
**Comhairle Contae an Chláir**

---

**Clare County Council**

**Central Waste Management Facility, Ballyduffbeg, Inagh, Co Clare.**

**Annual Environmental Report**

**2008**

Prepared by:

Environment and Emergency Services Directorate

Clare County Council.

Stiúrthóireacht Comhshaoil agus Seirbhísí Éigeandála.

Comhairle Contae an Chláir.

## 1.0 Contents

## 7.0 Review (cont'd)



## 8.0 Appendices

## 2.0 Introduction

### 2.1 Preamble.

The Environmental Protection Agency (the Agency) granted Clare County Council (CCC) a waste licence for the Central Waste Management Facility (CWMF) located at Ballyduff Beg, Inagh, County Clare, on 13th June 2001. The waste licence reference number is W0109-01.

This report addresses Condition 2.3 of the waste licence for the facility. Condition 2.3 states that within six months of the date of grant of this licence, the licensee shall 'submit to the Agency for its agreement, within 13 months of the date of grant of the licence and within one month of the end of each year thereafter, an Annual Environmental Report (AER)'.

The AER shall include as a minimum the information specified in Schedule B: Content of Annual Environmental Report of this licence and shall be prepared in accordance with any relevant written guidance issued by the Agency.
This report is prepared within the context of Schedule B (Content of the Annual Environmental Report). Where support information is required it is presented in the appendices.

### 2.2Reporting Period

This report covers the period from January 1st to December 31st 2008.

### 2.3Waste Activities carried out at CWMF.

Waste activities at the CWMF are restricted to those outlined in Part 1 Activities of the waste licence, these are reproduced in Appendix 8.1.

Municipal solid non-hazardous waste is accepted at the facility from both commercial and domestic customers and disposed of in engineered lined cells.

The Civic Amenity Area provides recycling receptacles for the collection and recycling of various recyclable waste streams, the materials accepted are detailed in Table 3.3

A composting area has been developed to accept and treat green waste from the public only, it began accepting waste in January 2006 with a total of 1094t of domestic 'green waste' has diverted from landfill between 2006 and 2008.

## 3.0 Materials/Waste transported on/off site

### 3.1 Quantity of disposed waste

The quantity of Municipal Solid Waste (MSW) disposed of in 2008 is indicated in Table 3.1.

***Table 3.1: Quantity (tonnes) of MSW disposed of in 2008.***

| Month | Domestic Waste | Commercial Waste | Total |
|---|---|---|---|
| January | 2,019 | 1,346 | 3,365 |
| February | 2,318 | 1,546 | 3,864 |
| March | 1,654 | 1,103 | 2,757 |
| April | 1,951 | 1,301 | 3,252 |
| May | 1,843 | 1,230 | 3,073 |
| June | 1,624 | 1,082 | 2,706 |
| July | 1,587 | 1,058 | 2,645 |
| August | 1,433 | 953 | 2,386 |
| September | 1,478 | 986 | 2,464 |
| October | 1,447 | 962 | 2,409 |
| November | 1,334 | 887 | 2,221 |
| December | 1,308 | 874 | 2,182 |
| **Total** | **19,996** | **13,328** | **33,324** |

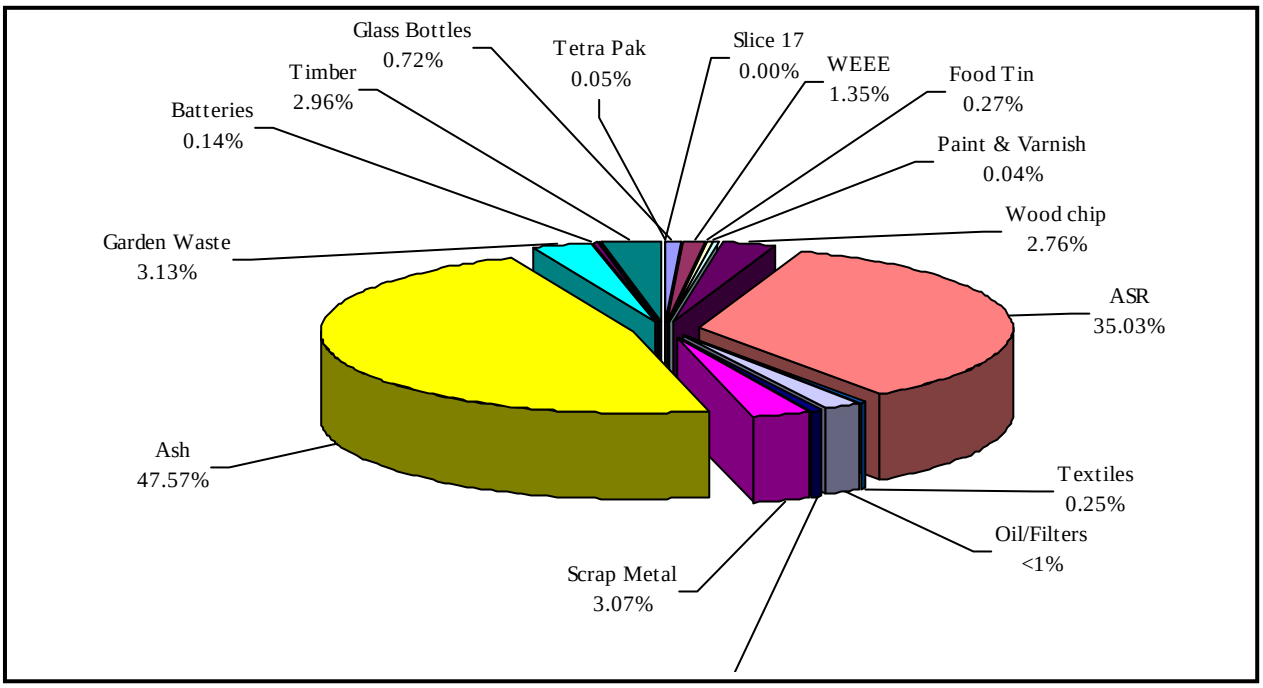
***Table 3.2: Waste Volume (tonnes) Accepted for Landfilling since July 2002***

| Period | Waste Type | | | Cumulative Total |
|---|---|---|---|---|
| | Household | Commercial | Total | |
| July 2002 - June 2003 | 31,548 | 5,799 | 37,347 | 37,347 |
| July 2003 - June 2004 | 33,522 | 9,764 | 43,287 | 80,634 |
| July 2004 - December 2004 | 19,929 | 10,055 | 29,934 | 110,568 |
| January - December 2005 | 30,773 | 22,169 | 52,942 | 163,510 |
| January - December 2006 | 20,227.26 | 13,484.84 | 33,712.1 | 197,222 |
| January - December 2007 | 26,386 | 19,903 | 46,289 | 243,511 |
| January - December 2008 | 19,996 | 13,328 | 33,324 | 276,835 |

***Table 3.3: Quantities (Tonnes) of Materials Recovered in 2008***

| Material | Quantity | Material | Quantity | Material | Quantity |
|---|---|---|---|---|---|
| Glass Bottles | 97.00 | Textiles | 34.00 | Batteries | 19.00 |
| WEEE | 182.00 | Paper/ cardboard | 293.00 | Oil | 7.40 |
| Beverage/ food/ tin cans | 37.00 | Plastic bottles | 59.00 | Timber | 399.00 |
| Paint, Varnish | 6.0 | Scrap metals | 415.00 | Plate Glass | 27.00 |
| Wood Chip | 372.00 | Ash | 6,420.00 | Tetra Pak | 6.50 |
| ASR | 4,728.00 | Garden Waste | 423.00 | Total | 13,524.90 |

***Figure 3.1: Quantities of Materials Recovered (percentage by weight)***




## 3.2 Methods of Deposition of Waste

Waste is deposited in compacted layers from the base of the cell up. Any large articles or hollow containers likely to cause voids are crushed and buried to a depth of not less than one metre from the surface. A 37 tonne steel-wheeled compactor is used to compact the waste. A minimum of three passes of the compactor is employed.

All exposed areas of the active cell are covered daily with a blanket of GeoPoly with Automotive Shredded Residue (ASR) and Wood-Ash. This Wood-Ash is recovered from three facilities that use wood waste as a fuel in their plants. Since October 2005 Automotive Shredded Residue (ASR) has been used as a daily & weekend cover. A sacrificial horizontal gas extraction system was installed in cell 6 of phase 2 as part of our daily cover in March 2006. Since September 2006 a sacrificial horizontal gas extraction system has been installed in all active cells & is used in combination with GeoPoly, Automotive Shredded Residue (ASR) and Wood-Ash to form the daily cover applied in 2008. Alternative cover materials from the perspective of source supply and appropriateness have been investigated throughout the year. The shape / profile of the internal side slope of the active cell 10 have been changed to conform with EPA guidelines issued 20th June 2007; this change has allowed application of a Linear Low Density Polyethylene Liner (LLDPE) liner to its internal side slopes.

Nuisance control measures are employed to reduce to a minimum the effect of landfilling operations. These are detailed in section 7.0

### 3.3 Civic Amenity Area

All non-commercial customers are directed to the Civic Amenity site. Within the site various receptacles are provided for collection of recycling materials. The materials accepted for recycling are outlined in Table 3.3. Collection receptacles for household waste deposited by the public are also provided. The public does not have access to any other part of the facility outside the Civic Amenity Site. The collection of Waste Electrical and Electronic Equipment (WEEE) commenced on August 13th 2005, all WEEE is stored on site prior to collection by the nominated contractor.

Composting of green waste commenced in January 2006. An Aerated Static Pile system is being employed. The air that is drawn through the composting material is expelled through a biofilter of woodchip to reduce any possible odours. The compost that is produced is used by the Gardening Section of Clare County Council and for onsite uses including landscaping and final capping works. All of the material produced in 2008 was used on site as a soil improver. The Council began accepting garden waste in January 2006 with a total of 1094t recovered to the end of 2008.

In August 2008 Clare County Council advertised seeking expression of interest from the private sector to extend / operate the current compost facility for inclusion of 'brown' bin feed stock.

In mid 2008 Clare County Council accepted for recovery 'hard plastics' from the public with the approval of the Agency

### 3.4 Leachate Quantities.

The quantities of leachate generated on site for 2008 are set out in figure 3.2a below. The leachate was removed off site to Wastewater Treatment Plants (WWTP) at Lisdoonvarna, Sixmilebridge and Bunlicky (Limerick City Main Drainage) by a permitted waste collector (WCP/LK/115/05c), Lack Plant Hire. The total amount of rainfall recorded on site for 2008 was 1738mm, this compares to the annual average rainfall for Inagh at approx 1581mm (see figure 3.2). Due to adverse weather conditions during 2008, Clare County Council received approval from the Agency to use the WWTP at Bunlicky in Limerick City as another alternative source of the treatment for the landfill leachate.

***Figure No 3.2: Rainfall recorded on site for 2008***

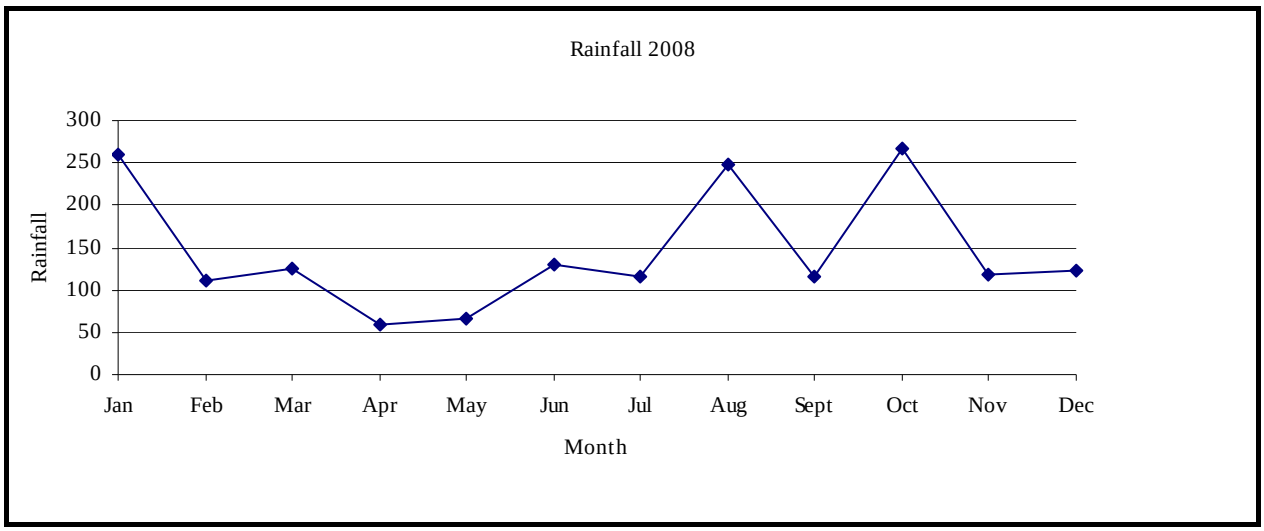
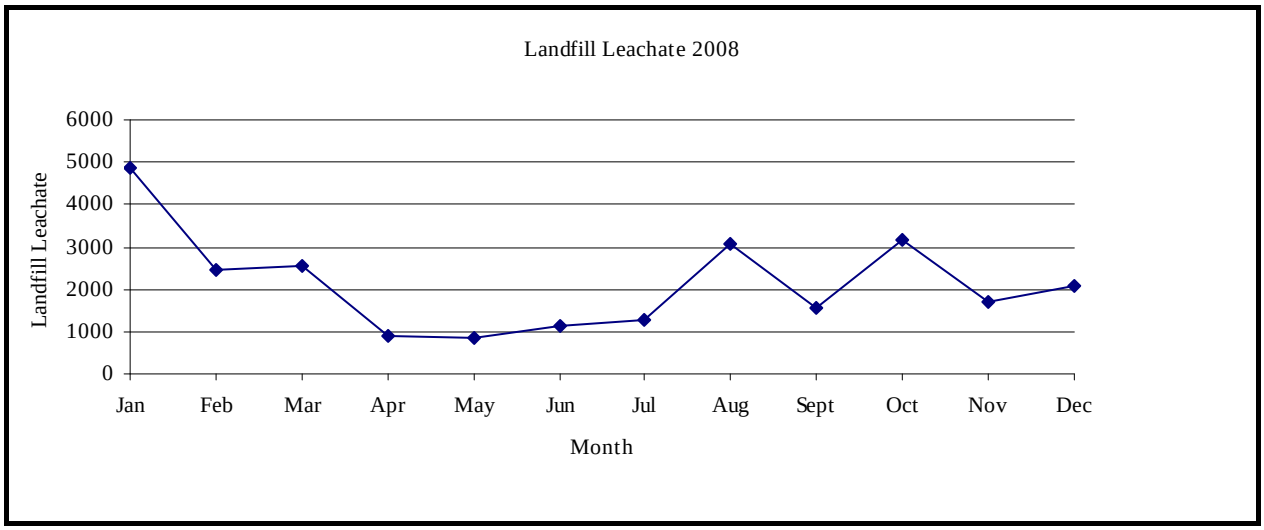



***Figure No 3.2 a: Quantities of Landfill Leachate Generated on site for 2008***




A water balance calculation is included in Appendix 8.3.

### 3.5 Landfill Gas Management

The landfill gas flare has been operating on a 24-hour basis since August-September of 2004. At the beginning of 2007, landfill gas was being actively extracted from a total of 29 wells in cells 1, 2, 3, 4, 5 of phase one & from cells 6, 8, 9 of phase 2. Vertical gas extraction wells were installed in cell 6 in March & September 2007; with cell 7 receiving vertical gas wells in September 2007.

5 new vertical gas extraction wells were installed in October 2008 in cell 10. By the end of 2008 landfill gas was being actively extracted from a total of 49 vertical gas extraction wells.

In an attempt to further the effective extraction of landfill gas from the waste body CCC changed from a 'passive' to 'active' extraction within the active cell from February 2006, starting in cell six of phase 2. This allowed for removal of landfill gas prior to capping, thereby assisting in the control of possible odour nuisance before cells are filled and capped. This system of extracting gas during the development of the active cell proved successful and this system has been modified & installed in all active cells since February 2006; all with the approval of the Agency.

Clare County Council continued with the active extraction of landfill gas in the active cell 10 through a sacrificial horizontal gas extraction system. In cell 11, gas extraction pipes were installed within the drainage stone on the internal cell bund to intercept any fugitive landfill gas during filling of this cell, this work was carried out before any waste was deposited in cell 11.

The high temperature ground flare was upgraded in May 2008 from a capacity of 750m3/hr to 850m3/hr, this will allow the continued effective management of captured gas & ensure future management capacity. Cell 10 received it permanent capping in Nov 2008, these works included the installation of a gas barrier layer to the cell interphase of cell 10;11 and cell 10;12, this works was carried out 7 months in advance of the licence requirement.

Landfill gas rates vary due to differential decomposition of the waste and fluctuating oxygen levels within the gas. When oxygen levels rise too high, the flare switches off. To prevent this occurring the flow rate to the flare is actively managed and balanced to maintain the optimum conditions for effective operation. This is done by maintaining the integrity of the pipe network and by controlling the speed of the blower at the flare which creates the suction to draw the landfill gas from the waste body.

