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environmental management for business

Office of Environmental Enforcement,
South East Region,
Environmental Protection Agency,
P.O. Box 3000,
Johnstown Caste Estate,
Co.Wexford.

30th March 2010

RE: Annual Environmental Report –
Drehid Integrated Waste Management Facility W0201-02

Dear Sir, Madam,

Please find enclosed an original and 2 no. copies of the 2009 Annual Environmental Report (AER) for the above referenced facility. The AER file has been uploaded to the EPA website and is a true copy of the original Annual Environmental Report. The AER/PRTR emissions data reporting workbook has also been uploaded to the EPA website.

If you have any queries, please call me.

Yours sincerely,

Jim O' Callaghan

1016702/MG/MS
Encl.
c.c. Mr. Ciaran Geoghegan, Bord Na Mona

email. info@ocallaghanmoran.com Website: www.ocallaghanmoran.com

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environmental management for business

ANNUAL ENVIRONMENTAL REPORT

FOR

DREHID INTEGRATED WASTE MANAGEMENT FACILITY

WASTE LICENCE REG. NO. – W0201-02

Prepared For: -

Bord Na Mona,
Drehid Facility,
Killinagh Upper,
Carbury,
Co. Kildare

Prepared By: -

O' Callaghan Moran & Associates,
Granary House,
Rutland Street,
Cork

30th March 2010

Project	Annual Environmental Report 2009			
Client	Bord Na Mona Ltd. W0201-02			
Report No	Date	Status	Prepared By	Reviewed By
1670201	25/03/2010	Draft	Martina Gleeson PhD	Michael Watson MSc.
	30/03/2010	Final Report	Martina Gleeson PhD	Michael Watson MSc.

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1. INTRODUCTION

This is the 2009 Annual Environmental Report (AER) for Bord na Mona Waste Management Facility at Drehid, County Kildare and it covers the period from 1st January 2009 to 31st December 2009. The facility is a non-hazardous residual landfill and is also authorised to carry out composting of biodegradable wastes, however the composting plant has not yet been constructed.

The Environmental Protection Agency (Agency) granted the Waste Licence (W0201-01) in August 2005 and construction works began in August 2006. Phase 1 was completed in 2007 and the facility began accepting waste in February 2008. There is a rolling construction programme for the subsequent 7 phases. In April 2009, the Agency issued a revised Waste Licence (W0201-02), which increased the annual waste acceptance limit to 360,000 tonnes until the end of 2015.

The content of the AER is based on *Schedule F* of the Waste Licence and the report format follows guidelines set in the "Guidance Note for Annual Environmental Report" issued by the Agency.

2. SITE DESCRIPTION

2.1 Site Location and Layout

The facility is located approximately 9km south of Enfield and is within the confines of the Bord na Mona owned Timahoe bog. The site encompasses approximately 139 hectares (ha), which includes the site access road, clay borrow area, landfill footprint, sand and gravel borrow area and associated infrastructure.

The landfill, when complete, will encompass approximately 21 ha. It will be developed in eight distinct phases, each having duration of between 2 to 3 years. Waste deposition will only take place in the active phase and each phase will occupy between 2.2ha and 2.6 ha in area. The initial phase was completed in January 2008 and waste acceptance began in February of that year.

Subsequent phases will involve the construction of additional engineered cells, the provision of additional leachate storage capacity required, landfill gas management infrastructure including a utilisation plant that will generate electricity, and the development of a composting facility.

2.2 Waste Types & Volumes

Only non-hazardous, solid, residual waste is accepted for disposal. Hazardous and liquid wastes are not accepted. All wastes deliveries are subject to Waste Acceptance Procedures that have been approved by the Agency, as specified in Condition 8.1.10 of the Waste Licence.

A maximum of 360,000 tonnes of non hazardous municipal, commercial and industrial waste can be accepted annually for disposal until the end of 2015, after which the annual intake reduces to 120,000 tonnes per annum. A maximum of 25,000 tonnes of compostable wastes can be accepted in the composting facility, however this facility has not yet been constructed. An unlimited amount of suitable inert waste can be accepted for use in on-site engineering works.

2.3 Waste Activities

The facility is a full containment landfill, which is designed to accept treated waste for final disposal. The waste activities carried out during the reporting period were: -

- Disposal (landfilling) of wastes,
- Recovery of wastes for removal off-site for recycling, and
- Recovery of certain inert wastes on-site for use in engineering works and as daily cover.

2.4 Waste Received, Recovered & Consigned

The different types and quantities of wastes received, disposed, recovered and consigned from the facility in 2009 are shown in Tables 2.1 and 2.2. The consigned wastes are those generated by daily operations and which were not suitable for recovery or disposal on-site.

Table 2.1 Waste Received 2009

Waste Type	Description	Tonnes
Commercial and Domestic	Mixed Commercial and Domestic	187,935.30
Industrial	Non Hazardous Industrial Solid Waste	109.82
Sludges/Filter Cake	Non Hazardous Peat Filter Media	49.56
Total Disposed to Landfill		**188,094.68**
Construction and Demolition	Inert Soil and Fines Material	51,264.46
Construction and Demolition	Shredded Timber	5,783.02
Municipal and Agricultural Compost	Compost	17,717.45
Construction and Demolition Rubble	Mix of C&D concrete, brick, tiles and ceramic	14,514.40
Total Recovered on Site		**89,279.33**
Total Accepted including Inert Waste		**277,374.04**

Table 2.2 Waste Consigned 2009

Description	Tonnes
Paper & Cardboard	1.30
Engine, Gear & Lub Oils	1.24
End of Life Tyres	14.16
Discarded Electrical Equipment	3.92
Leachate	16,874.86
Septic Tank Waste	109.72
Total Consigned	**17,005.20**

2.5 Landfill Capacity

The most recent topographic survey of landfill cell footprint is included in Appendix 1, which also includes calculations of the void space that has been used. The total capacity of the facility is estimated to be 4,080,000m^3. It is estimated that approximately 435,537 m^3 of void space has been used. The remaining capacity is approximately 3,644,463 m^3. The projected closure date of the facility is 2028. The mass balance calculation is included in Appendix 1.

2.6 Method of Deposition of Wastes

2.6.1 Waste Acceptance

The waste accepted for disposal is residual waste from household, commercial and industrial sources. All of the waste collectors that deliver the waste have systems in place whereby the recyclable fraction is either collected separately, or else separation is carried out at their recovery/transfer facilities.

Wastes are delivered in Heavy Goods Vehicles (HGV) provided with the appropriate covers to prevent loss of load. Each vehicle first proceeds to the incoming weighbridge where it is weighed. The weighbridge operator and/or the Facility Manager may, at their own discretion, request the load to be tipped in the Waste Inspection Area to ensure it is suitable for acceptance.

The vehicles then proceed to the active fill area, where it is deposited under the direction of a banksman. Each landfill cell is divided into a number of 'grids', which are used to identify the areas where waste is deposited. Each load is assigned the relevant grid number. The vehicles weigh out at the outgoing weighbridge and receive an individual weighbridge docket before exiting the site.

2.6.2 Working Face

Waste is deposited close to and above the advancing tipping face. In accordance with Condition 5.6.1, the active face is confined to a height of 2.5 metres after compaction, a width of 25 metres and a slope no greater than 1 in 3. The site operatives inspect the deposited waste for items that are not acceptable under the Waste Licence, such as tyres, gas bottles, batteries etc. These are removed and stored in appropriate areas for later removal from the site.

The deposited waste is then spread in shallow layers on the inclined surface and compacted. Steel-wheeled compactors operate on the gradient of the more shallow face, pushing and compacting thin layers of waste and compacting them. Each day's waste input forms 'block', which is compacted and covered. The following day a new 'block' of waste is deposited adjacent to this block. This allows areas that have been

filled and are to be left for a period, to be progressively restored over the site life, minimising the areas of active waste deposition.

3. ENVIRONMENTAL MONITORING

Bord na Mona implements a comprehensive environmental monitoring programme to assess the significance of emissions from site activities. The programme, which is specified in Schedule C of the Waste Licence, includes groundwater, surface water, leachate, landfill gas, noise, dust and particulate monitoring and a biological assessment of the Cushaling River. The monitoring locations are shown in Appendix 2.

The monitoring results, including the full laboratory reports, were submitted to the Agency at quarterly intervals in the reporting period. This section presents a summary of the monitoring, with summary graphs showing trends included in Appendix 2.

3.1 Groundwater Monitoring

3.1.1 Baseline Groundwater Conditions

The site is underlain by the Carboniferous Kildare Shelf, which comprises the Waulsortian, Boston Hill and Allenwood limestone Formations. The majority of the site is underlain by Waulsortian limestone, which comprises pale grey, fine grained limestone. The subsoil comprises basin peat deposits, which are underlain by thick (10 to 35m) undifferentiated till

The groundwater monitoring carried out before the start of the construction works established naturally occurring elevated ammonia, iron, manganese and electrical conductivity levels. The hydrochemistry in the upgradient and downgradient wells is similar and characteristic of the limestone rocks in confined conditions.

3.1.2 Groundwater Quality

Groundwater quality was monitored at monthly intervals. The sampling was carried out in accordance with internationally accepted techniques and control procedures and the analyses were completed by a laboratory using standard and internationally accepted procedures. Samples obtained were analysed for the monthly and annual parameters specified in Schedule C.3 of the Licence.

The results were generally consistent with those obtained previously, with naturally high levels of ammonia detected at all monitoring wells. The monitoring programme confirmed that the site activities are not impacting on groundwater quality.

3.2 Surface Water Monitoring

The site is located in the catchment of the River Barrow and a divide between the Barrow and the River Boyne catchments is more than 500m to the north. There is an extensive man made drainage network across the Bord Na Mona landholding and the site is divided into a number of discrete areas, referred to as 'peat fields' formed by the surface water drains.

The drains connect to a central underground culvert, which flows towards the south, where it passes through settlement ponds, before discharging to the Cushaling River. Rainfall on roof and paved areas of the landfill discharge to the underground culvert and are directed to the settlement ponds prior to discharge to the Cushaling. The Cushaling supports salmonid and cyprinid fish, the latter being dominant in the slower flowing upper reaches.

The Cushaling is a tributary of River Figile, which is a sub-catchment of the River Barrow. Biological monitoring in the Figile downstream of the site before site development works began established that the surface water quality had been impacted by the peat extraction activities. The Barrow is a candidate Special Area of Conservation (cSAC), and a nationally important river for fisheries.

3.2.1 Visual Assessment

Bord na Mona carries out weekly inspections of the surface water drainage system. The inspections completed in the reporting period did not identify the presence of any impact on the drainage system associated with site activities.

3.2.2 Chemical Assessment

The surface water monitoring was conducted weekly at the three locations specified in the Waste Licence. The sampling was carried out in accordance with internationally accepted techniques and control procedures, the analyses were completed by a laboratory using standard and internationally accepted procedures.

With the exception of ammonia and Total Suspended Solids (TSS) the results were below the relevant emission limit value (ELV). The ELV for ammonia was consistently exceeded at SW 6 (Settlement Lagoon). The likely cause is due to the pumping of groundwater, which contains naturally occurring high ammonia, into the settlement lagoons to regulate their levels.

The ELV for Total Suspended Solids (TSS) was exceeded on three occasions at SW-6. The reason for the exceedances at SW-6 was heavy rainfall prior to the monitoring event.

3.3 Leachate

Leachate samples are analysed quarterly for BOD and COD at one monitoring location LT1. The samples are also analysed annually for the range of parameters specified in the Licence. The results are typical of those of a leachate from a relatively young municipal solid waste landfill.

3.4 Landfill Gas (LFG)

The gas monitoring programme includes monthly measurements of methane, carbon dioxide, oxygen and atmospheric pressure in wells located both outside and inside the waste body.. The wells are at 50 m intervals around the landfill footprint and two per hectare within the cells. The locations of the 15 external wells (LG-01 – LG-15), which were agreed in advance with the Agency, are shown on the monitoring location map in Appendix 2.

3.4.1 Outside the Waste Body

Due to an oversight, landfill gas monitoring was not carried out in July or August 2009. The concentration limit for methane (1% v/v) was exceeded in monitoring wells LG-09 and LG-13 on one occasion April 2009 (3.5% v/v and 1.5% v/v respectively). The limit was not exceeded at any other time. Monitoring carried out in 2008 also identified the presence of low levels of methane in a number of the wells and it is considered that this is naturally occurring, most likely associated with the peat.

The concentration limit for carbon dioxide (1.5% v/v) was exceeded at LG-04 in February, April and June, at LG-09 in April, at LG-01 in April and at LG-02 in June. High carbon dioxide levels were also measured in 2008.

3.4.2 Inside the Waste Body

Methane levels varied from 0.6 to 61.1 %v/v, carbon dioxide levels varied from 2.1 to 54.0 %v/v, while oxygen levels varied from 0.1 to 22.1 %v/v. These levels are typical of those in an operational non-hazardous waste landfill.

3.5 Noise Survey

Noise monitoring is carried out annually at five monitoring locations (N2 – N5 and NSL-1) as shown on the monitoring location map in Appendix 2 in accordance with International Standards Organisation 1996: Acoustics-description and Measurement of Environmental Noise (Parts 1, 2 and 3). The monitoring includes both daytime and night time monitoring. The results confirmed compliance with the emission limits.

3.6 Dust Monitoring

Dust deposition is monitored monthly at five monitoring locations (D1, D2, D5, D6 and D8) as specified in Table D.1.1 of the Licence as shown on the monitoring location map in Appendix 2. With the exception of monitoring location D6 in June all of the monitoring results were less than the deposition limit set in the licence (350 mg/m^2/day). The exceedance at D6 was due to agricultural activity in the vicinity of the monitoring location.

3.7 Meteorological Monitoring

Average rainfall, temperature, humidity and wind speed and direction for the monitoring period were obtained from the Meteorological Station at Casement Aerodrome, which is located approximately 40 km from the facility, is presented in Table 3.1.

Table 3.1 Meteorological Data: Casement Aerodrome – 2009

Rainfall	
Total Annual	925.5 mm
Maximum month (November)	184.2 mm
Minimum month (September)	28.8 mm
Temperature	
Mean Daily	9.2°C
Mean Daily Maximum (August)	15.4°C
Mean Daily Minimum (December)	3.3°C
Wind (Knots)	
Frequency of calms	3.3%
Prevailing direction	South West
Prevailing sector	South West

The total annual rainfall is 925.5 mm. The winds are predominantly from the south west sector.

3.8 Biological Monitoring

The annual biological assessment of the Cushaling River was carried out in accordance with Condition 8.11 of the Licence on the 25th August 2009. Sampling was undertaken at one monitoring location downstream of the facility. As the river rises on-site there is no upstream sampling location. The assessment used the EPA Q-rating system for the evaluation of rivers and streams. Benthic macro-invertebrates were sampled qualitatively using kick-sampling and the results indicated that the Q value to be Q3-4, which is slightly polluted. The results of is that same as that for the 2008 assessment, which was carried out prior to waste acceptance. The assessment indicates that the facility is not impacting the Cushaling River.

4. SITE DEVELOPMENT WORKS

4.1 Tank, Pipeline and Bund Testing

An inspection and integrity testing of the leachate holding tank was carried out by Coffey Construction in November 2009 and was passed fit for purpose. A copy of the report is included in Appendix 3. Bund integrity testing will be carried out in 2010.

4.2 Summary of Resource & Energy Consumption

Table 4.1 presents an estimate of the resources used on-site in 2009. Bord na Mona completed an Energy Efficiency Audit of the facility in compliance with Conditions 7.1 and 7.2 of the Licence in January 2009. The audit was carried out in accordance with the Agency's "Guidance Note on Energy Efficiency Auditing" (2003). The Audit report recommended the development of a documented energy policy statement, as this is considered fundamental to the successful implementation of any management system as it provides the framework for the introduction and maintenance of energy efficiency and conservation measures in the day to day operation of the facility.

The facility is a significant source of greenhouse gas emissions, not through the use of fossil fuels, but as a result of the production and flaring of landfill gas. To address this Bord na Mona intends to install a landfill gas utilisation plant at the facility, when gas volumes are sufficient to support it. When operational, this will significantly reduce the facility's carbon footprint.

Table 4.1 Resources Used On-Site

Resources	Quantities
Diesel (green)	228,024 litres
Electricity	198,100 kWh
Hydraulic Oil	709.5

4.3 Site Developments

Phase 3 of the landfill was completed in 2009. It is proposed to construct the composting plant in 2010.

4.4 Stability Assessment

The Phase 3 construction works, which were completed in 2009 was, similar to Phases 1 and 3, subject to a stringent Construction Quality Assurance (CQA) programme that ensured the side slopes of the retaining bunds are stable. The CQA plan has been submitted to the Agency. The method of waste placement, where the active waste face is confined to a height of 2.5 metres after compaction, a width of 25 metres and a slope no greater than 1 in 3 means the risk of slope failure is negligible.

5. EMISSIONS

5.1 Landfill Gas

The volumes of landfill gas generated at the facility during the reporting period were estimated using predictive gas generation model GasSim Version 1.54. The model estimates that approximately 833 m^3 / hour of landfill gas (methane and carbon dioxide) was generated at the facility over reporting period. The volume of methane and carbon dioxide flared was 745.83 m^3 / hour comprising a mix of 38 % methane and 31 % carbon dioxide.

5.2 Surface Water

There is an extensive man made drainage network across the Bord Na Mona landholding and the site is divided into a number of discrete areas, referred to as 'peat fields' formed by the surface water drains. The drains connect to a central underground culvert, which flows towards the south, where it passes through settlement ponds, before discharging to the Cushaling River. Rainfall on roof and paved areas of the landfill discharge to the underground culvert and are directed to the settlement ponds prior to discharge to the Cushaling.

5.3 Leachate

The amount of leachate taken offsite in 2009 was 16,874.86 tonnes. The leachate was removed off site for treatment at Kildare County Council's Waste Water Treatment Plant in Lexslip, Co. Kildare.

