conducted during December 2007 on the oil bund on the IPS compound. The bund integrity was found to be good, it was watertight and found fit for its intended use. This report is available for inspection at the facility office.

An integrity test will be conducted on the oil bund during 2010.

13.0. REPORTED INCIDENTS AND COMPLAINTS SUMMARIES.

13.1. REPORTED ENVIRONMENTAL INCIDENTS.

There were fifty one reported incidents last year reported under condition 1.6 c) "Any trigger level specified in this licence which is attained or exceeded"; and d) "Any indication that environmental pollution has, or may have, taken place." Three of these were notified to the Eastern Regional Fisheries Board during 2009. (The fourth indicent report relating to groundwater and surface water was notified to the Agency, and ERFB during the 1st week of 2010.)

	EPA Notified					**ERFB* Notified**
	Surface Water	**Groundwater**	**Landfill Gas**	**Dissolved Methane**	**Noise**	**Surface Water & Groundwater**
Month	**2009**	**2009**	**2009**	**2009**	**2009**	**2009**
January			4			
February			4			
March	1	1	4	1		1
April			4			
May			5			
June	1	1	4	1		1
July			5			
August			4			
September	1	1	4	1		1
October			5			
November			4			
December			4	1		
Total Number of Incidents	**3**	**3**	**51**	**4**		**3**

TABLE 13.1: SUMMARY OF REPORTED INCIDENTS DURING 2009.

* Eastern Regional Fisheries Board.

A summary of the environmental incidents distributed by month and thematic area is provided in Table 13.1.

Table 13.1 indicates a similar number of incidents in 2009 compared to 2008 which had shown improvement on previous years. The number of landfill gas incidents is similar to last year. They primarily relate to regular breaches of trigger levels for carbon dioxide at the Sports field and on the monthly rounds at Dunsoghly and Cappagh boundaries.

Surface water incidents have increased slightly since 2008, but the incidents primarily related to elevated levels of suspended solids which may not have been related to the landfill. Dissolved Methane incidents were lower than 2008 though there remains a discord between the results recorded from grab sampling of leachate quality and continuous monitoring results.

The EPA was notified of all incidents. The ERFB were notified on all incidents pertaining to surface water and Dublin City Council continue to be informed in relation to Dissolved Methane.

13.2. REPORTED ENVIRONMENTAL COMPLAINTS.

Condition 10.4 of Licence 127-1 requires that the licensee shall maintain a written record of all complaints relating to the operation of the facility. No complaints were received by FCC during 2009.

It is considered that the documented improvements to landfill infrastructure and performance coupled with the decreased volume of traffic associated with the site during 2009, have meant that the landfill is now less of an issue for its surroundings. This is a continuation of the trend in recent years. In 2008 there were just two complaints, compared with five for 2004, one for 2005 and two for 2006.

14.0. REVIEW OF NUISANCE CONTROLS.

Condition 7 of Waste Licence 127-1 requires that vermin, birds, flies, mud, dust, litter, noise and odours do not give rise to nuisance at the facility or in the immediate area of the facility.

To this end a Nuisance Monitoring Programme was instigated. This involves weekly inspection of the nuisances stated in Condition 7.1, but also includes those associated with security, surface water and leachate. The nuisance inspection is conducted in conjunction with the weekly Surface Water Visual Inspection. The facility and some adjoining areas are separated into seven zones. A checklist was designed and is filled in weekly since inspections were formalised in August 2004. The nuisance-monitoring programme feeds into the Environmental Management System, in that if nuisances are detected which are not considered incidents under Condition 1.6 of the licence – Corrective Action Procedures are invoked. If nuisances are detected which are considered incidents under Condition 1.6 of the licence, procedures listed under condition 9.1 are adhered to. The records for weekly inspections are available in the facility office. Additional professional pest monitoring is carried out and logs are kept. These are available for inspection at the facility office.

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15.0 FINANCIAL PROVISION, MANAGEMENT AND STAFFING STRUCTURE AND PROGRAMME FOR PUBLIC INFORMATION.

15.1. FINANCIAL PROVISION.

With regard to the uptake of Environmental Liability Risk Assessment (ELRA), Residuals Management Plans (RMP), Closure Remediation and Aftercare Plans (CRAMP) and Financial Provision (FP), please find the following information in relation to Dunsink Landfill.

- Risk Category as derived using the system set out in the Guidance Document.

This specific exercise has not been carried out to date. However on looking at the guidance document it appears similar to the “Methodology for Determining Enforcement Category of Licences”. This exercise gave Dunsink an A2 enforcement category which would probably equate to a Risk Category 3 classification.

- The "Methodology for Determining Enforcement Category of Licences" was last completed for Dunsink in July 2008. This exercise gave Dunsink an A2 enforcement category which would probably equate to a Risk Category 3 classification.
- The facility's RMP/CRAMP was the culmination of a series of proposals beginning in June 2005. It was agreed by "The Agency" during 2005. The series of proposals are referenced and detailed below and "The Agency" would have received copies in triplicate.

FCC-127-1-2005-	LETTER DATED	POST TO EPA 127-1 REGARDING
FCC-127-1-2005-015	09/06/2005	restoration and aftercare plan
FCC-127-1-2005-022	28/07/2005	Restoration and aftercare plan & SEW Leachate Management & Drainage
FCC-127-1-2005-025	13/09/2005	Restoration and Aftercare Plans and achievement of final profile
FCC-127-1-2005-026	19/09/2005	Slope Stability Survey
FCC-127-1-2005-027	23/09/2005	Restoration & Aftercare plans Drilling Wells

- Fingal County Council's position to date with regard to financial provision currently in place for Dunsink and Balleally has been stated as follows; "In accordance with Condition 12.2 of the Waste Licence, Fingal County Council shall establish and maintain a fund or other form of approved security, that is adequate to assure the financial capability of implementing the Restoration and Aftercare Plan as agreed with "The Agency". Financial provision is made on an annual basis at Fingal County Council budgeting meetings.

As the CRAMP/RMP predates the Guidance Document (2006), there are some differences in content and methodology. The contents of the CRAMP/RMP broadly reflect the suggested contents in the guidance document. It is also worth stating that *The Agency* approved of the CRAMP/RMP at the time of submission. The restoration programme is now complete and the facility is now in it's aftercare phase. The financial provision is considered adequate.

Staff from Fingal County Council would be willing to attend a conference in 2009 on implementation of the Environmental Liability Directive.
FCC-W0127-01-2008-007

15.2. MANAGEMENT AND STAFFING STRUCTURE.

15.2.1. Management Structure.

The following comprise the current management structure for Dunsink Landfill.
Licence Compliance

Senior Engineer, Mr. John Daly.
Waste Infrastructure and Enforcement, John Daly. B.E. (Civil Engineering), M.Sc (Environmental Engineering), MIEI
Senior Executive Engineer, Mr. M. Kiely. Responsible for waste infrastructure within the Environment Department. B.E. (Civil Engineering) 1978, Passed all modules of FAS, Waste Management Training Program.

Executive Engineer, License Compliance. Mr. D. Devine.
Management of waste licence conditions.
B.S.c (Civil Engineering), MIEI, Chartered Engineer.

Landfill Management

Senior Parks Superintendant, Mr. Kevin Halpenny. Responsibility for Parks Department,
Senior Executive Parks Superintendant, Ruairi O'Dulaing. Responsibility For Parks Development and transition
District Supervisor, Ted Lynch Coolmine Depot District Supervisor. Responsibility for overseeing Landfill management operations.
Foreman, Colin Gilhooley, Management of Landfill, FAS safe pass, manual handling and CONSAW courses.
Assistant Landfill Manager/Foreman, Mr. R. Donnelly, Assistant to Landfill manager, task management of site operatives and rehabilitation works. 12 years experience working for Fingal County Council.

The management and staffing structure will be reviewed again this year with further involvement of the Parks Department.

15.3. PROGRAMME FOR PUBLIC INFORMATION.

Public information can be viewed at the **Council's Headquarters** between 9.30 a.m. and 12.45 p.m. and 2.00 p.m. and 4.00 p.m. Monday to Friday (excluding public holidays), unless otherwise arranged by prior appointment.

- Facilities for viewing information from a computer or files are provided at Dunsink Facility office by prior arrangement with the Landfill Manager.
- A register of information will be made available on www.fingalcoco.ie. The website was updated February 2005. Additional information relating to the waste licence was posted on the website including; Waste Acceptance Policy, Procedures and Application Forms.
- A Link to the EPA's website that has the licence conditions is as follows www.fingalcoco.ie/services/ENVIRON_MENT/Form.htm. Note that this is a pdf file.
- Requests for copies of environmental information on display should be made using the "Requests for copies of Environmental Information/Reports" form.

Site Visits

- Site visits to **Dunsink Landfill** can be arranged by applying in writing to the Landfill Manager requesting a date and time for the proposed visit and indicating the number of visitors and the purpose of such a visit and whether any presentation is required. The use of cameras and video equipment during the visit must be agreed in advance with Fingal County Council.
- Such requests will be accommodated where possible. Operational and security matters will take precedence and visits may be cancelled at short notice.

Information Meetings.
A Dunsink Task Force was set up which met up to once monthly in previous years. It's brief includes the discussion of environmental issues in the broader Dunsink area, including issues relating to the waste licence. Local representatives, elected members, local Garda Siochana representatives, Fingal County Council and Dublin City Council members attend these meetings.

Review.
The communication program will be reviewed during 2009 with further involvement of the Parks Department.

16.0. STAFF TRAINING.

16.1. STAFF TRAINING REPORT.
As activities at the landfill have gradually decreased during 2008 through 2009 training requirements have also decreased. The only training undertaken during the calendar year was manual handling training for site operatives. Details are provided in Appendix V.

GLOSSARY

Aftercare	Any measures that are necessary to be taken in relation to the facility for the purposes of preventing environmental pollution following the cessation of the activity in question at a facility.
Annually	At approximately twelve monthly intervals.
Aquifer	A formation (e.g. body of rock, gravel or sand stratum) that is capable of storing significant quantities of water and through which groundwater moves.
Baseline monitoring	Monitoring in and around the location of a proposed facility so as to establish background environmental conditions prior to any development of the proposed facility.
Borehole	A shaft installed outside a waste area for the monitoring of and/or extraction of landfill gas/groundwater. Established by placing a casing and well screen into the boring. If installed within the waste area, it is called a well.
Bunding / Berm	A dike or mound usually of clay or other inert material used to define limits of cells or phases or roadways; or to screen the operation of a landfill from adjacent properties; reducing noise, visibility, dust and litter impacts.
Capping	The covering of a landfill, usually with low permeability material (landfill cap).
Condensate	The liquid which forms within the gas pipe work due to the condensation of water vapour from landfill gas.
Detection limit.	The concentration of the determinant for which there is a 95% probability of detection when a single analytical result is obtained, detection being defined as obtaining a result which is significantly greater (p=0.05) than zero. Also referred to as Limit of Detection.
Direct discharge	The introduction into groundwater of List I or II substances without percolation through the ground or subsoil.
Downgradient	The direction towards which groundwater or surface water flows.
Emission	Meaning assigned by the EPA Act of 1992.
Flare unit	A device used for the combustion of landfill gas thereby converting its methane content to carbon dioxide.
Gas wells	Wells installed during filling or retrofitted later within the waste area for the monitoring of and/or removal of landfill gas either actively through an extraction system or passively by venting.
Groundwater	Groundwater is that part of the subsurface water which is in the saturated zone.
Hydrogeology	The study of the interrelationships of the geology of soils and rocks with groundwater.

Indirect discharge	The introduction into groundwater of List I or II substances after percolation through the ground or subsoil.
Inert landfill	A landfill that accepts only inert waste that fulfils the criteria set out in the Agency's draft manual "Waste Acceptance".
Lagoon	A land area used to contain liquid, e.g.leachate collected from landfill.
Landfill	Waste disposal facility used for the deposit of waste on to or in to land.
Landfill gas (LFG)	All gases generated from the landfilled waste.
Leachate	Any liquid percolating through the deposited waste and emitted from or contained within a landfill as defined in Section 5(1) of the Waste Management Act.
Leachate Well	Well installed within the waste area for the monitoring and/or extraction of leachate as opposed to borehole, which is the term, used when located outside the waste deposition area.
List I/II substances	Substances referred to in the EU Directives on Dangerous Substances (76/464/EEC) and Groundwater (80/68/EC).
Lower explosive limit (LEL)	The lowest percentage concentration by volume of a mixture of flammable gas with air which will propagate a flame at 25^{o}C and atmospheric pressure.
Macroinvertebrate	Larger invertebrate animals visible to the eye. Usually defined as those that are retained by a net or sieve of mesh size 0.6mm.
Minimum reporting value	This is the lowest concentration of a substance that can be determined with a known degree of confidence. It is a matrix dependent and not necessarily equivalent to the Limit of Detection of the analytical system but is generally a multiple of that value which reflects the robustness and reproducibility of the test method as applied to the specific matrix. Also referred to as the limit of quantitation or practical reporting limit.
Noise Sensitive Location	(NSL) Any dwelling-house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
Quarterly	At approximately three monthly intervals.
Receiving water	A body of water, flowing or otherwise, such as a stream, river, lake, estuary or sea, into which water or wastewater is discharged.
Restoration	Works carried out on a landfill site to allow planned afteruse.
Substrata	River bed or bottom on or in which invertebrates live.
Taxa	Named taxonomic groups. Usually family or species level in biotic indices.