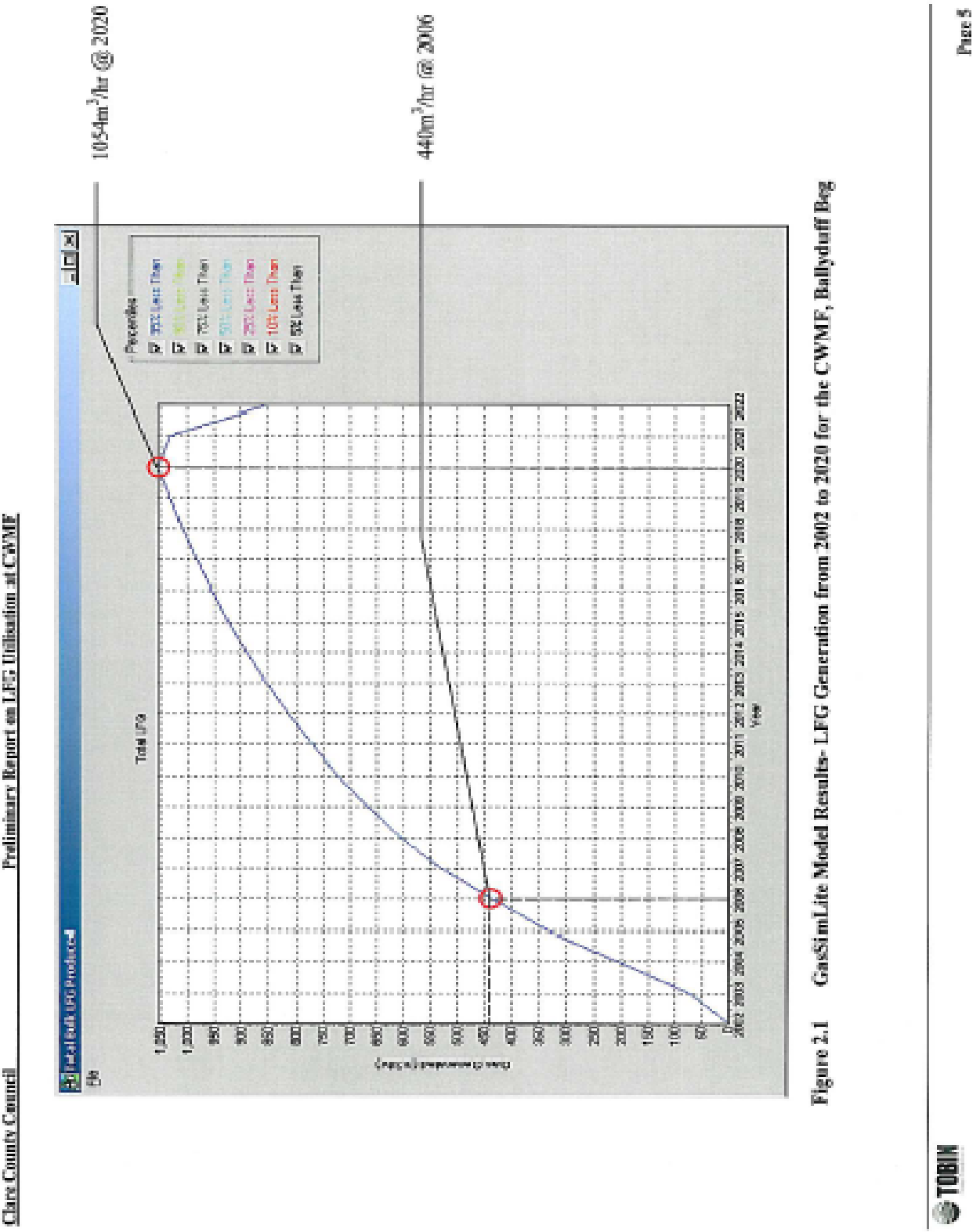
As an example of the typical operating conditions of the flare a 1-month period from 5$^{th}$ December 2008 to 23$^{rd}$ December 2008 during which the flare operated continuously is assessed below.

The average flow for the period was 291,587m$^3$ giving an average daily burn rate of 15,347m$^3$. The average levels of methane, carbon dioxide and oxygen were 53.1%, 30.3% and 0.1% respectively. Average burn temperature in the flare stack was 1100°C. Total volume of gas flared during the year was in the region of 5.18m m$^3$. This is calculated using the flow rates outlined in the above paragraph.

By the end of 2008, landfill gas is being extracted from five permanently capped cells in phase one i.e. 1,2,3,4 & 5, four permanently capped cell in phase two i.e. 6,7,8 & 9 and from one permanently capped cell in phase 3 i.e. 10.

During February 2008 CCC received a supplementary report to the '*Preliminary Report on Landfill Gas Utilisation at Ballyduff Beg Central Waste Management Facility*'. A sensitivity analysis was carried to examine the possible effects of reduced tonnage of waste landfilled due to the implementation of the Landfill Directive *(1999/31/EC)*, Government Policy, i.e. Changing Our Ways *(1998)*, Delivering Change – Preventing and Recycling Waste and Waste Management *(2002);* Taking Stock and Moving Forward and the National Strategy on Biodegradable Waste *(NBWS)* Dept of the Environment, Heritage and Local Government *(2006).* The NBWS targets are a reduction in the quantity of biodegradable waste deposited to landfill to 75% of 1995 levels in 2010, 50% of 1995 levels in 2013 and 35% of 1995 levels in 2020. The introduction of the 'brown bin' to commercial customers will take effect in January 2009 for this region with household collection beginning in September 2009. The model used was GasSimLite. A twenty-year time span was the maximum viewable period in the model. The model predicts a significant reduction in landfill gas generated when the targets in the NBWS are taken into account, up to a 37% reduction in 2021. The fundamental assumptions entered into the model include that the waste source is 65.6% domestic and 34.4% Commercial *(EPA Waste Characterisation Study 2005)*.

***Figure 3.3: Landfill Gas Generation Model: GasSim V1.02.***



### 3.6 Resource and Energy Consumption Summary

The resource and energy consumption is outlined below for diesel and electricity consumption on-site during the year.

***Table 3.4: Recorded Diesel consumption in 2008***

| Plant / Machinery | Unit | Quantity |
|---|---|---|
| Generator | litres | 400 |
| Water Pump | litres | 300 |
| JCB, Tractor and Track machine (CCC) | litres | 18,716 |
| CCC Site Vehicle (Toyota Pick-up) | litres | 1,713 |
| Compactor and Dozer (Lack Plant Hire-Active cell) | litres | 35,000 |
| Hyundai Track Machine and Dumper (Kearney Plant Hire) | litres | 15,000 |
| Total amount of Diesel Consumed: | litres | 71,129 |

Diesel consumption figures are based on plant hire contractor information and CCC records for its own vehicles.

Electricity consumption is recorded as 334,700 kWh for reporting period, January to December 2008. The Limerick-Clare Energy Agency carried out an energy survey analysis in October 2006, with the facility described as 'energy efficient'

## 4.0 Summary of Monitoring and Emissions

### 4.1 General

Section 4.0 presents the results of groundwater, surface water, leachate, noise and dust monitoring for compliance with Condition 9 of Waste Licence Register No.109-1 for the period January to December 2008. The monitoring was conducted in accordance with Schedule E of the Waste Licence as indicated in Table 4.1 below.

***Table 4.1: Central Waste Management Facility (W0109-01) Monitoring Schedule***

| Schedule | Monitoring Requirement |
|---|---|
| E.1 | Landfill Gas |
| E.2 | Landfill Gas Flare |
| E.3 | Dust |
| E.4 | Noise |
| E.5 | Surface water, Groundwater and Leachate |

Monitoring was conducted at the locations and frequencies specified in each of the above referenced schedules of the Waste Licence unless otherwise noted in this report. Surface water, groundwater, leachate, noise and dust monitoring was conducted by TMS Environment Limited. Conservation Services assessed biological quality of surface waters. Biosphere Environmental Services carried out the ecological surveys for the facility. Biannual monitoring of flare stack emissions was carried out by TMS Environment Ltd.

Environmental monitoring locations are shown in appendix 8.2.

### 4.2 Landfill Gas

See also section 3.5 above. Monitoring of waste body wells was carried out on a weekly basis throughout the year. Methane levels rose in a constant manner from approx 39% in January to approx 58% in December. Gas monitoring results were submitted to the Agency in monthly reports during the year. Monitoring of perimeter wells was conducted on a weekly basis throughout the year at LG1 to LG21b. An additional 6 perimeter monitoring wells were installed in 2008 with the total of wells been monitored at 24. Elevated methane levels continued to be observed at a number of perimeter wells, in particular LG7 and LG13. Extensive investigations into this phenomenon have consistently indicated that the elevated methane levels are unrelated to landfilling activities and are due to the decomposition of vegetation left in place prior to construction of the embankments. As final confirmation of this, Odour Monitoring Ireland *(OMI)* carried out a comparative assessment of the VOC profile of the landfill gas and of the perimeter well gas in early 2007, with their report forwarded to the EPA on 14/02/07. Results of the assessment showed no relationship between the two VOC profiles, providing further evidence that perimeter well methane levels are unrelated to landfilling activities; the report concludes that *'….In general, the speciated VOC profile detected in P1G4 is significantly different in comparison to the VOC profile in perimeter borehole LG7 and therefore it is unlikely that the elevated methane concentrations detected in perimeter borehole LG7 are due to the lateral or horizontal migration of landfill gas…*'.

### 4.3 Landfill Gas Flare

Monitoring was carried out at the outlet from the landfill gas flare on two occasions during the year. Results were submitted to the Agency in separate reports for each surve7y. A summary of survey findings is given in table 4.2 below:

***Table 4.2: Flare Monitoring Results:***

| **Parameter (units)** | **3rd September 2008** | **1st December'08** | **Emission Limit[1]** |
|---|---|---|---|
| Nitrogen Oxides ($NO_x$) as $NO_2$ ($mg/Nm^3$) | 10.9 | 10.3 | 150 $mg/m^3$ for Flare Stacks |
| Carbon Monoxide (CO) ($mg/Nm^3$) | 30 | 25 | 50 $mg/m^3$ for Flare Stacks |
| Sulphur Dioxide ($SO_2$) ($mg/Nm^3$) | <7.6 | <2.86 | - |
| Temperature ($^0C$) | 1,071 | 1,100 | - |
| Volumetric Flow Rate ($Nm^3/hr$) | 655 | 666 | 3,000 |
| Vinyl Chloride ($mg/Nm^3$) | <1.67 | - | - |
| Acetonitrile ($mg/Nm^3$) | <1.67 | - | - |
| Dichloromethane ($mg/Nm^3$) | <1.67 | - | - |
| Tetrachloroethylene ($mg/Nm^3$) | <1.67 | - | - |
| TA Luft Class I ($mg/Nm^3$) | <1.67 | - | 20 $mg/m^3$ (at mass flows >0.1 kg/hr) |
| TA Luft Class II ($mg/Nm^3$) | <1.67 | - | 100 $mg/m^3$ (at mass flows >2 kg/hr) |
| TA Luft Class III ($mg/Nm^3$) | <1.67 | - | 150 $mg/m^3$ (at mass flows >3 kg/hr) |
| HCl ($mg/Nm^3$) | <4.3 | - | 50 $mg/m^3$ (at mass flows >0.3kg/hr) |
| HF ($mg/Nm^3$) | <0.175 | - | 5 $mg/m^3$ (at mass flows >0.05 kg/hr) |

All results were within emission limit values specified in Schedule F.4. of Waste Licence W0031-01.

### 4.4 Dust

Three ambient dust monitoring surveys were carried out during the year. Results are summarised below in table 4.3.

***Table 4.3: Total Dust Monitoring Results.***

| Sample location | Monitoring Period | | | Limit for Dust Deposition ($mg/m^2/day$) |
|---|---|---|---|---|
| | 25th June to 23rd July 2008 | 23rd July to 5th September 2008 | 5th September to 7th October 2008 | |
| **ST1** | 111 | 84 | <20 | 350 |
| **ST2** | 199 | 223 | 65 | 350 |
| **ST6** | 128 | 73 | 24 | 350 |
| **ST7** | 227 | 37 | 97 | 350 |

All results were below the licence limit of 350$mg/m^2$/day.

$PM_{10}$ monitoring was carried out over four twenty-four hour periods as detailed below:

ST1: 3rd December 2008

ST2: 3rd December 2008

ST6: 1st December 2008

ST7: 1st December 2008

All results were within the licence limit of 50$ug/m^3$. These results were submitted in the quarterly environmental monitoring report for October to December 2008.

### 4.5 Noise

Results of a noise survey carried out in June 2008 are summarised in Table 4.4. Survey results were submitted to the Agency in the environmental monitoring report for Quarter 2, 2008. Survey findings were similar to previous reports, with noise levels at noise sensitive locations NS4 and NS5 in compliance with the 55 dB(A) daytime limit specified in the waste licence and noise levels at NS1, NS2 and NS3 above licence limits. The elevated noise levels at NS1, NS2 and NS3 were attributed to passing road traffic, as was reflected in the high $L_{10}$ readings recorded at each monitoring point. Site noise did not contribute to the measured noise levels at these locations. Results of the second noise survey for 2008 will follow shortly.

***Table 4.4: Environmental Noise Survey Results.***

| Survey Date | 30th June 2008 | | |
|---|---|---|---|
| | $L_{Aeq, 30min}$ dB(A) | $L_{A90, 30 min}$ dB(A) | $L_{A10, 30 min}$ dB(A) |
| NS1 | 70 | 44 | 74 |
| NS2 | 69 | 45 | 73 |
| NS3 | 73 | 46 | 77 |
| NS4 | 45 | 38 | 47 |
| NS5 | 50 | 41 | 54 |

## 4.6 Surface Water, Groundwater and Leachate

### 4.6.1 Surface Water

Surface water monitoring was carried out on a quarterly basis at SW1, SW1a, inlet to the stormwater pond (SW inlet), outlet from the sand filter (SW outlet), SW2, SW3, SW4, SW5, SW7, SW8, SW9, SW10, SW11 and SW12 (an eastern boundary drain feeding into Stream 2). Access to sample point SW6 is not permitted by the landowner. Samples were analysed for the parameters specified in Schedule E5 of Waste Licence 109-1. In addition, as in previous years, surface water was monitored on a monthly basis for total suspended solids. Weekly surface water visual inspections were also carried out. Sample locations are shown on the drawing attached in Appendix 8.2. A new stormwater pond was constructed during 2006/2007 as part of the phase 3 development programme. The pond was fully operational by February 2008. Monitoring of the inlet to and outlet from the pond commenced at that time.

Results for key parameters (ammonia, BOD and total suspended solids) are discussed in this report. Detailed results of all surface water monitoring carried out during the year have previously been submitted to the Agency in quarterly reports.

#### 4.6.1.1. Surface Water BOD:

BOD results for surface water streams and for the inlet and outlet to the stormwater ponds are graphed in figures 4.1 to 4.3. The 5ppm BOD limit for Salmonid Waters is also shown on the graphs. This limit is included for comparative purposes only; none of the surface water streams are designated Salmonid waters.

**Figure 4.1**

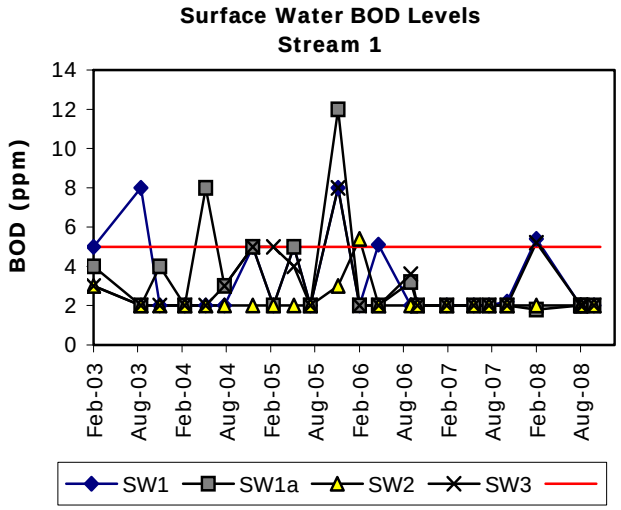



**Figure 4.2**

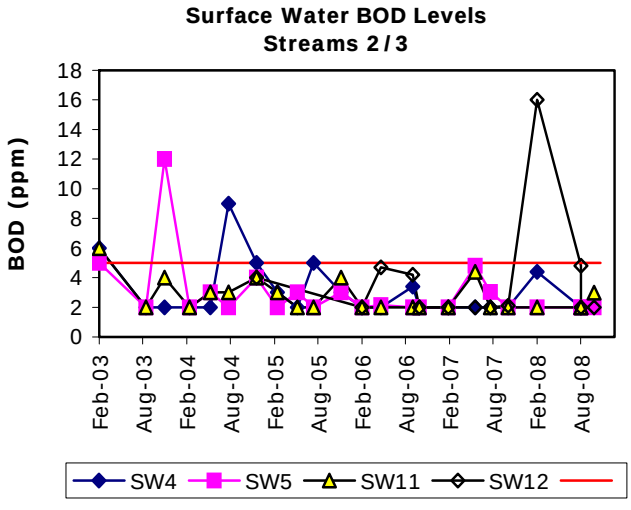
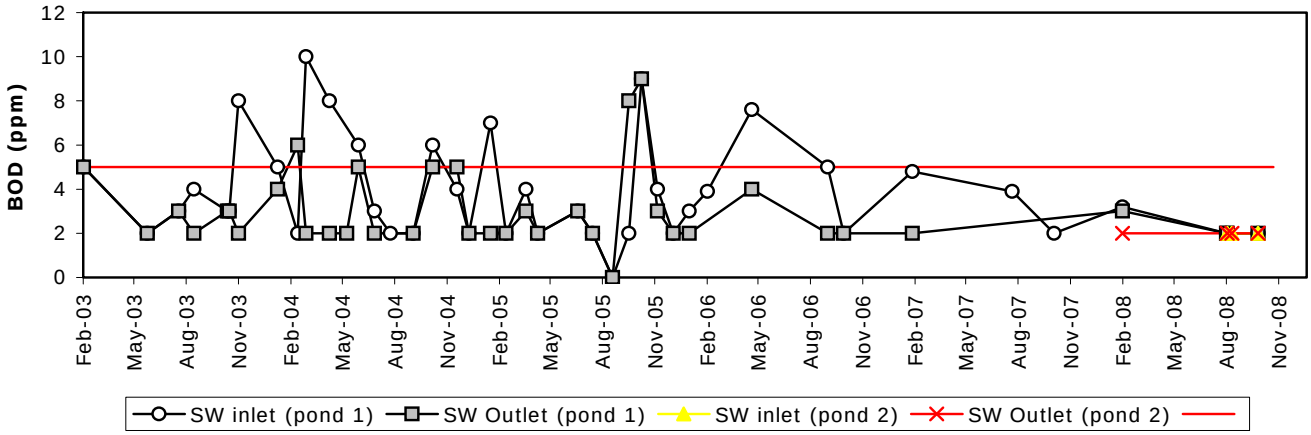


**Figure 4.3**

**SW Inlet and Outlet BOD Levels**




BOD results at SW1 were just above the 5ppm comparative limit in February 2008. SW1 is located on stream 1, immediately downstream of the discharge from stormwater pond 1. The slightly elevated BOD at this location was not due to landfilling activities - the BOD of the stormwater outlet from pond 1 was below 5ppm for all samples taken during 2008, including the February sample.

BOD results at SW12 were relatively elevated in February (16ppm). Again, this was not related to landfill activities as the BOD of the stormwater outlet from pond 2 (upstream of SW12) was below 5ppm for all samples collected during 2008. SW12 is a field drain; BOD levels in these drains can vary with water level.