6. NUISANCE CONTROL

Bord na Mona is committed to operating in the best possible manner, using the best available techniques to minimise impacts to the environment and local residential neighbours. The potential sources of nuisance at the facility are odour, vermin, birds, flies, mud, dust and litter.

6.1 Odour

In addition to the gas extraction and flaring system, good operational practices on-site are the main controls to avoid odour nuisances. The handling, depositing and covering of waste at the facility is carried out in accordance with the Agency's Landfill Manual "Landfill Operational Practices". In addition, Bord na Mona have developed a site specific Odour Management Plan a copy of which is included in Appendix 4.

The waste delivery trucks are unloaded at the working face and the waste is compacted within 3 to 4 minutes. The level areas of the working face are covered on a continuous basis during the day. The slope of the working face is covered completely with artificial cover sheets at the end of each working day, which can easily be removed again the following day prior to commencement of operations.

6.2 Vermin / Flies / Insects

The methods used for vermin control are as detailed in the EMS, which is ISO 14001 accredited. These control measures have found to be successful.

6.3 Birds

Bord Na Mona employs one of the leading bird control specialists, Falcon Bird Control Services, who operate a seven day dawn to dusk programme. An aviary is provided at the site, which houses the birds of prey. The aim is to create an association of danger, so that birds choose not to fly around the area where bird control is active. To date these measures have proven to be successful.

6.4 Dust & Litter

Bord na Mona has prepared a Dust and Litter Control Plan, a copy of which is included in Appendix 5.

Dust and mud control measures were implemented at the start of the construction phase of the site and continued into the operational phase. These measures include the use of a wheelwash, road sweeper and a water bowser to dampen access roads and stockpiles during periods of dry weather. To date these measures have proven to be successful.

Litter is controlled by fencing which was installed around the landfill footprint as specified in the waste licence. Portable litter fencing is also used at the working face, which can be moved to various points around the working face depending on the wind direction. As part of operational controls all litter is collected at the end of the working day and litter has not been an issue at the facility.

7. ENVIRONMENTAL INCIDENTS AND COMPLAINTS

7.1 Incidents

There were thirty three (33) incidents on-site during the reporting period. The majority related to exceedances of the ammonia limit set in the Licence at SW-6. One related to a dust exceedance, one to landfill gas, one to leachate, and two to the exceedance of the TSS limit as SW-6. All of these incidents were reported to the Agency.

7.2 Register of Complaints

Bord Na Mona maintains a register of complaints in compliance with Condition 11.4. Details of all complaints received during the reporting period and the action taken by Bord na Mona are available at the facility. A total of 41 complaints were received in the reporting period relating to odour, flood lights, noise, visual impact, flies, flooding, out of hours activity, litter, and security at the facility. All of the complaints were addressed by facility staff and were resolved.

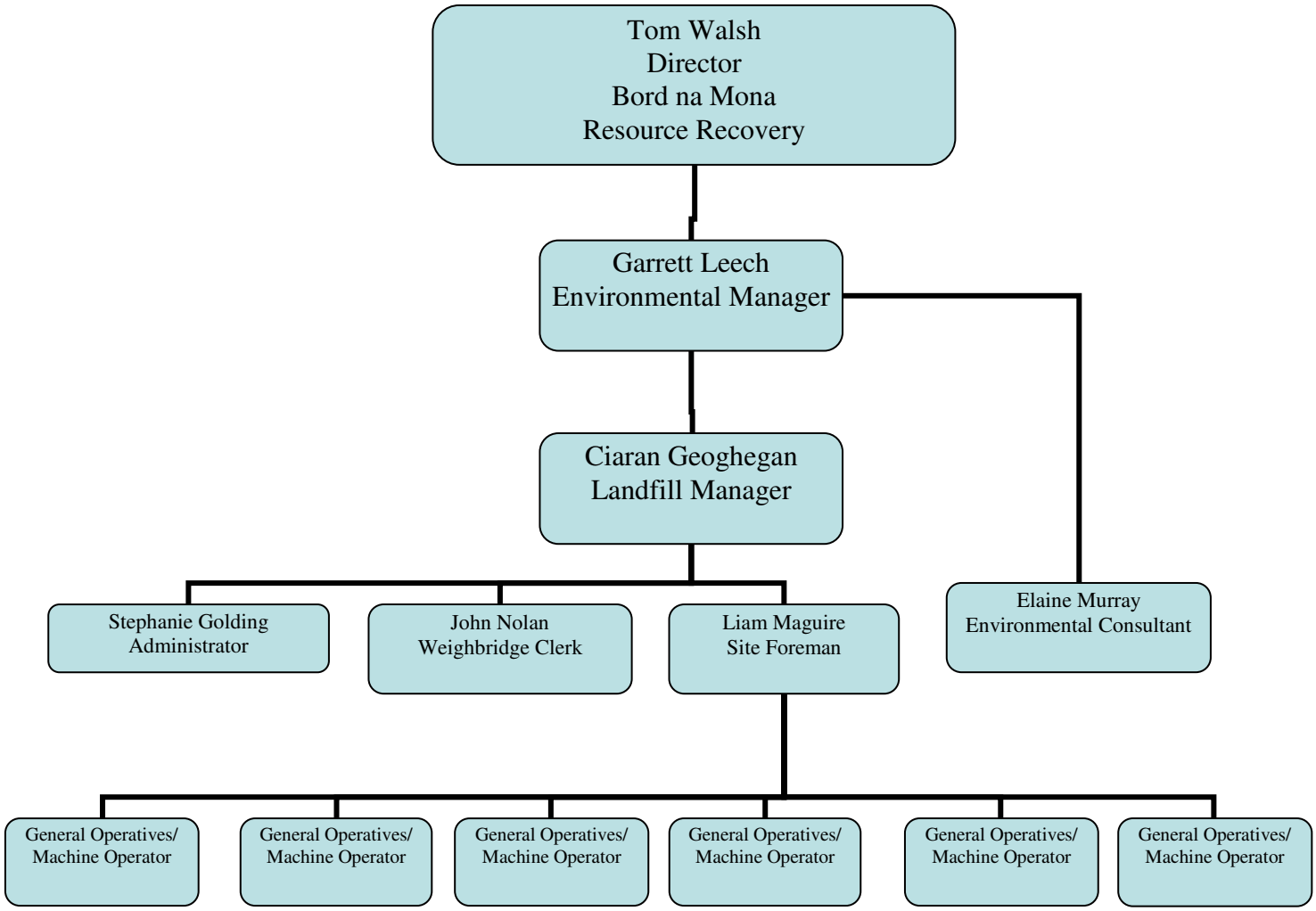
8. ENVIRONMENTAL MANAGEMENT SYSTEM

8.1 Management Structure

The Management Structure as required by Condition 2.2.2.1 of the waste licence was submitted to the Agency on 26th May 2006, as part of the EMS. An amended version is included below.

8.1.1 Site Management Structure

The day to day management of the facility and supervision of waste activities are the responsibility of the Environmental Manager, Landfill Manager, Facility Supervisor/Foreman and the General Operatives. The site organisational chart is shown below.



8.1.2 Staff Training

Staff training at the Facility is carried out in accordance with the training procedure a copy of which is included in Appendix 6.

8.2 EMP

In compliance with Condition 2.2.1 an Environmental Management System (EMS) has been documented and implemented at the Facility. As part of the EMS an Environmental Management Programme (EMP) was developed. In September 2009, the Facility was awarded ISO 14001 accreditation.

8.2.1 Schedule of Objectives 2009

Table 8.1 describes the implementation of the objectives and targets in the reporting period.

8.2.2 Schedule of Objectives 2010

Bord na Mona has set a schedule of targets and objectives for 2010. These are presented in Table 8.2.

8.3 Communications Programme

The Communications Programme required by Condition 2.4.1 Licence, was established three months before the start of waste activities and has been submitted to the Agency. A copy of the Programme for Public Information procedure in use at the Facility is included in Appendix 7.

Table 8.1 Progress Report on Schedule of Objectives and Targets for 2009

Ref.	Objective	Target	Timescale	Responsibility	Progress
1	Construction Strategy	• Construction of further engineered landfill cells along with associated infrastructure in line with the phased construction management plan • Construction of landfill gas management infrastructure	Ongoing	Drehid Waste Management Facility (DWMF)	Complete
2	Waste Minimisation	• Re-use where possible materials used on site • Minimise import of materials from off-site	Ongoing	DWMF	Ongoing Ongoing
3	Upkeep the documented EMS	• Update Operational Procedures • Implement work instructions as project develops • Gain accreditation of EMS to ISO 14001	Dec 09	DWMF	Complete Complete Complete
4	Construction/waste acceptance phase monitoring	• Assessment of Noise Emission • Maintain Weekly Surface water monitoring • Perform Annual and Monthly GW monitoring • Carry out monthly Landfill Gas and Dust monitoring	Ongoing	Technical Services (Newbridge)	Complete Complete Complete Complete
5	Implementation of the Environmental Awareness and Training Programme	• Continue internal training programme and assessment of training needs for all operational staff during 2009	Ongoing	DWMF	Complete
6	Review nuisance control procedures	• Assess effectiveness of nuisance control measures of litter, dust, birds and vermin	Ongoing	DWMF	Ongoing
7	Meteorological Monitoring	• Maintain log of meteorological data	Ongoing	DWMF	Ongoing
8	Documentation of on-site chemical and hydro-carbon control procedures	• Maintain good practice regarding handling chemicals and hydrocarbons and document control procedures	May 09	DWMF	Ongoing
9	Contractor Awareness	• Raise awareness with contractors of Environmental policy of the facility	Jan 09	DWMF	Ongoing
10	Assess Energy Efficiency Audit recommendations	• On completion of the energy efficiency audit assess recommendations and introduce where possible	Ongoing	DWMF	Ongoing
11	Liaise and assist local schools Green Flag Programme	• Liaise and assist local schools in order to forge closer links with the local community	Dec 09	DWMF	Ongoing

Table 8.2 Schedule of Objectives and Targets for 2010

Ref.	Objective	Target	Timescale	Responsibility
1	Completion of Construction Strategy	Construction of additional phases 4-8	Ongoing	C.G.
2	Waste Minimisation ongoing target (2020)	Reuse where possible materials used on site	Ongoing	C.G.
		Minimise import of materials from off site	Ongoing	Team
3	Environmental Management System	Maintain EMS to ISO 14001 standard/certification	Ongoing	Team
		Implement work instructions as project develops	Ongoing	L.M.
		Upload of EMS to ViewWise Document Management System	June '10	S.G.
		Maintain policy for the control of office waste	Ongoing	S.G.
4	Raise awareness with contractors of Environmental Policy of the site	Contractors Induction	Ongoing	J.N.
5	Environmental Monitoring	Maintain incident & reporting of Noise, Weekly surface water, Annual & Monthly Groundwater, Monthly Landfill Gas and Dust Monitoring	Dec '10	E.M.
6	Environmental Training and Awareness	Continue internal training programme and assessment of training needs for all operational staff during 2010	Dec '10	C.G.
7	Assess complaints received and monitor nuisance control procedures	For: litter, dust, birds, vermin, odour and flies	Ongoing	Team
8	Meteorological monitoring	Maintain log of meteorological data – Continuous	Ongoing	C.G.
9	BMW conversion rate (in line with EU landfill directive)	Reduce BMW content going to landfill to 40%	Jul '10	E.M.
10	Review outstanding energy efficiency audit recommendations	Assess recommendations and introduce where possible. Investigate and implement possible measures for the reduction of diesel consumption	Dec '10	C.G.
11	Review aspects register to accommodate new composting plant and construction phases 4-8	Assess risks associated with new construction phases	Ongoing	Team
12	Review communication section of Waste Licence	Ensure compliance with licence section	Dec '10	Team
13	Environmental compliance	Review licence conditions outlined in W0201-02	Ongoing	C.G/E.M.

9. OTHER REPORTS

9.1 Financial Provision

An Environmental Liability Risk Assessment (ELRA) was submitted as part of 2007 AER. There has been no change in operations at the facility and hence there remains no change in the environmental risks and liabilities. The ELRA outlines

- Estimated costs that may arise from accidents and unplanned events
- Estimated costs associated with the closure, restoration and aftercare measures, including unexpected closure

The following conclusions were made in the ELRA –

Cost of unexpected closure at the end of year 1 and reoccurring costs - €1,400,000.
Restoration and aftercare costs at the end of scheduled operational life - €3,200,000.
Maximum cost of unplanned incident - €200,000.

9.2 Contributions to Community fund

A contribution of €238,866.51 was made to the community fund in 2009 in compliance with planning condition 17 of PL09.212059.

9.3 Statement on Costs of Landfill

The costs in the setting up, operation of, and provision of financial security and closure and after-care for a period of at least 30 years, are covered by the price charged for the disposal of waste at the facility.

9.4 European Pollutant Release and Transfer Register

Under the European Pollutant Release and Transfer Register Regulation (EC) No. 166/2006 Bord Na Mona are required to submit information annually to the Agency. A copy of the information submitted to the Agency via the web-based data reporting system is included in Appendix 8.

9.5 Waste Recovery Report

National and regional policy on waste management is based on the Department of the Environment and Local Government's policy statement of September 1998, "Changing Our Ways", in which the Government affirmed its commitment to the EU hierarchy of waste management. In order of preference this is: -

- Prevention,
- Minimisation,
- Reuse,
- Recycling,
- Energy Recovery,
- Disposal.

The policy statement was based on, and is supported by, EU legislation (Landfill Directive 99/339/EC) that requires the diversion of organic wastes, including green waste, from landfill to alternative waste treatment facilities.

In 2009, Bord Na Mona accepted 88,857.14 tonnes of inert waste for recovery which was used in on-site engineering works at the facility.

APPENDIX 1

Topographic Survey

FUTURE CELLS

FUTURE CELLS

FUTURE CELLS

PHASE 3 - LINED AND READY FOR WASTE DEPOSITION

5000. 00

COMPOUND AREA FOR CONTRACTORS ACCOMODATION

0 50m 100m

SCALE

No.	Revision	Date

BORD NA MÓNA

Project :

DREHID WASTE MANAGEMENT FACILITY

Title :

WASTE DEPOSITION JANUARY 2009

Drawn by BH	**Scale** AS SHOWN
Checked by	**Drawing No.**
Date 1.03.10	

Mass Balance Calculation

To calculate the total void space consumed a number of assumptions must be made.

Assume Density of 0.88t/ m^3 for General Solid waste.
Assume Density of 1 .8t/ m^3 Non Hazardous soils + Sludge
Etc. (as in Table 1 below)

Total void space consumed by General waste in 2009 = 165,199 m^3
Total void space consumed by inert material = 140,748 m^3

Total void space consumed in 2008 = 164,167 m^3
Total void space consumed in 2009 = 305,947 m^3
Total void space remaining = 3,609,886 m^3

Table 1 Mass Balance 2009

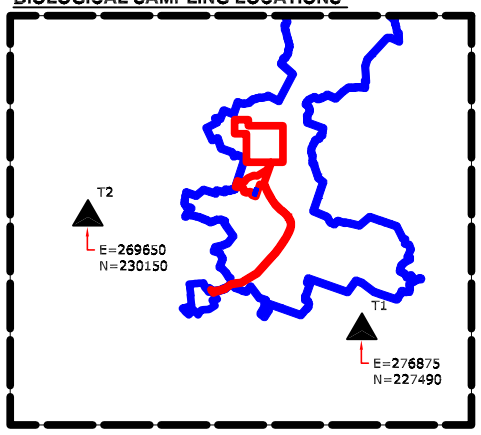
Waste Types	**Tonnage Intake**	**Density Tonnes/m^3**	**Volume Intake m^3**
General Solid Waste	187,726	0.88	165,199
Wood Chip	5,783	0.7	4,048
Sludge	50	1.6	79
Soil & Stones	3,445	1.8	6,200
Inert Rubble	13,710	1.9	26,048
Fines	47,820	1.6	76,512
Compost	17,413	1.6	27,860
Total Waste	**275,945**		**305,947**

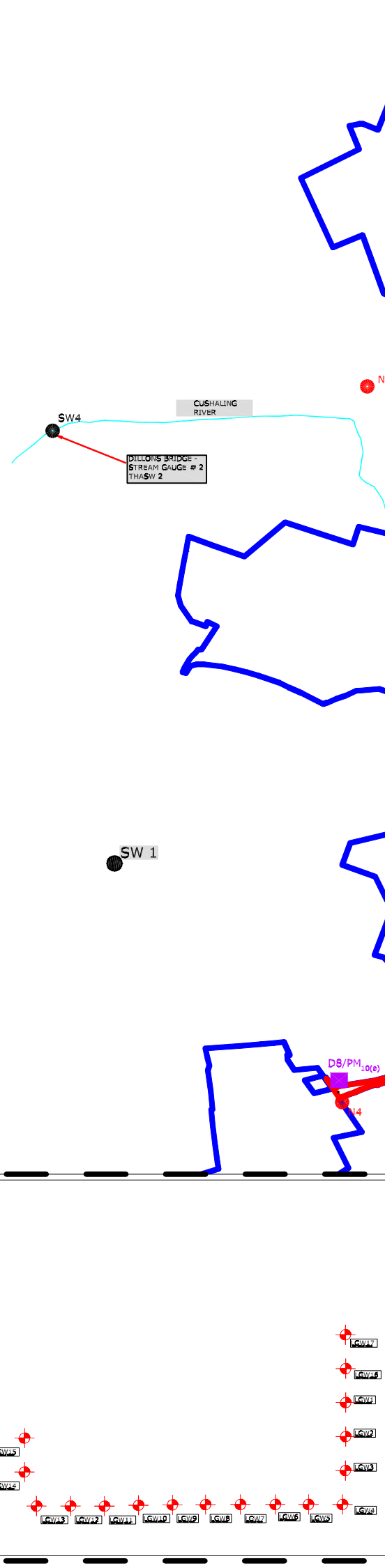
APPENDIX 2

Monitoring Location Map / Monitoring Results

Monitoring Location Map

BIOLOGICAL SAMPLING LOCATIONS





GENERAL LEGEND

- BORD NA MÓNA OWNERSHIP BOUNDARY
- SITE ACTIVITY BOUNDARY
- BORROW AREAS (Clay and sand & gravel)
- SUFACE WATER DRAIN
- STREAM
- RAIL LINE
- NOISE MONITORING LOCATION (N2)
- DUST MONITORING LOCATION (D4)
- PARTICULATE MATTER (D8/PM)
- SURFACE WATER MONITORING LOCATION (SW3)
- GROUND WATER MONITORING WELLS (GW9)
- BIOLOGICAL SAMPLING LOCATION (T1)
- LANDFILL GAS MONITORING WELLS (LGW9)

MONITORING POINT LOCATIONS

NOISE MONITORING POINTS

ID	EASTINGS	NORTHINGS
N1	273096.53	231449
N2	274374.1	233199.
N3	274935.223	232736.
N4	272977.555	228066.
N5	275559.517	230236.
N6	273252.982	231286

DUST MONITORING POINTS

D1	274922.236	232631.
D2	275644.031	231407.
D3	273793.764	231605.
D4	274261.869	230921.
D5	273578.483	230887.
D6	273913.816	232661.
D7	273390.503	232264.
D8 PM	272965.249	228170.
D9 PM	274194.294	228784.