Trigger level	A parameter value specified in the licence, the achievement or exceedance of which requires certain actions to be taken by the licensee.
Upper explosive limit (LEL)	The highest percentage concentration by volume of a mixture of flammable gas with air which will propagate a flame at 25^{o}C and atmospheric pressure.
Void space	Space available to deposit waste.
Water balance	A calculation to estimate a volume of liquid generated. In the case of landfills, water balance normally refers to leachate generation volumes.

APPENDIX I

Q1 - Dunsink Groundwater February 2009

Parameter	Unit	IGV's	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18R	BH18 Control Values	BH18 Trigger Values	BH27	BH27 Control Values	BH27 Trigger Values
pH	pH Units	6.5-9.5	7.47	8	8.38	7.58	8.2	8.59	7.88	8.24	8.64	7.8	8.72	8.57	7.56	8.18	8.57
Conductivity	mS/cm	1	1100	1.231	1.289	1020	1.352	1.414	0.660	0.838	0.878	1.060	2.708	2.708	1.000	1.282	1.343
Temperature	°C	-	-	-	-	-	-	-	8.8	-	-	9.9	-	-	8	-	-
Ammoniacal Nitrogen	mg/l	0.3	0.5	0.42	0.44	0.4	0.31	0.33	0.4	0.21	0.22	0.8	1.16	1.21	<0.2	1.89	1.98
Total Organic Carbon	mg/l	-	4	6.3	6.6	<3	6.3	6.6	<3	6.3	6.3	4	9.45	9.9	4	5.25	5.5

Parameter	Unit	IGV's	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH	pH Units	6.5-9.5	7.76	8.39	8.79	7.63	8.18	8.6	7.93	8.58	8.99	7.69	8.61	9.02
Conductivity	mS/cm	1	0.530	0.791	0.828	0.670	1.227	1.286	0.600	0.852	0.892	0.900	0.998	1.045
Temperature	°C	-	9.8	-	-	9.3	-	-	7.5	-	-	6.4	-	-
Ammoniacal Nitrogen	mg/l	0.3	<0.2	1.575	1.65	<0.2	0.735	0.77	<0.2	0.21	0.22	<0.2	0.21	0.22
Total Organic Carbon	mg/l	-	3	8.4	8.8	3	5.25	6	<3	5.25	5.5	5	6.3	6.6

IGV = Interim Guideline Value

Shading = Value has exceeded IGV's

Shading = Value has exceeded the Control Value

Shading = Value has exceeded Trigger Value

Sampled on 18th February 2009

Analysis conducted by Jones Environmental Forensics Ltd.

Q2 - Dunsink Groundwater May 2009

Parameter	Unit	IGV's	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18R	BH18 Control Values	BH18 Trigger Values	BH27	BH27 Control Values	BH27 Trigger Values
pH	pH Units	6.5-9.5	6.64	8	8.38	7.77	8.2	8.59	7.94	8.24	8.64	8.6	8.72	8.57	8	8.18	8.57
Conductivity	mS/cm	1	**2.2**	1.231	1.289	**1.673**	1.352	1.414	0.664	0.838	0.878	0.992	2.708	2.708	**1.015**	1.282	1.343
Temperature	°C	-	11.5	-	-	11.8	-	-	16.9	-	-	14.0	-	-	14.5	-	-
Ammoniacal Nitrogen	mg/l	0.3	<0.2	0.42	0.44	<0.2	0.31	0.33	<0.2	0.21	0.22	**0.4**	1.16	1.21	<0.2	1.89	1.98
Total Organic Carbon	mg/l	-	3	6.3	6.6	<2	6.3	6.6	<2	6.3	6.3	4	9.45	9.9	<2	5.25	5.5

Parameter	Unit	IGV's	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH	pH Units	6.5-9.5	8.06	8.39	8.79	8.17	8.18	8.6	8.07	8.58	8.99	7.85	8.61	9.02
Conductivity	mS/cm	1	0.705	0.791	0.828	0.657	1.227	1.286	0.624	0.852	0.892	0.934	0.998	1.045
Temperature	°C	-	17.6	-	-	15.1	-	-	12.8	-	-	15.4	-	-
Ammoniacal Nitrogen	mg/l	0.3	<0.2	1.575	1.65	<0.2	0.735	0.77	<0.2	0.21	0.22	<0.2	0.21	0.22
Total Organic Carbon	mg/l	-	2	8.4	8.8	<2	5.25	6	<2	5.25	5.5	<2	6.3	6.6

IGV = Interim Guideline Value

Shading Bold and Underlined = Value has exceeded IGV's

Shading = Value has exceeded the Control Value

Shading = Value has exceeded Trigger Value

Sampled on 28th May 2009

Analysis conducted by Jones Environmental Forensics Ltd.

Dunsink Q3 2009 GW

Groundwater Results

PARAMETER	UNIT	I.G.V.	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18	Bh18 Control Values	BH18 Trigger Values	BH27	BH27 Control Value	BH27 Trigger Values	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH Value	**units**	**6.5 - 9.5**	7.61	8	8.38	7.61	8.2	8.59	7.22	8.24	8.64	7.56	8.72	8.57	7.52	8.18	8.57	7.51	8.39	8.79	7.57	8.18	8.6	7.7	8.58	8.99	7.38	8.61	9.02
Conductivity	**mS/cm**	**1**	1.426	1.231	1.289	1.385	1.352	1.414	0.705	0.838	0.878	1.288	2.708	2.708	1.087	1.282	1.343	0.73	0.791	0.828	0.682	1.227	1.286	0.62	0.852	0.892	0.917	0.998	1.045
Ammonical Nitrogen as NH4-N	**N mg/l**	**0.15**	<0.01	0.42	0.44	<0.01	0.315	0.33	<0.01	0.021	0.22	0.65	1.16	1.21	<0.01	1.89	1.98	<0.01	1.575	1.65	<0.01	0.735	0.77	<0.01	0.21	0.22	<0.01	0.21	0.22
Dissolved Oxygen (O2)	**O2 mg/l**	**N-A-C**	4	-	-	7	-	-	3	-	-	3	-	-	6	-	-	10	-	-	3	-	-	7	-	-	6	-	-
Chloride (Cl)	**Cl mg/l**	**30**	196	76.65	80.3	179	91.35	95.7	26.48	40.95	42.9	210.8	388.5	407	57.84	75.6	79.2	29.28	32.55	34.1	28.6	26.25	27.5	17.4	28.35	29.7	10.86	32.55	34.1
Potassium (K)	**K mg/l**	**5**	4.5	5.25	5.5	5.64	7.77	8.14	1.94	3.78	3.96	3.8	3.99	4.18	2.22	3.36	3.52	2.66	4.41	4.62	3.56	6.72	7.04	2.02	5.25	5.5	1.96	3.99	4.2
Sodium (Na)	**Na mg/l**	**150**	74.72	51.24	53.68	95.33	37.8	39.6	17.44	21	22	62.36	103.31	108.23	30.68	47.25	49.5	17.78	25.2	26.4	18.03	21.31	22.33	16.88	82.95	86.9	40.57	64.58	67.7
Fluoride (F)	**F mg/l**	**1**	<0.3	0.315	0.33	<0.3	0.315	0.33	0.5	0.74	0.77	2.9	2.21	2.31	0.5	0.74	0.77	<0.3	0.945	0.99	<0.3	0.315	0.33	0.8	0.945	0.99	<0.3	0.32	0.3
Total Organic Carbon	**C mg/l**	**N-A-C**	10	6.3	6.6	9	6.3	6.6	8	6.3	6.6	14	9.45	9.9	11	5.25	5.5	9	8.4	8.8	10	5.25	6	9	5.25	5.5	19	6.3	6.6
Total Oxidised Nitrogen (water)	**N mg/l**	**N-A-C**	<0.05	-	-	0.87	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-	<0.05	-	-
Calcium (Ca)	**Ca mg/l**	**200**	176.4	-	-	182.3	-	-	82.25	-	-	69.13	-	-	78.48	-	-	115	-	-	104	-	-	75.8	-	-	79.54	-	-
Cadmium (Cd)	**Cd mg/l**	**0.005**	<0.00022	-	-	<0.00022	-	-	<0.00022	-	-	<0.00022	-	-	<0.00022	-	-	<0.00022	-	-	<0.00022	-	-	<0.00022	-	-	<0.00022	-	-
Chromium (Cr)	**Cr mg/l**	**0.03**	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-	<0.001	-	-
Copper (Cu)	**Cu mg/l**	**0.03**	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-	<0.0016	-	-
Total Cyanide (Cn)*	**Cn mg/l**	**0.01**	<0.04	-	-	<0.04	-	-	<0.04	-	-	<0.04	-	-	<0.04	-	-	<0.04	-	-	<0.04	-	-	<0.04	-	-	<0.04	-	-
Iron (Fe)	**Fe mg/l**	**0.2**	<0.02#	0.018	0.019	<0.02#	0.019	0.02	<0.02	0.03	0.028	<0.02#	0.0158	0.0165	<0.02	0.03	0.032	<0.02	0.0441	0.0462	<0.02#	0.01365	0.0143	<0.02#	0.0147	0.0154	<0.02	0.0304	0.0319
Lead (Pb)	**Pb mg/l**	**0.01**	<0.0004	-	-	<0.0004	-	-	<0.0004	-	-	<0.0004	-	-	<0.0004	-	-	<0.0004	-	-	<0.0004	-	-	<0.0004	-	-	<0.0004	-	-
Magnesium (Mg)	**Mg mg/l**	**50**	20.22	22.73	23.82	12.85	19.08	19.99	25.83	29.23	30.62	75.44	93.45	97.9	36.71	51.07	53.5	13.46	18.76	19.66	18.95	25.074	26.268	22.47	21.95	23.001	16.67	23.247	24.354
Manganese (Mn)	**Mn mg/l**	**0.05**	<0.001	0.151	0.158	<0.001	0.0294	0.0308	<0.001	0.169	0.177	<0.001	0.0515	0.0539	<0.001	0.077	0.08	<0.001	0.9135	0.957	0.225	0.0672	0.0704	<0.001	0.0483	0.0506	<0.001	0.391	0.4103
Nickel (Ni)	**Ni mg/l**	**0.02**	0.004	0.0116	0.0121	<0.0015	0.042	0.044	<0.0015	0.0021	0.0022	0.004	0.01	0.02	0.003	0.063	0.066	<0.0015	0.0105	0.011	<0.0015	0.0105	0.011	<0.0015	0.0021	0.022	<0.0015	0.00525	0.0055
Mercury (Hg)	**Hg mg/l**	**0.001**	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-	<0.00001	-	-
Residue on Evaporation	**mg/l**	**-**	854	-	-	930	-	-	358	-	-	845	-		641	-	-	681	-	-	347	-	-	315	-	-	1309	-	-
Sulphate (soluble) (SO4)	**SO4 mg/l**	**200**	185.3	-	-	207.49	-	-	40.07	-	-	99.89	-	-	86.22	-	-	53.01	-	-	42.54	-	-	22.45	-	-	71.21	-	-
Zinc (Zn)	**Zn mg/l**	**0.1**	<0.003	-	-	<0.003	-	-	<0.003	-	-	<0.003	-	-	<0.003	-	-	<0.003	-	-	0.003	-	-	<0.003	-	-	<0.003	-	-
Boron (B)	**B mg/l**	**1**	0.017	-	-	0.028	-	-	0.074	-	-	0.492	-	-	0.072	-	-	0.028	-	-	0.043	-	-	0.018	-	-	0.036	-	-
Alkalinity (as CaCO3)	**CaCO3 mg/l**	**N-A-C**	248	-	-	252	-	-	276	-	-	312	-	-	360	-	-	292	-	-	284	-	-	260	-	-	368	-	-
Ortho Phosphate	**P04 mg/l**	**-**	0.16	-	-	0.1	-	-	0.1	-	-	0.1	-	-	0.1	-	-	0.1	-	-	0.08	-	-	0.12	-	-	0.11	-	-

I.G.V.=Interim Guideline Values from Table 3.1 of EPA document "Towards Setting Guideline Values for the protection of Groundwater in Ireland"

Shading = Value has exceeded IGV

Shading = Value has exceeded the trigger/control value

* Laboratory level of Detection is above IGV recommended level

Laboratory level of Detection is in excess of trigger/control value

Sampling was undertaken on the 27th August 2009.