BOD results for Inagh river monitoring locations are graphed in figures 4.4 and 4.5. The 5ppm BOD limit for Salmonid Waters is also shown on the graphs for comparative purposes only. The Inagh river is not a designated Salmonid water.

**Figure 4.4**

**Surface Water BOD Levels**
**Inagh River**

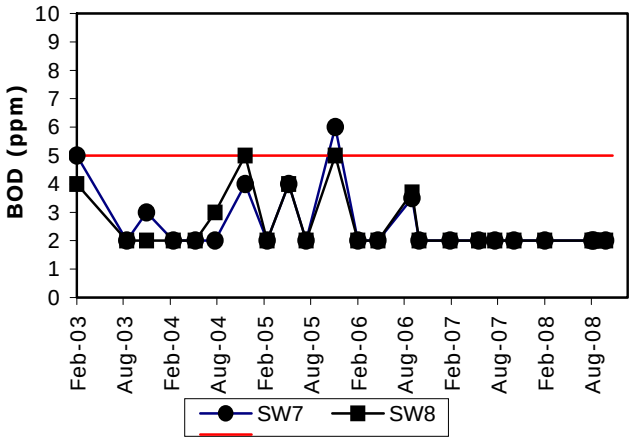
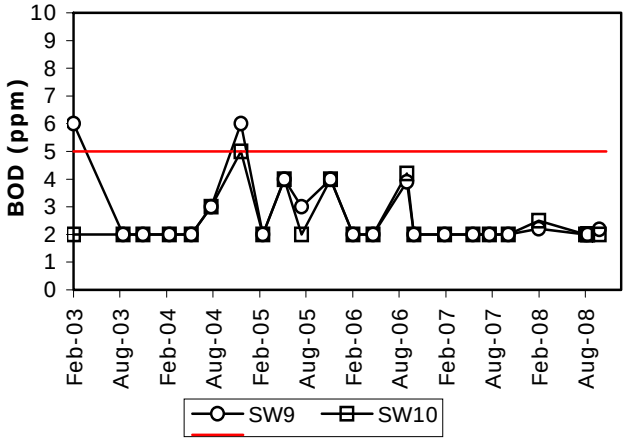



**Figure 4.5**

**Surface Water BOD Levels**
**Inagh River**




BOD results for all Inagh river samples were well below 5ppm in 2008.

#### 4.6.1.2 Surface Water Ammonia:

Surface water ammonia levels in Streams 1, 2 and 3 and the Inagh river are graphed in figures 4.6 to 4.9 for the six year period from 2003 to end of 2008. The ammonia limit for salmonid waters is shown on the graphs for comparative purposes only. As stated above, none of the surface waters sampled are of salmonid water quality.

**Figure 4.6**

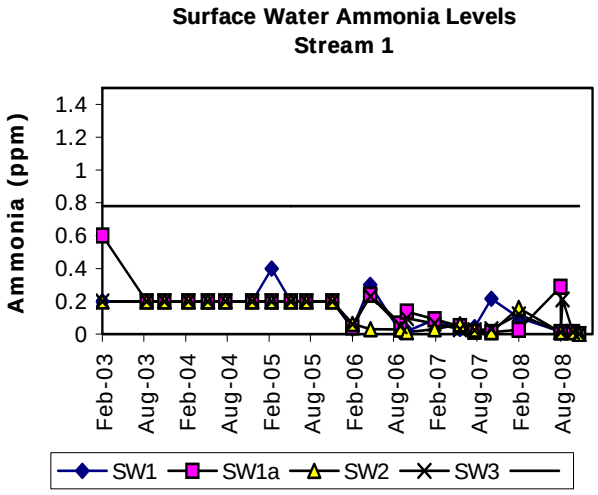



**Figure 4.7**

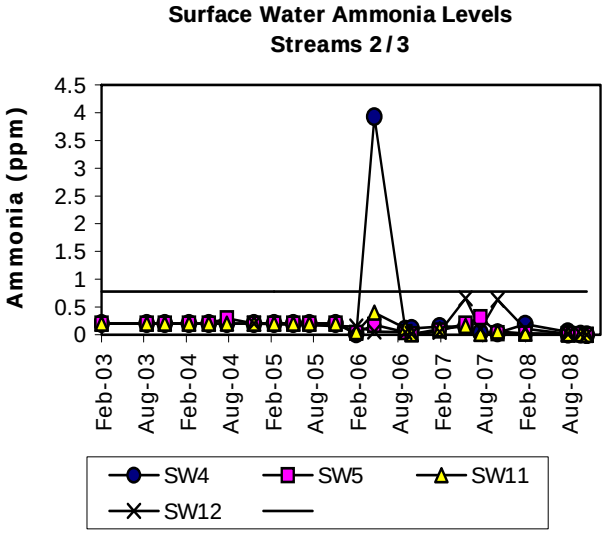



**Figure 4.8**

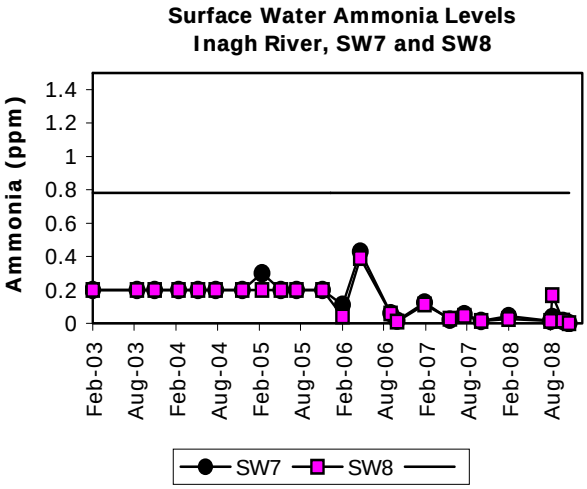
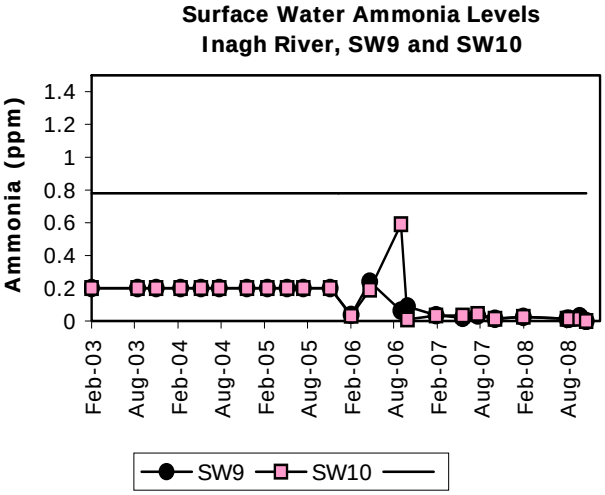



**Figure 4.9**




Ammonia results have been consistently below the limits for salmonid waters throughout the six-year period for all surface water samples except SW4. Ammonia levels at SW4 in stream 2 (upstream of the landfill) were slightly elevated in May 2006 but have been below the salmonid limit since that time.

Ammonia levels in SW inlet and outlet samples were very low throughout the year. All results were less than 0.04ppm.

The low ammonia results in SW outlet samples and at all surface water sample locations downstream of the landfill confirm that the landfill has had no impact on surface water ammonia levels.

#### 4.6.1.3 Surface Water Suspended Solids.

All surface water monitoring locations are visually inspected each week and monthly surface water samples are analysed for suspended solids levels by TMS Environment Ltd. Results obtained for 2008 are graphed in figures 4.10 to 4.14. The 25ppm suspended solids limit for Salmonid waters is included in figures 4.10 to 4.13 for comparative purposes only. The 35ppm licence limit for surface waters discharging from the site is shown on figure 4.14.

**Figure 4.10**

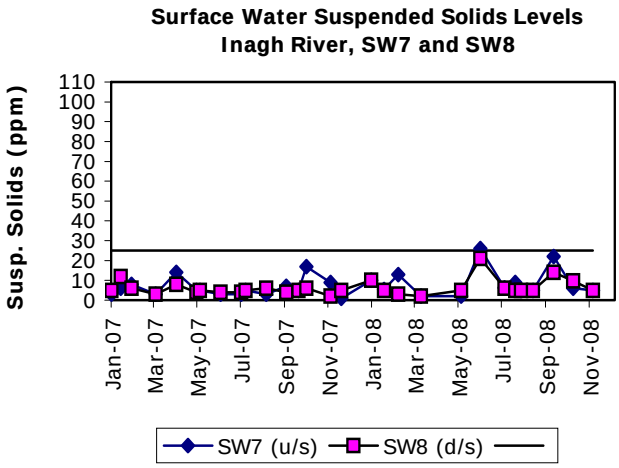
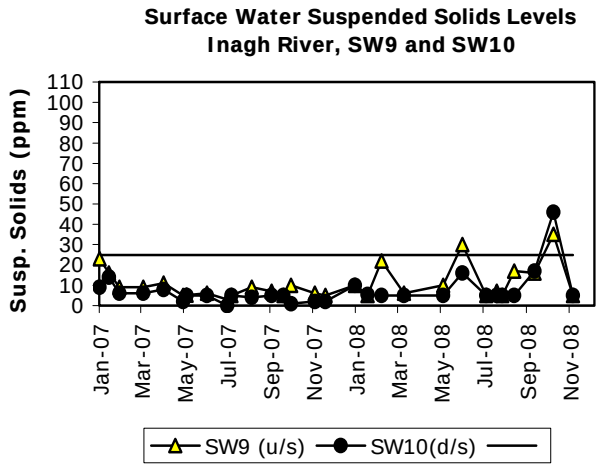



**Figure 4.11**




As can be seen from figures 4.10 and 4.11, Inagh River suspended solids levels were above 25ppm on one occasions at SW9 only (upstream of the confluence with stream 1) and on one occasion at both SW9 and SW10 (downstream of the confluence with stream 1). The elevated suspended solids levels are attributed to heavy rainfall and not to site activities, as both upstream and downstream results were elevated at the time.

There were occasional peaks in suspended solids levels in streams 1, 2 and 3 during the year (see figures 4.12 and 4,13).

**Figure 4.12**

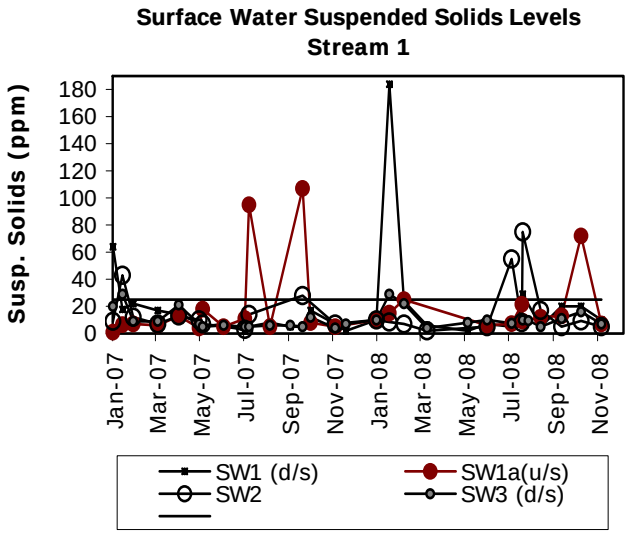
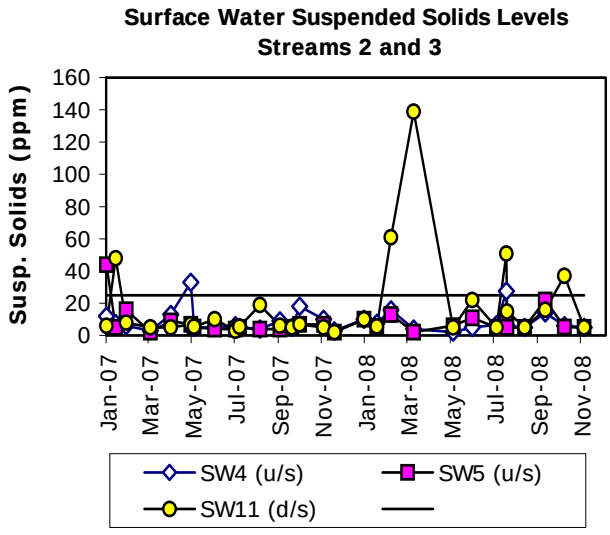


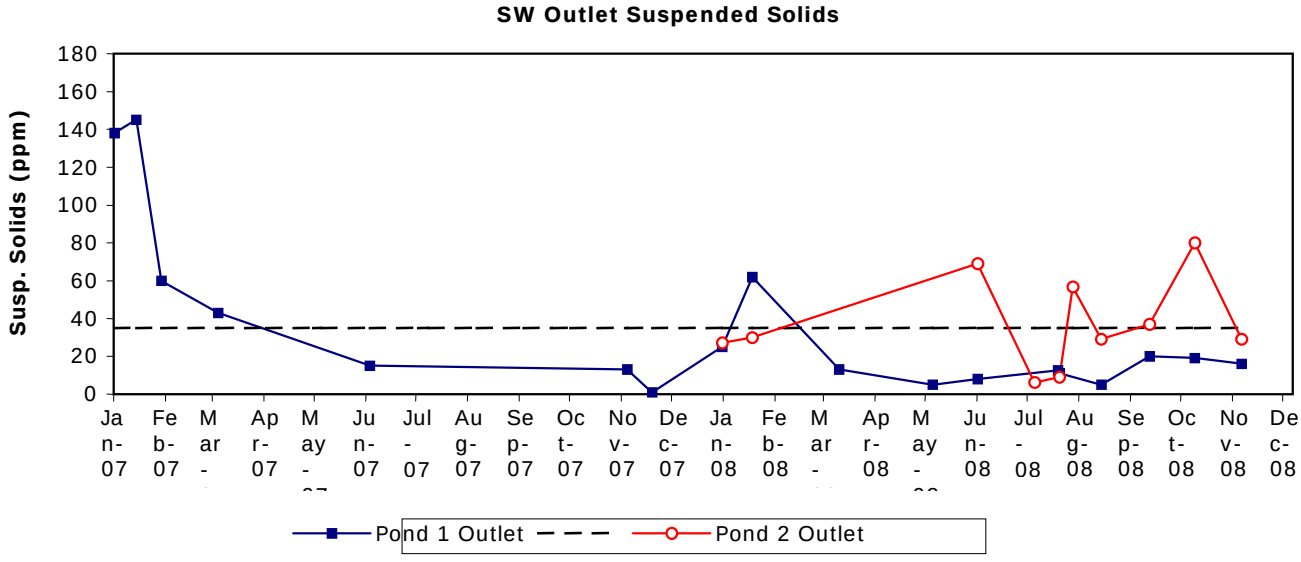

**Figure 4.13**




Two unusually elevated suspended solids results were observed in stream 1 (at SW1) and in stream 2 (at SW11) in the early part of 2008. The peaks in stream 1 are not considered to be due to landfilling activities as suspended solids levels in this stream were also elevated on a number of occasions at SW1a, upstream of the stormwater discharge point. The peaks in stream 2 (at SW11) occurred downstream of the facility and may be related to some extent to the discharge from the new stormwater pond. However heavy rainfall may also have contributed to the elevated results, particularly as there is a considerable amount of exposed clay in the vicinity of the sample location. There was no adverse effect on the Inagh river downstream of the confluence with either stream.

Suspended solids levels in both SW outlets are graphed below in figure 4.14.

**Figure 4.14**



As can be seen from the graph, the 35ppm suspended solids limit was exceeded for one outlet sample from pond 1 and four outlet samples from pond 2 during 2008. One of these results exceeded the limit only slightly (37ppm). Both ponds were cleaned out in February 2009.

### 4.6.2 Groundwater

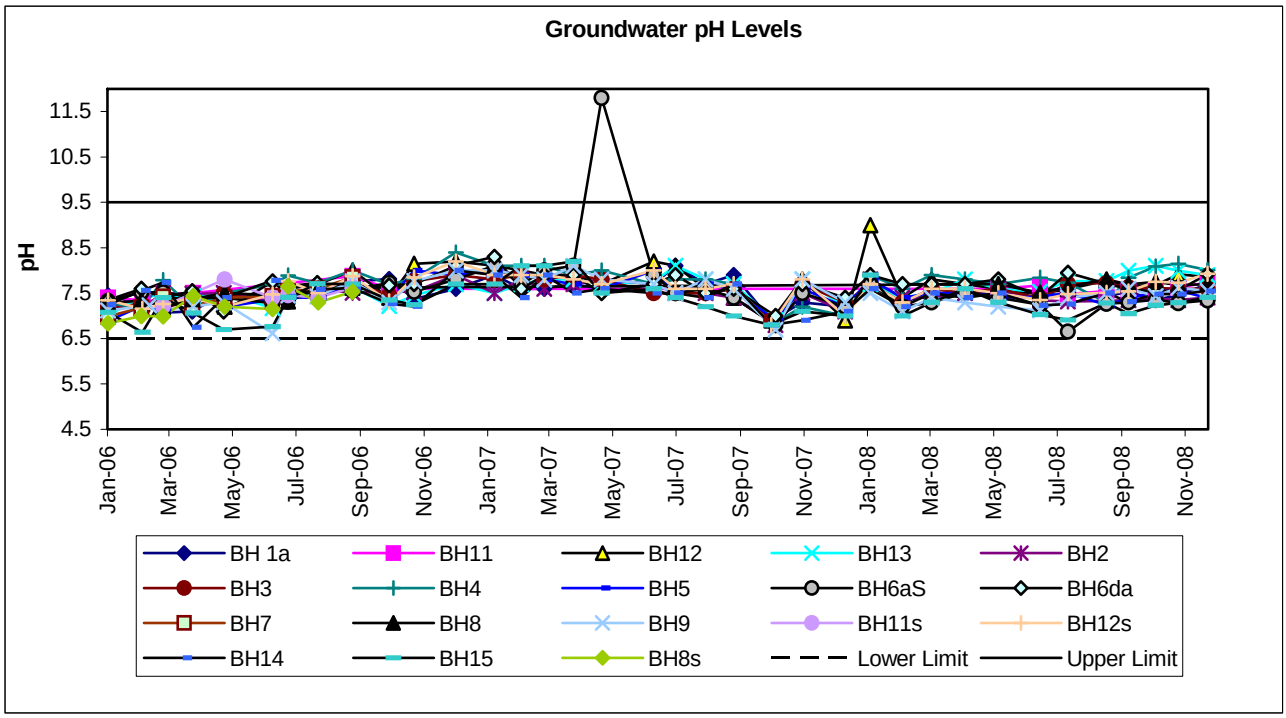
Groundwater monitoring was carried out on a monthly basis at BH1a, BH2, BH3, BH4, BH5, BH6As and BH6Ad, BH12s, BH12d, BH13, BH14 and BH15. Private wells and the facility drinking water supply (canteen tap) were also sampled on a monthly basis during the year. Monitoring wells BH7 BH8 and BH11 were lost early in 2007 due to Phase III construction. These wells were replaced in March 2008. Samples were analysed for the parameters and frequency specified in Schedule E5 of Waste Licence W0109-01.