SURFACE WATER MONITORING POINTS

SW1	271902.632	229195.
SW2	276296.503	226542.
SW3	276203.412	232476.
SW4	271601.83	231227.
SW5	274059.85	230848.
SW6	274404.302	231513.

GROUND WATER MONITORING POINTS

GW1 S&D	274787.673	232322.
GW2 S&D	275311.049	230649.
GW3 S&D	274362.312	230908.
GW4 S&D	275160.113	231735.
GW5 S&D	274230.627	232051.
GW 6	274747.82	232231.
GW 7	274855.495	232982.
GW 9	274173.573	231450.
GW 10	273761.555	231115.

BIOLOGICAL SAMPLING LOCATION

T1	276875	227.
T2	269650	230

LANDFILL GAS MONITORING WELLS

LGW1	274554.002	231923.
LGW2	274553.976	231873.
LGW3	274554.332	231823.
LGW4	274549.905	231773.
LGW5	274499.905	231773.
LGW6	274451.292	231773.
LGW7	274399.905	231773.
LGW8	274348.529	231772.
LGW9	274299.911	231772.
LGW10	274249.916	231772.
LGW11	274199.921	231770.
LGW12	274149.926	231770.
LGW13	274099.901	231770.
LGW14	274082.233	231820.
LGW15	274082.233	231870.
LGW16	274554.851	231973.

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD
5. 6" OS SHEET NO'S: KILDARE 3, 4, 8, 9 & 13

250m 0 250m 500m 750m

Issue	Date	Description	By	Chkd.
A	13-07-09	CLIENT ISSUE FOR REVIEW	MN	PO'N

Client: .\1131 - Bord na Mona Landfills\bnm logo.jpg

Project: DREHID WASTE MANAGEMENT FACILITY PHASES IV - VIII

Title: ENVIRONMENTAL MONITORING LOCATIONS

Scale @ A1: 1:12,500

Prepared by:	Checked:	Date:
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Project Director: D. Grehan

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Drawing No.: 5544 - 6003 Issue: A

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Groundwater Results

Parameter	Units	GW-1s											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH units	7.3	7.3	7.3	7.7	7.3	7.2	7.5	7.1	7.2	7.1	7.5	7.4
Conductivity	mS/cm	879	800	755	754	788	752	791	769	758	756	751	804
Ammoniacal Nitrogen	mg/l	6.1	6.5	6.9	7.5	7.2	8.1	7.7	7.8	8.1	7.9	6.2	7.1
Visual/ Odour		Cloudy brown, slight odour, few SS	Pale brown, slightly cloudy, strong odour, few SS	Cloudy light brown, few S.S., slight odour	Cloudy light brouwn, few SS, slight odour	cloudy brown, few SS No odour	Cloudy brown, few SS No odour	Cloudy/ Grey, foul odour, some SS	Cloudy brown, high S.S., no odour	Cloudy brown, high S.S., no odour	Cloudy, few S.S., Slight odour	Dark brown / black, high S.S, Strong odour	Grey, few S.S, Slight odour
Chloride	mg/l	12	14	16	15	14	14	13	13	14	14	12	13
Total Phosphorous	mg/l							0.27					
N03-N	mg/l							<0.2					
P04-P	µg/l							<0.01					
SO4	mg/l							<0.5					
Boron (Dissolved)	µg/l							14					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							<2					
Arsenic	µg/l							3					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							393					
Chromium	µg/l							<2					
Cadmium	µg/l							<2					
Cobalt	µg/l							3					
Manganese	µg/l							175					
Nickel	µg/l							22					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							240					
Iron	mg/l							<0.1					
Potassium	mg/l							2.1					
Magnesium	mg/l							14					
Sodium	mg/l							17					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							1.21					
SVOC (Diethylphthalate)	µg/l							1.12					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					

Parameter		GW-1d											
		January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
pH	pH units	7.5	7.5	7.4	7.8	7.5	7.6	7.6	7.3	7.2	7.3	7.5	7.5
Conductivity	mS/cm	751	761	746	747	758	749	771	745	742	755	830	751
Ammoniacal Nitrogen	mg/l	8.6	8.9	8.5	8.6	8.6	9.1	8.4	8.4	8.7	8.5	8.1	8
Visual/ Odour		Cloudy brown, no odour, few SS	Clear, slight odour, few SS	Cloudy light brown, few S.S., slight odour	Cloudy light brown, few SS, slight odour.	Cloudy light brown, few SS, No odour	Cloudy light brown, few SS, No odour	Cloudy, no odour, no SS	Clear, No SS, no odour	Clear, No SS, no odour	Clear, few SS, Slight odour	Dark brown, high SS, no odour	Clear, no odour, No S.S
Chloride	mg/l	14	14	15	14	13	13	13	13	13	13	12	13
Total Phosphorous	mg/l							0.39					
N03-N	mg/l							<0.2					
P04-P	mg/l							<0.01					
SO4	mg/l							0.73					
Boron (Dissolved)	µg/l							13					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							<2					
Arsenic	µg/l							52					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							312					
Chromium	µg/l							<2					
Cadmium	µg/l							<2					
Cobalt	µg/l							10					
Manganese	µg/l							63					
Nickel	µg/l							33					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							120					
Iron	mg/l							<0.1					
Potassium	mg/l							1.7					
Magnesium	mg/l							8.7					
Sodium	mg/l							16					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							<1					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					

Parameter	Units	GW-2S											
		January	February	March	April *	May	June	July	August	September	October	November	December
pH	pH units	7.2	7.2	7.2		7.1	7.2	7.3	7.1	7	7	7.2	7.2
Conductivity	mS/cm	1116	849	832		847	840	936	851	864	853	893	861
Ammoniacal Nitrogen	mg/l	1.8	2.14	2.12		0.48	2.15	2.43	2.21	2.1	2.2	1.46	1.12
Visual/ Odour		Brown cloudy, no odour, few SS	Light brown cloudy, no odour, some SS	Cloudy brown, few S.S., no odour		Light brown cloudy, some SS No odour	Brown, high SS, No odour	Brown/ Cloudy, no odour, few SS	Brown high S.S., no odour	Light brown some S.S., no odour	Light brown, some S.S., no odour	Brown, high S.S, no odour	Light brown, few S.S, no odour
Chloride	mg/l	13	13	15		14	14	13	13	13	13	11	12
Total Phosphorous	mg/l							<0.05					
N03-N	mg/l							<0.2					
P04-P	mg/l							<0.01					
SO4	mg/l							9.97					
Boron (Dissolved)	µg/l							25					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							<2					
Arsenic	µg/l							<2					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							518					
Chromium	µg/l							<2					
Cadmium	µg/l							<2					
Cobalt	µg/l							5					
Manganese	µg/l							402					
Nickel	µg/l							27					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							160 3					
Iron	mg/l							<0.1					
Potassium	mg/l							2					
Magnesium	mg/l							24					
Sodium	mg/l							15					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							<1					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					

*- Sample damaged in transit to laboratory

Parameter	Units	GW-3S											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH units	6.7	7.1	7.1	7.6	7	7.1	7.3	6.9	7.1	7.2	7.4	7.2
Conductivity	mS/cm	771	800	784	793	792	780	826	804	771	799	936	833
Ammoniacal Nitrogen	mg/l	4.39	4.42	4.32	4.84	4.64	5	4.96	5.1	4.69	4.84	1.57	3.77
Visual/ Odour		Cloudy, Slight odour, few SS	Light brown cloudy, no odour, some SS	Cloudy light brown, few S.S., slight odour	cloudy, few SS, slight odour	Brown/grey, high SS, foul odour	Grey/cloudy, some SS, foul odour	Cloudy, slight strong odour, few SS	Grey/ Cloudy, some S.S., foul odour	Light brown, few S.S., foul odour	Cloudy/ light brown, some S.S, very strong odour	Brown, some S.S, strong odour	Brown, some S.S, strong odour
Chloride	mg/l	15	17	18	18	16	16	15	15	16	16	14	16
Total Phosphorous	mg/l							0.43					
N03-N	mg/l							<0.2					
P04-P	mg/l							0.11					
SO4	mg/l							1.18					
Boron (Dissolved)	µg/l							19					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							<2					
Arsenic	µg/l							3					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							415					
Chromium	µg/l							<2					
Cadmium	µg/l							<2					
Cobalt	µg/l							<2					
Manganese	µg/l							292					
Nickel	µg/l							4					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							320					
Iron	mg/l							0.5					
Potassium	mg/l							2.5					
Magnesium	mg/l							16					
Sodium	mg/l							20					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							<1					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					

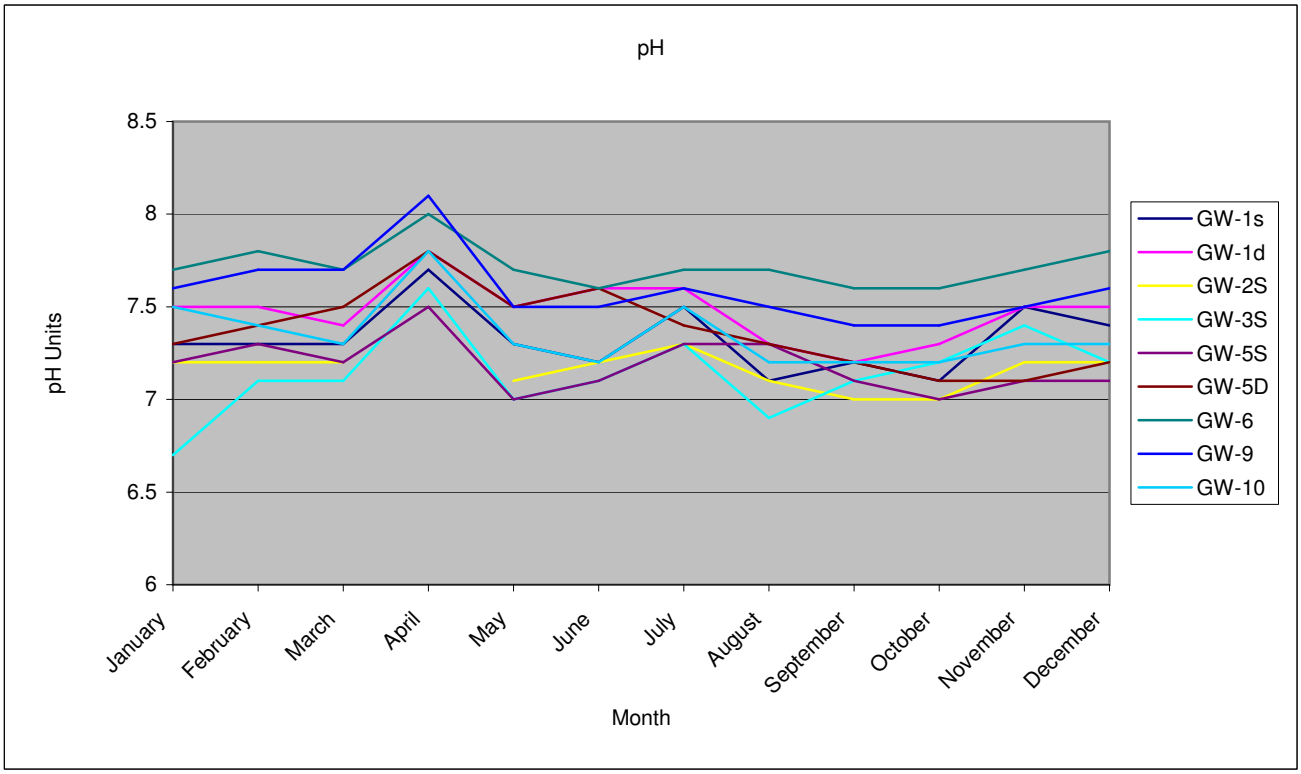
Parameter	Units	GW-5S											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH units	7.2	7.3	7.2	7.5	7	7.1	7.3	7.3	7.1	7	7.1	7.1
Conductivity	mS/cm	843	766	800	703	693	702	756	745	705	752	662	653
Ammoniacal Nitrogen	mg/l	6.8	6.6	6.7	5.6	5.5	5.8	5.1	5.9	5.1	5.5	4.54	4.07
Visual/ Odour		Cloudy brown, no odour, few SS	Grey brown, no odour, few SS	Cloudy light brown, few S.S., no odour	clougy light brown, few SS slight odour	Cloudy light brown, few SS, No odour	Cloudy, light brown, few SS, No odour	Brown, no odour, high SS	brown, high S.S., no odour	Brown, high S.S., no odour	Cloudy, few S.S., no odour	Brown, high S.S., strong odour	Light brown, some S.S., Slight odour
Chloride	mg/l	12	13	13	12	10	10	9.6	9.2	10	9.1	8.7	9.1
Total Phosphorous	mg/l							0.11					
N03-N	mg/l							<0.2					
P04-P	mg/l							<0.01					
SO4	mg/l							0.87					
Boron (Dissolved)	µg/l							7					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							6					
Arsenic	µg/l							7					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							471					
Chromium	µg/l							<2					
Cadmium	µg/l							<2					
Cobalt	µg/l							4					
Manganese	µg/l							288					
Nickel	µg/l							27					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							360					
Iron	mg/l							0.9					
Potassium	mg/l							1.6					
Magnesium	mg/l							3					
Sodium	mg/l							6.3					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							1.25					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							>100					
e.Coli	CFU/100mls							>100					

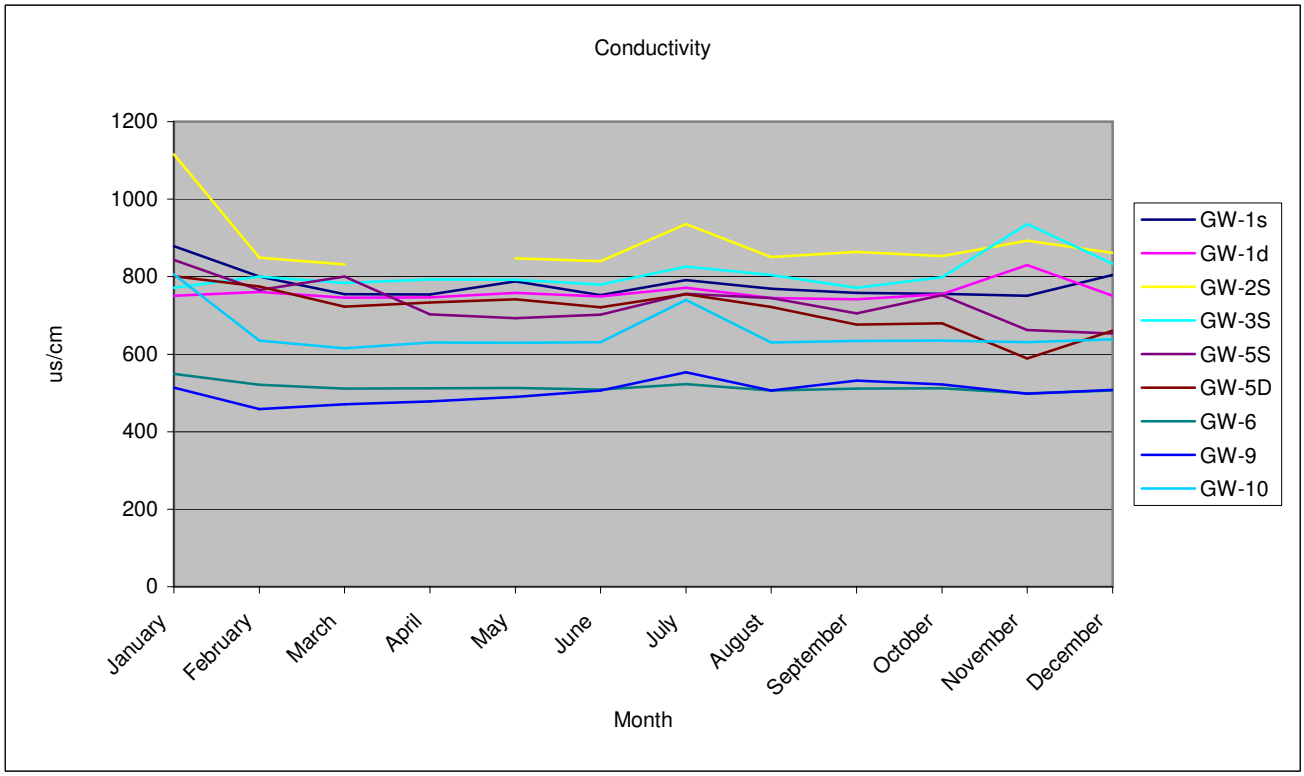
Parameter	Units	GW-5D											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH units	7.3	7.4	7.5	7.8	7.5	7.6	7.4	7.3	7.2	7.1	7.1	7.2
Conductivity	mS/cm	801	775	723	733	742	721	755	722	676	680	589	661
Ammoniacal Nitrogen	mg/l	5	3.72	2.8	2.94	2.86	2.9	2.78	2.48	2	1.98	1.83	1.76
Visual/ Odour		Cloudy grey, no odour, few SS	Brown/ grey, no odour, few SS	Cloudy light brown, few S.S., no odour	cloudy pink, few SS No odour	Cloudy brown, few SS, No odour	Cloudy brown, few SS, No odour	Grey/Cloudy, slight odour, some SS	Clear/ Cloudy, low S.S., no odour	Cloudy/ Light Brown, some S.S., no odour	Cloudy, few S.S., no odour	Cloudy, some S.S., no odour	Cloudy / brown, few S.S., no odour
Chloride	mg/l	9	11	12	11	9.7	10	8.9	9.5	8.9	8.4	7.5	8.5
Total Phosphorous	mg/l							0.08					
N03-N	mg/l							<0.2					
P04-P	mg/l							<0.01					
SO4	mg/l							6.08					
Boron (Dissolved)	µg/l							14					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							<2					
Arsenic	µg/l							7					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							260					
Chromium	µg/l							<2					
Cadmium	µg/l							<2					
Cobalt	µg/l							<2					
Manganese	µg/l							429					
Nickel	µg/l							7					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							200					
Iron	mg/l							<0.1					
Potassium	mg/l							1.8					
Magnesium	mg/l							13					
Sodium	mg/l							21					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							1.12					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					