N-A-C= No abnormal change

Analysis conducted by Jones Environmental , Deeside, UK

CE5977

Volatile Organic Compounds
Dunsink

White Young Green Ireland

Job Number: CE05977
3rd Quarter 2009

Units - µg/kg

Compound	BH3	BH4	BH31	BH32	BH33	BH34
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2
Methyl Tertiary Butyl Ether#	<2	<2	<2	<2	<2	<2
Chloromethane #	<3	<3	<3	<3	<3	<3
Vinyl Chloride	<2	<2	<2	<2	<2	<2
Bromomethane #	<1	<1	<1	<1	<1	<1
Chloroethane #	<3	<3	<3	<3	<3	<3
Trichlorofluoromethane #	<3	<3	<3	<3	<3	<3
1,1-Dichloroethene #	<3	<3	<3	<3	<3	<3
Carbon Disulphide #	<3	<3	<3	<3	<3	<3
Dichloromethane #	<3	<3	<3	<3	<3	<3
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1
Bromochloromethane #	<2	<2	<2	<2	<2	<2
Chloroform #	<3	<3	<3	<3	<3	<3
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3
Carbon tetrachloride #	<2	<2	<2	<2	<2	<2
1,2-Dichloroethane #	<2	<2	<2	<2	<2	<2
Benzene #	<3	<3	<3	<3	<3	<3
Trichloroethene #	<3	<3	<3	<3	<3	<3
1,2-Dichloropropane #	<2	<2	<2	<2	<2	<2
Dibromomethane #	<3	<3	<3	<3	<3	<3
Bromodichloromethane #	<3	<3	<3	<3	<3	<3
cis-1-3-Dichloropropene #	<2	<2	<2	<2	<2	<2
Toluene #	<3	<3	<3	<3	<3	<3
trans-1-3-Dichloropropene #	<2	<2	<2	<2	<2	<2
1,1,2-Trichloroethane #	<2	<2	<2	<2	<2	<2
Tetrachloroethene #	<3	<3	<3	<3	<3	<3
1,3-Dichloropropane #	<2	<2	<2	<2	<2	<2
Dibromochloromethane #	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane #	<2	<2	<2	<2	<2	<2
Chlorobenzene #	<2	<2	<2	<2	<2	<2
1,1,1,2-Tetrachloroethane #	<2	<2	<2	<2	<2	<2
Ethylbenzene #	<3	<3	<3	<3	<3	<3
p/m-Xylene #	<5	<5	<5	<5	<5	<5
o-Xylene #	<3	<3	<3	<3	<3	<3
Styrene #	<2	<2	<2	<2	<2	<2
Bromoform #	<2	<2	<2	<2	<2	<2
Isopropylbenzene	<3	<3	<3	<3	<3	<3
1,1,2,2-Tetrachloroethane #	<4	<4	<4	<4	<4	<4
Bromobenzene #	<2	<2	<2	<2	<2	<2
1,2,3-Trichloropropane #	<3	<3	<3	<3	<3	<3
Propylbenzene #	<3	<3	<3	<3	<3	<3
2-Chlorotoluene #	<3	<3	<3	<3	<3	<3
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3
4-Chlorotoluene #	<3	<3	<3	<3	<3	<3
tert-Butylbenzene #	<3	<3	<3	<3	<3	<3
1,2,4-Trimethylbenzene #	<3	<3	<3	<3	<3	<3
sec-Butylbenzene #	<3	<3	<3	<3	<3	<3
4-Isopropyltoluene #	<3	<3	<3	<3	<3	<3
1,4-Dichlorobenzene #	<3	<3	<3	<3	<3	<3
1,3-Dichlorobenzene #	<3	<3	<3	<3	<3	<3
n-Butylbenzene #	<3	<3	<3	<3	<3	<3
1,2-Dichlorobenzene #	<3	<3	<3	<3	<3	<3
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2
1,2,4-Trichlorobenzene#	<3	<3	<3	<3	<3	<3
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3
Naphthalene	<2	<2	<2	<2	<2	<2
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3

N.B Water Blank Corrected

Semivolatiles
Dunsink

White Young Green Ireland

Job Number: CE05977
3rd Quarter 2009

Units - µg/kg

Compound	BH3	BH4	BH31	BH32	BH33	BH34
Phenol	<10	<10	<10	<10	<10	<10
2-Chlorophenol	<10	<10	<10	<10	<10	<10
2-Methylphenol	<10	<10	<10	<10	<10	<10
4-Methylphenol	<10	<10	<10	<10	<10	<10
2-Nitrophenol	<10	<10	<10	<10	<10	<10
4-Nitrophenol	<10	<10	<10	<10	<10	<10
2,4-Dichlorophenol	<10	<10	<10	<10	<10	<10
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10
Pentachlorophenol	<10	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10
1,2,4-Trichlorobenzene	<10	<10	<10	<10	<10	<10
Nitrobenzene	<10	<10	<10	<10	<10	<10
Azobenzene	<10	<10	<10	<10	<10	<10
Hexachlorobenzene	<10	<10	<10	<10	<10	<10
Naphthalene	<10	<10	<10	<10	<10	<10
Acenaphthylene	<10	<10	<10	<10	<10	<10
Acenaphthene	<10	<10	<10	<10	<10	<10
Fluorene	<10	<10	<10	<10	<10	<10
Phenanthrene	<10	<10	<10	<10	<10	<10
Anthracene	<10	<10	<10	<10	<10	<10
Fluoranthrene	<10	<10	<10	<10	<10	<10
Pyrene	<10	<10	<10	<10	<10	<10
Benzo(a)anthracene	<10	<10	<10	<10	<10	<10
Chrysene	<10	<10	<10	<10	<10	<10
Benzo(b)fluoranthrene	<10	<10	<10	<10	<10	<10

CAS No	Compound	BH3	BH4	BH31	BH32	BH33
Benzo(k)fluoranthrene	<10	<10	<10	<10	<10	<10
Benzo(a)pyrene	<10	<10	<10	<10	<10	<10
Indeno(1,2,3-cd)pyrene	<10	<10	<10	<10	<10	<10
Dibenzo(a,h)anthracene	<10	<10	<10	<10	<10	<10
Benzo(ghi)perylene	<10	<10	<10	<10	<10	<10
2-Chloronaphthalene	<10	<10	<10	<10	<10	<10
2-Methylnaphthalene	<10	<10	<10	<10	<10	<10
Carbazole	<10	<10	<10	<10	<10	<10
Isophorone	<10	<10	<10	<10	<10	<10
Dibenzofuran	<10	<10	<10	<10	<10	<10
Dimethyl phthalate	<10	<10	<10	<10	<10	<10
Diethyl phthalate	<10	<10	<10	<10	<10	<10
Di-n-butylphthalate	<10	<10	<10	<10	<10	<10
Di-n-octylphthalate	<10	<10	<10	<10	<10	<10
Bis(2-ethylhexyl)phthalate	<10	<10	<10	<10	<10	<10
Butylbenzylphthalate	<10	<10	<10	<10	<10	<10
4-Chloroaniline	<10	<10	<10	<10	<10	<10
2-Nitroanaline	<10	<10	<10	<10	<10	<10
3-Nitroaniline	<10	<10	<10	<10	<10	<10
4-Nitroaniline	<10	<10	<10	<10	<10	<10
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10
Bis(2-chloroethyl)ether	<10	<10	<10	<10	<10	<10
4-Bromophenylphenylether	<10	<10	<10	<10	<10	<10
4-Chlorophenylphenylether	<10	<10	<10	<10	<10	<10
Hexachloroethane	<10	<10	<10	<10	<10	<10
Hexachlorobutadiene	<10	<10	<10	<10	<10	<10
Hexchlorocyclopentadiene	<10	<10	<10	<10	<10	<10
Bis(2-chloroethoxy)methane	<10	<10	<10	<10	<10	<10
N-nitrosodi-n-propylamine	<10	<10	<10	<10	<10	<10

N.B Water Blank Corrected

OCP/OPP Ground Water
Dunsink

Job No: CE05977
3rd Quarter 2009

Compound	Units	Method Detection Limit	BH3	BH4	BH31	BH32	BH33	BH34
Dichlorvos**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
alpha-BHC**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
beta-BHC**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
gamma-BHC (Lindane)**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Methyl parathion**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Malathion**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aldrin**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan 1**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDE**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dieldrin**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endrin**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan 2**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDD**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethion**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-DDT**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Endosulfan sulphate**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
p,p'-Methoxychlor**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Azinphos methyl**	ug/l	<0.01ug/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

PAH's for Groundwater
Dunsink

Job No: CE05977
3rd Quarter 2009

Parameter	Units	BH3	BH4	BH31	BH32	BH33	BH34
2-Chloronaphthalene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
2-Methylnaphthalene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b)flouranthene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(ghi)perylene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(k)flouranthene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenzo(ah)anthracene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Flourene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(123cd)pyrene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of 6 PAHs	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of 10 PAHs	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of 16 PAHs	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Legend:
mg/kg = miligrams per kilogram

White Young Green Ireland
Environmental Consultants
Job No: CE5977

Q4 - Dunsink Groundwater December 2009

Parameter	Unit	IGV's	BH3	BH3 Control Values	BH3 Trigger Values	BH4	BH4 Control Values	BH4 Trigger Values	BH16	BH16 Control Values	BH16 Trigger Values	BH18R	BH18 Control Values	BH18 Trigger Values	BH27	BH27 Control Values	BH27 Trigger Values
pH	pH Units	6.5-9.5	7.64	8	8.38	7.78	8.2	8.59	8.2	8.24	8.64	8.39	8.72	8.57	8.04	8.18	8.57
Conductivity	mS/cm	1	**1.203**	1.231	1.289	**1.024**	1.352	1.414	0.741	0.838	0.878	**1.287**	2.708	2.708	**1.023**	1.282	1.343
Temperature	°C	-	10.6	-	-	10	-	-	11.5	-	-	10.5	-	-	12.5	-	-
Ammoniacal Nitrogen	mg/l	0.3	**0.73**	0.42	0.44	**0.32**	0.31	0.33	0.23	0.21	0.22	**1.4**	1.16	1.21	<0.2	1.89	1.98
Total Organic Carbon	mg/l	-	4	6.3	6.6	<2	6.3	6.6	<2	6.3	6.3	5	9.45	9.9	<2	5.25	5.5

Parameter	Unit	IGV's	BH31	BH31 Control Values	BH31 Trigger Values	BH32	BH32 Control Values	BH32 Trigger Values	BH33	BH33 Control Values	BH33 Trigger Values	BH34	BH34 Control Values	BH34 Trigger Values
pH	pH Units	6.5-9.5	8.32	8.39	8.79	8.28	8.18	8.6	8.15	8.58	8.99	7.86	8.61	9.02
Conductivity	mS/cm	1	0.567	0.791	0.828	0.676	1.227	1.286	0.634	0.852	0.892	0.835	0.998	1.045
Temperature	°C	-	11.4	-	-	11	-	-	12.1	-	-	11.2	-	-
Ammoniacal Nitrogen	mg/l	0.3	<0.2	1.575	1.65	<0.2	0.735	0.77	0.28	0.21	0.22	<0.2	0.21	0.22
Total Organic Carbon	mg/l	-	6	8.4	8.8	<2	5.25	6	<2	5.25	5.5	<2	6.3	6.6

IGV = Interim Guideline Value

Shading Bold and Underlined = Value has exceeded IGV's

Shading = Value has exceeded the Control Value

Shading = Value has exceeded Trigger Value

Sampled on 8th December 2009

Analysis conducted by Jones Environmental Forensics Ltd.

APPENDIX II

Q1 - Dunsink Surface Water February 2009

Parameter	Unit	Salmonid Regs	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH	pH Units	≥6≤9	8.06	7.25	7.76	7.73	8.09	8.06	7.09
Conductivity	mS/cm	-	1.240	1.085	0.690	0.320	0.820	1.110	0.860
Temperature	^{o}C	<10^{o}C*	9.5	7.3	7.2	8	9.5	7.1	9.9
Dissolved Oxygen	mg/l	50%>9	9.0	11.5	9.0	9.0	10.0	9.0	9.0
Ammoniacal Nitrogen#	mg/l	<1	<0.2	<0.2	<0.2	0.2	0.2	0.6	<0.2
BOD	mg/l	5	<1	<1	<1	<1	<1	<1	<1
Total Suspended Solids	mg/l	25	11	12	498	<10	21	66	<10

Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation , SI 293 of 1988.

Shading = Value has exceeded Salmonid Regulations

Standard for Ionised Ammonia = <1,Ionised Ammonia= total ammonium x 1.28-Results stated should be converted before being compared to the standard.

*=Second Schedule of Salmonid Regulations states " temperature must not exceed 10 degrees celsius during the period from 1 November to 30 April where species which need cold water for reproduction are present

Sampled on 18th February 2009/March 31st 2009

Analysis conducted by Jones Environmental Forensics Ltd.

Q2 - Dunsink Surface Water May 2009

Parameter	Unit	Salmonid Regs	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH	pH Units	≥6≤9	8.13	8.15	8.2	8.12	8.02	8.41	NOTE 1
Conductivity	mS/cm	-	0.767	0.550	0.649	0.832	0.842	0.824	NOTE 1
Temperature	^{o}C	<10^{o}C*	15.2	16	19.4	13.8	14.4	15	NOTE 1
Dissolved Oxygen	mg/l	50%>9	11.0	11.0	10.0	10.0	10.0	10.0	NOTE 1
Ammoniacal Nitrogen#	mg/l	<1	<0.2	<0.2	<0.2	0.2	0.2	0.6	NOTE 1
BOD	mg/l	5	<1	2	<1	1	<1	2	NOTE 1
Total Suspended Solids	mg/l	25	17	<10	**55**	<10	<10	<10	NOTE 1

Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation , SI 293 of 1988.

Note 1= Sampling point SW18 was inaccessible due to works in progress relating to M50 widening

Shading Bold and Underlined = Value has exceeded Salmonid Regulations

Standard for Ionised Ammonia = <1,Ionised Ammonia= total ammonium x 1.28-Results stated should be converted before being compared to the standard.

*=Second Schedule of Salmonid Regulations states " temperature must not exceed 10 degrees celsius during the period from 1 November to 30 April where species which need cold water for reproduction are present

Sampled on 28th May 2009

Analysis conducted by Jones Environmental Forensics Ltd.