Results for key groundwater parameters, pH, conductivity and ammonia are summarised in this report. Results are compared with EPA Interim Guidance Values from "Towards setting guidance values for the protection of groundwater in Ireland", for comparative purposes. Detailed results of all groundwater monitoring carried out during the year were previously been submitted to the Agency in quarterly reports.

#### 4.6.2.1 Groundwater pH:

Groundwater pH results from January 2006 to December 2008 are graphed below in figure 4.15. The EPA Interim Guidance Value range for pH (6.5 – 9.5) is also shown on the graph

**Figure 4.15**

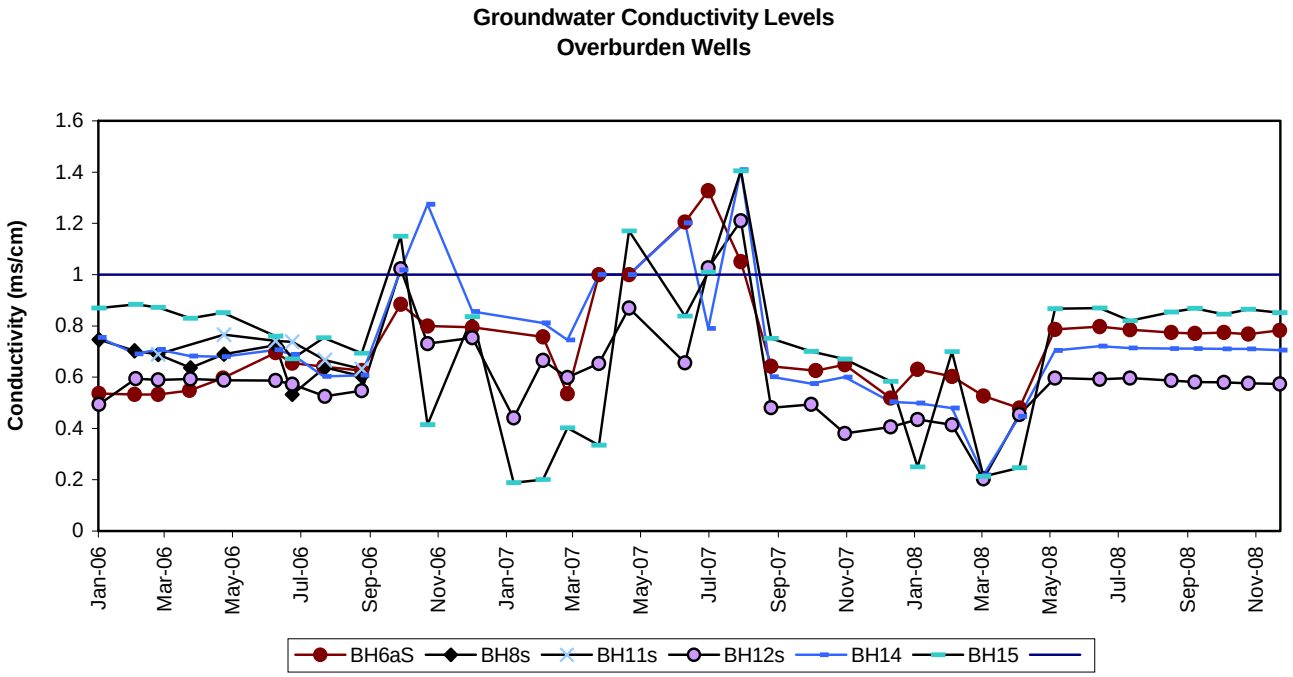


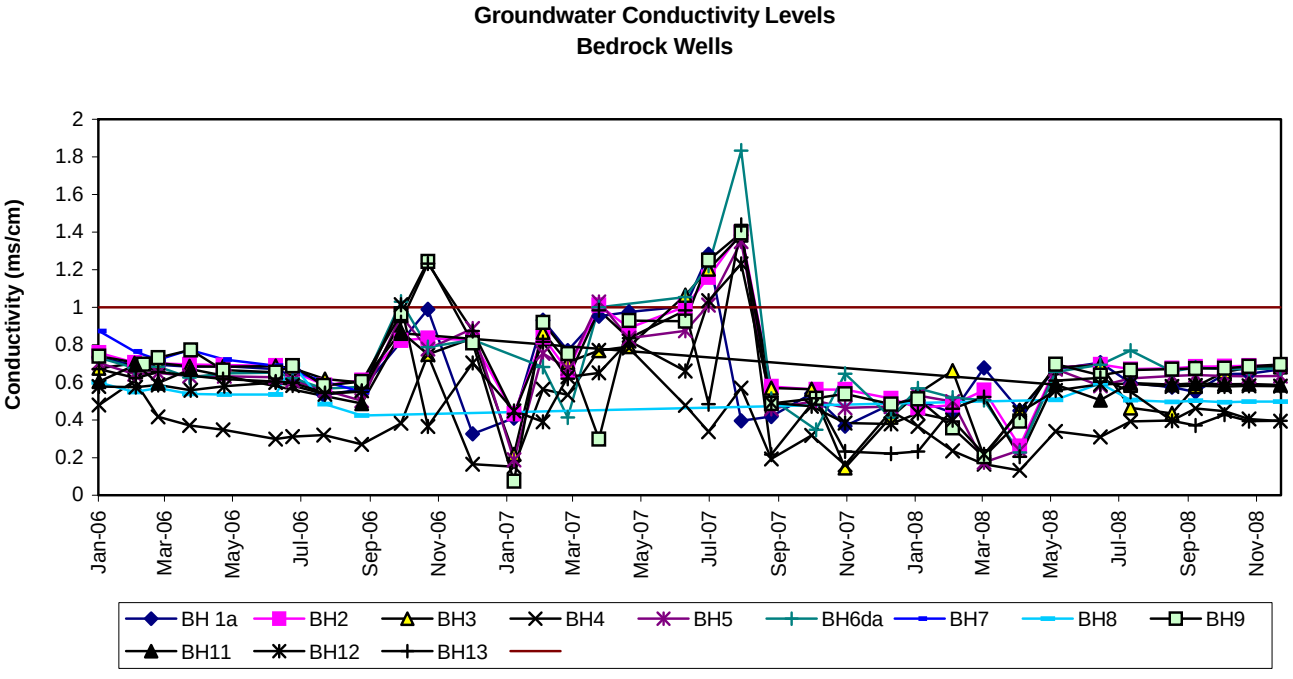
As can be seen from the graph, pH results were within the IGV range for all groundwater samples throughout 2008.

### 4.6.2.2. Groundwater Conductivity:

Groundwater conductivity readings for 2007 are graphed in figures 4.16 and 4.17. The conductivity interim guidance value (IGV) of 1ms/cm is shown on the graphs for comparative purposes. As can be seen from the graphs, all results for 2008 were below the IGV of 1ms/cm.

**Figure 4.16**



### 4.6.2.3 Groundwater Ammonia

Groundwater ammonia results are graphed below in figures 4.18 and 4.19. The ammonia IGV of 0.15ppm is also shown on the graphs for comparative purposes:

**Figure 4.18**

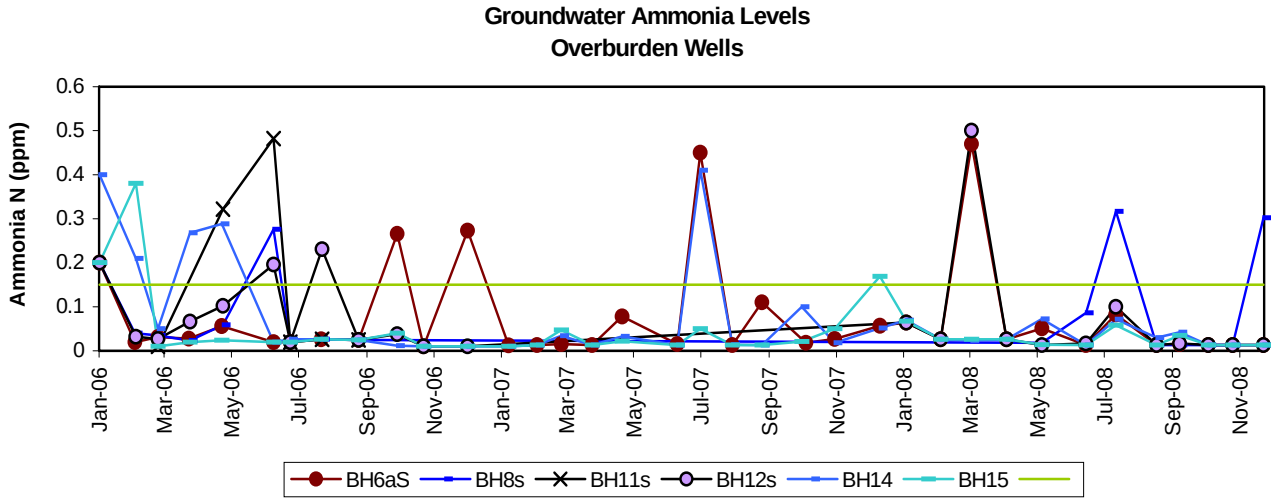
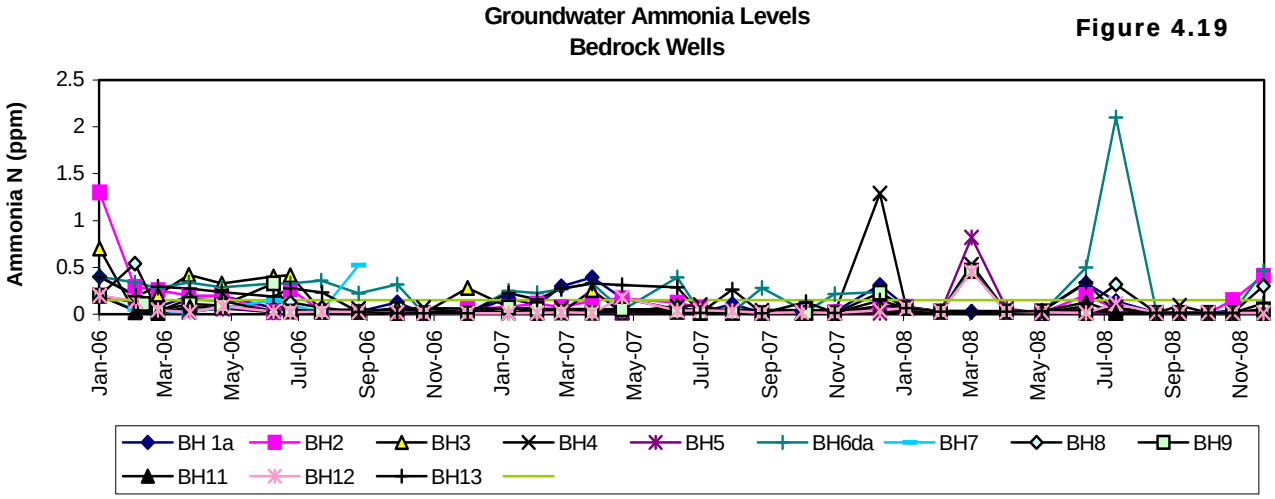


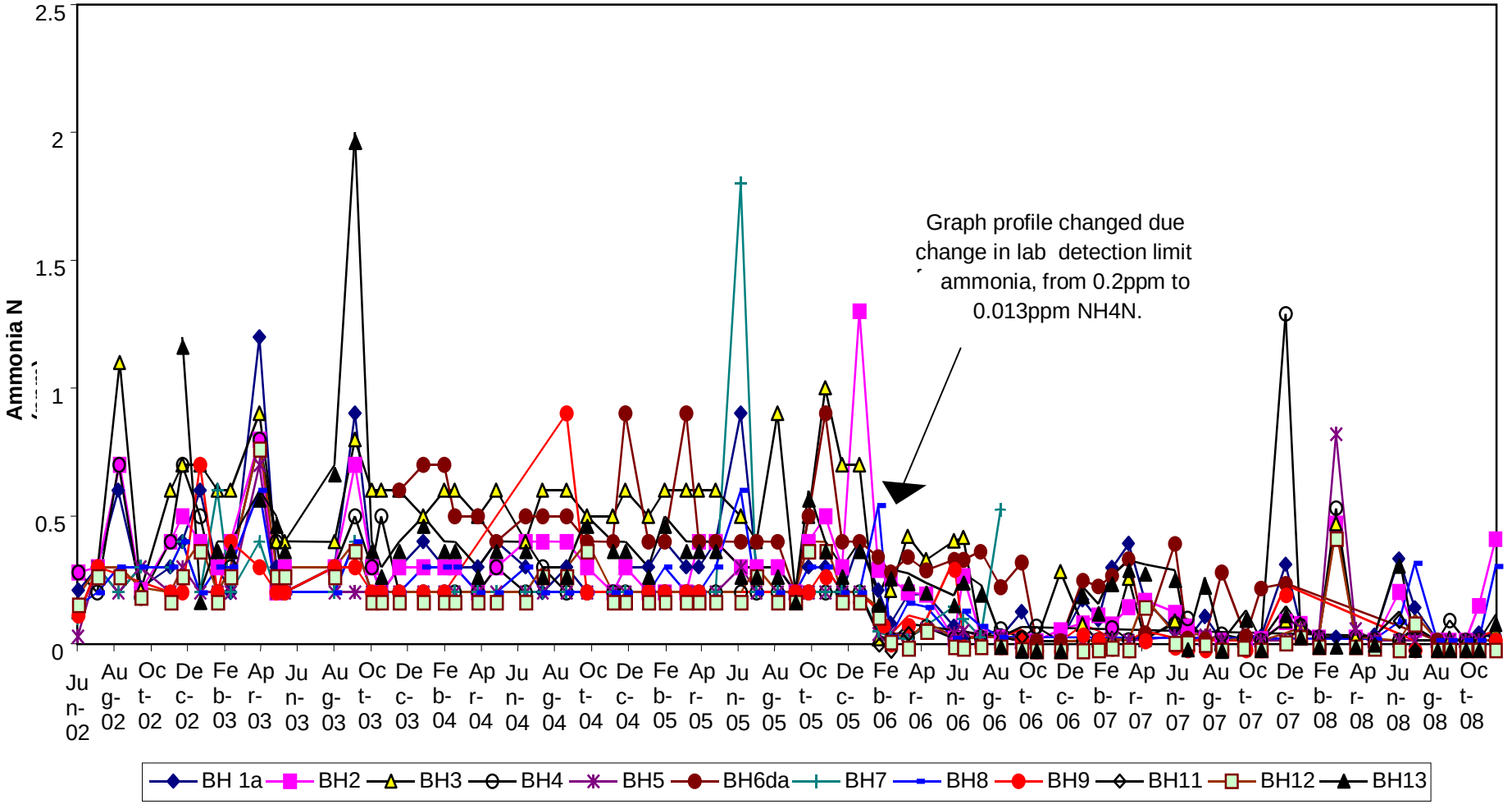

**Figure 4.19**




As can be seen from the graphs, bedrock groundwater ammonia levels ranged from <0.0.13 ppm (external laboratory method detection limit) to 2.1ppm (at BH6 in July 2008). As noted in previous years, overburden groundwater ammonia levels were lower than bedrock levels.

Groundwater ammonia results have fluctuated since monitoring commenced at the facility in June 2002. Elevated results were measured on occasion in a number of wells, including upgradient bedrock well BH9 (see figure 4.20). These results indicate that background ammonia levels are elevated in groundwater in the area, unrelated to landfilling activities but possibly due to the extensive afforestation in the region.

## Ammonia Levels in Bedrock Groundwater
## June '02 to December '08



### 4.6.2.4 Groundwater Chloride.

Groundwater chloride levels from 2002 to 2008 are graphed in Figures 4.21 and 4.22. The EPA recommended interim guidance value for chloride (30ppm) is included in the graphs for comparative purposes. Mean chloride levels for a number of wells in 2008 were above the IGV. Results for upgradient well BH9 ranged from 31 to 33ppm, indicating that background levels are high in comparison to the IGV.