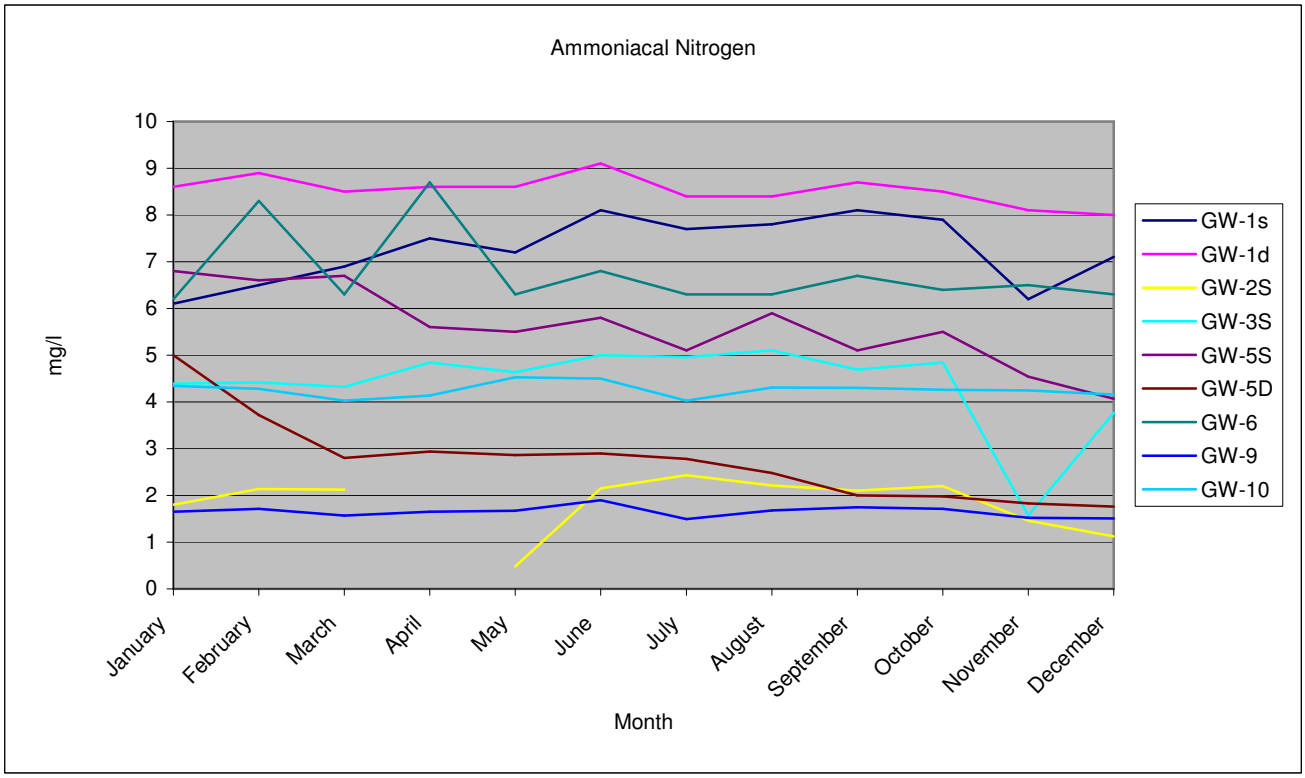
Parameter	Units	GW-6											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH units	7.7	7.8	7.7	8	7.7	7.6	7.7	7.7	7.6	7.6	7.7	7.8
Conductivity	mS/cm	549	521	511	512	513	509	523	506	511	512	499	506
Ammoniacal Nitrogen	mg/l	6.2	8.3	6.3	8.7	6.3	6.8	6.3	6.3	6.7	6.4	6.5	6.3
Visual/ Odour		Clear, no odour, no SS	Clear, no S.S., no odour	Clear, no S.S., no odour	clear No SS No odour	Clear, no S.S., no odour	Clear, no S.S., no odour	Clear, no S.S., no odour	Clear, no S.S., no odour	Clear, no S.S., no odour	Clear, no S.S., no odour	Clear, no S.S., no odour	Clear, no S.S., no odour
Chloride	mg/l	12	12	15	14	13	12	12	12	12	12	12	12
Total Phosphorous	mg/l							0.27					
N03-N	mg/l							<0.2					
P04-P	mg/l							<0.01					
SO4	mg/l							<0.50					
Boron (Dissolved)	µg/l							13					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							<2					
Arsenic	µg/l							26					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							124					
Chromium	µg/l							<2					
Cadmium	µg/l							<2					
Cobalt	µg/l							8					
Manganese	µg/l							29					
Nickel	µg/l							18					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							60					
Iron	mg/l							<0.1					
Potassium	mg/l							2.1					
Magnesium	mg/l							9.6					
Sodium	mg/l							15					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							<1					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					

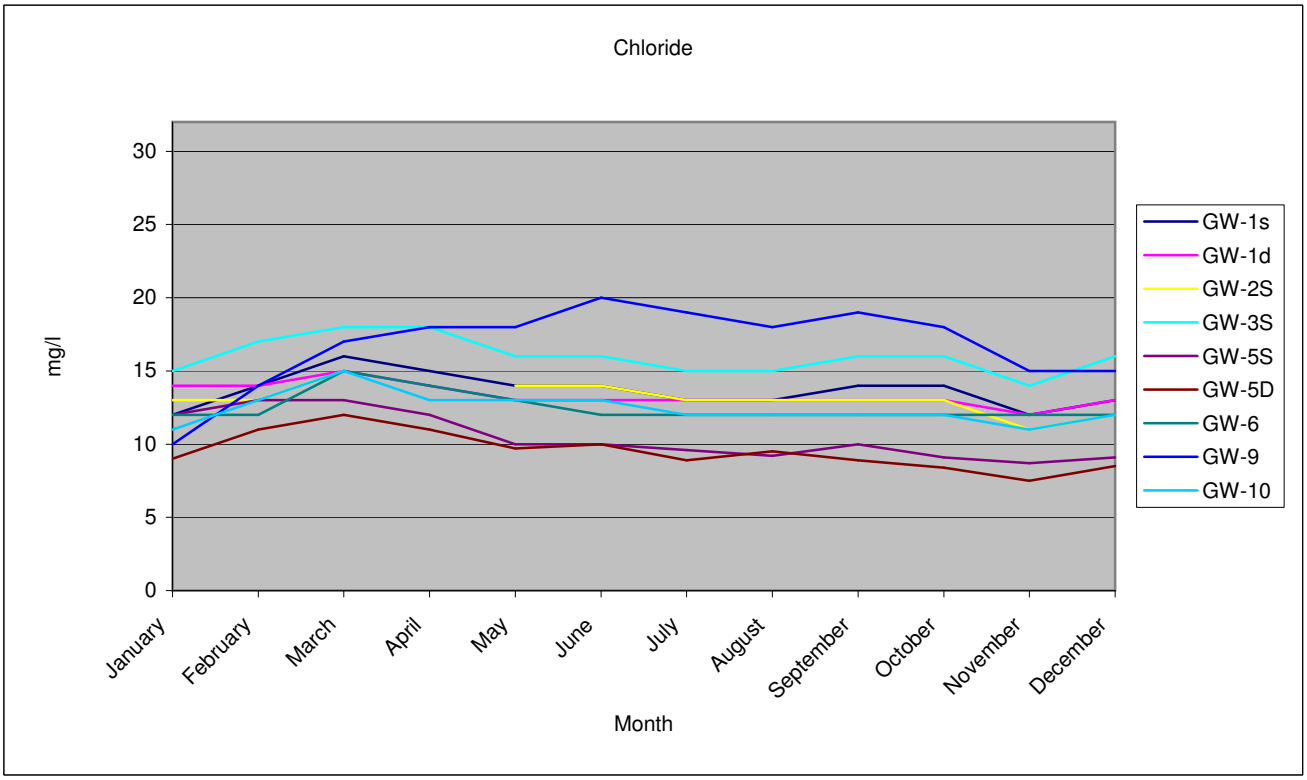
Parameter	Units	GW-9											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH units	7.6	7.7	7.7	8.1	7.5	7.5	7.6	7.5	7.4	7.4	7.5	7.6
Conductivity	mS/cm	514	458	471	478	490	506	553	506	532	522	498	508
Ammoniacal Nitrogen	mg/l	1.65	1.71	1.57	1.65	1.67	1.9	1.49	1.68	1.75	1.71	1.52	1.51
Visual/ Odour		Cloudy, few SS, no odour	Pale yellow, few SS, no odour	Cloudy, few S.S., no odour	Dull few SS No odour	Cloudy/brown, few SS, No odour	Cloudy/brown, few SS, No odour	Cloudy/ light brown, slight odour, few SS	Cloudy/ brown, high S.S., ammonia odour	Cloudy/ light brown, some S.S., no odour	Cloudy,some S.S., foul odour	Cloudy, some S.S., strong odour	Light brown, some S.S., no odour
Chloride	mg/l	10	14	17	18	18	20	19	18	19	18	15	15
Total Phosphorous	mg/l							0.42					
N03-N	mg/l							<0.2					
P04-P	mg/l							0.1					
SO4	mg/l							4.22					
Boron (Dissolved)	µg/l							10					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							28					
Arsenic	µg/l							19					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							133					
Chromium	µg/l							2					
Cadmium	µg/l							<2					
Cobalt	µg/l							3					
Manganese	µg/l							325					
Nickel	µg/l							20					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							180					
Iron	mg/l							1.6					
Potassium	mg/l							1.6					
Magnesium	mg/l							9.8					
Sodium	mg/l							19					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							<1					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					

Parameter	Units	GW-10											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH units	7.5	7.4	7.3	7.8	7.3	7.2	7.5	7.2	7.2	7.2	7.3	7.3
Conductivity	mS/cm	806	635	615	630	629	631	740	630	634	635	631	638
Ammoniacal Nitrogen	mg/l	4.34	4.28	4.03	4.14	4.53	4.5	4.03	4.31	4.3	4.26	4.25	4.16
Visual/ Odour		Brown cloudy, no odour high SS	Pale yellow, no odour, few SS	Cloudy, few S.S., no odour	cloudy few SS No odour	cloudy, few SS, No odour	Cloudy, few SS, No odour	Cloudy, slight odour few SS	Clear, no S.S., ammonia odour	Clear, few S.S., foul odour	Very light brown, some S.S., foul odour	Yellow brown, few S.S, strong odour	Light brown, few S.S, strong odour
Chloride	mg/l	11	13	15	13	13	13	12	12	12	12	11	12
Total Phosphorous	mg/l							0.21					
N03-N	mg/l							<0.2					
P04-P	mg/l							0.08					
SO4	mg/l							<0.50					
Boron (Dissolved)	µg/l							6					
Comb Pesticide Suite	ng/l							<0.01					
Mercury	µg/l							<1					
Aluminium	µg/l							27					
Arsenic	µg/l							5					
Silver	µg/l							<2					
Beryllium	µg/l							<2					
Barium	µg/l							121					
Chromium	µg/l							3					
Cadmium	µg/l							<2					
Cobalt	µg/l							<2					
Manganese	µg/l							300					
Nickel	µg/l							2					
Copper	µg/l							<2					
Tin	µg/l							<2					
Lead	µg/l							<2					
Antimony	µg/l							<2					
Selenium	µg/l							<2					
Zinc	µg/l							<2					
Calcium	mg/l							100					
Iron	mg/l							2.1					
Potassium	mg/l							1.1					
Magnesium	mg/l							13					
Sodium	mg/l							12					
VOC's USEPA 524.2 µg/l	µg/l							<10					
SVOC (Acenaphthene)	µg/l							<1					
SVOC (Diethylphthalate)	µg/l							<1					
SVOC's (All remaining Components)	µg/l							<1					
VOC's by GC-FID	mg/l							<0.5					
Total Coliforms	CFU/100mls							0					
e.Coli	CFU/100mls							0					


pH
8.5
8
7.5
7
6.5
6
pH Units
January
February
March
April
May
June
July
August
September
October
November
December
Month
GW-1s
GW-1d
GW-2S
GW-3S
GW-5S
GW-5D
GW-6
GW-9
GW-10


Conductivity
1200
1000
800
600
400
200
0
us/cm
January
February
March
April
May
June
July
August
September
October
November
December
Month
GW-1s
GW-1d
GW-2S
GW-3S
GW-5S
GW-5D
GW-6
GW-9
GW-10


Ammoniacal Nitrogen
mg/l
10
9
8
7
6
5
4
3
2
1
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
GW-1s
GW-1d
GW-2S
GW-3S
GW-5S
GW-5D
GW-6
GW-9
GW-10


Chloride
mg/l
30
25
20
15
10
5
0
January
February
March
April
May
June
July
August
September
October
November
December
Month
GW-1s
GW-1d
GW-2S
GW-3S
GW-5S
GW-5D
GW-6
GW-9
GW-10

Surface Water Results

Parameter	Units	SW-4 Cushaling River (Dillon's Bridge)																										
		week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10	week 11	week 12	week 13	week 14	week 15	week 16	week 17	week 18	week 19	week 20	week 21	week 22	week 23	week 24	week 25	week 26	week 27
Temp.	ºC	8.3	6.4	4.9	3.5	4.9	6.2	6.2	7.3	10.1	8.6	8.9	8.4	7.8	8	9.7	8.9		7.1	10.9	9.2	8.1	12.6		11.9	12.5	16.9	14.6
pH	pH Units																											
Conductivity	µS/cm																											
Dissolved Oxygen	mg/l	8.55	8.56	8.9	8.54	8.51	8.62	8.64	8.8	8.74	8.19	9.22	9.3	7.91	8.04	8.21	9.5		9.64	9.16	10.04	8.76	9.84		7.53	7.77	8.89	7.13
Suspended Solids	mg/l	6	5	<5	8	<5	14	<5	15	26	8	5	8	7	<5	9	<5	<5	<5	6	<5	9	<5	11	6	<5	6	<5
NH_3-N	mg/l																											
Chloride	mg/l																											
P04-P	mg/l	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.04	0.02	0.02	0.02	0.03	0.03	0.02	<0.01	0.07	0.02	0.02	0.03	<0.01	0.03
BOD	mg/l														<2													<2
COD	mg/l														55													53
Sulphate	mg/l																											
Nitrate	mg/l																											
Total P	mg/l																											
Boron (total)	ug/l																											
Arsenic (total)	ug/l																											
Silver (total)	ug/l																											
Aluminium (total)	ug/l																											
Berylium (total)	ug/l																											
Barium (total)	ug/l																											
Chromium (total)	ug/l																											
Cadmium (total)	ug/l																											
Cobalt (total)	ug/l																											
Copper (total)	ug/l																											
Iron (total)	ug/l																											
Manganese (total)	ug/l																											
Nickel (total)	ug/l																											
Lead (total)	ug/l																											
Antimony (total)	ug/l																											
Selenium (total)	ug/l																											
Tin (total)	ug/l																											
Zinc (total)	ug/l																											
Mercury (total)	ug/l																											
VOC	ug/l																											
SVOC	ug/l																											
Pesticides	ug/l																											

* - Due to laboratory error results not available

SW-4 Cushaling River (Dillon's Bridge)

week 28	Week 29	week 30	Week 31	Week 32	week 33	week 34	week 35	week 36	week 37	week 38	week 39	week 40	Week 41 *	week 42	week 43	week 44	week 45	week 46	week 47	week 48	week 49	week 50	week 51	week 52
14.2																								
	7.4	7.3																						
	505	571																						
7.75														530										
<5	9	<5		<5	9	<5	<5	10	<5	<5	14	<5		20	15	13	6	31	20	10	6	7	20	50
	0.08			0.09	0.04	0.04	0.05	0.05	0.03	0.04	<0.02	0.04		0.02	<0.02	<0.02	0.07	0.08	0.06	0.09	0.09	0.08	0.14	0.14
	11													12										
0.03	0.02	0.03																						
<2	<2	<2		<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2	3	<2	<2	<2	<2	<2	<2
60	89	69												68										93
	11.35																							
	0.74																							
	0.08																							
	20																							
	3																							
	<2																							
	35																							
	<2																							
	54																							
	<2																							
	<2																							
	<2																							
	<2																							
	0.6																							
	54																							
	4																							
	<2																							
	<2																							
	<2																							
	<2																							
	<2																							
	<1																							
	<10																							
	<5																							
	<0.01																							