Dunsink Q3 2009 SW

Surface Water Results

PARAMETER	UNIT	EQS	Salmonid	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH Value	units	6-9	6-9	7.86	8.16	7.35	7.84	8.08	7.75	-
Conductivity	mS/cm	1	-	0.568	0.416	0.614	0.603	0.798	0.727	-
Ammonical Nitrogen as NH4-N	N mg/l	0.02 NH3	1	0.29	<0.01	<0.01	<0.01	<0.01	3.09	-
Dissolved Oxygen (O2)	O2 mg/l	N-A-C	50% >9	7	9	7	8	6	2	-
Chloride (Cl)	Cl mg/l	250	-	25.8	22.5	25.1	28.6	31.5	32.8	-
Potassium (K)	K mg/l	-	-	3.69	5	3.04	4.95	0.89	5.61	-
Sodium (Na)	Na mg/l	-	-	16.52	16.21	15	21.06	21.84	19.66	-
COD	02 mg/l	-	-	<7	<7	<7	<7	9	10	-
BOD	02 mg/l	-	5	<1	<1	<1	<1	<1	2	-
Total Oxidised Nitrogen (water)	N mg/l	N-A-C	-	0.17	<0.05	<0.05	<0.05	<0.05	1.29	-
Total Suspended Solids	mg/l	-	25	<10	<10	23	<10	10	20	-
Calcium (Ca)	Ca mg/l	-	-	92.16	50.66	103	95.69	121.2	119.5	-
Cadmium (Cd)	Cd mg/l	0.005	-	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	<0.00022	-
Chromium (Cr)	Cr mg/l	0.03	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-
Copper (Cu)	Cu mg/l	0.03	-	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	-
Iron (Fe)	Fe mg/l	1	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Lead (Pb)	Pb mg/l	0.01	-	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	-
Magnesium (Mg)	Mg mg/l	-	-	7.3	5.66	6.88	7.73	10.11	8.16	-
Manganese (Mn)	Mn mg/l	0.3	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-
Nickel (Ni)	Ni mg/l	0.05	-	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	-
Mercury (Hg)	Hg mg/l	0.001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-
Sulphate (soluble) (SO4)	SO4 mg/l	200	-	72.68	82.77	46.45	97.14	69.1	96.93	-
Zinc (Zn)	Zn mg/l	0.1	-	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	-
Alkalinity (as CaCO3)	CaCO3 mg/l	N-A-C	-	196	88	22	180	280	240	-
Boron (B)	B mg/l	2	-	0.016	<0.012	0.015	0.023	0.04	0.029	-
ortho - phosphate	PO4 mg/l	-	-	0.15	0.08	0.09	0.09	0.27	0.96	-

EQS = Environmental Quality Standard for Surface Waters 1997 (Standards of SI 272 of 2009 will be applied during next quarter)

Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation, 1988

Shading = Value has exceeded Salmonid Water Quality Standard

Sampling was undertaken on 27th August 2009

N-A-C= No abnormal change

White Young Green Environmental

CE05977

Analysis conducted byJones Environmental Forensis Ltd. Deeside, UK

Q4 - Dunsink Surface Water December 2009

Parameter	Unit	Salmonid Regs	SW2	SW7	SW9	SW10	SW11	SW17	SW18
pH	pH Units	≥6≤9	8.25	8.15	8.2	7.37	8.02	8.41	8.22
Conductivity	mS/cm	-	0.919	0.550	0.649	0.870	0.842	0.824	1.014
Temperature	^{o}C	<10^{o}C*	8.5	5.3	11	7.6	7.4	9.2	9.8
Dissolved Oxygen	mg/l	50%>9	9.0	9.0	8.0	9.0	9.0	9.0	9.0
Ammoniacal Nitrogen#	mg/l	<1	0.32	<0.2	0.63	<0.2	0.22	0.64	0.29
BOD	mg/l	5	<1	<1	<1	<1	<1	1.16	<1
Total Suspended Solids	mg/l	25	14	6	23	<10	10	**41**	**144**

Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation , SI 293 of 1988.

Shading Bold and Underlined = Value has exceeded Salmonid Regulations

Standard for Ionised Ammonia = <1, Ionised Ammonia= total ammonium x 1.28-Results stated should be converted before being compared to the standard.

*=Second Schedule of Salmonid Regulations states " temperature must not exceed 10 degrees celsius during the period from 1 November to 30 April where species which need cold water for reproduction are present

Sampled on 8th December 2009

Analysis conducted by Jones Environmental Forensics Ltd.

Q1 - Dunsink Leachate Results February 2009

Parameter	Units	Leachate Sump 18/02/2009	Lagoon 18/02/2009
pH	pH units	7.46	9.06
Conductivity	mS/cm	3210	1330
Temperature	^{o}C	9.9	7.6
Dissolved Oxygen	mg/l	5.0	12
Dissolved methane CH4	mg/l	0.467	0.002

Sampled on 18th February 2009

Analysis conducted by Jones Environmental Forensics Ltd.

Q2 - Dunsink Leachate Results May 2009

Parameter	Units	Leachate Sump 28/05/2009	Lagoon 28/05/2009
pH	pH units	8.03	8.51
Conductivity	mS/cm	3.02	1.134
Temperature	^{o}C	16.0	16.9
Dissolved Oxygen	mg/l	11.0	6
Dissolved methane CH4	mg/l	0.009	0.043

Sampled on 28th May 2009

Analysis conducted by Jones Environmental Forensics Ltd.

Dunsink Q3 2009 Leachate

Leachate Monitoring

PARAMETER	UNIT	LAG	LSP
pH Value	units	9.09	7.29
Conductivity	mS/cm	1.129	3.45
Ammonical Nitrogen as NH4-N	N mg/l	0.21	130.79
Dissolved Methane	CH4 mg/l	0.019	0.019
Chloride (Cl)	Cl mg/l	236.1	394.9
Potassium (K)	K mg/l	78.09	102
Sodium (Na)	Na mg/l	149.3	216.9
COD	02 mg/l	168	108
BOD	02 mg/l	9	2
Total Oxidised Nitrogen (water)	N mg/l	<0.05	<0.05
Calcium (Ca)	Ca mg/l	13.39	167.8
Cadmium (Cd)	Cd mg/l	<0.00022	<0.00022
Chromium (Cr)	Cr mg/l	<0.001	<0.001
Copper (Cu)	Cu mg/l	<0.0016	<0.0016
Fluoride (F)	F mg/l	<0.3	<0.3
Iron (Fe)	Fe mg/l	0.026	0.056
Lead (Pb)	Pb mg/l	<0.0004	<0.0004
Magnesium (Mg)	Mg mg/l	19.57	36.7
Manganese (Mn)	Mn mg/l	<0.001	1.471
Nickel (Ni)	Ni mg/l	0.013	0.028
Mercury (Hg)	Hg mg/l	<0.00001	<0.00001
Sulphate (soluble) (SO4)	SO4 mg/l	25.75	90.86
Zinc (Zn)	Zn mg/l	<0.003	<0.003
Boron (B)	B mg/l	0.523	0.981
ortho-phosphate	PO4 mg/l	0.62	0.14

Analysis conducted byJones Environmental Forensics Ltd. Deeside, UK
CE05977

Q4 - Dunsink Leachate Results December 2009

Parameter	Units	Leachate Sump 08/12/2009	Lagoon 08/12/2009
pH	pH units	8.03	8.51
Conductivity	mS/cm	3.02	1.134
Temperature	^{o}C	12.5	7.4
Dissolved Oxygen	mg/l	10.0	9.0
Dissolved methane CH4	mg/l	<0.001	<0.001

Sampled on 8th December 2009

Analysis conducted by Jones Environmental Forensics Ltd.

APPENDIX III

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	06/01/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Dry/overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.5	20.3	0.0	1021	2.4	0.0
G36		0.0	0.0	20.6	0.0	1021	2.4	0.0
G37		**3.2**	**2.9**	0.0	0.0	1021	2.4	64.0
G38		0.3	**4.5**	8.4	0.0	1021	2.4	0.0
G39		0.1	**7.8**	12.7	0.0	1020	2.4	0.0
G40		0.0	**3.9**	0.1	0.0	1021	2.4	0.0
Leachate Sump		0.1	**4.5**	19.7	0.0	1021	2.4	2.0
Sewer		0.0	**2.6**	19.4	0.0	1021	2.4	0.0
IPS INLET*		**46.9**	**26.8**	2.7	0.0	1021	2.4	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	14/01/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF	Damp dull	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.5	19.2	0.0	997	5.5	0.0
G36		0.0	0.1	21.0	0.0	997	5.2	0.0
G37		0.1	**4.0**	2.2	0.0	997	5.5	2.0
G38		0.0	0.2	20.5	0.0	997	5.5	0.0
G39		0.0	**6.5**	9.7	0.0	997	5.0	0.0
G40		0.0	**3.5**	0.5	0.0	997	5.7	0.0
Leachate Sump		0.0	**1.8**	20.6	0.0	996	5.5	0.0
Sewer		0.0	**2.7**	20.2	0.0	997	5.5	0.0
IPS INLET*		**25.0**	**15.2**	9.2	0.0	997	5.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	29/01/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Cold, wet windy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.1	21.1	0.0	998	6.5	0.0
G36		0.0	0.0	21.3	0.0	997	6.5	0.0
G37		0.0	**3.0**	9.5	0.0	998	6.5	0.0
G38		0.0	0.5	21.0	0.0	997	6.5	0.0
G39		0.0	**5.1**	10.6	0.0	997	6.5	0.0
G40		0.1	**3.5**	0.7	0.0	998	6.5	1.0
Leachate Sump		0.0	0.4	21.1	0.0	999	6.5	0.0
Sewer		0.0	**2.2**	20.2	0.0	999	6.5	0.1
IPS INLET*		**44.3**	**1.8**	25.0	0.0	999	6.5	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM

(Baseline [ ] Ambient [x])

Site Name :	Site Address :				
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin				
Operator : Fingal County Council	National Grid Reference :				
Site Status : Operational	Date :	20/01/09	*Time:*	am	

Instrument Used :		Next Calibration due:
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Cold, Wet Blustery	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.1	21.0	0.0	977	2.2	0.0
G6		0.0	0.9	18.5	0.0	975	2.2	0.0
G7		0.0	0.2	21.0	0.0	975	2.2	0.0
G8		0.0	0.3	20.7	0.0	975	2.2	0.0
G9		0.0	**3.2**	16.1	0.0	976	2.2	0.0
G10		0.0	**3.0**	16.9	0.0	977	2.2	0.0
G12		0.0	0.0	21.3	0.0	976	2.2	0.0
G13		0.0	0.2	21.0	0.0	973	2.2	0.0
G18		0.0	0.3	21.0	0.0	977	2.2	0.0
G21		0.0	1.2	19.9	0.0	977	2.2	0.0
G23		0.0	**2.8**	14.0	0.0	975	2.2	0.0
G32		0.0	0.5	20.5	0.0	975	2.2	0.0
G35		0.0	0.0	21.3	0.0	977	2.2	0.0
G36		0.0	0.0	21.3	0.0	977	2.2	0.0
G37		0.0	1.5	18.2	0.0	977	2.2	0.0
G38		0.0	**1.9**	18.5	0.0	977	2.2	0.0
G39		0.0	**6.1**	4.2	0.0	977	2.2	0.0
G40		0.0	**2.7**	1.4	0.0	977	2.2	0.0
G41		0.0	0.0	20.1	0.0	977.0	2.2	0.0
G42		0.0	**2.0**	18.2	0.0	977	2.2	0.0
G43		0.0	1.0	19.8	0.0	976	2.2	0.0
G44		0.0	**3.0**	17.1	0.0	976	2.2	0.0
Leachate Sump		0.2	**3.8**	20.1	0.0	977	2.2	4.0
Sewer		0.0	**1.7**	18.6	0.0	977	2.2	0.0
IPS INLET*		**35.0**	**22.1**	3.9	0	977	2.2	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date	04/02/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Cold occassional snow/sleet	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.0	0.0	984	3.0	0.0
G36		0.0	0.0	21.0	0.0	984	3.0	0.0
G37		**6.1**	**3.5**	0.0	0.0	984	3.0	>>>>
G38		0.0	0.4	20.1	0.0	984	3.0	0.0
G39		**12.0**	**6.1**	0.9	0.0	984	3.0	>>>>
G40		0.0	0.4	2.2	0.0	984	3.0	0.0
Leachate Sump		1.0	**2.9**	20.0	0.0	984	3.0	20.0
Sewer		0.3	**2.5**	19.8	0.0	985	3.0	5.0
IPS INLET*		**40.6**	**23.8**	3.5	0.0	985	3.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date	11/02/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Fine Cold	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.1	21.0	0.0	1010	5.0	0.0
G36		0.0	0.0	21.0	0.0	1010	5.0	0.0
G37		0.1	1.3	19.2	0.0	1010	5.0	2.0
G38		0.0	0.3	20.2	0.0	1010	5.0	0.0
G39		**21.5**	**6.9**	0.0	0.0	1010	5.0	>>>>
G40		0.0	2.3	0.5	0.0	1010	5.0	0.0
Leachate Sump		0.4	**1.9**	20.3	0.0	1010	5.0	8.0
Sewer		0.0	**4.2**	20.0	0.0	1010	5.0	0.0
IPS INLET*		**37.8**	**22.0**	4.1	0.0	1010	5.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date	18/02/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Dry/overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.3	20.6	0.0	1019	6.0	0.0
G36		0.0	0.0	21.0	0.0	1019	6.0	0.0
G37		0.0	**1.9**	13.6	0.0	1019	6.0	0.0
G38		0.0	0.8	18.3	0.0	1019	6.0	0.0
G39		**11.0**	**5.9**	0.0	0.0	1019	6.0	15.9
G40		0.0	**3.0**	1.4	0.0	1019	6.0	0.0
Leachate Sump		0.0	0.6	20.8	0.0	1019	6.0	0.0
Sewer		0.0	0.4	20.8	0.0	1019	6.0	0.0
IPS INLET*		**47.1**	**25.6**	3.1	0	0	6.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	24/02/09	*Time:*	am