**Figure 4.21**

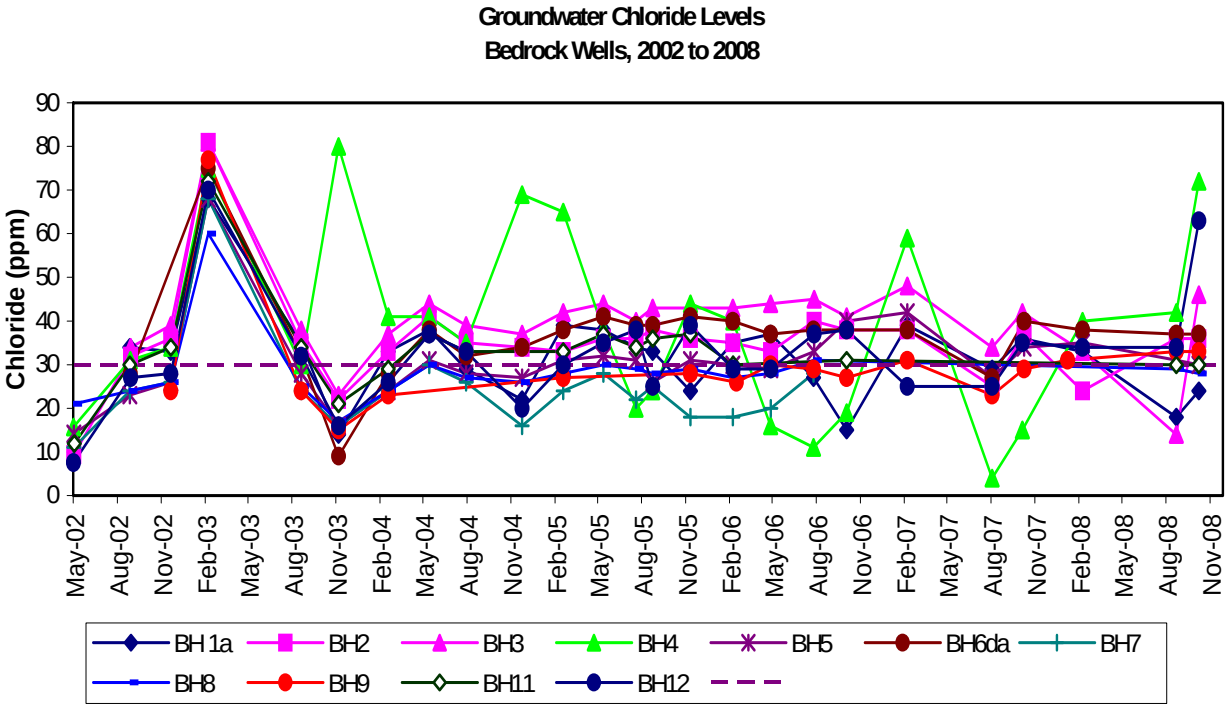
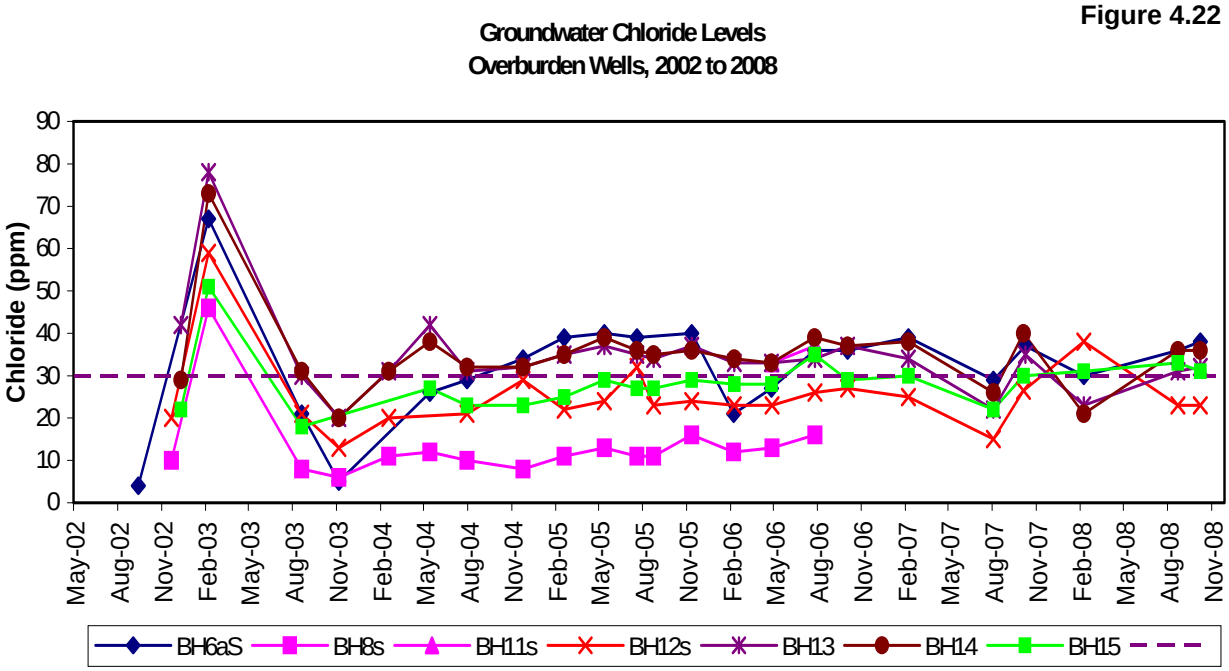



**Figure 4.22**



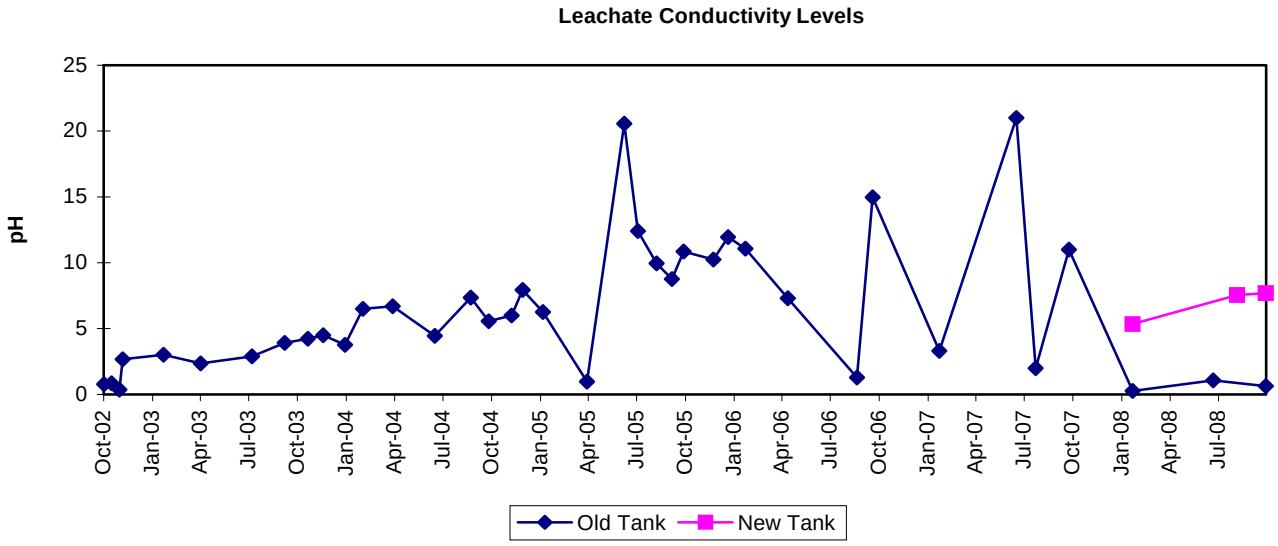
### 4.6.3 Leachate.

Two leachate tanks have been operational at the site since November 2007. The second tank was installed as part of the phase 3 construction project. This tank receives all leachate from the landfill area. The older tank receives leachate/potentially contaminated runoff from the civic amenity area. Results for both tanks for conductivity, BOD, COD and ammonia levels are graphed in figures 4.23 to 4.27 of this report. Results obtained since monitoring commenced at the facility have been included in the graphs in order to provide a more comprehensive picture of leachate quality. All results have previously been submitted in quarterly environmental reports for the facility.

#### 4.6.3.1 Leachate Conductivity

Leachate conductivity levels are graphed in figure 4.23. As would be expected with the removal of high strength landfill leachate from the old leachate lagoon (tank 1), conductivity levels in this tank dropped dramatically in 2008. Higher levels were observed in the new tank.

**Figure 4.23**




#### 4.6.3.2 Leachate BOD and COD

Leachate BOD and COD results are graphed in figures 4.24 and 4.25. Again, as expected, BOD and COD levels in the old leachate tank dropped at the end of 2007 with the diversion of landfill leachate to the new tank. Leachate BOD and COD levels have varied considerably since landfilling commenced at the facility in September 2002.

**Figure 4.24**

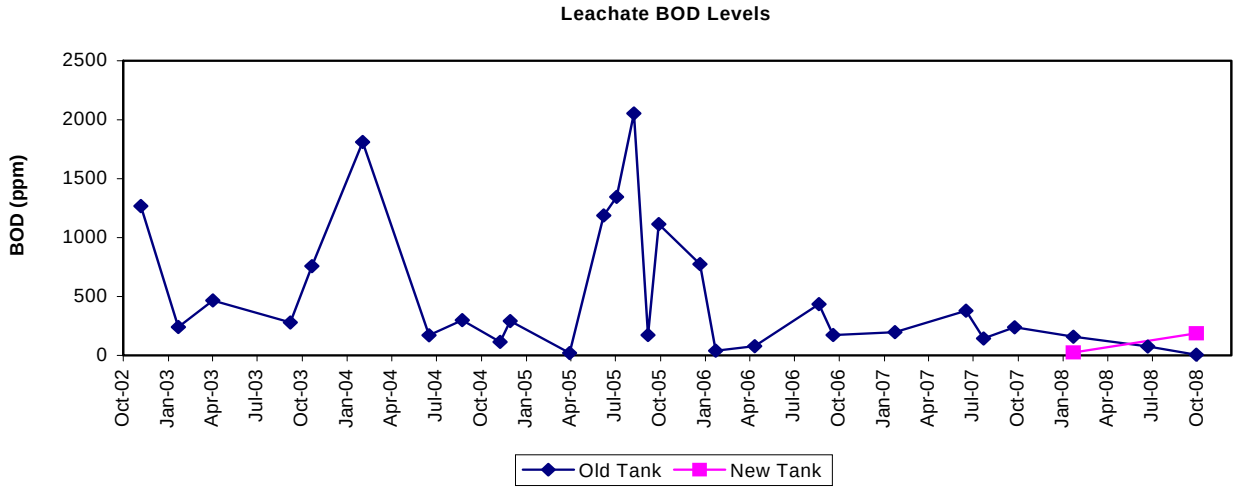
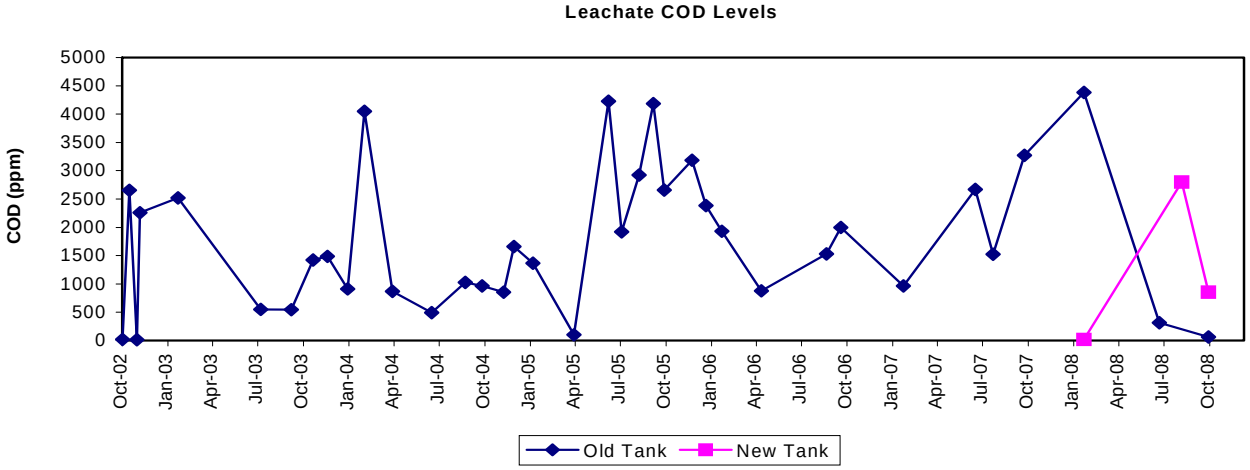



**Figure 4.25**




Leachate BOD:COD ratios have reduced gradually over the past six years. It was noted in the 2007 AER that the mean ratio for the year was slightly lower than previous years, at 0.13. This was potentially attributed to the recirculation of leachate within the landfill, which commenced in January 2007. Since then, only leachate from the old tank has been used for recirculation; this is lower strength material, mainly potentially contaminated runoff from the civic amenity area. Annual mean leachate BOD:COD ratios from 2002 to 2008 are summarised in table 4.5:

***Table 4.5: Leachate BOD:COD Ratios***

| | **Leachate BOD:COD Ratios** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **2002** | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** |
| **Old Tank** | 0.56 | 0.38 | 0.28 | 0.39 | 0.16 | 0.13 | 0.12 |
| **New Tank** | - | - | - | - | - | - | 0.70* |

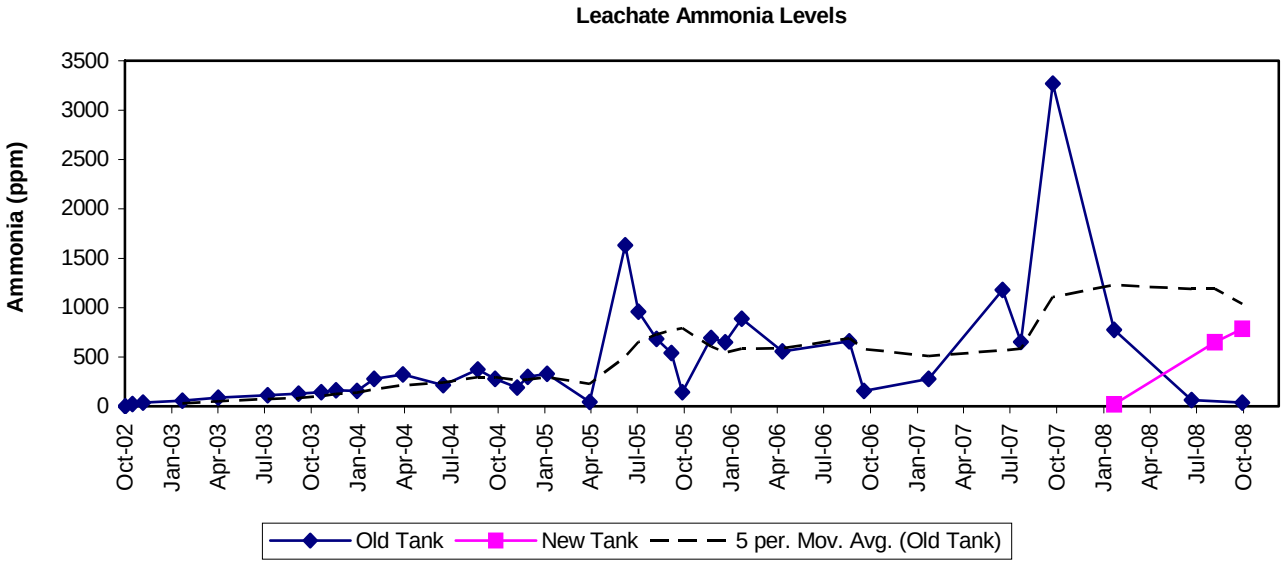
*Note*: Mean of two results only.*

As can be seen from table 4.4, the 2008 BOD:COD ratio for the old tank was surprisingly low, at 0.12. This poor ratio is not related to leachate from the landfill area as the only material discharging to the old tank is potentially contaminated rainfall from the Civic Amenity area and the treated effluent from the two wastewater treatment units on site. We will continue to monitor the situation in 2009 and will arrange for more frequent leachate samples to be collected for COD and BOD analysis.

#### 4.6.3.3 Leachate Ammonia.

Leachate ammonia levels are graphed in figure 4.26. A five-point moving average trendline is also shown. As can be seen from the graph, the concentration of ammonia gradually increased in the five years up to January 2008, as would be expected with final capping in place in phases 1 and 2. Final capping of filled cells and recirculation of leachate within the cells will both contribute to increased levels of ammonia and other parameters in the leachate. The reduction in 2008 is due to the fact that leachate from the landfill area is no longer discharged to the old tank.

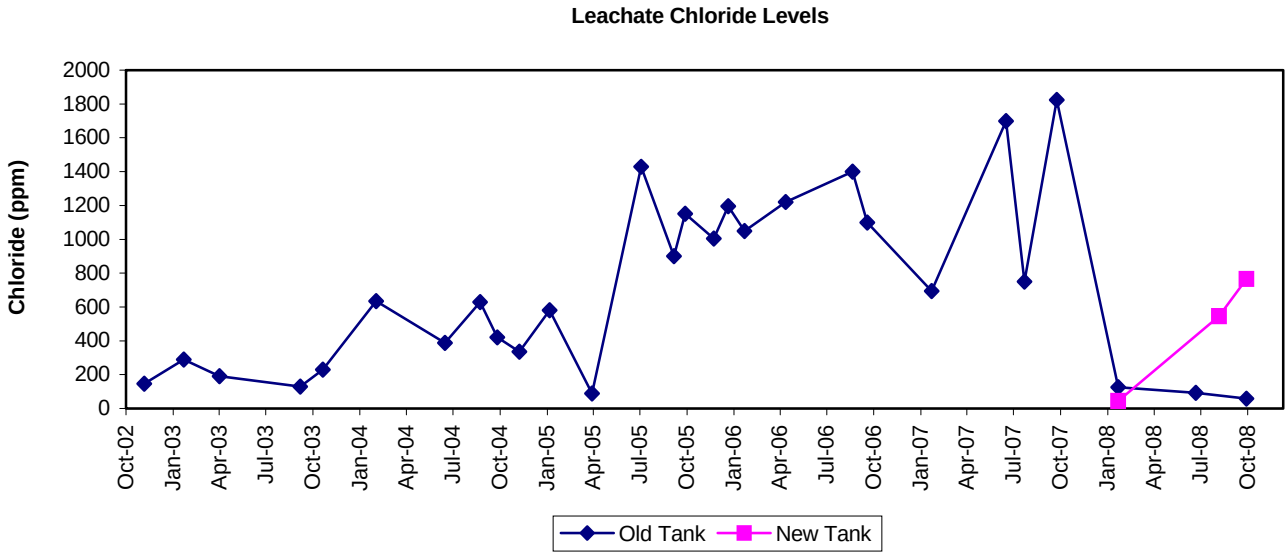
**Figure 4.26**




#### 4.6.3.4. Leachate Chloride

Leachate chloride levels are graphed in figure 4.27. As discussed above, the significant reduction in leachate chloride levels in the old leachate tank at the end of 2007 is due to the fact that the new tank was in operation and receiving all leachate from the landfill area from November 2007.

**Figure 4.27**




In summary, levels of all leachate parameters were within the ranges expected for municipal waste landfills. Continued leachate recirculation has the potential to gradually increase the concentration of chemical parameters in the leachate. However, the Council uses only low strength leachate from the Civic Amenity Area for recirculation in order to ensure that no problems arise with the strength or treatability of the leachate leaving the site and to achieve the optimum leachate BOD:COD ratio of 0.3. The unusually low BOD:COD ratio obtained for the CA site leachate in 2008 will be investigated by additional monitoring in 2009. This leachate should not present any treatability problems because it contains very low levels of organic material and other parameters in comparison to leachate from the landfill area.