Parameter	Units	SW-5 Sedimentation Lagoon																										
		week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10	week 11	week 12	week 13	week 14	week 15	week 16	week 17	week 18	week 19	week 20	week 21	week 22	week 23	week 24	week 25	week 26	week 27
Temp.	ºC	8.1	2.5	6.4	2.2	5.7	4.8	5.8	6.2	9.6	8.1	9.8	8.9	7.9	7.9	10.4	10	14.1	6.8	12.5	14.2	9.8	15.4	20.3	15.6	19.8	18.5	20
pH	pH Units	7.3	7.4	7.5	7.3	7.4	7.6	7.4	7.4	7.4	7.6	8	8.1	8.1	8.1	8.3	8.1	7.8	7.6	7.6	7.6	7.6	7.3	7.4	7.6	7.5	7.8	7.6
Conductivity	µS/cm	354	343	373	304	286	281	329	306	329	344	338	331	357	375	408	389	417	398	320	327	338	325	335	391	396	366	381
Dissolved Oxygen	mg/l	7.32	8.42	8.3	8.64	8.24	8.01	8.54	8.1	8.24	7.91	9.63	9.89	8.01	9.47	7.22	8.91	9.75	8.92	9.28	9.96	7.24	6.59	5.43	5.64	5.65	7.33	6.36
Suspended Solids	mg/l	<5	<5	14	<5	<5	5	<5	7	23	<5	<5	7	<5	5	5	<5	<5	<5	<5	5	<5	<5	<5	7	<5	10	<5
NH_3-N	mg/l	0.15	0.21	0.22	0.11	0.11	0.14	0.12	0.14	0.12	0.11	0.1	0.08	0.07	0.08	0.06	0.1	0.09	0.09	0.1	0.06	0.13	0.07	0.05	0.1	0.11	0.09	<0.02
Chloride	mg/l	12	12	12	12	11	13	12	12	12	12	15	13	13	13	14	15	15	15	12	13	14	13	13	14	13	12	13
P04-P	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BOD	mg/l														<2													<2
COD	mg/l														85													87
Sulphate	mg/l																											
Nitrate	mg/l																											
Total P	mg/l																											
Boron (total)	ug/l																											
Arsenic (total)	ug/l																											
Silver (total)	ug/l																											
Aluminium (total)	ug/l																											
Berylium (total)	ug/l																											
Barium (total)	ug/l																											
Chromium (total)	ug/l																											
Cadmium (total)	ug/l																											
Cobalt (total)	ug/l																											
Copper (total)	ug/l																											
Iron (total)	ug/l																											
Manganese (total)	ug/l																											
Nickel (total)	ug/l																											
Lead (total)	ug/l																											
Antimony (total)	ug/l																											
Selenium (total)	ug/l																											
Tin (total)	ug/l																											
Zinc (total)	ug/l																											
Mercury (total)	ug/l																											
VOC	ug/l																											
SVOC	ug/l																											
Pesticides	ug/l																											

* - Due to laboratory error results not available

SW-5 Sedimentation Lagoon

week 28	Week 29	week 30	Week 31	week 32	week 33	week 34	week 35	week 36	week 37	week 38	week 39	week 40	week 41 *	week 42	week 43	week 44	week 45	week 46	week 47	week 48	week 49	week 50	week 51	week 52
18.1																								
7.7	7	7.5	7.5																					
357	305	306	296																					
5.2														337										
10	7	6	5	5	8	5	<5	9	<5	12	9	<5		<5	<5	<5	5	26	17	12	26	5	10	<5
0.07	7	0.1	0.08	0.07	0.06	0.09	0.11	0.07	0.09	0.08	0.04	0.06		0.09	0.09	0.1	0.09	0.08	0.12	0.11	0.13	0.12	0.18	0.21
13	11	10.99	11											11										
<0.01	<0.01	<0.01	0.01																					
<2	<2	<2		<2	<2	2	<2	<2	<2	<2	<2	<2		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
93	128	113												95										106
	67																							
	0.45																							
	<0.05																							
	16																							
	4																							
	<2																							
	68																							
	<2																							
	16																							
	<2																							
	<2																							
	<2																							
	<2																							
	0.8																							
	29																							
	2																							
	<2																							
	<2																							
	<2																							
	<2																							
	<2																							
	<1																							
	<10																							
	<5																							
	<0.01																							

Parameter	Units	SW-6 Settlement Lagoon																										
		week 1	week 2	week 3	week 4	week 5	week 6	week 7	week 8	week 9	week 10	week 11	week 12	week 13	week 14	week 15	week 16	week 17	week 18	week 19	week 20	week 21	week 22	week 23	week 24	week 25	week 26	week 27
Temp.	ºC	7.9	3.2	6.2	2.6	3.9	4.9	5.9	6.5	9.4	8.1	7.5	8.1	8.4	8.3	10.1	10	13.1	6.7	12.3	12.8	10.76	15.5	-	16.7	17.1	18.2	20.1
pH	pH Units	8.2	8.1	8.2	8.2	8.3	7.7	8.2	8.1	8.1	8.3	8.7	8.6	8.6	8.6	8.7	8.6	8.2	8.1	8.3	8.2	8.3	8.1	7.9	8.4	7.6	8.1	8.3
Conductivity	µS/cm	308	640	718	653	637	312	215	672	717	707	686	693	659	647	612	624	593	614	616	558	570	560	546	465	585	500	448
Dissolved Oxygen	mg/l	7.65	9.1	8.6	8.89	8.37	8.24	8.49	8.2	8.37	8.12	10.75	10.04	8.24	8.76	7.39	10.92	12.46	8.63	10.15	11.81	12.3	11.93	-	12.6	6.81	9.76	12.29
Suspended Solids	mg/l	<5	<5	29	21	19	9	9	9	23	10	7	6	5	7	10	6	8	9	11	5	22	21	11	29	<5	29	25
NH_3-N	mg/l	1.2	1.65	1.37	1.14	0.92	1.2	1.18	1.46	1.58	1.26	0.93	0.98	0.69	0.77	0.29	0.71	0.33	0.58	0.65	0.24	0.47	0.31	1.66	0.04	0.55	0.49	0.13
Chloride	mg/l	21	23	26	30	31	39	41	43	44	45	42	43	40	40	36	37	35	36	36	38	36	38	37	33	24	28	29
P04-P	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
BOD	mg/l														<2													4
COD	mg/l														20													45
Sulphate	mg/l																											
Nitrate	mg/l																											
Total P	mg/l																											
Boron (total)	ug/l																											
Arsenic (total)	ug/l																											
Silver (total)	ug/l																											
Aluminium (total)	ug/l																											
Berylium (total)	ug/l																											
Barium (total)	ug/l																											
Chromium (total)	ug/l																											
Cadmium (total)	ug/l																											
Cobalt (total)	ug/l																											
Copper (total)	ug/l																											
Iron (total)	ug/l																											
Manganese (total)	ug/l																											
Nickel (total)	ug/l																											
Lead (total)	ug/l																											
Antimony (total)	ug/l																											
Selenium (total)	ug/l																											
Tin (total)	ug/l																											
Zinc (total)	ug/l																											
Mercury (total)	ug/l																											
VOC	ug/l																											
SVOC	ug/l																											
Pesticides	ug/l																											

* - Due to laboratory error results not available

SW-6 Settlement Lagoon

week 28	Week 29	Week 30	week 31	week 32	week 33	week 34	week 35	week 36	week 37	week 38	week 39	week 40	week 41 *	week 42	week 43	week 44	week 45	week 46	week 47	week 48	week 49	week 50	week 51	week 52
18.1																								
8	8.5	8.4	8.3																					
495	599	473	459																					
8.4														593										
20	35	15	14	7	8	15	25	30	24	20	14	8		20	18	39	56	26	122	103	56	21	14	20
0.44	0.27	0.19	0.09	0.25	0.35	0.62	0.58	0.42	0.53	0.57	0.55	0.36		0.32	0.27	0.42	0.8	0.85	0.94	0.85	0.73	0.85	0.84	0.84
26	25	26.55	23											16										
<0.01	<0.01	<0.01	<0.01																					
2	3	3		2	<2	<2	<2	<2	<2	<2	<2	<2		<2	2	5	8	5	5	3	<2	4	<2	<2
45	54	44												31										39
	46.31																							
	<0.2																							
	0.08																							
	23																							
	11																							
	<2																							
	357																							
	<2																							
	100																							
	<2																							
	<2																							
	<2																							
	<2																							
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	6																							
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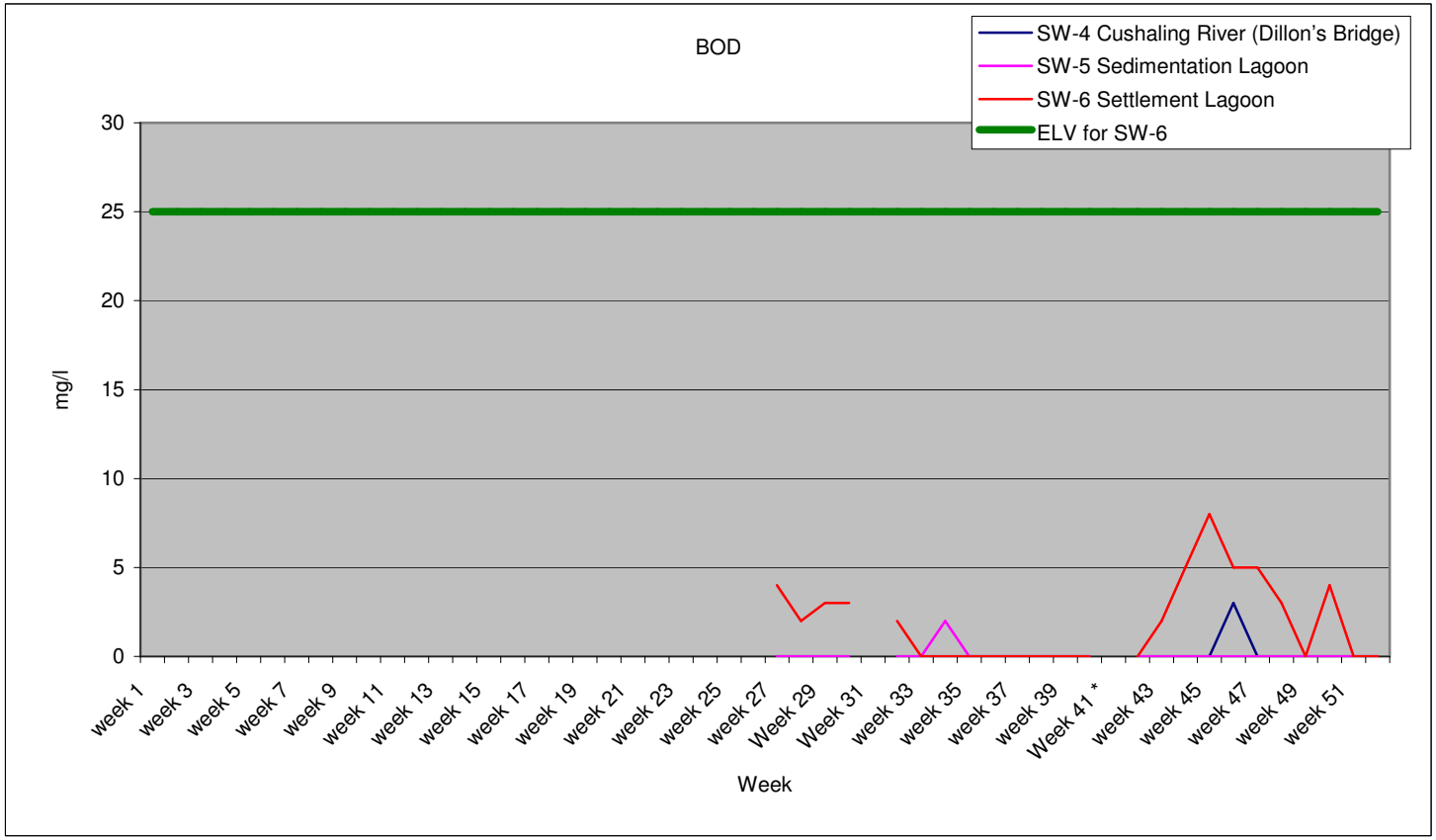
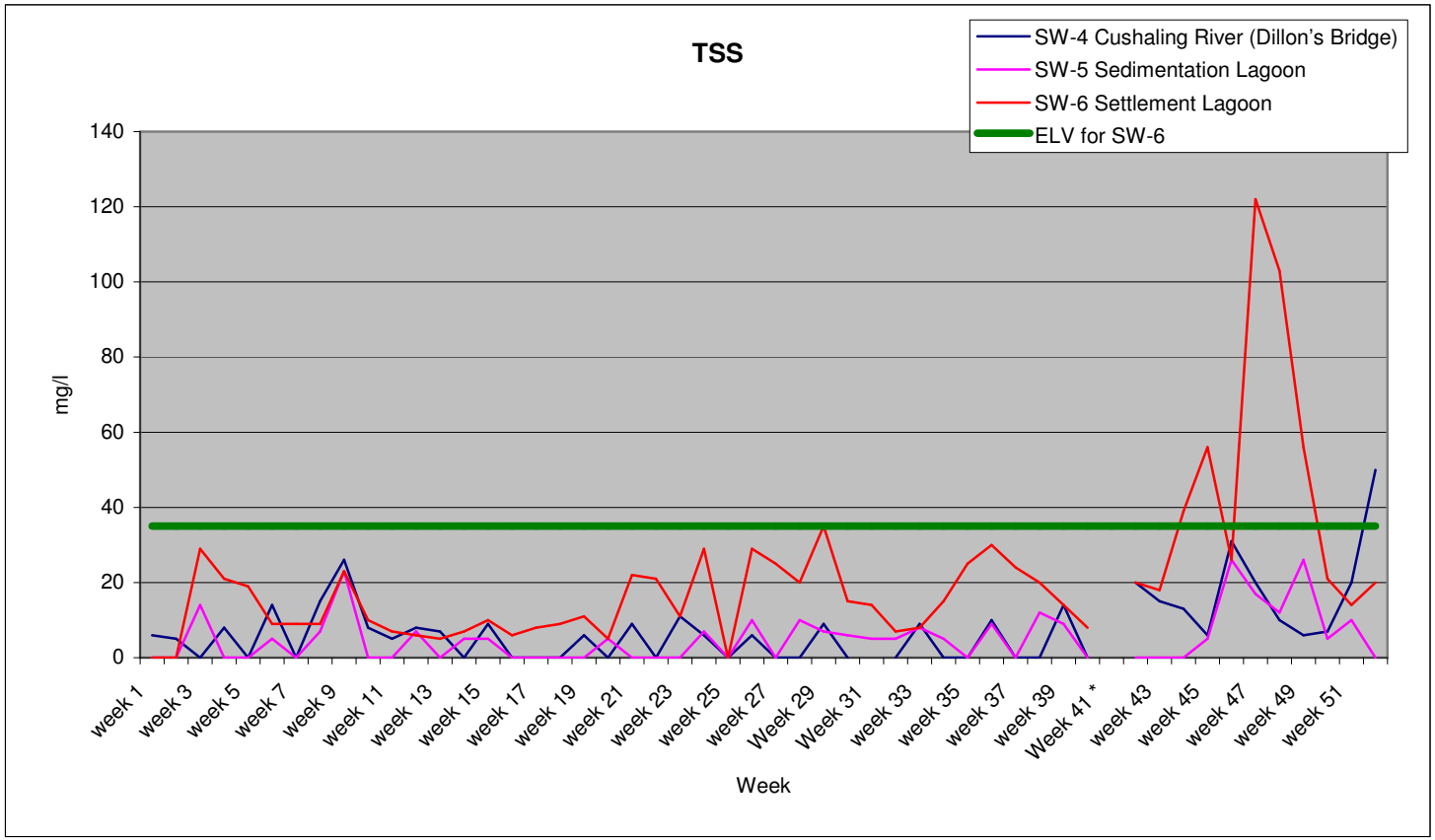
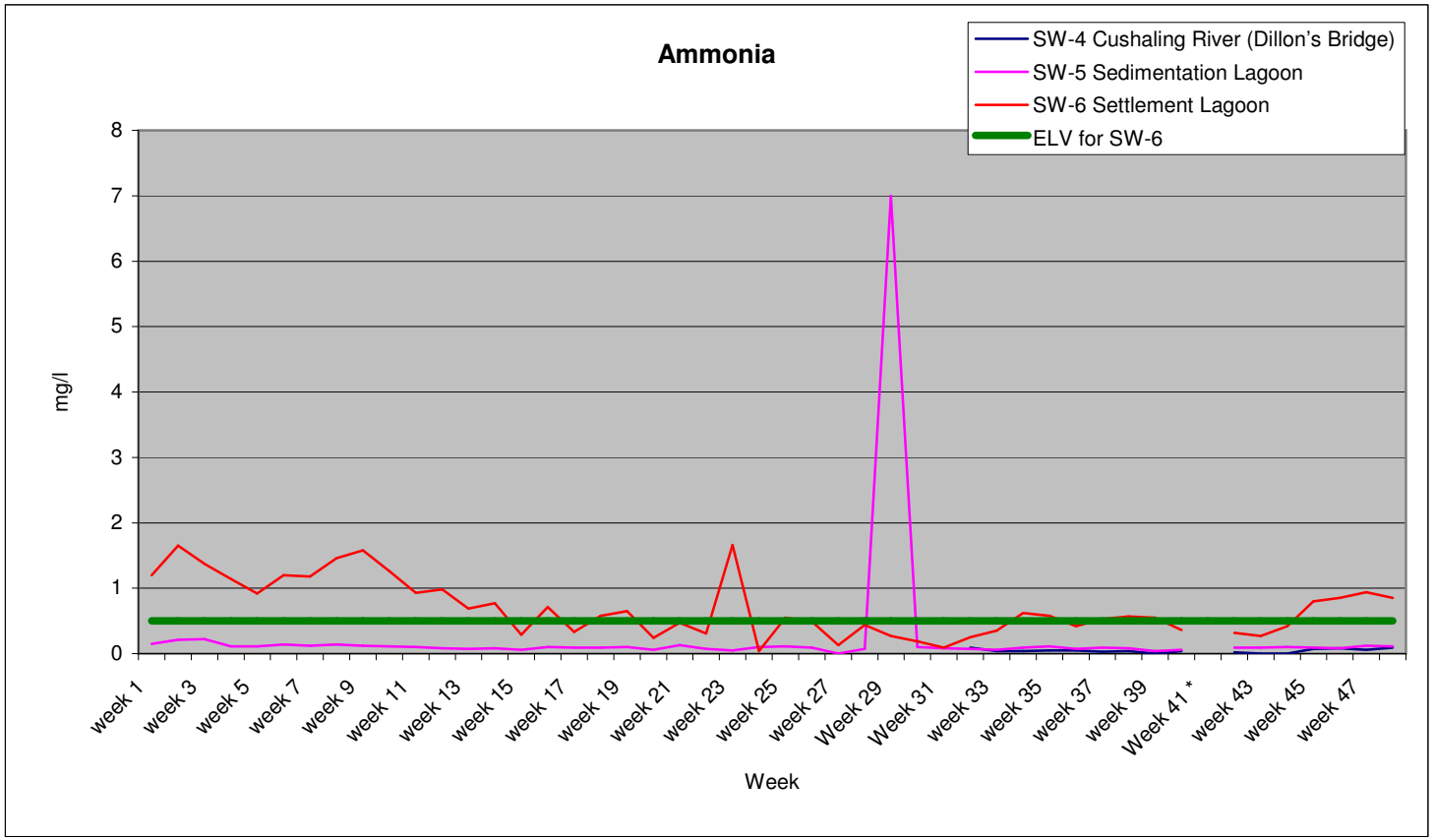
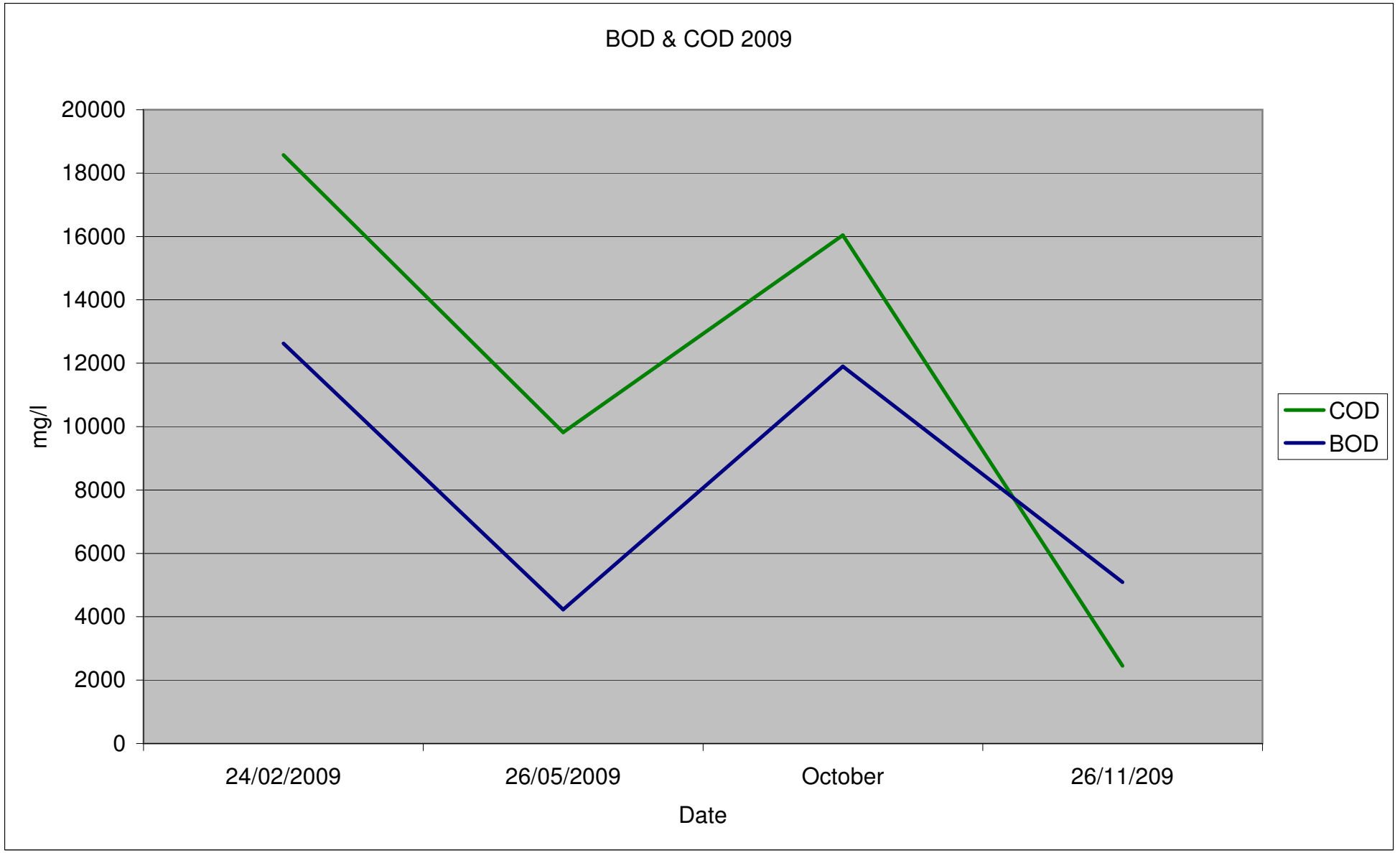