Instrument Used :		Next Calibration due:
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Dunsink Lane, Dunsink., Co. Dublin	Barometric Pressure :
		Dry/Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.2	0.0	1021	8.0	0.0
G6		0.0	**1.7**	17.0	0.0	1020	8.0	0.0
G7		0.0	0.1	21.1	0.0	1020	8.0	0.0
G8		0.0	0.2	20.6	0.0	1021	8.0	0.0
G9		0.0	**3.4**	16.3	0.0	1021	8.0	0.0
G10		0.0	**2.3**	14.4	0.0	1021	8.0	0.0
G12		0.0	0.0	20.0	0.0	1019	8.0	0.0
G13		0.0	0.2	21.2	0.0	1018	8.0	0.0
G18		0.0	0.2	20.6	0.0	1020	8.0	0.0
G21		0.0	0.0	21.1	0.0	1021	8.0	0.0
G23		0.0	**3.2**	16.3	0.0	1020	8.0	0.0
G32		0.0	0.5	19.5	0.0	1020	8.0	0.0
G35		0.0	0.3	20.9	0.0	1021	8.0	0.0
G36		0.0	0.0	21.0	0.0	1021	8.0	0.0
G37		0.0	0.6	18.3	0.0	1021	8.0	0.0
G38		0.0	0.1	20.9	0.0	1021	8.0	2.8
G39		0.4	**8.4**	0.1	0.0	1021	8.0	8.0
G40		0.0	**3.0**	1.7	0.0	1021	8.0	0.0
G41		0.2	0.0	20.7	0.0	1021	8.0	4.0
G42		0.0	0.0	20.9	0.0	1021	8.0	0.0
G43		0.0	1.2	17.6	0.0	1021	8.0	0.0
G44		0.0	1.4	17.4	0.0	1021	8.0	0.0
Leachate Sump		0.0	0.4	20.8	0.0	1021	8.0	0.0
Sewer		0.0	**3.9**	19.6	0.0	1021	8.0	0.0
IPS INLET*		**52.8**	**28.8**	2.8	0.0	1021	8.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date	11/03/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Warm/Dry	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.3	19.6	0.0	1011	15	0.0
G36		0.0	0.1	20.9	0.0	1010	15	0.0
G37		0.0	0.7	18.7	0.0	1010	15	0.0
G38		0.0	0.0	21.0	0.0	1010	15	0.0
G39		0.0	**9.6**	6.8	0.0	1010	15	0.0
G40		0.0	**3.8**	1.9	0.0	1010	15	0.0
Leachate Sump		0.0	0.3	21.1	0.0	1011	15	0.0
Sewer		0.0	**2.2**	20.1	0.0	1011	15	0.0
IPS INLET*					0.0	1011	15	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date	04/03/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Dry/overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.2	20.7	0.0	973	8.0	0.0
G36		0.0	0.0	21.2	0.0	973	8.0	0.0
G37		0.3	**3.9**	1.7	0.0	973	8.0	0.0
G38		0.0	0.2	20.0	0.0	973	8.0	0.0
G39		**7.6**	**8.9**	0.0	0.0	972	8.0	18.1
G40		0.0	**3.5**	1.8	0.0	973	8.0	0.0
Leachate Sump		0.0	**3.3**	21.3	0.0	973	8.0	0.0
Sewer		0.0	**1.8**	20.4	0.0	973	8.0	0.0
IPS INLET*		**53.8**	**27.8**	2.3	0	973	8.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date	18/03/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Warm/Dry	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.1	20.9	0.0	1023	16	0.0
G36		0.0	0.0	21.1	0.0	1023	16	0.0
G37		0.0	**2.8**	11.2	0.0	1023	16	0.0
G38		0.0	0.3	19.6	0.0	1023	16	0.0
G39		0.0	**9.1**	8.9	0.0	1023	16	0.0
G40		0.1	**4.0**	1.9	0.0	1023	16	0.0
Leachate Sump		0.0	0.6	20.8	0.0	1024	16	0.0
Sewer		0.0	**2.6**	20.0	0.0	1023	16	0.0
IPS INLET*		**38.6**	**23.7**	3.1	0.0	1023	16	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :	Site Address :			
Dunsink Landfill	Dunsink Lane, Dunsink., Co. Dublin			
Operator : Fingal County Council	National Grid Reference :			
Site Status : Operational	Date :	24/03/09	*Time:*	am

Instrument Used :		Next Calibration due:
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF	Cool/Dry/windy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.1	0.0	1012	0.0	0.0
G6		0.0	**2.8**	18.8	0.0	1014	11.0	0.0
G7		0.2	0.0	20.5	0.0	1014	11.0	5.0
G8		0.4	0.4	20.2	0.0	1014	11.0	9.7
G9		0.2	**3.5**	15.9	0.0	1014	11.0	3.7
G10		0.3	**2.7**	15.9	0.0	1014	11.0	6.2
G12		0.0	0.0	21.2	0.0	1010	11.0	0.0
G13		0.0	0.9	19.1	0.0	1009	11.0	0.0
G18		0.0	0.7	19.6	0.0	1012	11.0	0.0
G21		0.0	0.0	21.2	0.0	1010	11.0	0.0
G23		inaccessible due to M50 upgrade works						
G32		inaccessible due to M50 upgrade works						
G35		0.0	0.0	20.3	0.0	1012	11.0	0.0
G36		0.0	0.0	20.4	0.0	1012	11.0	0.0
G37		0.0	**1.7**	14.2	0.0	1012	11.0	0.0
G38		0.0	**3.9**	11.4	0.0	1012	11.0	0.0
G39		0.0	**8.3**	7.2	0.0	1012	11.0	0.0
G40		0.0	**3.9**	1.3	0.0	1014	11.0	0.0
G41		0.0	0.0	20.8	0.0	1014	11.0	0.0
G42		0.0	0.6	18.8	0.0	1013	11.0	0.0
G43		0.0	**1.7**	17.8	0.0	1014	11.0	0.0
G44		0.0	0.8	18.9	0.0	1014	11.0	0.0
Leachate Sump		0.3	**2.5**	20.3	0.0	1013	11.0	10.5
Sewer		0.0	0.3	20.9	0.0	1014	11.0	0.0
IPS INLET*		**44.2**	**25.3**	2.9	0.0	977	11.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	01/04/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Clear/dry	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.0	20.5	0.0	1014	13.0	0.0
G36		0.0	0.0	20.2	0.0	1015	13.0	0.0
G37		0.0	0.1	20.2	0.0	1014	13.0	0.0
G38		0.0	0.6	19.0	0.0	1015	13.0	0.0
G39		0.0	**9.1**	13.1	0.0	1014	13.0	0.0
G40		0.0	**4.7**	2.7	0.0	1014	13.0	0.0
Leachate Sump		0.0	0.4	20.3	0.0	1016	13.0	0.0
Sewer		0.0	**3.0**	19.9	0.0	1016	13.0	0.0
IPS INLET*		**62.8**	**25.9**	1.3	0.0	1016	13.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	08/04/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	DMcD	Weather :	Barometric Pressure :
		Dry/Fine	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.1	20.6	0.0	990	10.0	0.0
G36		0.0	0.1	20.7	0.0	990	10.0	0.0
G37		0.0	**2.0**	12.5	0.0	990	10.0	0.0
G38		0.0	0.0	20.8	0.0	990	10.0	0.0
G39		0.0	**9.8**	3.8	0.0	990	10.0	0.0
G40		0.0	**5.0**	3.2	0.0	990	10.0	0.0
Leachate Sump		0.0	0.6	20.5	0.0	990	10.0	0.0
Sewer		0.0	0.4	20.5	0.0	990	10.0	0.0
IPS INLET*		**47.9**	**27.3**	1.1	0.0	990	10.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	15/04/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	DMcD	Weather :	Barometric Pressure :
		Overcast/rainy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.6	19.4	0.0	1001	11.0	0.0
G36		0.0	0.0	21.0	0.0	1001	11.0	0.0
G37		0.7	**6.2**	0.0	0.0	1001	11.0	0.0
G38		0.0	**6.5**	8.0	0.0	1001	11.0	0.0
G39		0.0	**9.5**	8.9	0.0	1001	11.0	0.0
G40		0.0	**5.9**	2.9	0.0	1001	11.0	0.0
Leachate Sump		0.0	0.2	21.2	0.0	1001	11.0	0.0
Sewer		0.0	**1.6**	20.7	0.0	1001	11.0	0.0
IPS INLET*		**44.0**	**26.9**	1.2	0.0	1001	11.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	22/04/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Dry/Fine	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.6	18.9	0.0	1014	12.0	0.0
G36		0.0	0.0	21.1	0.0	1014	12.0	0.0
G37		0.3	1.1	15.5	0.0	1014	12.0	0.0
G38		0.0	**6.4**	8.2	0.0	1014	12.0	0.0
G39		0.0	**10.0**	8.7	0.0	1014	12.0	0.0
G40		0.0	**5.9**	2.1	0.0	1014	12.0	0.0
Leachate Sump		0.0	0.3	20.9	0.0	1015	12.0	0.0
Sewer		0.0	**1.9**	20.3	0.0	1015	12.0	0.0
IPS INLET*		**42.7**	**26.3**	1.1	0.0	990	12.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature recorded as ambient outdoor temperature

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	01/05/09	***Time:***	am

Instrument Used :		**Next Calibration due:**
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	DMcD	**Weather :**	**Barometric Pressure :**
		Wet, Blustery	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.7	0.0	1005	12.0	0.0
G6		0.0	**3.0**	13.7	0.0	1005	12.0	0.0
G7		0.0	0.0	20.4	0.0	1005	11.0	0.0
G8		0.0	0.3	19.4	0.0	1005	11.0	0.0
G9		0.0	0.0	20.6	0.0	1005	11.0	0.0
G10		0.0	**4.6**	10.1	0.0	1005	12.5	0.0
G12		0.0	0.1	20.7	0.0	1001	12.0	0.0
G13		0.0	0.7	18.9	0.0	1001	12.0	0.0
G18		0.0	0.0	20.7	0.0	1001	12.0	0.0
G21		0.0	0.0	20.7	0.0	1005	12.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.8	17.9	0.0	1004	12.0	0.0
G36		0.0	0.0	20.6	0.0	1004	12.0	0.0
G37		0.0	0.0	20.8	0.0	1001	12.0	0.0
G38		0.0	0.0	19.7	0.0	1001	12.0	0.0
G39		0.0	**12.1**	4.1	0.0	1004	12.0	0.0
G40		0.0	0.0	20.6	0.0	1004	12.0	0.0
G41		0.2	**7.0**	0.0	0.0	1004.0	12.0	0.0
G42		0.0	1.1	18.4	0.0	1004	12.0	0.0
G43		0.0	**6.4**	9.1	0.0	1005	13.5	0.0
G44		0.0	**8.8**	7.2	0.0	1005	13.5	0.0
Leachate Sump		0.0	0.5	19.5	0.0	1004	12.0	0.0
Sewer		0.0	**2.5**	18.1	0.0	1006	12.0	0.0
IPS INLET*		**46.1**	**27**	0.9	0.0	1006	12.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	06/05/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	Weather :	Barometric Pressure :
		Dry/Fine	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C*	LEL % v/v
G35		0.0	0.5	19.9	0.0	1004	15.0	0.0
G36		0.0	0.1	20.2	0.0	1003	14.0	0.0
G37		0.0	**6.0**	11.4	0.0	1003	15.5	0.0
G38		0.0	**4.9**	12.0	0.0	1003	14.5	0.0
G39		0.0	**10.9**	7.4	0.0	1002	13.0	0.0
G40		0.0	**7.0**	1.3	0.0	1004	14.0	0.0
Leachate Sump		0.0	0.2	20.0	0.0	1004	14.0	0.0
Sewer		0.0	**1.6**	19.4	0.0	1004	14.5	0.0
IPS INLET*		**45.1**	**26.8**	1.1	0.0	1004	14.5	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	14/05/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF	Dull/ Damp	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	0.6	19.9	0.0	1008	12.0	0.0
G36		0.0	0.1	20.8	0.0	1008	12.0	0.0
G37		3.2	**3.4**	0.4	0.0	1008	12.0	64.0
G38		0.0	0.1	20.8	0.0	1008	12.0	0.0
G39		0.0	**3.6**	16.0	0.0	1007	12.0	0.0
G40		0.0	**5.5**	2.6	0.0	1008	12.0	0.0
Leachate Sump		0.0	0.0	21.1	0.0	1008	12.0	0.0
Sewer		0.0	0.4	20.1	0.0	1008	12.0	0.0
IPS INLET*					0.0	1008	12.0	0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature probe malfunctioning- average daily ambient temperature noted