## 4.7. Biological / Ecological Status.

**Biological Monitoring:**

Biological and ecological monitoring surveys were carried out during the year in accordance with Condition 9.15 of W0109-01. Details have been submitted in separate reports to the Agency in 2008. The following conclusions were drawn:

The biological monitoring for 2008 indicates a small but significant deterioration in the Inagh river from a slightly polluted Q3-4 at the four sites in 2007, to moderately polluted (Q3) at all sites in 2008. As this decline is also recorded at Site AE7, which is upstream of any possible landfill influence, this decline cannot be attributed to landfill effects.

**Ecological Monitoring:**

A general habitat and vegetation survey was carried out on the 29th August 2008. The survey concluded that while there are no habitats of significant conservation value within the site, the site does provide useful habitat for local wildlife including such species as the common frog and badger…..Furthermore the diversity of species within the site is increasing as new habitats are being established (at the expense of closed canopy coniferous forest)

Two countryside bird surveys were carried out during the year, on the 8th May and 15th June. These surveys have been conducted at the facility since 2002. Thirty-two bird species were recorded in 2008, which is higher than in any previous year, with three new species recorded. Crows were again scarce in the 2008 surveys. The survey report concluded "crow numbers have fallen back to relatively low levels, due presumably to bird control methods. However crows are ubiquitous in the countryside and would be quick to avail of any feeding opportunities that might arise (for instance if bird control were to cease)".

Two surveys for Hen Harriers were also carried out on the same dates as the countryside bird surveys. No sightings were made.

A mammal survey was carried out in January 2009. The survey report concluded that badgers are present on site in a number of setts close to the boundary. It was recommended that setts be avoided and that no interference should take place within 30m of any sett. The non-interference zone of 30m should be increased, at main setts only, to 50m during the badger breeding season. Overall habitat suitability for Pine Marten on site remains low. The species is present within the - site area and one individual was found within a recycling skip in 2008. No otters were observed in the 2008 survey. Further measures may be required to enhance the suitability of a number of site locations for frogs. These locations may tend to dry out during the summer months.

## 5.0 Works Programme 2008- 2009

### 5.1 Development Works in 2008

Site development works that have been carried out during the reporting period are outlined in Table 5.1.

***Table 5.1: List of development works carried out during 2008.***

| Site Development Works | Date/Status |
|---|---|
| Installation of temporary capping to cell 10 | Complete 06.08 |
| Installation of vertical gas extraction wells cell 10 | Complete 10.08 |
| Installation of sacrificial horizontal gas extraction system in cell 10 & 11 | Ongoing throughout 2008 |
| Permanent capping of closed cell 10 | Complete 11.08 |
| Installation of leachate recirculation in cell 10 | Complete 11.08 |
| Installation of 'gas barrier' to cell 10; 11 and 10; 12 interface | Complete 11.08 |
| Installation of perimeter gas wells & ground water wells | Complete 2008 |
| Upgrading of flare stack from 750m3/hr to 850m3/hr | Complete 05.08 |

Site development works that will be carried out in over the next 12 months are outlined in section 5.2.

A leachate recirculation system was installed for cell 8 & 9 of phase 2 in 2006, with a similar system installed in cell 6 & 7 in December 2007 and cell 10 in November 2008. The permanent capping to cell 10 was carried out 7 months in advance of the required time set out in the licence. This work was project managed by CCC with a nominated sub contractor FLI Environmental Ltd. This project involved placing of approx. 3,500$m^2$ of 1mm LLDPE smooth liner to the permanent cap of cell 10 and approx 5000$m^2$ of textured liner to the interface of cell 10;11 and cell 10;12 by a specialist sub-contractor and the placement of approximately 10,000$m^3$ of subsoil sourced from site. A manually operated leachate recirculation system started operating in late 2007 for cell 8 & 9, cell 6 & 7 was operational by early 2008 and cell 10 was operational in late 2008.

### 5.2 Progress to Site Restoration

A Restoration Plan was submitted to the Agency in April 2003. The plan covered the following issues related to the restoration of the site, including:

- Final landfill profile
- Final cap construction

- Access roads
- Proposed land use
- Fencing and security
- Environmental monitoring and pollution

This plan is being progressed in a sequential manner as cells are completed.

The landfill profile is that as set out in Figure 2.12, the profile used of the pre settlement profile. Cells 1-5 of Phase 1 is permanently capped; cells 6-9 of Phase 2 is permanently capped.; cell 10 of Phase 3 is permanently capped. Screening embankments for phase 4 & 5 were constructed as part of the phase 3 development works during 2007, with extensive landscaping of the embankments in late 2007 / early 2008. New guidelines issued by the Agency 20th June 2007 has reduced the timing of the placement of permanent capping systems after cells are competed.

### 5.3 Proposed Development 2009

The proposed developments are set out in Table 5.2.
(Note these proposed works are dependent on waste intake for completion of active cell & weather)

***Table 5.2: Proposed Development of the Facility during 2009***

| Site Development Works | Date |
|---|---|
| Review / modification to existing layout of civic amenity area | January 2009 |
| Cleaning of new & old storm water ponds | Early2009, (weather dependable) |
| Installation intermediate capping of cell 11 | June 2009 |
| Installation of vertical gas extraction wells for cell 11 | July 2009 |
| Installation of leachate recirculation system for 11 | July 2009 |
| Installation of sacrificial horizontal gas extraction system in cell 11 | Ongoing throughout 2009 |
| Permanent capping of cell 11 | August 2009 |
| Installation of new gas manifold & knock-out pot cell 10;11 | May 2009 |

Permanent capping of the cells will be completed as per condition 4.19.3.

### 5.4 Site Survey and Remaining Void Space

The site is surveyed to ensure that the landfill profile does not exceed the licence requirement. A copy of the most recent topographical survey is attached in Appendix 8.2. The survey has spot levels recorded in December 2006 imposed upon the contours of the August 2005 survey. It is proposed to update the 'site survey' in early 2009, as

the permanent capping works of cell 10 and the Phase 3 development works will be fully completed, i.e. landscaping etc.

In January 2008 it was estimated that there was an approximate residual capacity for 120,000 tonnes of waste within phase III, excluding cover material. Cell 10 of phase 3 was completed in June 2008 with approx 28,000t of waste landfilled. Landfilling started in cell 11 of phase3 in July 2008. This calculation was based on a number of assumptions including that the density of compacted waste being 0.75 tonnes/$m^3$ and that pre settlement profile is adopted.

## 6.0 Financial Aspects

### 6.1 Annual Budget and Operating Costs

The annual budget for the Central Waste Management Facility is outlined in Table 6.1 below.

***Table 6.1: Summary of Financial Provisions 2008***

| Item | 2008 budget |
|---|---|
| CWMF - Landfill operation | € 1,623,949.00 |
| CWMF - Recycling centre operation | € 232,000.00 |
| CWMF - Compost operation | € 10,000.00 |
| Total | € 1,865,949.00 |

### 6.2 Portion of Gate Fees for Environmental Improvement Projects.

The Community Fund was included in the Licence and was a result of the Government Policy Statement on waste management 'Changing Our Ways'. Local authorities working in partnership with local communities to mitigate the impact of waste management facilities on these communities through appropriate environmental improvement projects.

An amount of €1.27 per tonne of waste *(start 2002 index linked)* accepted for disposal at the landfill is allocated to the Community Fund. The fund will be available as long as the facility accepts waste for disposal

Eligible local communities to benefit from the Community Fund are Inagh, Cloonanaha and Kilnamona.

A structure was put in place for the distribution of the Community Fund, which was agreed with the Community Liaison and Monitoring Committee *(CLMC).* A weighting criteria ranging between 5 to 10 with projects nearest to the facility carrying the greatest weighting was also adopted.

The format of Evaluation Panel to access the application for funding was agreed at the meeting of the 24th May 2005, this panel has been appointed for 3 years with a review proposed in early 2008. This review was started in mid 2008 by Exodea Europe Consulting Ltd and should be completed in early 2009. Their scope is to review the fund and its impact & effectiveness to date. The Evaluation Panel for 2008 selected was Mr Seamus O'Grady, Chairman, Mr Michael McNamara (CCC), Ms Doirin Graham, CEO Leader, and two community representatives Ms Perry Long Chair of the CLMC & Mr Pat Crowe CLMC member. Evaluation panel recommended distribution of the 3rd tranche with a value of €122,885 distributed among 7 projects. The fund was distributed among 7 projects as follows:

| **Project Name** | **Amount Recommended** |
|---|---|
| Inagh & District Gun Club | 2,750.00 |
| Inagh Hurling Club | 33,135.00 |
| Kilnamona Parish Council | 4,000.00 |
| Kilnamona Hurling Club | 17,500.00 |
| St Flannan's NS | 31,000.00 |
| Inagh Development Ltd | 28,500.00 |
| Kilnamona National School | 6,000.00 |

## 7.0 Review

### 7.1 Nuisance Controls

Nuisance control at CWMF addresses the environmental impacts of landfilling activity on site.

A full register of nuisances and complaints is held in the site administration office. The list of nuisances and complaints and subsequent follow-up actions are given. The list of on-site incidents are contained in Appendix 8.5.

Clare County Council carry out mitigation measures to reduce nuisances at CWMF, these include:

### 7.1.1 Litter Control

Careful management of the site, including adequate compaction of the waste and the use of sufficient cover material will reduce the incidence of windblown plastic and paper. A nylon mesh catch fence and/or free standing, moveable litter screens close to the point of deposit and positioned to take account of the wind direction is employed to intercept litter and prevent it leaving the site. Perimeter security fencing also intercepts wind-blown litter. This perimeter security fence has been extended to include the Phase 3 development works.

Any loose material lying inside the site is gathered and disposed of regularly to keep the site tidy. Wind-blown material caught by the catch netting or moveable screens is cleaned frequently. Clare County Council personnel conduct litter checks at areas outside the site when necessary.

The facility and the main road outside the facility are patrolled daily for litter and a record is kept in the site office of any action carried out to remove nuisance caused by litter.

### 7.1.2 Birds

Clare County Council currently employs Bird Control Ireland Ltd to control bird activities on site. The methods employed are both active and passive. Bird Control Ireland Ltd. maintain a continuous presence on site from dawn to dusk by way of balloons, heli-kites, flashers, audio devices, dummy launchers and birds of prey. Peregrine falcons and Harris hawks are flown daily (weather permitting) to discourage birds from congregating on site. An operational report is completed each day and a file copy kept at the site office. Bird control measures are in place from dawn until sunset each day. Bird scavenging is minimised by the compaction and daily covering of waste.

### 7.1.3 Vermin

Curtin Pest Control is employed by Clare County Council to minimise any nuisance caused by vermin. The compaction and daily covering of waste makes food waste unavailable and ensures that there is minimal nuisance from vermin. The confinement of the active area resulting in the relative rapid rising of levels mitigates against colonisation of the area by flies. Where necessary spraying with an approved insecticide is utilised when appropriate by specially trained personnel. A log is kept of insecticide spraying. Curtain Pest Control Ltd. conducts monthly inspections on site and maintains a baiting programme to control rat or mice infestations. Details of the baiting programme are kept on file.

### 7.1.4 Fires

Adequate fire fighting equipment capable of handling small outbreaks of fire is maintained on site. Site staff are trained in the use of the equipment. In the event that a fire breaks out it will be treated as an emergency and dealt with immediately. In all cases, the county fire brigade & the Agency will be contacted in the event of an incident.

### 7.1.5 Vehicles

All vehicles leaving the active tipping area are directed to use the dry-wheel shakeout and wheelwash unit. In the event that mud and debris is carried from the active site onto the main access road due to inclement weather conditions, the site manager will arrange that the road is cleaned. Internal roadways are brushed or wetted as required in dry periods.

The haul road around phase one and as far as cell 11 / 13 to the east and to the stormwater lagoon is surface dressed, remedial work will be required on this section of site work due to Phase 3 development works. All access roads from Phase 1 to 5 are now stoned coated.

### 7.1.6 Odours

Covering daily with suitable cover material in combination with a sacrificial horizontal gas extraction system within the active cell helps to control generated odours from the active cell. The waste is covered during weekdays / weekends with a combination of suitable site clay, ASR, Wood Ash and a fabric material as a base (Geopoly) to minimise odour. Control of odour is achieved by the placement, compaction and covering of waste in the active area that is kept to a minimum in area.

Adherence to good landfill practice is the primary mechanism for odour control at the site. The active gas abstraction and utilisation will destroy odoriferous compounds in the gas. In 2006 active gas extraction was extended to the active area; this system of actively extracting gas from the active cells is used in combination with the daily /weekend cover and has been implemented in all active cells.

The installation of the high temperature enclosed ground flare and gas collection system further reduces odour generation. LFG is actively extracted from cells 1 to 5 of phase 1 and from cells 6,7, 8 and 9 of phase 2. The flare was upgraded from 500$m^3$/hr to 750$m^3$/hr in August 2006 and was again upgraded in May 2008 from 750m3/hr to 850m3/hr by consultants AFS to assist with the management of existing & future landfill production.

Horizontal active gas extraction collection network was placed in cell 10 & 11 during 2008 as a measure to reduce possible gas migration from the active cell.

On 20th June 2007 the EPA issued a '*circular letter to all landfills'* concerning the odour management; the following is an extract ''*In 1997 and 2000, the Agency published a number of guidelines manuals specifically to assist different parties in the operation (Landfill Operational Practices) and design (Landfill Site Design) of landfills in Ireland. Through its role as an Enforcement body for all landfills licensed by the Agency, the Office of Environmental Enforcement (OEE) has undertaken a review of the various practices taking place at such facilities''.* The OEE is of the opinion that some of the strategies outlined in the above named manuals should be revised and / or updated to take into *account the changing situations at landfills across the country*. CCC has implemented these guidelines in terms of operation of the facility & the future design of landfill infrastructure. CCC successfully applied an *LLDPE* liners to the cell interface of cell 9;10 & cell 7;13 during the permanent capping of cell 6 & 7 in December 2007. Similar work was carried out during the permanent capping of cell 10 in November 2008 with the application of a gas barrier to the cell interface of 10;11 and 10;12.

A daily odour patrol is carried out to investigate if odours are present on-site and off-site. If odour is detected it is logged, an incident report is issued to the Agency and measures are taken to deal with the odour immediately. Independent odour patrols are also carried out on a random basis, generally twice per month, by Environmental Health Inspectors of the Health Services Executive based in Ennis.

### 7.1.7 Dust

In dry weather, all site access roads are sprayed with water using a bowser to suppress dust. On very dry, windy days, this is done throughout the working day. Ambient dust levels are measured at four boundary locations, three times per annum in accordance with the conditions of the waste licence.

### 7.1.8 Visual Intrusion

The principle method of mitigating visual intrusions is the retention of a screening belt of trees around the site.

Landscaping is implemented at the site entrance and access routes. These measures minimise visual intrusion during the initial phases. The earth embankments surrounding the landfill area to the east, west and north of the site have been raised to minimise visual intrusion.

New screening embankments have been constructed as part of the phase 3 development works, they enclose future phases 4 & 5; all these embankments have received a good growth of grass towards the end of 2007. These embankments also received semi mature Scots Pine and Sitka Spruce saplings during 2008.

### 7.1.9 Noise

Two noise surveys are carried out each year at noise sensitive locations adjacent to the facility. Results indicate that noise generated by activities at the site complies with licence limits.

### 7.1.10 Complaints Register

Details of all complaints made by the public are recorded in a complaint register. This register is located in the site administration office. The register includes the name of the complainant, the nature of the complaint, the date of the complaint and the actions taken to remedy the complaint. The site manager signs off completed complaint forms. The complaints register is available for inspection by members of the public.

## 7.2 Environmental Objectives

Fehily Timoney and Company Ltd., consultants to Clare County Council, submitted the Environmental Management System *(EMS)* for the Central Waste Management Facility to the EPA in April 2002. The EMS contained objectives and targets for the following year. The document has been revised and updated by Clare County Council on a yearly basis since then with each revision presenting a schedule of objectives and targets for the coming year. The section below outlines the schedule for the coming year January-December 2009.

### 7.2.1 Objective 1, Obtaining & Maintaining International Standards Organisation *(ISO)* 14001:2004

In accordance with the EPA manuals on Landfill Operations and Best Landfill Practice, all landfill sites should operate a detailed Environment Management Plan *(EMP),* which will also permit the implementation of a site EMS.

Organisations of all kinds, private or public orientated are increasingly concerned with achieving and demonstrating sound environmental performance by controlling the impacts of their activities, products and services on the environment, consistent with their environmental policy and objectives. Clare County Council already operates a comprehensive Environmental Management System (EMS) as part of its EPA approved waste licence.

ISO 14001:2004 is an internationally recognised and respected standard, which governs how the environmental impacts of industrial and other activities should be managed to avoid pollution and damage. It is intended to provide private or public organisations, with the elements of an effective EMS that can be integrated with other management requirements and help organisations achieve environmental goals and objectives in relation to their identified significant environmental aspects

A summary of the project tasks and timeframe is set out in Table 7.1 and Table 7.2 below.

***Table 7.1: Lists of tasks associated with setting-up / maintaining ISO 14001.***

| Task Number | Activity |
|---|---|
| Task 1 | Draft policy statement |
| Task 2 | Prepare register of legislative & other requirements |
| Task 3 | Prepare list of environmental aspects |
| Task 4 | Preliminary Assessment by NSAI |
| Task 5 | Registration Assessment, formal registration |
| Task 6 | Audit by NSAI, |
| Task 7 | ISO 14001 certification |
| Task 8 | Set objectives & targets for next year |

***Table 7.2: Timescale of tasks associated with setting-up / maintaining ISO 14001***

| | | | 2008 | | | | | | | | | | | | 2009 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | | | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D |
| 1 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | |

### 7.2.2 Objective 2: Install & operated a Construction and Demolition Waste Recovery Centre on Site

It is the intention to investigate the feasibility of installing a Construction & Demolition (C&D) Waste Recovery Centre on site. C&D waste management in Ireland is coming under increasing pressure as landfill void space is decreasing, waste management costs are rising and with the large activity in the construction industry. It is the intention of CCC to use this C&D waste for on-site engineering works, restoration or remedial

purposes. CCC has operated a civic amenity site at the facility and has been used to recycle some of the waste streams associated with C&D, i.e. timber and metal.

***Table 7.3: List of tasks associated with installing a Construction and Demolition Waste Recovery Centre on Site***

| | |
|---|---|
| Task 1 | Arrange for feasibility study |
| Task 2 | Investigate options for C & D recovery |
| Task 3 | C & D recovery trial period of 3 month |

***Table 7.4: Timescale of tasks associated with installing a Construction and Demolition Waste Recovery Centre on Site.***

| | 2009 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | J | F | M | A | M | J | J | A | S | A | N | D |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |

### 7.2.3 Objective 3: Maintain ongoing training and development for all staff on site

Maintain the Performance Management and Development System (PMDS) implemented on site in early 2006. Clare County Council, along with all local authorities, is currently introducing PMDS. This will centre on an overall Corporate Plan for the LA, which then feeds into provide all staff at the facility with individual work plans which will in turn link to a Team Development Plan for the Facility.