BOD
SW-4 Cushaling River (Dillon's Bridge)
SW-5 Sedimentation Lagoon
SW-6 Settlement Lagoon
ELV for SW-6
mg/l
30
25
20
15
10
5
0
week 1
week 3
week 5
week 7
week 9
week 11
week 13
week 15
week 17
week 19
week 21
week 23
week 25
week 27
Week 29
Week 31
week 33
week 35
week 37
week 39
Week 41 *
week 43
week 45
week 47
week 49
week 51
Week


TSS
SW-4 Cushaling River (Dillon's Bridge)
SW-5 Sedimentation Lagoon
SW-6 Settlement Lagoon
ELV for SW-6
mg/l
140
120
100
80
60
40
20
0
week 1
week 3
week 5
week 7
week 9
week 11
week 13
week 15
week 17
week 19
week 21
week 23
week 25
week 27
Week 29
Week 31
week 33
week 35
week 37
week 39
Week 41 *
week 43
week 45
week 47
week 49
week 51
Week


Ammonia
SW-4 Cushaling River (Dillon's Bridge)
SW-5 Sedimentation Lagoon
SW-6 Settlement Lagoon
ELV for SW-6
mg/l
0
1
2
3
4
5
6
7
8
week 1
week 3
week 5
week 7
week 9
week 11
week 13
week 15
week 17
week 19
week 21
week 23
week 25
week 27
Week 29
Week 31
week 33
week 35
week 37
week 39
Week 41 *
week 43
week 45
week 47
Week

Leachate Results

Parameter	Units	LT1			
		Q-1 2009	Q-2 2009	Q-3 2009	Q-4 2009
		24/02/2009	26/05/2009	October	26/11/209
COD	(mg/l)	18575	9820	16040	2450
BOD	(mg/l)	12625	4225	11900	5090
pH	pH units			7.4	
Conductivity	µS/cm			19900	
Ammonia-N	mg/l			1427	
Orthophosphate	mg/l			7.5	
Total Phosphorous	mg/l			15.55	
Chloride	mg/l			1551	
Fluoride	mg/l			<0.10	
Sulphate	mg/l			32.65	
Nitrate	mg/l			0.44	
TON	mg/l			0.41	
Boron	µg/l			1910	
Mercury	µg/l			<1	
Arsenic	µg/l			37	
Silver	µg/l			<2	
Aluminium	µg/l			1081	
Beryllium	µg/l			<2	
Barium	µg/l			263	
Chromium	µg/l			190	
Cadmium	µg/l			<2	
Cobalt	µg/l			28	
Copper	µg/l			687	
Manganese	µg/l			7505	
Tin	µg/l			14	
Nickel	µg/l			267	
Lead	µg/l			64	
Antimony	µg/l			37	
Selenium	µg/l			3	
Zinc	µg/l			636	
Calcium	µg/l			482	
Sodium	mg/l			735	
Magnesium	mg/l			184	
Potassium	mg/l			553	
Iron	mg/l			19	
Cyanide	mg/l			<0.01	
Bromochloromethane	µg/l			11	
Chloroform	µg/l			21	
M, p-Xylene	µg/l			25	
o-Xylene	µg/l			11	
Tert-Butylbenzene	µg/l			16	
Toluene	µg/l			51	
VOC's USEPA 524.2 (Al	µg/l			<10	
Acetone	mg/l			9	
Methanol	mg/l			<0.5	
Ethanol	mg/l			<0.5	
Isopropanol	mg/l			7.8	
Acetonitrile	mg/l			<0.5	
Phenol	µg/l			547	
2-Methylphenol	µg/l			13700	
SVOC'S (All Remaining (	µg/l			<1	
Comb Pesticide Suite	ng/l			<100	

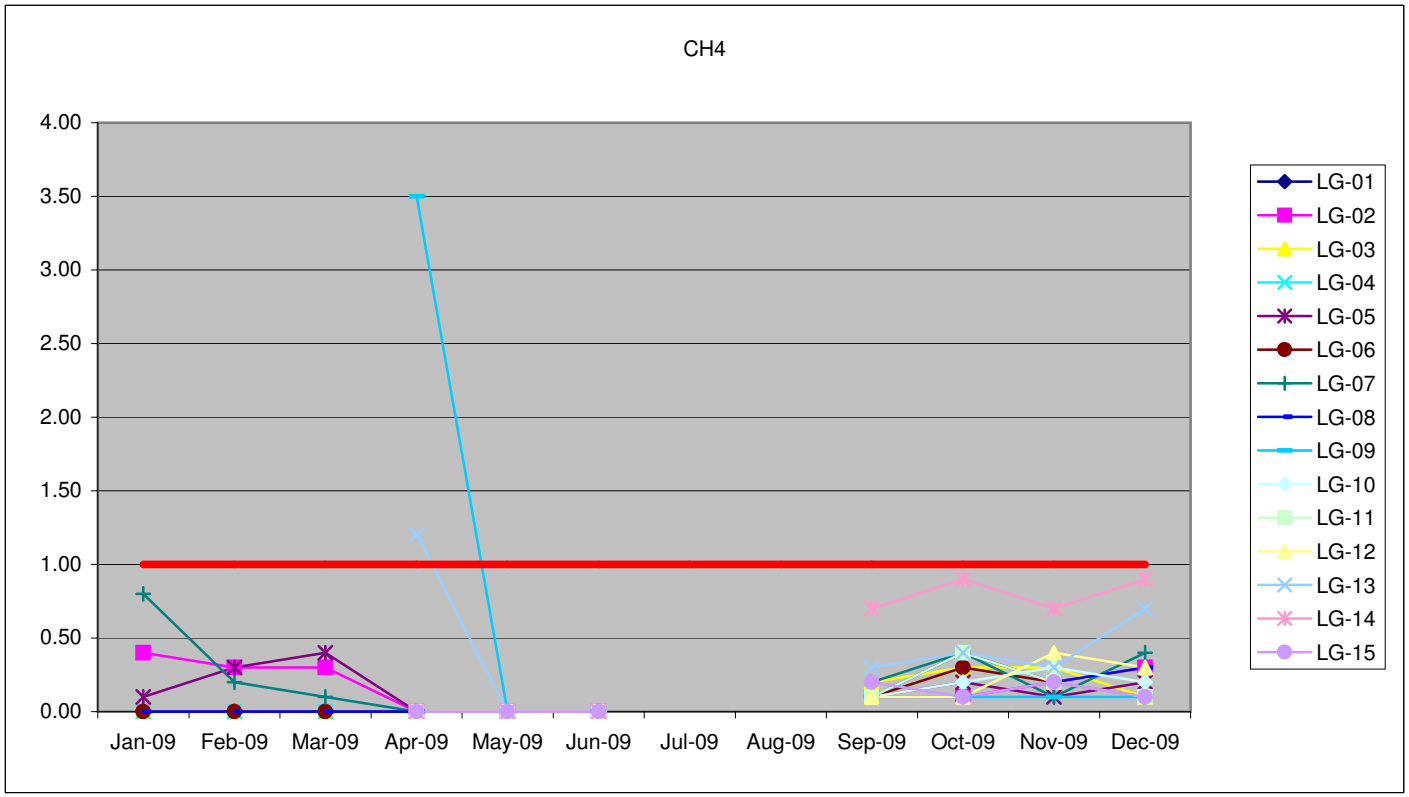

BOD & COD 2009
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
mg/l
24/02/2009
26/05/2009
October
26/11/209
Date
COD
BOD

Landfill Gas Results

Sample Station	Jan-09			Feb-09			Mar-09			Apr-09			May-09			Jun-09			Sep-09			Oct-09			Nov-09			Dec-09		
	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2	CH4	CO2	O2
	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)	(% v/v)
LG-01	0.00	0.20	25.60	0.00	0.00	26.50	0.00	0.10	25.80	0.00	2.90	22.60	0.00	0.00	27.80	0.00	0.00	27.60	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
LG-02	0.40	0.50	23.50	0.30	0.50	23.10	0.30	0.80	23.10	0.00	1.00	23.60	0.00	0.20	25.40	0.00	2.70	21.50	0.10	0.70	19.20	0.10	0.20	19.30	0.20	0.90	20.10	0.30	1.10	20.20
LG-03	0.00	0.20	25.20	0.00	0.20	26.20	0.00	0.40	25.80	0.00	0.90	26.10	0.00	0.00	27.50	0.00	1.00	25.90	0.20	0.40	20.50	0.30	1.10	20.10	0.30	0.40	19.20	0.10	1.30	19.90
LG-04	0.00	1.30	24.00	0.00	1.70	24.00	0.00	1.10	24.20	0.00	5.30	6.20	0.00	1.00	24.70	0.00	5.20	5.50	0.10	0.90	18.80	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
LG-05	0.10	0.90	21.20	0.30	0.70	22.10	0.40	0.70	23.30	0.00	1.50	20.10	0.00	0.80	24.50	0.00	0.30	26.20	0.10	0.20	20.70	0.20	1.20	20.30	0.10	0.70	17.30	0.20	0.70	21.50
LG-06	0.00	0.10	25.60	0.00	0.00	26.40	0.00	0.10	26.00	0.00	0.10	27.10	0.00	0.00	27.20	0.00	0.30	27.30	0.10	0.50	20.20	0.30	1.30	20.50	0.20	0.50	20.20	0.10	0.40	20.80
LG-07	0.80	0.00	20.80	0.20	0.00	24.10	0.10	0.20	25.10	0.00	0.10	22.40	0.00	0.00	27.40	0.00	0.80	14.00	0.20	0.70	17.30	0.40	0.90	19.70	0.10	0.30	20.50	0.40	0.70	19.40
LG-08	0.00	0.30	25.30	0.00	0.20	26.10	0.00	0.10	25.40	0.00	0.40	26.40	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	0.10	0.40	20.30	0.40	1.20	18.90	0.20	0.70	17.10	0.30	1.20	18.80
LG-09	-	-	-	-	-	-	-	-	-	3.50	4.80	3.80	0.00	0.10	27.30	0.00	1.20	22.80	0.10	0.30	20.50	0.10	0.50	21.40	0.10	0.30	19.40	0.10	0.40	20.50
LG-10	-	-	-	-	-	-	-	-	-	0.00	0.10	25.90	0.00	0.00	26.90	0.00	0.10	27.10	0.10	0.30	20.50	0.20	0.70	20.80	0.30	0.60	20.10	0.20	0.70	21.80
LG-11	-	-	-	-	-	-	-	-	-	0.00	0.10	26.70	0.00	0.00	27.50	0.00	0.00	27.70	0.10	0.50	20.20	0.40	1.10	20.40	0.20	0.50	20.70	0.10	0.40	22.00
LG-12	-	-	-	-	-	-	-	-	-	0.00	0.00	26.70	0.00	0.00	27.50	0.00	0.00	27.70	0.10	0.10	20.70	0.10	0.20	21.50	0.40	0.60	20.70	0.30	0.20	22.30
LG-13	-	-	-	-	-	-	-	-	-	1.20	1.60	25.60	0.00	0.00	26.60	0.00	0.40	26.20	0.30	0.80	19.40	0.40	0.60	19.10	0.30	0.70	19.50	0.70	0.50	17.70
LG-14	-	-	-	-	-	-	-	-	-	0.00	0.50	26.40	0.00	0.00	27.20	0.00	0.00	27.60	0.70	0.90	13.80	0.90	1.20	15.80	0.70	0.90	14.20	0.90	1.40	19.70
LG-15	-	-	-	-	-	-	-	-	-	0.00	0.10	26.60	0.00	0.00	26.80	0.00	0.00	27.30	0.20	0.20	20.60	0.10	0.90	20.10	0.20	0.50	20.30	0.10	1.20	20.20
Internal Cell 1	15.80	40.30	10.10	15.30	22.30	16.20	17.10	23.10	15.70	48.50	38.50	3.20	46.40	37.70	3.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal Cell 1A	-	-	-	-	-	-	-	-	-	44.40	35.60	5.00	50.60	41.30	2.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal Cell 2	19.20	41.10	9.60	11.90	27.10	16.10	12.10	25.30	15.10	54.00	42.20	0.60	56.70	41.80	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal Cell 2A	-	-	-	-	-	-	-	-	-	25.60	24.50	12.30	25.60	30.40	11.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal Cell 3	21.10	41.80	10.00	15.50	26.90	14.90	14.80	26.30	15.90	53.50	44.20	1.10	57.00	40.20	0.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Internal Cell 3A	-	-	-	-	-	-	-	-	-	47.00	47.60	1.40	53.20	38.70	1.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LFG-05A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46.90	39.20	2.70	-	-	-	-	-	-	-	-	-	-	-	-
LFG-08A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52.10	39.80	1.90	-	-	-	-	-	-	-	-	-	-	-	-
LFG-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43.00	39.60	0.40	-	-	-	-	-	-	-	-	-
LFG-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	47.80	37.90	0.80	45.3	38.6	0.5	-	-	-
LFG-02A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	54.9	39.1	0.7
GV-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.70	40.90	0.20	50.00	35.50	2.20	41.30	32.90	0.50	40.20	34.30	0.60
GV-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32.80	40.50	4.10	55.10	45.40	0.20	39.60	32.30	3.30	32.80	35.10	0.90	32.50	30.30	1.50
GV-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28.80	41.30	4.60	56.50	47.70	0.30	12.50	10.10	17.20	39.70	40.20	0.70	21.30	15.70	3.80
GV-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.30	39.90	9.00	48.40	54.00	0.30	58.60	40.10	1.20	50.30	43.70	0.60	51.50	37.60	0.80
GV-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	56.70	45.30	1.10	23.60	8.50	2.70	49.70	54.00	0.30	39.10	27.60	0.60
GV-06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61.10	43.10	0.70	2.40	4.60	19.50	42.10	52.20	0.70	25.40	35.30	4.80
GV-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.40	47.30	0.10	0.60	2.10	21.20	0.80	3.20	22.10	1.90	3.30	19.40
GV-08	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.50	38.40	10.90	-	-	-	-	-	-	-	-	-
Pump 1	14.60	20.80	16.10	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pump 2	25.20	30.00	11.60	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note 1: Point flooded, unable to take landfill gas measurement