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	20/05/09	***Time:***	am

Instrument Used :		**Next Calibration due:**
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	**Weather :**	**Barometric Pressure :**
		Wet, Blustery	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.0	0.0	1006	12.0	0.0
G6		0.0	1.2	17.8	0.0	1006	12.0	0.0
G7		0.0	0.0	20.9	0.0	1006	12.0	0.0
G8		0.0	0.0	21.0	0.0	1006	12.0	0.0
G9		0.0	0.3	20.1	0.0	1006	12.0	0.0
G10		0.0	**2.3**	13.3	0.0	1006	12.0	0.0
G12		0.0	0.0	21.0	0.0	1003	12.0	0.0
G13		0.0	0.0	20.9	0.0	1003	12.0	0.0
G18		0.0	0.0	20.6	0.0	1006	12.0	0.0
G21		0.0	0.0	20.7	0.0	1006	12.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.0	20.9	0.0	1006	12.0	0.0
G36		0.0	0.0	20.8	0.0	1006	12.0	0.0
G37		0.0	0.0	20.8	0.0	1006	12.0	0.0
G38		0.3	**3.7**	7.5	0.0	1006	12.0	0.0
G39		0.0	0.0	20.9	0.0	1006	12.0	0.0
G40		0.0	**4.2**	4.6	0.0	1006	12.0	0.0
G41		0.0	**4.4**	4.3	0.0	1006.0	12.0	0.0
G42		0.0	0.0	20.9	0.0	1006	12.0	0.0
G43		0.0	**2.9**	17.4	0.0	1006	12.0	0.0
G44		0.0	**6.7**	13.3	0.0	1006	12.0	0.0
Leachate Sump		0.0	0.3	20.6	0.0	1006	12.0	0.0
Sewer		0.0	**2.9**	19.0	0.0	1006	12.0	0.0
IPS INLET*		**43.8**	**27.1**	0.4	0.0	1006	12.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	28/05/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Fine Sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	1.2	19.7	0.0	1021	18.0	0.0
G36		0.0	0.1	20.8	0.0	1021	18.0	0.0
G37		0.0	0.9	19.6	0.0	1021	18.0	0.0
G38		0.0	**3.7**	14.0	0.0	1021	18.0	0.0
G39		0.0	0.0	20.9	0.0	1021	18.0	0.0
G40		0.0	**4.4**	4.9	0.0	1021	18.0	0.0
Leachate Sump		0.0	0.2	20.4	0.0	1023	18.0	0.0
Sewer		0.0	0.6	20.2	0.0	1023	18.0	0.0
IPS INLET*		**53.3**	**29.4**	0.3	0.0	1023	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature probe malfunctioning- average daily ambient temperature noted

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	03/06/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Fine Sunny	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	**1.6**	18.6	0.0	1016	21.0	0.0
G36		0.0	0.0	20.8	0.0	1016	21.0	0.0
G37		0.0	**3.1**	14.6	0.0	1016	21.0	0.0
G38		0.0	**7.7**	7.6	0.0	1016	21.0	0.0
G39		0.0	0.0	20.8	0.0	1016	21.0	0.0
G40		0.1	**5.8**	1.1	0.0	1016	21.0	0.0
Leachate Sump		0.0	0.3	20.6	0.0	1016	21.0	0.0
Sewer		0.0	1.0	20.4	0.0	1016	21.0	0.0
IPS INLET*		**43.5**	**27.3**	0.4	0.0	1016	21.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature probe malfunctioning- average daily ambient temperature noted

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	11/06/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Fine Slightly Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	**2.5**	17.2	0.0	1007	15.0	0.0
G36		0.0	0.1	20.8	0.0	1006	16.5	0.0
G37		0.0	0.1	20.6	0.0	1007	16.5	0.0
G38		0.0	**7.2**	8.3	0.0	1007	18.5	0.0
G39		0.0	0.0	20.9	0.0	1006	18.5	0.0
G40		0.1	**6.9**	2.0	0.0	1008	13.0	0.0
Leachate Sump		0.0	0.1	20.8	0.0	1009	12.0	0.0
Sewer		0.0	**2.5**	19.7	0.0	1009	13.0	0.0
IPS INLET*		**45.9**	**27.7**	0.4	0.0	1009	13.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature probe malfunctioning- average daily ambient temperature noted

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	17/06/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Raining Mild	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C**	LEL % v/v
G35		0.0	**2.6**	16.0	0.0	999	15.0	0.0
G36		0.0	0.2	20.7	0.0	999	15.0	0.0
G37		0.0	**3.0**	11.8	0.0	999	15.0	0.0
G38		0.0	**9.0**	4.9	0.0	999	15.0	0.0
G39		0.0	0.0	21.0	0.0	999	15.0	0.0
G40		0.0	**5.7**	3.6	0.0	999	15.0	0.0
Leachate Sump		0.0	0.0	20.9	0.0	999	15.0	0.0
Sewer		0.0	**3.1**	19.7	0.0	999	15.0	0.0
IPS INLET*		**Inaccessible on day of monitoring**						

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

** Temperature probe malfunctioning- average daily ambient temperature noted

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	24/06/09	***Time:***	am

Instrument Used :		**Next Calibration due:**
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF	**Weather :**	**Barometric Pressure :**
		Sunny Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.6	0.0	1014	20.0	0.0
G6		0.0	1.2	19.2	0.0	1014	20.0	0.0
G7		0.0	0.0	20.9	0.0	1014	20.0	0.0
G8		0.0	0.0	20.9	0.0	1014	20.0	0.0
G9		0.0	0.0	20.9	0.0	1014	20.0	0.0
G10		0.0	**8.5**	11.5	0.0	1014	20.0	0.0
G12		0.0	0.0	20.0	0.0	1012	20.0	0.0
G13		0.0	0.1	20.2	0.0	1012	20.0	0.0
G18		0.0	0.0	20.5	0.0	1014	20.0	0.0
G21		0.0	0.0	20.5	0.0	1014	20.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	**1.7**	16.8	0.0	1014	20.0	0.0
G36		0.0	0.0	20.3	0.0	1014	20.0	0.0
G37		0.0	**5.8**	6.1	0.0	1014	20.0	0.0
G38		0.0	**9.3**	7.5	0.0	1014	20.0	0.0
G39		0.0	0.0	20.4	0.0	1014	20.0	0.0
G40		0.0	**5.4**	3.2	0.0	1014	20.0	0.0
G41		0.0	0.0	20.4	0.0	1014	20.0	0.0
G42		0.0	0.0	20.5	0.0	1014	20.0	0.0
G43		0.0	**8.2**	6.9	0.0	1014	20.0	0.0
G44		0.0	**9.9**	7.3	0.0	1014	20.0	0.0
Leachate Sump		0.0	0.0	20.6	0.0	1014	20.0	0.0
Sewer		0.2	**2.8**	20.3	0.0	1015	20.0	0.0
IPS INLET*		**39.2**	**26.4**	0.5	0.0	1015	20.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	02/07/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	**10.5**	0.8	0.0	1006	19.0	0.0
G36		0.0	0.7	19.5	0.0	1006	18.5	0.0
G37		0.0	**3.8**	12.5	0.0	1006	18.5	0.0
G38		0.0	**12.5**	2.3	0.0	1007	21.0	0.0
G39		0.0	**4.0**	12.1	0.0	1006	18.0	0.0
G40		0.0	**7.8**	0.0	0.0	1006	18.0	0.0
Leachate Sump		0.0	0.2	20.5	0.0	1007	20.5	0.0
Sewer		0.1	**4.5**	19.2	0.0	1007	18.5	4.4
IPS INLET*		**45.0**	**27.4**	0.3	0.0	1007.0	18.5	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	09/07/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Warm Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.7	20.1	0.0	1008	17.5	0.0
G36		0.0	0.2	20.2	0.0	1008	19.0	0.0
G37		0.0	0.7	19.3	0.0	1008	17.0	0.0
G38		0.0	0.5	19.2	0.0	1008	21.0	0.0
G39		0.0	**12.5**	3.9	0.0	1008	18.0	0.0
G40		0.0	**7.3**	1.6	0.0	1008	21.0	0.0
Leachate Sump		0.0	0.2	20.3	0.0	1009	19.5	0.0
Sewer		0.0	**2.2**	19.6	0.0	1010	20.0	0.0
IPS INLET*		**39.3**	**25.9**	1.0	0.0	1010.0	20.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	16/07/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/NR	Weather :	Barometric Pressure :
		Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	**1.9**	18.2	0.0	1007	21.0	0.0
G36		0.0	0.4	19.8	0.0	1006	18.5	0.0
G37		0.0	**13.8**	2.6	0.0	1006	19.0	0.0
G38		0.0	0.5	18.9	0.0	1007	20.5	0.0
G39		0.0	0.6	19.6	0.0	1006	18.0	0.0
G40		0.0	**7.9**	0.5	0.0	1006	19.0	0.0
Leachate Sump		0.2	0.6	20.1	0.0	1007	22.0	0.0
Sewer		0.0	**3.4**	19.1	0.0	1007	17.5	0.0
IPS INLET*		**43.8**	**26.8**	0.9	0.0	1007.0	17.5	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	22/07/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Cloudy Damp	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.1	20.6	0.0	984	18.0	0.0
G36		0.0	0.0	20.7	0.0	984	18.0	0.0
G37		0.0	0.0	20.6	0.0	984	18.0	0.0
G38		0.0	0.0	20.6	0.0	984	18.0	0.0
G39		0.0	1.0	18.0	0.0	984	18.0	0.0
G40		0.0	**3.6**	8.5	0.0	982	18.0	0.0
Leachate Sump		0.0	0.2	19.9	0.0	985	18.0	0.0
Sewer		0.3	**5.0**	19.1	0.0	985	18.0	0.0
IPS INLET*		**47.7**	**28.0**	0.8	0.0	985.0	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	30/07/09	***Time:***	AM

Instrument Used :		**Next Calibration due:**
GFM 430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Cloudy Warm	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	1.3	19.7	0.0	1009	20.0	0.0
G6		0.0	**1.6**	18.7	0.0	1008	20.0	0.0
G7		0.0	0.0	21.0	0.0	1008	20.0	0.0
G8		0.0	0.0	20.9	0.0	1008	20.0	0.0
G9		0.0	1.2	19.0	0.0	1008	20.0	0.0
G10		0.0	1.3	18.7	0.0	1008	20.0	0.0
G12		0.0	1.1	19.0	0.0	1008	20.0	0.0
G13		0.0	0.0	20.6	0.0	1008	20.0	0.0
G18		0.0	0.0	20.6	0.0	1008	20.0	0.0
G21		0.0	0.0	21.3	0.0	1010	20.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.4	20.4	0.0	1010	20.0	0.0
G36		0.0	0.1	20.6	0.0	1010	20.0	0.0
G37		0.0	0.3	20.1	0.0	1010	20.0	0.0
G38		0.0	0.0	20.1	0.0	1010	20.0	0.0
G39		0.0	0.0	20.7	0.0	1010	20.0	0.0
G40		0.0	**12.0**	5.1	0.0	1008	20.0	0.0
G41		0.3	**3.7**	6.4	0.0	1008.0	20.0	6.0
G42		0.0	0.0	20.5	0.0	1010	20.0	0.0
G43		0.0	**7.3**	12.8	0.0	1008	20.0	0.0
G44		0.7	0.4	19.0	0.0	1010	20.0	14.0
Leachate Sump		0.3	0.0	20.5	0.0	1008	20.0	6.0
Sewer		0.0	1.1	19.2	0.0	1010	20.0	0.0
IPS INLET*		**39.9**	**25**	1.1	0.0	1008	20.0	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	06/08/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/NR	Weather :	Barometric Pressure :
		Cloudy Damp	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.6	19.5	0.0	1009	20.0	0.0
G36		0.0	1.3	19.1	0.0	1009	21.0	0.0
G37		0.0	0.2	19.9	0.0	1009	21.0	0.0
G38		0.0	**4.3**	14.6	0.0	1009	22.5	0.0
G39		0.0	**14.7**	2.3	0.0	1007	21.5	0.0
G40		0.0	**8.4**	1.2	0.0	1009	22.5	0.0
Leachate Sump		0.0	0.2	19.8	0.0	1009	22.0	0.0
Sewer		0.0	**2.2**	17.9	0.0	1010	21.5	0.0
IPS INLET*		**41.3**	**26.3**	11.0	0.0	1010.0	21.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	14/08/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.6	0.0	1010	19.0	0.0
G36		0.0	0.2	20.2	0.0	1010	19.0	0.0
G37		0.0	1.2	18.8	0.0	1010	19.0	0.0
G38		0.0	**7.3**	11.6	0.0	1010	19.0	0.0
G39		0.0	**14.7**	5.4	0.0	1010	19.0	0.0
G40		0.0	**7.7**	1.5	0.0	1011	19.0	0.0
Leachate Sump		0.0	0.5	20.2	0.0	1011	19.0	0.0
Sewer		0.0	**3.7**	19.3	0.0	1010	19.0	0.0
IPS INLET*		**37.5**	**28.8**	12.0	0.0	1010	19.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	20/08/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.4	19.4	0.0	992	17.5	0.0
G36		0.0	0.2	19.7	0.0	993	15.5	0.0
G37		0.0	0.0	20.4	0.0	992	18.0	0.0
G38		0.0	**9.1**	9.8	0.0	993	18.0	0.0
G39		0.0	**15.1**	3.9	0.0	992	19.0	0.0
G40		0.0	**9.0**	0.6	0.0	992	19.6	0.0
Leachate Sump		0.0	0.3	19.7	0.0	993	18.0	0.0
Sewer		0.0	**3.0**	19.0	0.0	992	19.0	0.0
IPS INLET*		**42.8**	**27.0**	1.0	0.0	992	19.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	27/08/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.5	20.1	0.0	998	20.0	0.0
G36		0.0	0.0	20.9	0.0	998	20.0	0.0
G37		0.0	**6.2**	7.2	0.0	998	20.0	0.0
G38		0.0	**13.0**	5.6	0.0	999	20.0	0.0
G39		0.0	**8.6**	11.8	0.0	998	20.0	0.0
G40		0.0	**9.2**	12.0	0.0	997	20.0	0.0
Leachate Sump		0.0	0.2	20.7	0.0	998	20.0	0.0
Sewer		0.0	**2.8**	19.9	0.0	999	20.0	0.0
IPS INLET*		**41.1**	**26.6**	1.1	0.0	999	20.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	02/09/09	***Time:***	AM