### 7.2.4 Objective 4: Review / modify the layout of the civic amenity site

It is the intention to investigate the feasibility & review the existing layout of the civic amenity site to make it more user friendly, introduce new materials for recovery for the public and take into account movement of traffic / pedestrians. It is proposed that all work from design to construction will be carried out directly by Clare County Council.

***Table 7.5: List of tasks associated with modifying the layout of the civic amenity site***

| | |
|---|---|
| Task 1 | Arrange for feasibility study |
| Task 2 | Investigate options |
| Task 3 | Construction of new layout |

***Table 7.6: Timescale of tasks associated with modifying the layout of the civic amenity layout***

| | 2008 | | | | | | | | | | | | 2009 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | J | F | M | A | M | J | J | A | S | A | N | D | J | F | M | A | M | J | J |
| 1 | | | | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | |

## 7.3 Programme of Public Information

The following information is held in public files at the site offices and is available for the public inspection.

- A copy of the waste licence.
- All correspondence from the Agency relating to the facility.
- All correspondence from Clare County Council to the Agency relating to the facility.
- Copies of quarterly monitoring reports.
- Copies of annual environmental reports (AER)
- Copy of all procedures relating to the facility.

Personnel associated with the facility are also available to meet with members of the public and answer queries regarding the facility if requested. Copies of all reports, correspondence with / to the EPA and testing associated with the facility are maintained for public inspection at the facility.

A monthly Community Liaison & Monitoring Committee *(CLMC)* meeting is held on the 1st Wednesday of each month at the Community Hall, Inagh. This affords members of the public the opportunity to ask questions and seek any information /clarification that is required; it also allows Clare County Council to pass on any information regarding the operation of the facility during the past month & any future work planned.

## 7.4 Management and Staffing Structure

The management structure is detailed in Appendix 8.4

## 7.5 Environmental Incidents and Complaints

### 7.5.1 Environmental Incident Summary

Condition 3 of the waste licence requires that the licensee shall make written records of environmental incidents. Details of recordable incidents and complaints during the reporting period are summarised below. Incidents are forwarded to the EPA.

Note CCC employed the services of Odour Management Ireland *(OMI)* to investigate borehole LG7, they produced a report in Feburary 2007 titled *'Speciated volatile Organic Compound Landfill Gas Testing of Borehole* '……..; with the report concluding *'In general, the speciated VOC profile detected in P1G4 is significantly different in comparison to the VOC profile in perimeter borehole LG7 and therefore it is unlikely that the elevated methane concentrations detected in perimeter borehole LG7 are due to the lateral or horizontal migration of landfill gas……';*

***Table 7.7: Summary of Incidents Relating to Schedule F during the Reporting Period***

| Nature of Incident | Number of Incidences |
|---|---|
| Non compliance with Schedule F2 - Landfill Gas trigger levels | 24 |
| Non compliance with Schedule F4 | 1 |

Condition 3 of the waste licence requires that the licensee shall make written records of all complaints. Details of complaints taken during the reporting period are summarised below and outlined in detail in Appendix 8.5.

***Table 7.8: Recorded Complaints during 2008.***

| Number of Complaints | Nature of Complaint |
|---|---|
| 46 *(18 via EPA)* | Odour |

Corrective actions taken in response to incidents and complaints are in accordance with the requirements of the licence and with the site Corrective Action Procedure.

## 7.6 Waste Reduction and Recovery

Clare County Council is required under Condition 4.22 of the Waste Licence to install the following infrastructure in regard to waste reduction and recovery.

### 7.6.1 Construction & Demolition Waste Recovery Area

Construction and demolition waste is a very significant component of the overall waste stream, particularly with current high levels of building construction, renovation and demolition. It is the objective of Clare County Council to divert significant volumes of C&D waste from landfill.

Clare County Council intend to carry out a study to determine the feasibility of installing a Construction and Demolition waste recovery Centre on site (See Section 5, Obj. 2)

### 7.6.2 Civic Amenity Area

Clare County Council has a civic amenity centre at CWMF. In order to maximise the recovery of waste on a programme is being developed to increase recycling and recovery

of waste streams by the provision of opportunity to customers to divert waste from disposal to recovery. In mid 2007 Clare County Council started the recovery of household 'plate glass' with the approval of the Agency, since then approx 26t was recovered during this period (see section 3.3). In mid 2008 Clare County Council started the recovery of household 'hard plastics' with the approval of the Agency A review of the layout of the civic amenity area was carried out in January 2009, this revised layout will be monitored during 2009 i.e. traffic movement form public & commercial contractors.

### 7.6.3 Composting Area

The aerated static pile green waste composting project commenced on site in January 2006. The initial material received was woody in nature, this is expected to vary throughout the year as the growing season extends. A total of 1076t of 'green waste' was diverted from landfill since January 2006. The produced compost is been used on site for landscaping purposes and when required by the gardening section of Clare County Council. Clare County Council invested in new equipment to assist with the processing of compost in 2007. In August 2008 the Council advertised seeking expression of interest from the private sector to extend / operate the current compost facility for inclusion of 'brown' bin feed stock.

## 7.7 Biodegradable Waste / Diversion from Landfill

In line with Clare County Council's objective to reduce the quantity of biodegradable waste being landfilled at the Ballyduff Beg Central Waste Management Facility, it has been proposed to introduce on-site composting of green waste and household biodegradable waste. Clare County Council in conjunction with Celtic Composting Ltd. has constructed a composting facility, the first stage of which was completed in late 2005. The composting of green garden waste commenced in January 2006. Members of the public bring clean green waste e.g. cut grass, hedge and bush clippings etc. to the facility as well as to the Council's recycling centre in Ennis where it is accepted free of charge. The material is processed on site at Ballyduff Beg before being placed in aerated static piles. Air is continuously pumped through the piles by way of fans to provide the oxygen needed by the micro-organisms breaking down the waste. The temperature of the material is monitored to maintain optimum composting conditions. Each pile is turned to ensure even decomposition. After approximately twelve weeks the material will have formed compost that the Council can use for on-site landscaping purposes or within the Gardening Section.

Food waste is not currently accepted at the facility for composting. However in August 2008 CCC advertised seeking expression of interest from the private sector to extend / operate the current compost facility for inclusion of 'brown' bin feed stock. The necessary infrastructure (apart from tipping building) is in place to accept such waste should the need arise. An licence under the Animal Byproducts Regulations from the Department of Agriculture would also be required to allow commencement of composting of food waste. The facility is currently licensed to accept up to 2,000 tonnes of material for composting per annum. Initially, it was expected that approximately 1,000 tonnes per annum of green garden waste will be processed, however this figure may vary depending on demand for the service. A record is kept on site of green waste quantities.

The National Strategy on Biodegradable Waste (NSBW) was published in April 2006 and sets out measures to progress the diversion of biodegradable municipal waste from landfill in accordance with the Landfill Directive. Collection of commercial 'brown bin' for this region is set to commence in January 2009, with household collection in September 2009.

### 7.8 Landfill Directive

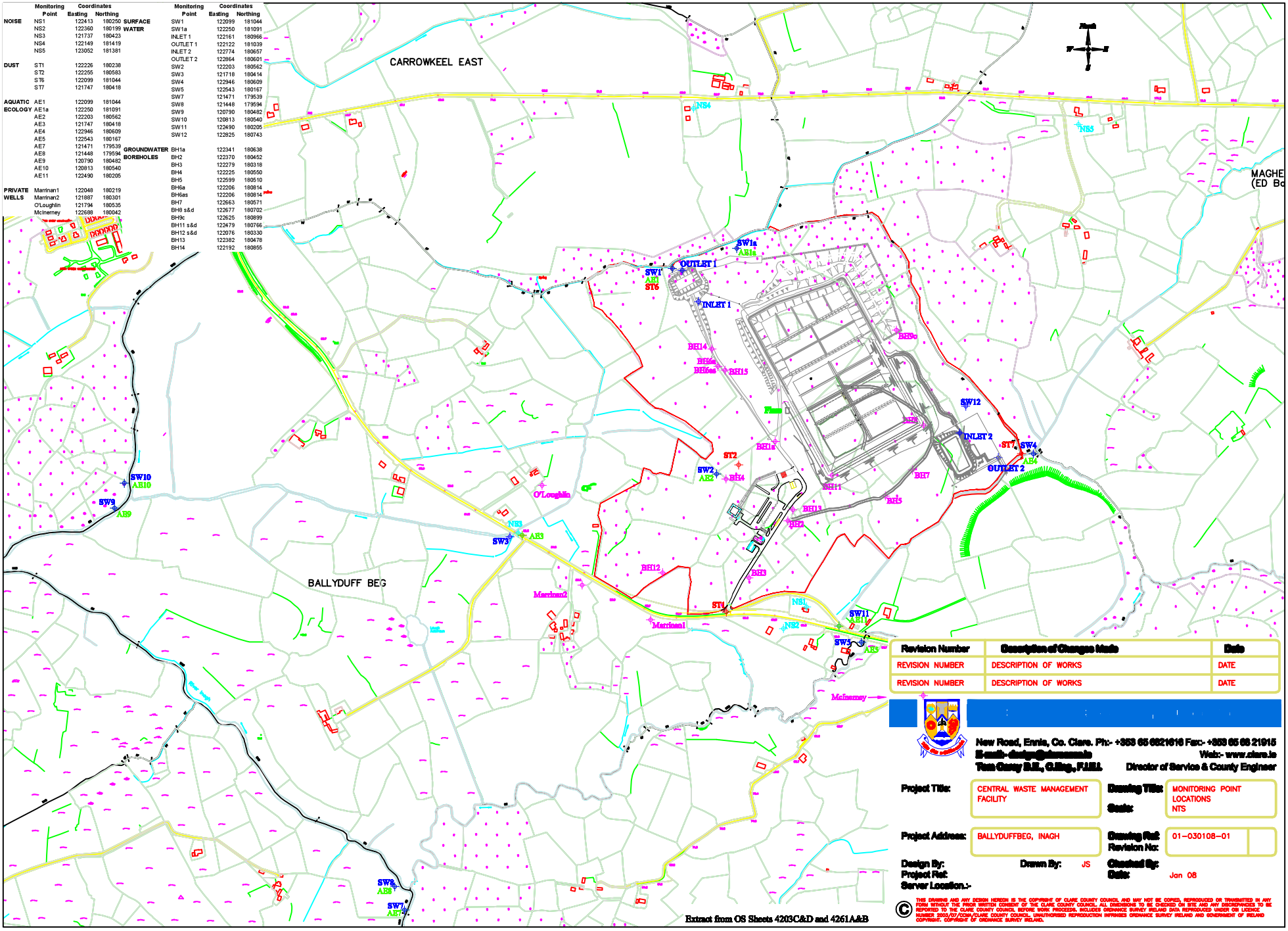
The Directive's overall aim is "to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from the landfilling of waste, during the whole lifecycle of the landfill". The Landfill Directive represents a change in the way waste is managed, requiring waste minimisation and increased levels of recycling and recovery. CWMF landfill meets the following parameters outlined in the Directive: It is a newly developed, engineered, non-hazardous waste landfill and so meets the requirements of such a facility, as outlined in Annex I of the Directive. It is licensed as required under Article 7 of the Directive and managed in accordance with Article 8-13 of the Directive. The facility has a civic amenity area for recycling waste and is investigating the feasibility of providing a C & D recovery for the public.

Appendix 8.1, Licensed waste disposal activities, in accordance with the Third Schedule of the Waste Management Act, 1996 - 2005

| | |
|---|---|
| *Class 2.* | *Land treatment, including biodegradation of liquid or sludge discards in soils:*<br>*This activity is limited to the disposal of treated de-watered non-hazardous industrial sludge at the facility.* |
| *Class 4.* | *Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons:*<br>*This activity is limited to the storage and management of leachate and stormwater in lined lagoons.* |
| *Class 5.* | *Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.*<br>*This activity is limited to the disposal of a maximum of 56,500 tonnes of non-hazardous waste, excluding sewage sludge, per annum into engineered lined cells.* |
| *Class 6.* | *Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule:*<br>*This activity is limited to leachate re-circulation and the disposal of compost that is produced on site.* |
| *Class 7.* | *Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcination) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule (including evaporation, drying and calcination):*<br>*This activity is limited to possible future leachate treatment at the facility in order to reduce the strength and volume of leachate tankered off-site for treatment.* |
| *Class 11.* | *Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.*<br>*This activity is limited to the mixing of waste at the Civic Waste Facility prior to being landfilled.* |
| *Class 12.* | *Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.*<br>*This activity is limited to the mixing or compaction of waste and the reloading of waste tipped for inspection into a container prior to landfilling at the facility or disposal off site.* |
| *Class 13.* | *Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.*<br>*This activity is limited to the storage of waste at the Civic Waste Facility prior to disposal either off site or at the landfill.* |

*Table 8.2, Licensed waste recovery activities, in accordance with the Fourth Schedule of the Waste Management Act, 1996 – 2005.*

| | |
|---|---|
| *Class 2.* | *Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes):*<br>*This activity is limited to the composting of waste and the recovery of organic wastes including timber, paper and cardboard at the facility.* |
| *Class 3.* | *Recycling or reclamation of metals and metal compounds:*<br>*This activity is limited to the storage of metals including white goods, batteries and scrap metal at the facility pending further recovery off-site.* |
| *Class 4.* | *Recycling or reclamation of other inorganic materials:*<br>*This activity is limited to the storage and recovery of glass and construction and demolition waste at the facility pending the recovery off-site or in the case of construction and demolition waste its use in landfill restoration and engineering works.* |
| *Class 9.* | *Use of any waste principally as a fuel or other means to generate energy:*<br>*This activity is limited to the possible future use of landfill gas as an energy resource to produce electricity and heat.* |
| *Class 10.* | *The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system:*<br>*This activity is limited to the use of compost as a soil conditioner at the facility for restoration.* |
| *Class 11.* | *Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule:*<br>*This activity is limited to the use of compost and construction and demolition waste as cover material or in restoration, and the use of construction and demolition waste as building material at the facility.* |
| *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:*<br>*This activity is limited to the storage of waste destined for recovery activities.* |




| | Monitoring Point | Coordinates Easting | Northing |
|---|---|---|---|
| NOISE | NS1 | 122413 | 180259 |
| | NS2 | 122360 | 180199 |
| | NS3 | 121737 | 180423 |
| | NS4 | 122149 | 181419 |
| | NS5 | 123052 | 181381 |
| DUST | ST1 | 122226 | 180238 |
| | ST2 | 122255 | 180583 |
| | ST6 | 122099 | 181044 |
| | ST7 | 121747 | 180418 |
| AQUATIC ECOLOGY | AE1 | 122099 | 181044 |
| | AE1a | 122250 | 181091 |
| | AE2 | 122203 | 180562 |
| | AE3 | 121747 | 180418 |
| | AE4 | 122946 | 180609 |
| | AE5 | 122543 | 180167 |
| | AE7 | 121471 | 179539 |
| | AE8 | 121448 | 179594 |
| | AE9 | 120790 | 180482 |
| | AE10 | 120813 | 180540 |
| | AE11 | 122490 | 180205 |
| PRIVATE WELLS | Marrinan1 | 122048 | 180219 |
| | Marrinan2 | 121887 | 180301 |
| | O'Loughlin | 121794 | 180535 |
| | McInerney | 122688 | 180042 |

| | Monitoring Point | Coordinates Easting | Northing |
|---|---|---|---|
| SURFACE WATER | SW1 | 122099 | 181044 |
| | SW1a | 122250 | 181091 |
| | INLET 1 | 122161 | 180966 |
| | OUTLET 1 | 122122 | 181039 |
| | INLET 2 | 122774 | 180657 |
| | OUTLET 2 | 122864 | 180601 |
| | SW2 | 122203 | 180562 |
| | SW3 | 121718 | 180414 |
| | SW4 | 122946 | 180609 |
| | SW5 | 122543 | 180167 |
| | SW7 | 121471 | 179539 |
| | SW8 | 121448 | 179594 |
| | SW9 | 120790 | 180482 |
| | SW10 | 120813 | 180540 |
| | SW11 | 122490 | 180205 |
| | SW12 | 122825 | 180743 |
| GROUNDWATER BOREHOLES | BH1a | 122341 | 180638 |
| | BH2 | 122370 | 180452 |
| | BH3 | 122279 | 180318 |
| | BH4 | 122225 | 180550 |
| | BH5 | 122599 | 180510 |
| | BH6a | 122206 | 180814 |
| | BH6as | 122206 | 180814 |
| | BH7 | 122663 | 180571 |
| | BH8 s&d | 122677 | 180702 |
| | BH9c | 122625 | 180899 |
| | BH11 s&d | 122479 | 180766 |
| | BH12 s&d | 122076 | 180330 |
| | BH13 | 122382 | 180478 |
| | BH14 | 122192 | 180855 |

| Revision Number | Description of Changes Made | Date |
|---|---|---|
| REVISION NUMBER | DESCRIPTION OF WORKS | DATE |
| REVISION NUMBER | DESCRIPTION OF WORKS | DATE |