Note 2: Inaccessible due to construction works on the site


CH4
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
LG-01
LG-02
LG-03
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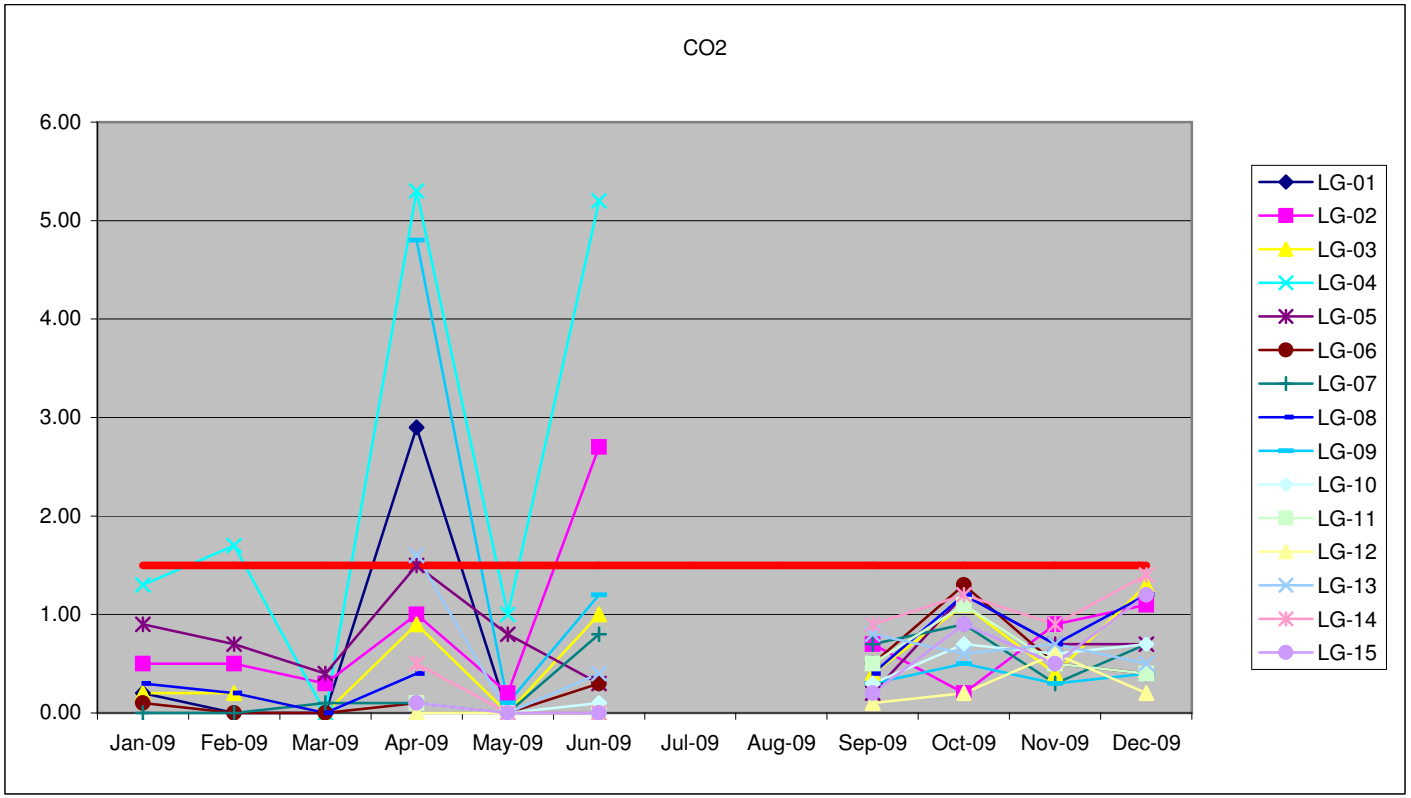
LG-15


CO2
6.00
5.00
4.00
3.00
2.00
1.00
0.00
Jan-09
Feb-09
Mar-09
Apr-09
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Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
LG-01
LG-02
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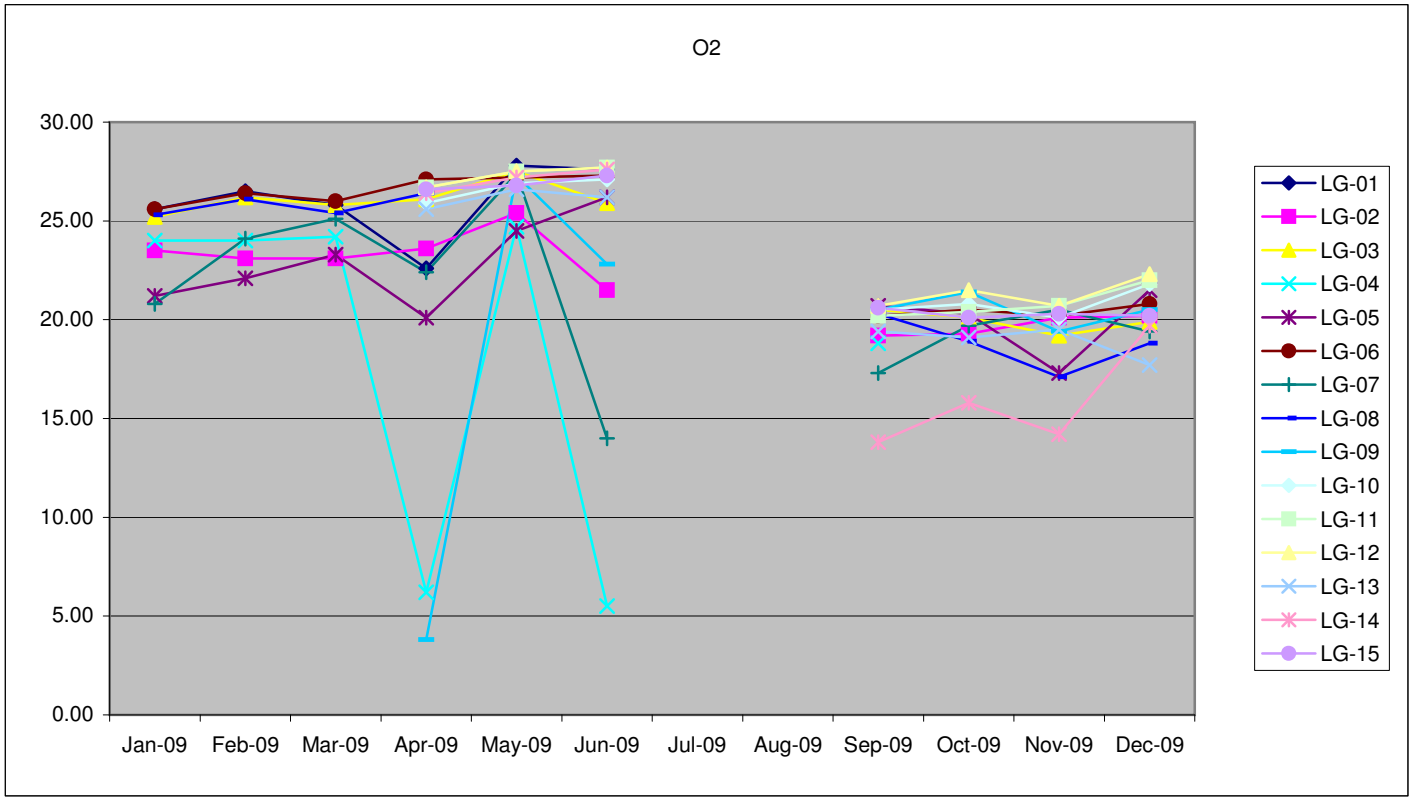
LG-11
LG-12
LG-13
LG-14
LG-15


O2
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
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Sep-09
Oct-09
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LG-01
LG-02
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LG-04
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LG-06
LG-07
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LG-10
LG-11
LG-12
LG-13
LG-14
LG-15

Dust Results

	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Emission Limit ($mg/m^2/day$)
	13th Jan - 12th Feb	12th Feb - 16th Mar	16th Mar - 15th Apr	15th Apr - 15th May	15th May - 15th June	15th June - 15th July	15th July - 17th Aug	17th Aug - 15th Sept	16th Sept - 16th Oct	16th Oct - 16th Nov	16th Nov - 17th Dec	15th Dec - 13th Jan	
D1	28	38	34	46	72	207	16	36	29	23	28	30	350
D2	33	<16	23	57	<17	57	136	53	34	17	22	18	350
D5	33	<16	23	80	Note 1	63	89	65	46	29	<17	<18	350
D6	33	65	92	161	233	465	94	184	86	23	<17	30	350
D8	28	22	126	138	344	207	31	Note 2	75	<17	28	<18	350

Note 1: An invalid result was recorded at D5 due to the presence of a flaky white substance inside of the Bergerhoff jar which originated from the Bergerhoff jar itself.

Note 2: The Bergerhoff Dust Deposition Gauge for the site boundary location at D8 was missing; as a result a deposition rate could not be calculated.

Noise Results

Daytime Noise Survey

Location	Date	Sampling Time	Leq dB(A) (30 min)	L_{10} dB(A)	L_{90} dB(A)	LAS Max dB(A)	Comments
N1	29th July 2009	13:47 - 14:17	37	37	<32	58	Dominant noise sources included a car passing close-by and distant reverse alarms from the drehid site and offsite(unknown location). Bird song, buzzing insects and distant air traffic also contributed to noise levels.
N2	29th July 2009	14:37 - 15:25	47	45	<32	67	Site activities were not audible at this location. Dominant noise sources included tractors and cars passing along the L5025 road. Intermittent chainsaw use and thunder in the distance also contributed to noise levels.
N3	29th July 2009	15:30 - 16:00	40	44	<32	59	Dominant noise sources included a cars passing along the L5025 road and the movement and associated reverse alarms of dozers and excavators on the landfill. Bird song and a helicopter flying in the distance also contributed to noise levels.
N4	29th July 2009	12:59 - 13:31	53	57	38	67	Dominant noise source at this location was passing vehicles on the R403 road (including louder tractors and trucks) and waste truck entering and exiting the site. Idling engines close-by also contributed to noise levels.
N5	29th July 2009	12:14 - 12:44	48	37	<31	00:00	Dominant noise sources included occasional site traffic on the entrance road and site activity (reverse alarms). The single loudest noise was planes flying overhead. Constant bird song also contributed to noise levels.

Nighttime Noise Survey

Location	Date	Sampling Time	Leq dB(A) (30 min)	L_{10} dB(A)	L_{90} dB(A)	LAS Max dB(A)	Comments
N1	3rd December 2009	23:26 - 23:56	<32	<32	<32	59	Noise sources at N1 included dogs barking in the distance along with the faint noise of car traffic. A flight of a bird from the undergrowth also contributed to noise levels
N2	4th December 2009	00:14 - 00:44	<32	34	<32	49	Dominant noise sources were dogs barking continuously in the distance along with the passing of 3 cars on the L5025 road near-by. Bellowing cattle were also noted.
N3	4th December 2009	00:46 - 01:16	<32	<32	<32	53	Dominant noise sources were dogs barking continuously in the distance along with the passing of 3 cars on the L5025 road near-by. Bellowing cattle were also noted.
N4	3rd December 2009	22:45 - 23:15	51	54	<32	71	The dominant noise source at this location was passing vehicles on the R403 road (including HGVs and the revving of a modified car). Dogs barking neary-by also contributed to noise levels
N5	3rd December 2009	22:02 - 22:32	<32	<32	<32	54	Dominant noise sources very distant cars and motorbikes. Dogs barking in the distance also contributed to the low noise level.

APPENDIX 3

Leachate Tank Testing Report

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Athenry,
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Website: www.coffeygroup.com
Tel: (091) 844356
Fax: (091) 844519

Leachate Holding Tank Testing Record

Contract Title: Drehid W.M.F. Contract 3 Additional Works

Start date and time: 6/11/09 12pm

Finish date and time: 9/11/09 3pm

Street / Road: Leachate holding tank Drehid

Drawing: —

Testing Details

Head of leachate in tank: 3.3 m

Duration of Test: 48hr

Allowable Drop in Head as per Spec: 0 m

Head at Start of Test 3.3m Time: 12pm Date: 6/11/09

Head at End of Test 3.3m Time: 3pm Date: 9/11/09

To: Billy Hoey R.E. Date: 6/11/09

Coffey Construction (I) Ltd. give notification that this test was commenced on

Time: 12pm Day Friday Date 6/11/09

Signed: Fiona Lyst

Returned to Coffey Construction Ltd.:-

We acknowledge receipt of this notice. The holding tank has been filled to a level of 3.3m.
This test has been inspected and is deemed to be satisfactory when checked >48 hours later.
The head of leachate has remained the same. (From the info. on the pump chamber control kiosk)
Visual inspection of the holding tank has indicated no leakage.
Manual measurement taken from the top of the tank indicates no leakage of leachate.

Signed:- Billy Hoey Date: 9/11/09

Signed:- Fiona Lyst Date: 9/11/09

APPENDIX 4

Odour Management Plan

Odour Management Plan

This plan is in place to best manage foreseeable situations which may compromise the sites ability to prevent and/or minimise odorous releases from the process and the actions the site management will subsequently take to minimise the impact. This will include operational and control measures for normal as well as abnormal conditions. It is intended to be used as a reference document for operational staff on a day-to-day basis and shows what actions should be taken to minimise the event and who is responsible for authorising or undertaking the action.
The plan is intended primarily to detail operational and control measures appropriate to management and control of odour. It should also document foreseeable events which are outside of the control of the operator, it will include types of failure that are preventable, for example pump/flare failure, capping breakthrough in order to highlight the need for the appropriate maintenance work to be undertaken before the failure occurs.

1. **The activity which produces the odour and the point of odour release**

(i) The anaerobic breakdown of the organic waste within the Landfill cells creating methane and other odorous vocs.
(ii) Landfill Gas collection system.
(iii) Haulage of fresh waste
(iv) Depositing of Fresh waste at tip face.
(v) Handling and pumping of leachate
(vi) Wheelwash
(vii) Site Foul water system

2. Possible process or control failures or abnormal situations

(i) Cap failure cracking due to settlement.
(ii) Insufficient extraction, well head not under negative pressure, flare shutdown or failure.
(iii) Trailers transporting odorous wastes with inadequate covering
(iv) Municipal waste being deposited during period's of hot humid weather with increased bacterial activity, odorous wastes being placed on the surface of the tip face releasing vocs.
(v) Agitation of hot evaporating leachate releasing vocs venting of empty tank during the filling process.
(vi) Recycled water and sludge in wheelwash becoming septic.
(vii) Failure of biocycle or foul sysem.

3. potential outcome of a failure in respect of the likely odour impact on local sensitive receptors

4. what actions are to be taken to mitigate the episode, timescales and details of the persons responsible for the actions at the site
5. record keeping.

Examples of the Issues which may be Considered in an Odour Management Plan?

1. Those which have potential to affect the process and the generation of odour

Examples of factors which the operator should normally have made arrangements for are:
• Materials input (seasonal variation in weather may affect odour of influent and intermittent discharge of odorous substances to the sewerage system)
• Process parameters (changes in temperature, aerobic conditions)
• Rate of throughput or increased hours of operation
• Development of anaerobic conditions
• Routine maintenance and inspection.

2 Those which affect the ability to abate/minimise odour

Examples of factors which might be considered to be outside of operator's control and best dealt
with by management actions:
• Start-up and shut-down of key plant and equipment
Examples of factors which the operator should normally have made arrangements for are:
• Mechanical breakdown of abatement equipment such as pumps, fans etc
• Power failure
• Compaction of the biofilter or surface fissures
• Saturation of a carbon filter bed and subsequent breakthrough of odours
• Below optimum temperature of a thermal oxidiser or boiler etc
• Saturation of scrubber liquor, blocked injection nozzles etc.
• Routine maintenance and inspection.

3. Those which affect the ability to contain odour (where releases are not normally permitted)

Examples of factors which might be considered to be outside of the operator's control and best
dealt with by management actions:
• Building damage which affects integrity due to for example storms
• Power failure
Examples of factors which the operator should normally have made arrangements for are:
• Failure of automatic doors, i.e. in open position
• Failure in procedures to maintain containment (human error)
• Routine maintenance and inspection.