Instrument Used :		**Next Calibration due:**	
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10	
Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Rainy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.5	0.0	992	16.0	0.0
G6		0.0	**1.9**	18.6	0.0	993	15.5	0.0
G7		0.0	0.0	20.3	0.0	993	14.5	0.0
G8		0.0	0.4	19.9	0.0	993	14.0	0.0
G9		0.0	**3.6**	18.0	0.0	993	14.5	0.0
G10		0.0	**12.4**	5.1	0.0	993	14.5	0.0
G12		0.0	0.1	20.1	0.0	988	16.0	0.0
G13		0.0	0.7	20.0	0.0	988	13.0	0.0
G18		0.0	0.4	20.1	0.0	990	13.5	0.0
G21		0.0	0.2	20.4	0.0	993	15.5	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.8	19.1	0.0	991	17.0	0.0
G36		0.0	0.3	20.2	0.0	991	15.5	0.0
G37		0.0	**9.3**	1.9	0.0	991	15.5	0.0
G38		0.0	0.0	20.6	0.0	991	15.5	0.0
G39		0.4	**15.0**	1.4	0.0	990	15.5	0.0
G40		0.0	**9.6**	0.7	0.0	993	14.5	0.0
G41		0.0	0.6	19.8	0.0	993.0	14.5	0.0
G42		0.0	**2.6**	16.0	0.0	992	14.5	0.0
G43		0.0	**9.1**	12.1	0.0	993	15.0	0.0
G44		0.0	**16.0**	2.6	0.0	993	15.0	0.0
Leachate Sump		0.0	0.6	20.3	0.0	993	15.0	0.0
Sewer		0.0	**4.7**	18.9	0.0	993	19.5	0.0
IPS INLET*		**42.9**	**27.1**	1	0.0	993	19.5	>>>>

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	10/09/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-09

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Warm Fine	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.6	20.1	0.0	1030	20.0	0.0
G36		0.0	0.2	20.9	0.0	1030	20.0	0.0
G37		0.0	**3.3**	14.8	0.0	1030	20.0	0.0
G38		0.0	**11.0**	9.0	0.0	1030	20.0	0.0
G39		0.0	**16.0**	6.0	0.0	1030	20.0	0.0
G40		0.0	**9.8**	1.1	0.0	1030	20.0	0.0
Leachate Sump		0.0	0.6	20.9	0.0	1030	20.0	0.0
Sewer		0.0	**3.8**	19.8	0.0	1030	20.0	0.0
IPS INLET*		**36.2**	**25.6**	1.1	0.0	1030	20.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	18/09/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Overcast	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.2	21.1	0.0	1016	20.0	0.0
G36		0.0	0.0	21.3	0.0	1016	20.0	0.0
G37		**1.4**	**1.9**	13.9	0.0	1015	20.0	28.0
G38		0.0	**2.5**	17.6	0.0	1015	20.0	0.0
G39		0.0	**1.8**	18.3	0.0	1015	20.0	0.0
G40		0.0	**1.9**	15.7	0.0	1015	20.0	0.0
Leachate Sump		0.0	0.2	21.1	0.0	1017	20.0	0.0
Sewer		0.0	0.5	20.2	0.0	1016	20.0	0.0
IPS INLET*		**47.2**	**27.7**	1.3	0.0	1016	20.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	24/09/09	***Time:***	AM

Instrument Used :		**Next Calibration due:**
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/AW	**Weather :**	**Barometric Pressure :**
		Fine	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.3	0.0	1017	18.0	0.0
G6		0.0	0.1	21.3	0.0	1017	18.0	0.0
G7		0.0	0.0	21.3	0.0	1017	18.0	0.0
G8		0.0	0.0	21.3	0.0	1017	18.0	0.0
G9		0.0	0.4	21.0	0.0	1017	18.0	0.0
G10		0.0	0.0	21.3	0.0	1017	18.0	0.0
G12		0.0	0.0	21.3	0.0	1014	18.0	0.0
G13		0.0	0.0	21.3	0.0	1014	18.0	0.0
G18		0.0	0.0	21.2	0.0	1016	18.0	0.0
G21		0.0	0.0	21.4	0.0	1017	18.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.1	21.0	0.0	1017	18.0	0.0
G36		0.0	0.1	21.1	0.0	1017	18.0	0.0
G37		0.0	0.4	20.8	0.0	1017	18.0	0.0
G38		0.0	0.2	20.8	0.0	1017	18.0	0.0
G39		0.0	0.0	21.2	0.0	1017	18.0	0.0
G40		0.0	**1.6**	19.1	0.0	1017	18.0	0.0
G41		0.0	1.3	19.4	0.0	1017.0	18.0	0.0
G42		0.0	0.0	21.0	0.0	1017	18.0	0.0
G43		0.0	1.3	20.0	0.0	1017	18.0	0.0
G44		0.0	1.2	20.1	0.0	1017	18.0	0.0
Leachate Sump		0.0	0.1	21.3	0.0	1017	18.0	0.0
Sewer		0.0	0.0	21.3	0.0	1017	18.0	0.0
IPS INLET*		**38.4**	**25.8**	1.4	0.0	1017	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	01/10/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cloudy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	20.9	0.0	1012	18.0	0.0
G36		0.0	0.0	21.0	0.0	1012	18.0	0.0
G37		0.0	0.0	20.9	0.0	1012	18.0	0.0
G38		0.0	0.5	19.8	0.0	1012	18.0	0.0
G39		0.0	1.2	19.2	0.0	1012	18.0	0.0
G40		0.0	**1.7**	15.8	0.0	1012	18.0	0.0
Leachate Sump		0.0	0.0	21.0	0.0	1013	18.0	0.0
Sewer		0.0	0.0	20.7	0.0	1013	18.0	0.0
IPS INLET*		**37.0**	**25.6**	1.5	0.0	1013	18.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	08/10/09	***Time:***	AM

Instrument Used :		**Next Calibration due:**	
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10	
Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Cloudy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.0	0.0	1010	16.0	0.0
G6		0.0	0.1	20.7	0.0	1009	16.0	0.0
G7		0.0	0.0	21.1	0.0	1010	16.0	0.0
G8		0.0	0.0	21.0	0.0	1010	16.0	0.0
G9		0.0	0.2	20.6	0.0	1010	16.0	0.0
G10		0.0	**1.9**	17.7	0.0	1010	16.0	0.0
G12		0.0	0.0	21.0	0.0	1010	16.0	0.0
G13		0.0	0.0	21.2	0.0	1008	16.0	0.0
G18		0.0	0.0	21.1	0.0	1010	16.0	0.0
G21		0.0	0.0	20.9	0.0	1010	16.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.0	20.8	0.0	1010	16.0	0.0
G36		0.0	0.0	20.9	0.0	1010	16.0	0.0
G37		0.0	0.4	19.6	0.0	1010	16.0	0.0
G38		0.0	1.0	18.9	0.0	1010	16.0	0.0
G39		0.4	**4.6**	15.5	0.0	1010	16.0	0.0
G40		0.0	0.0	20.8	0.0	1010	16.0	0.0
G41		0.0	0.0	21.2	0.0	1010.0	16.0	0.0
G42		0.0	0.0	20.9	0.0	1010	16.0	0.0
G43		0.0	**4.1**	13.3	0.0	1010	16.0	0.0
G44		0.0	0.2	20.8	0.0	1010	16.0	0.0
Leachate Sump		0.0	0.1	20.8	0.0	1010	16.0	0.0
Sewer		0.0	0.4	20.9	0.0	1010	16.0	0.0
IPS INLET*		Temporarily Inaccessible						

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	15/10/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Cloudy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.0	0.0	1023	16.0	0.0
G36		0.0	0.0	21.0	0.0	1023	16.0	0.0
G37		0.0	0.0	20.6	0.0	1023	16.0	0.0
G38		0.0	1.4	18.3	0.0	1023	16.0	0.0
G39		0.0	0.0	21.0	0.0	1023	16.0	0.0
G40		0.0	**3.0**	12.4	0.0	1023	16.0	0.0
Leachate Sump		0.0	0.0	21.1	0.0	1024	16.0	0.0
Sewer		0.0	0.6	20.7	0.0	1025	16.0	0.0
IPS INLET*		**13.1**	**8.9**	14.2	0.0	1025	16.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	22/10/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Damp Dull	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	**1.8**	15.6	0.0	982	14.0	0.0
G36		0.0	0.0	20.8	0.0	981	14.0	0.0
G37		0.0	0.1	20.3	0.0	981	14.0	0.0
G38		0.0	0.3	20.3	0.0	981	14.0	0.0
G39		0.3	**9.0**	6.2	0.0	981	14.0	0.0
G40		0.0	1.0	18.0	0.0	980	14.0	0.0
Leachate Sump		0.0	0.0	20.9	0.0	981	14.0	0.0
Sewer		0.0	0.3	20.1	0.0	982	14.0	0.0
IPS INLET*		**50.3**	**29.4**	1.3	0.0	982	14.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	29/10/09	***Time:***	AM

Instrument Used :		**Next Calibration due:**
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Dull Damp	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.1	20.7	0.0	1006	14.0	0.0
G6		0.0	0.4	20.3	0.0	1006	14.0	0.0
G7		0.0	0.0	21.2	0.0	1006	14.0	0.0
G8		0.0	0.0	21.3	0.0	1006	14.0	0.0
G9		0.0	0.2	20.7	0.0	1006	14.0	0.0
G10		0.0	0.3	20.6	0.0	1006	14.0	0.0
G12		0.0	0.0	21.2	0.0	1004	14.0	0.0
G13		0.0	0.0	21.2	0.0	1004	14.0	0.0
G18		0.0	0.0	21.2	0.0	1006	14.0	0.0
G21		0.0	0.0	21.1	0.0	1006	14.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.5	20.1	0.0	1006	14.0	0.0
G36		0.0	0.0	20.8	0.0	1006	14.0	0.0
G37		0.0	0.0	20.8	0.0	1006	14.0	0.0
G38		0.0	0.4	20.0	0.0	1006	14.0	0.0
G39		0.0	0.5	19.7	0.0	1005	14.0	0.0
G40		0.1	1.4	16.9	0.0	1006	14.0	0.0
G41		0.0	0.0	20.9	0.0	1006.0	14.0	0.0
G42		0.0	0.0	21.2	0.0	1006	14.0	0.0
G43		0.0	1.2	18.9	0.0	1006	14.0	0.0
G44		0.0	**1.7**	18.3	0.0	1006	14.0	0.0
Leachate Sump		0.0	0.0	21.2	0.0	1006	14.0	0.0
Sewer		0.0	0.0	21.1	0.0	1006	14.0	0.0
IPS INLET*		**38.7**	**25.6**	1.9	0.0	1006.0	14.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	05/11/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Wet & Windy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.2	0.0	984	14.0	0.0
G36		0.0	0.0	21.2	0.0	984	14.0	0.0
G37		0.0	0.0	21.3	0.0	985	14.0	0.0
G38		0.0	0.0	20.0	0.0	984	14.0	0.0
G39		0.0	**1.8**	16.3	0.0	984	14.0	0.0
G40		0.0	0.0	21.4	0.0	984	14.0	0.0
Leachate Sump		0.0	0.0	21.3	0.0	986	14.0	0.0
Sewer		0.0	0.4	21.2	0.0	986	14.0	0.0
IPS INLET*		**40.3**	**25.9**	2.1	0.0	986	14.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	12/11/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Wet & Windy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.1	0.0	976	11.0	0.0
G36		0.0	0.0	21.1	0.0	977	11.0	0.0
G37		**2.0**	1.0	14.6	0.0	978	11.0	393.0
G38		0.0	0.0	21.6	0.0	978	11.0	0.0
G39		0.0	1.0	14.6	0.0	976	11.0	0.8
G40		0.0	0.0	21.1	0.0	978	11.0	0.0
Leachate Sump		0.0	0.0	21.2	0.0	978	11.0	0.1
Sewer		0.1	0.5	21.0	0.0	978	11.0	1.2
IPS INLET*		**42.1**	**26.4**	1.8	0.0	978	11.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	19/11/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Very Wet & Windy	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.1	0.0	982	15.0	0.0
G36		0.0	0.0	21.1	0.0	982	15.0	0.0
G37		0.0	0.0	21.0	0.0	982	15.0	0.0
G38		0.0	0.0	20.9	0.0	982	15.0	0.0
G39		0.0	0.6	17.9	0.0	982	15.0	0.0
G40		0.0	**1.8**	16.4	0.0	982	15.0	0.0
Leachate Sump		0.0	0.1	21.2	0.0	984	15.0	0.0
Sewer		0.1	0.7	20.9	0.0	984	15.0	1.9
IPS INLET*		**42.3**	**25.9**	1.9	0.0	984	15.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	26/11/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/JF	Weather :	Barometric Pressure :
		Dull	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.1	0.0	984	11.0	0.0
G36		0.0	0.0	21.1	0.0	984	11.0	0.0
G37		0.0	0.0	21.0	0.0	984	11.0	0.0
G38		0.0	0.0	21.0	0.0	984	11.0	0.0
G39		0.0	0.6	21.0	0.0	984	11.0	0.0
G40		0.0	**3.6**	11.0	0.0	984	11.0	0.0
Leachate Sump		0.0	0.1	20.8	0.0	984	11.0	0.0
Sewer		0.0	0.1	21.1	0.0	984	11.0	0.0
IPS INLET*		**45.8**	**26.9**	1.9	0.0	984	11.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	03/12/09	***Time:***	AM