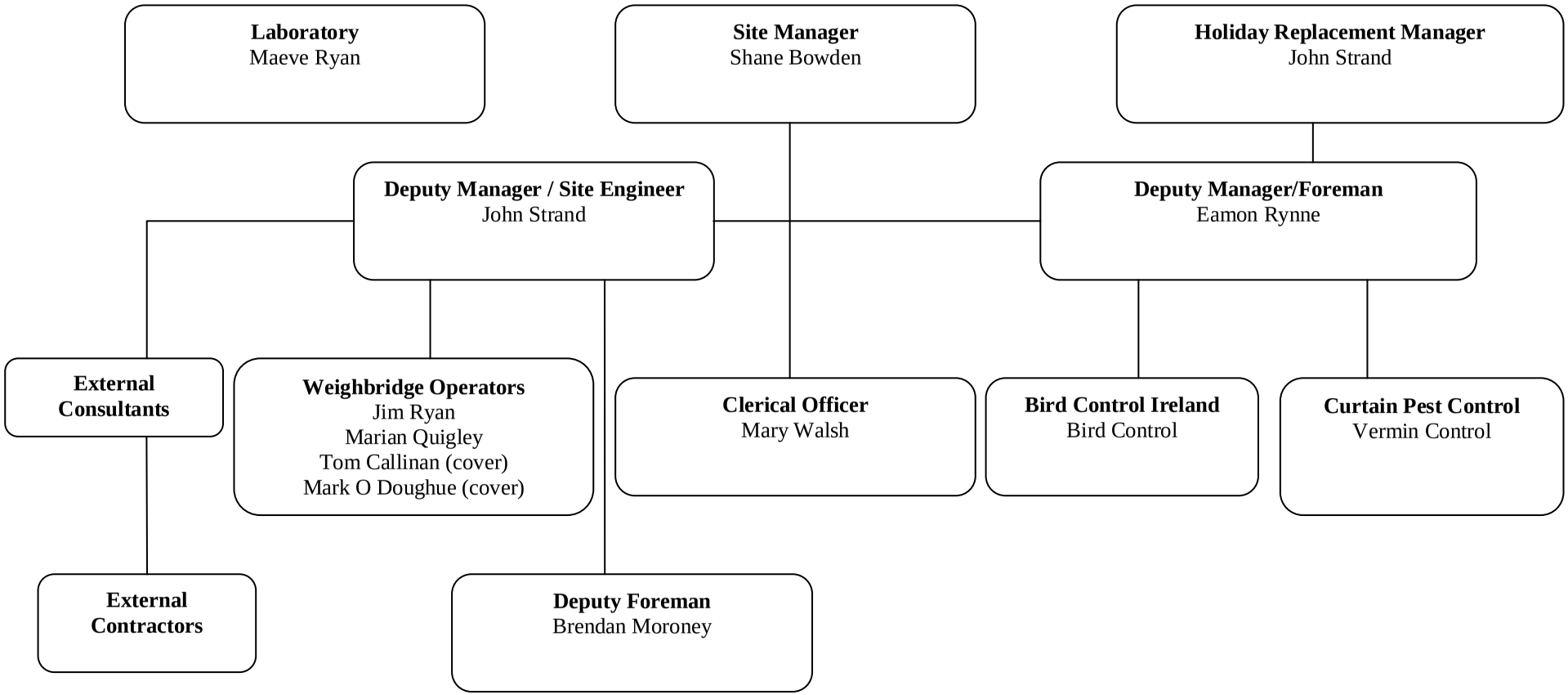
New Road, Ennis, Co. Clare. Ph:- +353 65 6821616 Fax:- +353 65 68 21915
E-mail:- design@clarecoco.ie Web:- www.clare.ie
Tom Gassy B.E., C.Eng., F.I.E.I. Director of Service & County Engineer

| | | | |
|---|---|---|---|
| Project Title: | CENTRAL WASTE MANAGEMENT FACILITY | Drawing Title: | MONITORING POINT LOCATIONS |
| | | Scale: | NTS |
| Project Address: | BALLYDUFFBEG, INAGH | Drawing Ref: | 01-030108-01 |
| | | Revision No: | |
| Design By: | | Drawn By: | JS |
| Project Ref: | | Checked By: | |
| Server Location:- | | Date: | Jan 08 |

## Appendix 8.3: Water Balance Calculation 2008

| | Landfill Operations | | | | Area | | | | Infiltration | | | | Total Leachate | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | m2 | | | | m3 | | | | m3 | |
| Month | Monthly Rainfall Figures (mm) | Active Cell | Temp Cap | Full Cap | Active Area | Temp Cap | Full Cap | Concrete | Active Area @ 100% estimated infiltration | Temp Cap @ 50% estimated infiltration | Full Cap @ 10% estimated infiltration | Concrete @ 100% infiltration | Monthly | Cumulative |
| January | 259 | 10 | - | 9,8,7,6,5,4, 3,2,1 | 7,000 | 0 | 40,000 | 2,500 | 1,813 | 0 | 1,036 | 648 | 3,497 | 398 |
| February | 111 | 10 | - | 9,8,7,6,5,4, 3,2,1 | 7,000 | 0 | 40,000 | 2,500 | 777 | 0 | 444 | 278 | 1,499 | 1,897 |
| March | 125 | 10 | - | 9,8,7,6,5,4, 3,2,1 | 7,000 | 1,000 | 40,000 | 2,500 | 875 | 63 | 500 | 313 | 1,750 | 3,647 |
| April | 59 | 10 | - | 9,8,7,6,5,4, 3,2,1 | 7,000 | 2,000 | 40,000 | 2,500 | 413 | 59 | 236 | 148 | 856 | 4,502 |
| May | 66 | 10 | - | 9,8,7,6,5,4, 3,2,1 | 7,000 | 4,000 | 40,000 | 2,500 | 462 | 132 | 264 | 165 | 1,023 | 5,525 |
| June | 130 | 10 | - | 9,8,7,6,5,4, 3,2,1 | 7,000 | 6,000 | 40,000 | 2,500 | 910 | 390 | 520 | 325 | 2,145 | 7,670 |
| July | 116 | 11 | 10 | 9,8,7,6,5,4, 3,2,1 | 7,000 | 8,500 | 40,000 | 2,500 | 812 | 493 | 464 | 290 | 2,059 | 9,729 |
| August | 249 | 11 | 10 | 9,8,7,6,5,4, 3,2,1 | 7,000 | 8,500 | 40,000 | 2,500 | 1,743 | 1,058 | 996 | 623 | 4,420 | 14,149 |
| September | 116 | 11 | 10 | 9,8,7,6,5,4, 3,2,1 | 7,000 | 8,500 | 40,000 | 2,500 | 812 | 493 | 464 | 290 | 2,059 | 16,208 |
| October | 267 | 11 | 10 | 9,8,7,6,5,4, 3,2,1 | 7,000 | 8,500 | 40,000 | 2,500 | 1,869 | 1,135 | 1,068 | 668 | 4,739 | 20,947 |
| November | 118 | 11 | - | 10, 9,8,7,6,5,4, 3,2,1 | 7,000 | 4,000 | 48,500 | 2,500 | 826 | 236 | 572 | 295 | 1,929 | 22,876 |
| December | 122 | 11 | - | 10,9,8,7,6,5 ,4,3,2,1 | 7,000 | 0 | 48,500 | 2,500 | 854 | 0 | 592 | 305 | 1,751 | 24,627 |
| *Active area for cell 10 includes runoff from side slope oft cell 9 & 10 interphase & entrance ramp ie 3000m2. Active area for cell 11 includes runoff from side slope oft cell 10 & 11 interphase & entrance ramp ie 3000m2* | | | | | | | | | | | | | - | 24,627 |

*Site Management Structure, Central Waste Management Facility(Jan – Dec 2008)*



**Appendix 8.5: Incident Report Summary 2008**

| Date | Incident Number | Incident Type | Description |
|---|---|---|---|
| 02/01/2008 | CWMF 2008/01 | Odour | Off site odour detected at Carrowkeel East, Maghera Road |
| 04/01/2008 | CWMF 2008/02 | Flare | Flare shutdown at 04:00 due to low methane |
| 04/01/2008 | CWMF 2008/03 | Equipment | TOC meter shutdown |
| 04/01/2008 | CWMF 2008/04(i) | Gas | Perimeter Wells; CH4 level exceeded LG7 LG7b LG8 LG13; CO2 level exceeded LG2 LG7 LG7a LG7b LG13 |
| 06/01/2008 | CWMF 2008/05 | Flare | Flare shutdown at 21:53 |
| 07/01/2008 | CWMF 2008/06 | Leachate | Leachate lagoon freeboard warning level reached 12:05 |
| 08/01/2008 | CWMF 2008/07 | Leachate | Leachate lagoon freeboard warning level reached 07:20 |
| 09/01/2008 | CWMF 2008/08 | Leachate | Leachate lagoon freeboard warning level reached 00:44 |
| 09/01/2008 | CWMF 2008/09 | Equipment | SW Outlet Conductivity meter shutdown |
| 09/01/2008 | CWMF 2008/10 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 09/01/2008 | CWMF 2008/04(ii) | Gas | Perimeter Wells; CH4 level exceeded LG1; CO2 level exceeded LG1 |
| 16/01/2008 | CWMF 2008/11 | Odour | Off site odour detected on N85 1km east of Facility |
| 17/01/2008 | CWMF 2008/12 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 17/01/2008 | CWMF 2008/04(iii) | Gas | Perimeter Wells; CO2 level exceeded LG12 |
| 20/01/2008 | CWMF 2008/13 | Leachate | Leachate lagoon freeboard warning level reached 04:48 |
| 20/01/2008 | CWMF 2008/14 | Equipment | Cell 1 pump and level transducer fault |
| 31/01/2008 | CWMF 2008/15 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 01/02/2008 | CWMF 2008/16(i) | Gas | Perimeter Wells; CH4 level exceeded LG1 LG7 LG7b LG8 LG11 LG12 LG13 LG19; CO2 level exceeded LG1 LG2 LG7 LG7a LG7b LG11 LG12 LG13 LG19 |
| 05/02/2008 | CWMF 2008/17 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 06/02/2008 | CWMF 2008/18 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 08/02/2008 | CWMF 2008/19 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 11/02/2008 | CWMF 2008/20 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 14/02/2008 | CWMF 2008/21 | Odour | Off site odour detected at Inagh Cross |
| 15/02/2008 | CWMF 2008/22 | Odour | Off site odour detected at Carrowkeel East, Maghera Road |
| 19/02/2008 | CWMF 2008/23 | Odour | Off site odour detected at Carrowkeel East, Maghera Road |
| 23/02/2008 | CWMF 2008/24 | Leachate | Leachate spill into surface water swale |
| 22/02/2008 | CWMF 2008/25 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 27/02/2008 | CWMF 2008/26 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 06/03/2008 | CWMF 2008/27(i) | Gas | Perimeter Wells; CH4 level exceeded LG7 LG7b LG8 LG11 LG12 LG13; CO2 level exceeded LG2 LG7 LG7a LG7b LG12 LG13 |
| 07/03/2008 | CWMF 2008/28 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 12/03/2008 | CWMF 2008/29 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 12/02/2008 | CWMF 2008/30 | Suspended Soli | Suspended solids at old SW Basin: 61.9mg/l |
| 14/03/2008 | CWMF 2008/27(ii) | Gas | Perimeter Wells; CH4 level exceeded LG19; CO2 level exceeded LG19 |
| 20/03/2008 | CWMF 2008/27(iii) | Gas | Perimeter Wells; CO2 level exceeded LG3, LG11 |
| 27/03/2008 | CWMF 2008/31 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 02/04/2008 | CWMF 2008/32 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 02/04/2008 | CWMF 2008/33(i) | Gas | Perimeter Wells; CH4 level exceeded LG7b LG8 LG11 LG13; CO2 level exceeded LG2 LG7b LG13 |
| 04/04/2008 | CWMF 2008/34 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 10/04/2008 | CWMF 2008/35 | Odour | Off site odour detected at Brian Fitzgerald's and Bridget Fitzgerald's Residence |
| 11/04/2008 | CWMF 2008/36 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 11/04/2008 | CWMF 2008/33(ii) | Gas | Perimeter Wells; CH4 level exceeded LG7 LG12 LG19; CO2 level exceeded LG7 LG11 LG12 LG19 |
| 15/04/2008 | CWMF 2008/33(iii) | Gas | Perimeter Wells; CO2 level exceeded LG7a |
| 29/04/2008 | CWMF 2008/37 | Odour | Off site odour detected at SW3 on N85 |
| 07/05/2008 | CWMF 2008/38(i) | Gas | Perimeter Wells; CH4 level exceeded LG7 LG7b LG8 LG11 LG13; CO2 level exceeded LG2 LG7 LG7b LG11 LG13 |
| 05/06/2008 | CWMF 2008/39(i) | Gas | Perimeter Wells; CH4 level exceeded LG7 LG7b LG8 LG13; CO2 level exceeded LG2 LG7 LG7b LG13 |
| 10/06/2008 | CWMF 2008/40 | Equipment | Cell 1 level transducer fault |
| 11/06/2008 | CWMF 2008/41 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 17/06/2008 | CWMF 2008/39(ii) | Gas | Perimeter Wells; CH4 level exceeded LG11 LG12 LG19; CO2 level exceeded LG11 LG12 LG19 |
| 20/06/2008 | CWMF 2008/42 | Flare | CO 107.5mg/$m^3$ on 20/12/07; Exceeds limit of 50mg/$m^3$ |
| 26/06/2008 | CWMF 2008/43 | Odour | Off site odour detected at Brian Fitzgerald's Residence |

| | | | |
|---|---|---|---|
| 30/06/2008 | CWMF 2008/44 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| **Date** | **Incident Number** | **Incident Type** | **Description** |
| 02/07/2008 | CWMF 2008/45 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 03/07/2008 | CWMF 2008/46 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 03/07/2008 | CWMF 2008/47(i) | Gas | Perimeter Wells; CH4 level exceeded LG7 LG7b LG8 LG11 LG12 LG13 LG19; CO2 level exceeded LG2 LG7 LG7b LG11 LG12 LG13 LG19 |
| 14/07/2008 | CWMF 2008/48 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 16/07/2008 | CWMF 2008/49 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 18/07/2008 | CWMF 2008/50 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 21/07/2008 | CWMF 2008/51 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 22/07/2008 | CWMF 2008/52 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 24/07/2008 | CWMF 2008/47(ii) | Gas | Perimeter Wells; CH4 level exceeded LG1; CO2 level exceeded LG1 |
| 28/07/2008 | CWMF 2008/53 | Odour | Off site odour detected at SW3 on N85 |
| 29/07/2008 | CWMF 2008/54 | Equipment | Fault with pH and Conductivity meters at old SW pond |
| 29/07/2008 | CWMF 2008/55 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 30/07/2008 | CWMF 2008/56 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 05/08/2008 | CWMF 2008/57(i) | Gas | Perimeter Wells; CH4 level exceeded LG1 LG7 LG7b LG8 LG11 LG12 LG13 LG19; CO2 level exceeded LG1 LG2 LG7 LG7b LG11 LG12 LG13 LG19 |
| 08/08/2008 | CWMF 2008/58 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 13/08/2008 | CWMF 2008/59 | Flare | Flare shutdown at 02:00 |
| 15/08/2008 | CWMF 2008/60 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 15/08/2008 | CWMF 2008/61 | Flare | Flare shutdown at 22:00 |
| 16/08/2008 | CWMF 2008/62 | Equipment | Cell 7 level transducer fault |
| 20/08/2008 | CWMF 2008/63 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 28/08/2008 | CWMF 2008/64 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 28/08/2008 | CWMF 2008/57(ii) | Gas | Perimeter Wells; CO2 level exceeded LG18 |
| 31/08/2008 | CWMF 2008/65 | Equipment | Cell 8 level transducer fault |
| 01/09/2008 | CWMF 2008/66 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 05/09/2008 | CWMF 2008/67(i) | Gas | Perimeter Wells; CH4 level exceeded LG1 LG7 LG7b LG8 LG11 LG12 LG13 LG19 LG20 LG21; CO2 level exceeded LG1 LG7 LG7b LG11 LG12 LG13 LG18 LG19 LG20 LG21 |
| 09/09/2008 | CWMF 2008/68 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 15/09/2008 | CWMF 2008/69 | Equipment | New SW Pond - Inlet TOC probe fault |
| 26/09/2008 | CWMF 2008/70 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 29/09/2008 | CWMF 2008/71 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 30/09/2008 | CWMF 2008/72 | Flare | Flare shutdown at 01:00, restarted at 09:00 |
| 01/10/2008 | CWMF 2008/73 | Flare | Flare shutdown at 10:00, restarted at 09:00 2/10/08 |
| 06/10/2008 | CWMF 2008/74 | Odour | Off site odour detected at Carrowkeel East, Maghera Road |
| 08/10/2008 | CWMF 2008/75 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 09/10/2008 | CWMF 2008/76 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 10/10/2008 | CWMF 2008/77 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 08/10/2008 | CWMF 2008/78(i) | Gas | Perimeter Wells; CH4 level exceeded LG1 LG7b LG8 LG13 LG20 LG21; CO2 level exceeded LG1 LG7a LG7b LG13 LG20 LG21 |
| 15/10/2008 | CWMF 2008/79 | Equipment | Cell 8 level transducer fault |
| 21/10/2008 | CWMF 2008/80 | Odour | Off site odour detected at Bridget Fitzgerald's Residence |
| 20/10/2008 | CWMF 2008/78(ii) | Gas | Perimeter Wells; CH4 level exceeded LG7 LG11 LG12 LG19; CO2 level exceeded LG2 LG11 LG12 |
| 28/10/2008 | CWMF 2008/78(iii) | Gas | Perimeter Wells; CO2 level exceeded LG7 LG18 |
| 03/11/2008 | CWMF 2008/81 | Odour | Off site odour detected at SW3 on N85 |
| 05/11/2008 | CWMF 2008/82 | Odour | Off site odour detected at Boolavaun, Maghera Road |
| 05/11/2008 | CWMF 2008/83(i) | Gas | Perimeter Wells; CH4 level exceeded LG1 LG7 LG7b LG8 LG12a LG13 LG19 LG20 LG21; CO2 level exceeded LG1 LG7 LG7b LG12a LG13 LG18 LG20 LG21 |
| 22/08/2008 | CWMF 2008/84 | Suspended Soli | Suspended solids at old SW Basin: 56.9mg/l |
| 28/11/2008 | CWMF 2008/83(ii) | Gas | Perimeter Wells; CO2 level exceeded LG7 LG11 LG12 LG17 |
| 02/12/2008 | CWMF 2008/85 | Odour | Off site odour detected at Carrowkeel East, Maghera Road |
| 07/10/2008 | CWMF 2008/86 | Suspended Soli | Suspended solids at new SW Basin: 37mg/l |
| 05/12/2008 | CWMF 2008/87(i) | Gas | Perimeter Wells; CH4 level exceeded LG1 LG7 LG7b LG8 LG11 LG12 LG13 LG19 LG20 LG21; CO2 level exceeded LG1 LG7 LG7a LG8 LG11 LG12 LG13 LG16 LG17 LG18 LG20 LG21 |
| 03/11/2008 | CWMF 2008/88 | Suspended Soli | Suspended solids at new SW Basin: 80mg/l |

| | | | |
|---|---|---|---|
| 23/12/2008 | CWMF 2008/89 | Odour | Off site odour detected at Boolavaun, Maghera Road |