Instrument Used :		**Next Calibration due:**
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Bright Cold	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	20.9	0.0	993	7.0	0.0
G6		0.0	0.0	20.8	0.0	992	7.0	0.0
G7		0.0	0.0	20.8	0.0	992	7.0	0.0
G8		0.0	0.0	20.9	0.0	991	7.0	0.0
G9		0.0	0.0	20.9	0.0	993	7.0	0.0
G10		0.0	0.0	21.1	0.0	992	7.0	0.0
G12		0.0	0.0	21.0	0.0	991	7.0	0.0
G13		0.0	0.0	21.0	0.0	991	7.0	0.0
G18		0.0	0.0	21.1	0.0	992	7.0	0.0
G21		0.0	0.0	21.0	0.0	993	7.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.0	20.9	0.0	992	7.0	0.0
G36		0.0	0.0	20.9	0.0	992	7.0	0.0
G37		0.0	0.0	20.9	0.0	993	7.0	0.0
G38		0.0	0.0	20.8	0.0	993	7.0	0.0
G39		0.0	0.0	20.9	0.0	993	7.0	0.0
G40		0.0	**1.6**	17.5	0.0	991	7.0	0.0
G41		0.0	0.1	20.6	0.0	993	7.0	0.0
G42		0.0	0.0	20.7	0.0	993	7.0	0.0
G43		0.0	0.3	20.3	0.0	993	7.0	0.0
G44		0.0	0.4	20.3	0.0	993	7.0	0.0
Leachate Sump		0.0	0.0	20.8	0.0	993	7.0	0.0
Sewer		0.0	0.1	21.1	0.0	993	7.0	0.0
IPS INLET*		**39.5**	**24.7**	2.7	0.0	993	7.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council Comhairle Contae Fhine Gall	National Grid Reference :			
Site Status :	Operational	Date :	09/12/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
LMSx Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :		Weather :	Barometric Pressure :
	RF/MG	Fine Cold	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.0	21.1	0.0	991	8.0	0.0
G36		0.0	0.0	21.1	0.0	988	8.0	0.0
G37		0.0	0.9	18.0	0.0	988	8.0	0.0
G38		0.0	0.0	21.0	0.0	988	8.0	0.0
G39		0.0	0.5	18.5	0.0	988	8.0	0.0
G40		0.0	**5.7**	0.2	0.0	991	8.0	0.0
Leachate Sump		0.0	0.3	21.2	0.0	990	8.0	0.0
Sewer		0.0	0.3	21.2	0.0	991	8.0	0.0
IPS INLET*		**45.2**	**26.9**	1.7	0.0	991	8.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		**Site Address :**			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	**National Grid Reference :**			
Site Status :	Operational	**Date :**	18/12/09	***Time:***	AM

Instrument Used :		**Next Calibration due:**
LMSxi Landfill Gas Analyser	0-100% CH_4, CO_2.	Sep-10

Monitoring Personnel :	RF/MG	**Weather :**	**Barometric Pressure :**
		Cold, some sleet and snow	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G3		0.0	0.0	21.3	0.0	1014	4.0	0.0
G6		0.0	0.4	20.3	0.0	1014	4.0	0.0
G7		0.0	0.0	21.5	0.0	1014	4.0	0.0
G8		0.0	0.0	20.4	0.0	1014	4.0	0.0
G9		0.0	0.3	20.4	0.0	1014	4.0	0.0
G10		0.0	1.3	19.5	0.0	1014	4.0	0.0
G12		0.0	0.0	21.2	0.0	1012	4.0	0.0
G13		0.0	0.0	21.1	0.0	1012	4.0	0.0
G18		0.0	0.0	21.3	0.0	1014	4.0	0.0
G21		0.0	0.3	21.2	0.0	1014	4.0	0.0
G23		Inaccessible due to M50 works						
G32		Inaccessible due to M50 works						
G35		0.0	0.0	21.3	0.0	1014	4.0	0.0
G36		0.0	0.0	21.2	0.0	1014	4.0	0.0
G37		**3.7**	**1.8**	9.5	0.0	1014	4.0	0.0
G38		0.0	**5.3**	8.5	0.0	1014	4.0	0.0
G39		0.0	0.6	17.9	0.0	1014	4.0	0.0
G40		0.1	**5.9**	2.6	0.0	1014	4.0	0.0
G41		0.4	0.4	19.7	0.0	1014	4.0	0.0
G42		0.0	0.0	21.4	0.0	1014	4.0	0.0
G43		0.1	**7.2**	5.6	0.0	1014	4.0	0.0
G44		0.0	**4.6**	10.7	0.0	1014	4.0	0.0
Leachate Sump		0.5	**3.4**	20.4	0.0	1014	4.0	0.0
Sewer		0.0	0.4	21.3	0.0	1014	4.0	0.0
IPS INLET*		**41.8**	**25.2**	2.2	0.0	1014	4.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

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LANDFILL GAS MONITORING FORM (Baseline [ ] Ambient [x])

Site Name :		Site Address :			
Dunsink Landfill		Dunsink Lane, Dunsink., Co. Dublin			
Operator :	Fingal County Council	National Grid Reference :			
Site Status :	Operational	Date :	23/12/09	*Time:*	am

Instrument Used :	Normal Analytical Range	Next Calibration due:
GFM430 Landfill Gas Analyser	0-100% CH_4, CO_2.	Dec-10

Monitoring Personnel :	RF/MG	Weather :	Barometric Pressure :
		Cold Clear	See individual readings

Results

Borehole Number	Survey Depth	CH_4 % v/v	CO_2 % v/v	O_2 % v/v	H_2S (ppm)	Atmospheric Pressure (mbar)	Temperature °C	LEL % v/v
G35		0.0	0.2	20.4	0.0	984	6.0	0.0
G36		0.0	0.3	20.4	0.0	984	4.5	0.0
G37		**6.2**	**3.9**	0.0	0.0	983	4.5	>>>>
G38		0.0	**4.5**	8.8	0.0	984	5.0	0.0
G39		0.0	**6.4**	4.4	0.0	984	5.5	0.0
G40		0.0	**6.9**	0.0	0.0	985	7.5	0.0
Leachate Sump		**1.3**	**7.4**	17.9	0.0	986	6.0	0.0
Sewer		0.0	1.5	19.6	0.0	986	9.0	0.0
IPS INLET*		**7.5**	**4.3**	18.1	0.0	986	9.0	0.0

* Note monitoring of inlet gases undertaken at new continuous sampling point off enclosed flare

Bold underlined text indicates methane values greater than 1%v/v and Co2 values greater than 1.5%v/v

APPENDIX IV

SURFACE WATER VISUAL INSPECTION RECORD

DUNSINK LANDFILL W-L 127-1 – Condition 8.2 (Schedule D.5)

Date: ..... Week no:.....

Inspected By: ..... Time: .....

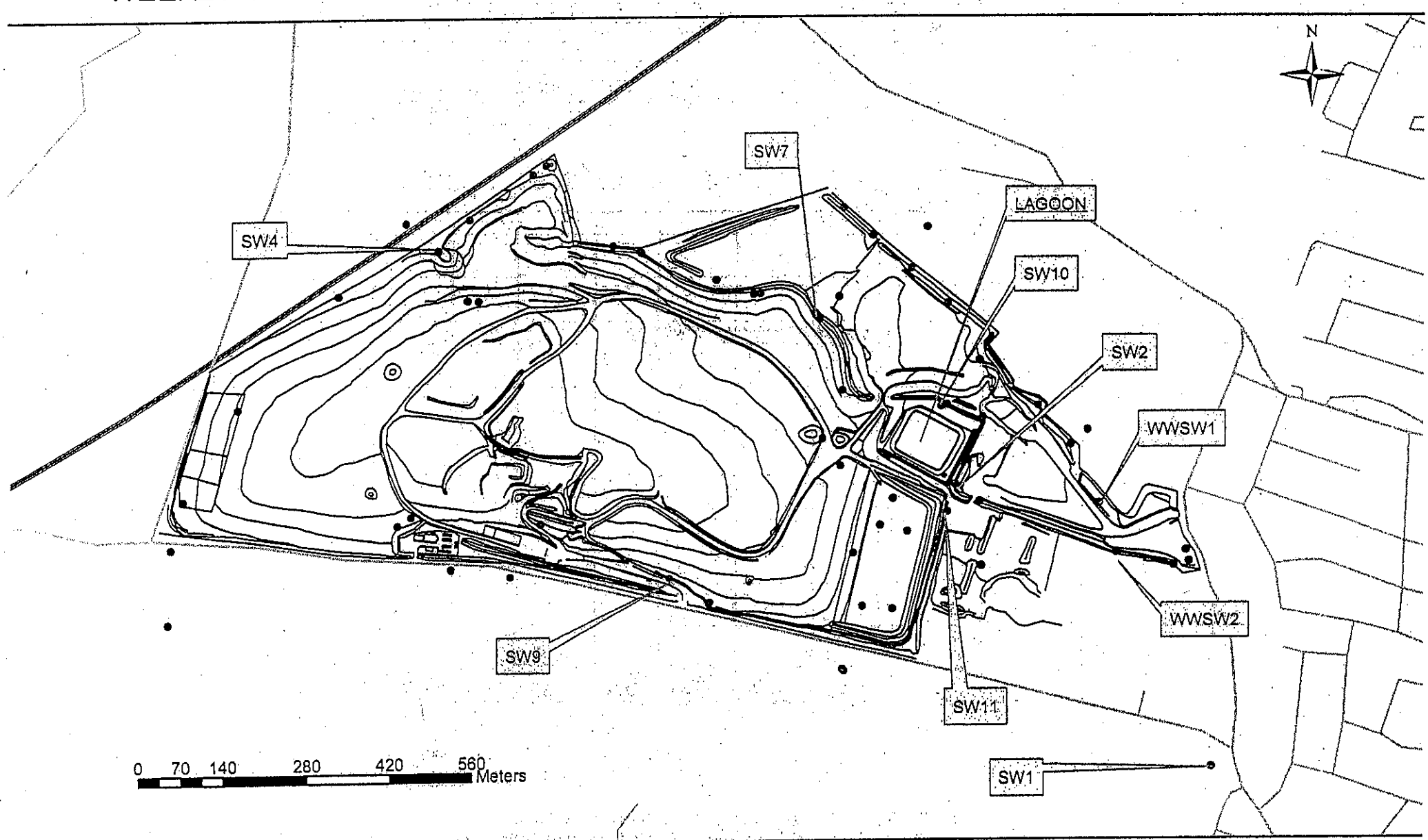
Weather: .....

NUISANCES	SW8	SW7	SW10	SW2	SW11	SW9	SW12	WWSW1	WWSW2	
COLOUR (clear/tinted/cloudy)										
ODOUR (none/oily/leachate/organic)										
Herbaceous bank cm										
Herbaceous stream cm										
Algae %										
Flow Rate (none/low/moderate/fast)										
Depth (cm)										
Erosion at toe of slope (none/moderate/severe										
Additional Parameters (OPTIONAL)										
Conductivity µS										
Temperature °C										
PH										

Samples Taken: Yes / No Photographs Taken: Yes / No	Inspector's Signature:	Reviewed By:	Site Inspector's Comments:

OTHER OBSERVATIONS/ ANY IMMEDIATE ACTION REQUIRED

WEEKLY SURFACE WATER MONITORING LOCATIONS.



APPENDIX V

	Richard Donnelly	David Devine	Tony Masterson	John Donnelly
Title	*Ganger*	*Landfill Compliance*	*Operative*	*Operative*
Role	*Management*	*Management*	*Ticket Collection*	*Tractor*
Role			*Inspections*	
Role				
Safe Pass		*		
Manual Handling	*	*	*	*
Slinger / Signaller				
Waste Management	*			
Use of Fire Extinguishers	*		*	
Occupational First Aid			*	
Health and Safety Management	*		*	
Safe Tractor Operation				*
Safe Use of Sprayers			*	
Fire Warden	*		*	
Safety in Excavations				
Confined Spaces Training			*	
Computer Skills - Introduction			*	
Banksman				