4. Those affecting dispersion between the source and sensitive receptors (for permitted release points such as vents, stacks or biofilters):

Examples of factors which might be considered to be outside of the operator's control and best dealt with by management actions:

• Short term weather patterns which fall outside of the normal conditions for that area (ie highly unusual, not just the normal meteorological pattern - for example inversions and other conditions unfavourable to dispersion should have been considered in designing the process).

Examples of factors which the operator should normally have made arrangements for are:

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• Weather – wind direction, temperature, inversion conditions if these are normal variants of local weather

• Loss of plume buoyancy/temperature

Note: many of the above are design issues to a large extent – the process should be designed to prevent/minimise odour to the required level (a level of acceptability) which takes the range of meteorological conditions into account.

APPENDIX 5

Dust & Litter Control Plan

Title **Litter and Dust Control**

Purpose: The facility licence requires that litter and dust is controlled, and, wherever possible, contained within the site boundary. However, under certain conditions it will be impossible to contain all litter. In such circumstances, litter that has left the site and contaminated other people's property must be collected as a priority.

Scope: Every day the foreman ensures that an employee checks the environs of the site and to collect any loose litter by placing it into plastic bags or similar. These are disposed of at the tip face, before the end of the working day. All litter should be collected in accordance with Licence by 10 am the following morning..

References: WIF 5.1 Daily Site Snspection
Customer contact list

Procedure

1. Permanent litter nets are erected around the lined area with an entrance for access, they consist of 6m poles with UV treated netting.

2. Semi-permanent litter nets or cages should be erected close to the active face working cell, across the front of the cell while still allowing access for vehicles to the working face.

   Semi-Permanent Litter Netting is the most common type of litter prevention on site. Typically these nets are 3-4 metres in height and are suspended on mobile litter poles it is important that on a 4 meter pole you use a 5m net ensuring that in a high wind event, the additional force on the net from the litter in the net does not cause windblown litter to escape underneath. Alternatively, poles mounted in a tripod fashion may also be used.
   All nets should be cleared on a routine daily basis to prevent too much litter accumulating in the nets and causing them to split or overturn.

   Litter Cages are also available on site. Cages must only be used on the direction of the FM or supervisor. The cages should be positioned next to each other in lines around the tipping area to minimise windblown litter. The cages should only be moved by on-site plant.

   During high wind events the Landfill Manager and Site Foreman will agree if necessary to close the site.

   Customers are contacted and given notice of closure from the Customer contact list.

Once working face is closed all staff will assist in litter picking and insure excessive pressure is not on the netting system.

3. **Dust minimisation** The site foreman must insure that there dust generation is minimised on the site.
   With speed restrictions, wetting of haul roads, wetting of stockpiles prior to movement and grassing up exposed soil.

   Adhering to site conditions, speed restrictions, and using only the designated access roads, will assist in limiting dust problems.

   In dry weather, it may be necessary to damp down areas using water from bowsers, sprays or similar - this action is decided locally by the FM.

   A wheelwash has been installed on site to prevent tracking of material onto the public road. All vehicles leaving the tip face must use this wheelwash.

   Occasionally, due both to heavy traffic and works elsewhere on site, material may start to track past the wheelwash and along the site road. To remediate this, the metalled site roads and hard standing surfaces are swept using a road sweeper as conditions dictate. The road should be swept until the FM or his representative is satisfied that the required standard has been reached and maintained.

APPENDIX 6

Training Procedure

Title Training

Purpose: To define how Bord na Móna ensures awareness of environmental issues and how environmental training is identified and conducted.

Scope: This procedure applies to employees at the Drehid Waste Management Facility

References:
EPF 19.1 Environmental Training Record
EPF 19.2 Environmental Training Summary
EPF 19.3 Training Needs Matrix
EPF 19.4 Employee Induction Training Certificate

Procedure:

1. The Landfill Manager is responsible for ensuring that his reports are fully trained for their specific tasks, and are aware of the implications of waste licence W0201-02.

2. All employees shall be made familiar with their environmental responsibilities through a comprehensive environmental training programme

   - All employees will have an individual training file created which will detail all training received.
   - Training shall be updated as the environmental responsibilities of employees develop.

3. Environmental Training Records will be maintained on file for individual employees for 7 years.

4. External training programmes conducted on Drehid Waste Management Facility premises will be documented on Environmental Training Summary EPF 19.2, and the trainee's individual Environmental Training Records EPF 19.1 should be updated with same.

5. The Landfill Manager shall request that all relevant personnel undertake training in any new environmental procedure adopted by Drehid Waste Management Facility. (or any new amendments to existing environmental procedures). This Internal training should be recorded in the Environmental Training Records EPF 19.1.

Title Training

6. As part of the Annual Review, the Management will review all training requirements. This environmental training review will identify the specific environmental training requirements for each operation within the company.

7. The Environmental Management Team will identify Environmental Training needs under the following headings:
    - Introduction of new materials
    - Introduction of new or altered work processes
    - Appointment of new personnel to plant
    - Transfer of personnel to new duties in plant
    - As part of Annual Review of Objectives and Targets and programmes
    - New environmental regulatory requirements
    - Updating of skills
    - Corrective and Preventive Action
    - Environmental Complaints

8. The planned environmental Training shall be documented on the Environmental Training need matrix EPF 19.3. This planned training shall be undertaken as scheduled.

9. The Landfill Manager shall ensure that all training tasks are completed by each employee identified as requiring environmental training.

10. Once an environmental training task has been completed by an employee, the Environmental Training record EPF 19.1 shall be updated.

11. All new employees will be required to undergo an environmental induction programme before commencing work at the facility. EPF 19.4 the Employee Induction Training Certificate shall be completed detailing the elements covered by the training. The induction will include the following:
    - Information with regards to the Company Structure and Environmental Responsibility
    - Environmental Policy Statement
    - Supplied with a description of the Waste Licence W0201-02
    - Awareness of the Emergency Response Procedures
    - Supplied with a description of activities on site
    - Reporting of environmental incidents to Environmental Team

When induction is completed an Environmental Training Record EPF 19.1 is created for each individual. All subsequent environmental training will also be retained on this record.

12. Employees, who have potential to have an effect on the environment, should undergo a more comprehensive training programme subsequent to Environmental Induction as follows:
    - Training on all Environmental Procedures specific to their roles in the EMS
    - Fire Hazard Training
    - Spill Kit Training

When environmental training is complete Environmental Training Record EPF 19.1 will be updated.

APPENDIX 7

Programme for Public Information

Title Programme for Public Information

Purpose: To define how Bord na Móna manages the communication of environmental information concerning the facility with external parties.

Scope: This procedure applies to Bord na Móna Drehid Waste Management Facility.

References: Data Protection Act 1988 with 2003 amendment

Procedure

1. All external, out-going communication of environmental issues, unless specifically outlined below, must be approved by the Landfill Operations Manager. If the Facility Manager is unavailable, then the designated Environmental Officer may approve the communication.

2. Certain environmental information, as detailed below, will be available to external parties. Only 1 copy of each document is available for view at any time.

3. It is recommended that visitors should phone or write in advance, as this will facilitate the company to arrange for the necessary staff and documents to be available. However, a prior appointment by any member of the public is not necessary.

4. Viewing time is restricted to normal office hours (9.30 to 12.50, 14.00 to 16.30).
   No more than 1 hour of staff time is available for assistance or queries per day.

5. Visitors may ask for the Landfill Operations Manager. They are requested to sign in at reception, giving their name, address, and reason for their visit.

6. Access is restricted to the Meeting Room, and the information will be brought to this designated room for viewing. The original documents are not to be removed, altered or damaged in any way.

7. A copy of the following files will be kept in Document Control and are available to the public as outlined above:

- Waste licence
- Annual Environmental Reports
- Monthly monitoring reports
- Ground water monitoring results
- Surface water monitoring results
- Air monitoring results
- Environmental noise monitoring results

8. Every effort will be made to keep the files up-to-date. The information provided will comply with legal requirements and the requirements of the Waste licence, but confidential and commercially sensitive information will be restricted and Bord na Móna must comply with the Data Protection Act 1988 with 2003 amendment.

APPENDIX 8

E-PRTR Returns

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201_2009.xls | Return Year : 2009 |

AER Returns Worksheet

Version 1.1.10

REFERENCE YEAR	2009

1. FACILITY IDENTIFICATION

Parent Company Name	Bord na Mona Plc
Facility Name	Drehid Waste Management Facility
PRTR Identification Number	W0201
Licence Number	W0201-02

Waste or IPPC Classes of Activity

No.	class_name
3.1	Deposit on, in or under land (including landfill).
11.1	##

Address 1	In the townlands of Parsonstown, Loughnacush, Kilkeaskin, Drumond
Address 2	Timahoe West, Coolcarrigan
Address 3	Killinagh Lower and Killinagh Upper, Carbury
Address 4	County Kildare
Country	Ireland
Coordinates of Location	-6.88508 53.3335
River Basin District	IESE
NACE Code	3821
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Ciaran Geoghegan
AER Returns Contact Email Address	ciaran.geoghegan@bnm.ie
AER Returns Contact Position	
AER Returns Contact Telephone Number	045 439470
AER Returns Contact Mobile Phone Number	0863880679
AER Returns Contact Fax Number	045 439489
Production Volume	0.0
Production Volume Units	
Number of Installations	0
Number of Operating Hours in Year	0
Number of Employees	0
User Feedback/Comments	
Web Address	

2. PRTR CLASS ACTIVITIES

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

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

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

4.2 RELEASES TO WATERS

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

Data on ambient monitoring of storm/surface water or groundwater, conducted as part of your licence requirements, should NOT be submitted under AER / PRTR Reporting as this

RELEASES TO WATERS								
POLLUTANT					QUANTITY			
			Method Used		SW-6			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
79	Chlorides (as Cl)	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	1.325096	1.325096	0.0	0.0
13	Total phosphorus	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.003178	0.003178	0.0	0.0
17	Arsenic and compounds (as As)	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.000437	0.000437	0.0	0.0
22	Nickel and compounds (as Ni)	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.000238	0.000238	0.0	0.0

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

SECTION B : REMAINING PRTR POLLUTANTS

RELEASES TO WATERS								
POLLUTANT					QUANTITY			
			Method Used					
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
					0.0	0.0	0.0	0.0

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

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

RELEASES TO WATERS								
POLLUTANT					QUANTITY			
			Method Used		SW-6			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
240	Suspended Solids	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.885425	0.885425	0.0	0.0
238	Ammonia (as N)	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.027812	0.027812	0.0	0.0
303	BOD	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.15226	0.15226	0.0	0.0
306	COD	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	1.577451	1.577451	0.0	0.0
343	Sulphate	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	1.839433	1.839433	0.0	0.0
374	Boron	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.000914	0.000914	0.0	0.0

355	Aluminium	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.01418	0.01418	0.0	0.0
373	Barium	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.003972	0.003972	0.0	0.0
357	Iron	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.000012	0.000012	0.0	0.0
321	Manganese (as Mn)	E	Estimate	Calculated based on the estimate of flow and the average of the results over the year	0.00294	0.00294	0.0	0.0

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

4.3 RELEASES TO WASTEWATER OR SEWER

SECTION A : PRTR POLLUTANTS

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER

POLLUTANT		METHOD			QUANTITY			
			Method Used		LT1			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
79	Chlorides (as Cl)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	26172.90786	26172.90786	0.0	0.0
17	Arsenic and compounds (as As)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.62437	0.62437	0.0	0.0
19	Chromium and compounds (as Cr)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	3.206223	3.206223	0.0	0.0
20	Copper and compounds (as Cu)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	11.593029	11.593029	0.0	0.0
22	Nickel and compounds (as Ni)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	4.505588	4.505588	0.0	0.0
23	Lead and compounds (as Pb)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	1.079991	1.079991	0.0	0.0
24	Zinc and compounds (as Zn)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	10.732411	10.732411	0.0	0.0
78	Xylenes	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.607495	0.607495	0.0	0.0
73	Toluene	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.860618	0.860618	0.0	0.0

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

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

OFFSITE TRANSFER OF POLLUTANTS DESTINED FOR WASTE-WATER TREATMENT OR SEWER

POLLUTANT		METHOD			QUANTITY			
			Method Used		LT1			
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
306	**COD**	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	197794.452775	197794.452775	0.0	0.0

303	BOD	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	142761.3156	142761.3156	0.0	0.0
238	Ammonia (as N)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	24080.42522	24080.42522	0.0	0.0
332	Ortho-phosphate (as PO4)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	126.56145	126.56145	0.0	0.0
343	Sulphate	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	550.964179	550.964179	0.0	0.0
327	Nitrate (as N)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	1.67659861	1.67659861	0.0	0.0
374	Boron	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	32.230983	32.230983	0.0	0.0
355	Aluminium	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	18.241724	18.241724	0.0	0.0
373	Barium	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	4.438088	4.438088	0.0	0.0
356	Cobalt	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.472496	0.472496	0.0	0.0
321	Manganese (as Mn)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	126.645824	126.645824	0.0	0.0
358	Tin	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.236248	0.236248	0.0	0.0
205	Antimony (as Sb)	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.62437	0.62437	0.0	0.0
370	Selenium	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.050625	0.050625	0.0	0.0

305	Calcium	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	8.133683	8.133683	0.0	0.0
341	Sodium	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	12.403022	12.403022	0.0	0.0
320	Magnesium	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	3.104974	3.104974	0.0	0.0
338	Potassium	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	9.331798	9.331798	0.0	0.0
357	Iron	C	PER	Calculated based on average results over the reporting period and the amount of leachate removed off site	0.320622	0.320622	0.0	0.0
					0.0	0.0	0.0	0.0

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

4.1 RELEASES TO AIR

SECTION A : SECTOR SPECIFIC PRTR POLLUTANTS

RELEASES TO AIR									
POLLUTANT		METHOD					QUANTITY		
			Method Used		Flare 1	Flare 2			
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	Emission Point 2	T (Total) KG/Year	A (Accidental) KG/Year	F (Fugitive) KG/Year
01	Methane (CH4)	E	Estimate	Fugitive emission based on GasSim Model	0.0	0.0	195710.54	0.0	195710.54
03	Carbon dioxide (CO2)	E	Estimate	Fugitive emission based on GasSim Model	0.0	0.0	477956.9	0.0	477956.9
02	Carbon monoxide (CO)	E	Estimate	Estimated based on the average flow for the year and results from the flare	71.868179	65.334808	137.202987	0.0	0.0
08	Nitrogen oxides (NOx/NO2)	E	Estimate	Estimated based on the average flow for the year and results from the flare	52.267766	365.87436	418.142126	0.0	0.0
11	Sulphur oxides (SOx/SO2)	E	Estimate	Estimated based on the average flow for the year and results from the flare	98.002062	91.468591	189.470653	0.0	0.0

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

SECTION B : REMAINING PRTR POLLUTANTS

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

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

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

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

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

Additional Data Requested from Landfill operators

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

Landfill: Drehid Waste Management Facility

Please enter summary data on the quantities of methane flared and / or utilised	T (Total) kg/Year	M/C/E	Method Used: Method Code	Method Used: Designation or Description	Facility Total Capacity m3 per hour	
Total estimated methane generation (as per site model)	1870217.75	E	Estimate	Estimate based on Gas Sim Model	N/A	
Methane flared	1674507.209	C	PER	Calculated based on percen	2500.0	(Total Flaring Capacity)
Methane utilised in engine/s	0.0				0.0	(Total Utilising Capacity)
Net methane emission (as reported in Section A above)	195710.54	E	Estimate	Estimate based on Gas Sim	N/A	

4.4 RELEASES TO LAND

SECTION A : PRTR POLLUTANTS

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
			Method Used				
No. Annex II	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

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

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

RELEASES TO LAND							
POLLUTANT		METHOD			QUANTITY		
			Method Used				
Pollutant No.	Name	M/C/E	Method Code	Designation or Description	Emission Point 1	T (Total) KG/Year	A (Accidental) KG/Year
					0.0	0.0	0.0

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

5. ONSITE TREATMENT & OFFSITE TRANSFERS OF WASTE

| PRTR# : W0201 | Facility Name : Drehid Waste Management Facility | Filename : W0201_2009.xls | Return Year : 2009 |

Transfer Destination	European Waste Code	Hazardous	Quantity (Tonnes per Year)	Description of Waste	Waste Treatment Operation	Method Used		Location of Treatment	Haz Waste : Name and Licence/Permit No of Next Destination Facility Non Haz Waste: Name and Licence/Permit No of Recover/Disposer	Haz Waste : Address of Next Destination Facility Non Haz Waste: Address of Recover/Disposer	Name and License / Permit No. and Address of Final Recoverer / Disposer (HAZARDOUS WASTE ONLY)	Actual Address of Final Destination i.e. Final Recovery / Disposal Site (HAZARDOUS WASTE ONLY)
						M/C/E	Method Used					
Within the Country	03 03 08	No	1.3	Paper & Cardboard	R3	M	Weighed	Offsite in Ireland	AES,W0194-02	Kyletalesha,Portlaoise,Co. Laois,.,Ireland		
Within the Country	13 02 08	Yes	1.24	Engine, gear & lubricant oils	R9	M	Weighed	Offsite in Ireland	Enva,W0184-01	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland	Enva Ltd.,W0184-01,Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland	Clonminam Industrial Estate,Portlaoise,Co. Laois,.,Ireland
Within the Country	16 01 03	No	14.16	End of Life Tyres	R5	M	Weighed	Offsite in Ireland	Crumb Rubber Ireland Ltd.,WP 2007/01	Mooretown,Dromiskin,Dundalk,Co. Louth,Ireland		
Within the Country	16 02 14	No	3.92	Discarded Electrical Equipment	R5	M	Weighed	Offsite in Ireland	KMK Metals Recycling Ltd.,W0113-02	Cappincur Industrial Estate,Daingean Road,Tullamore,Co. Offaly,Ireland		
Within the Country	19 07 03	No	16874.86	Leachate	R3	M	Weighed	Offsite in Ireland	Kildare County Council Waste Water Treatment Plant,WWDA D004-01	Lexslip,Co. Kildare,.,.,Ireland		
Within the Country	20 03 04	No	109.72	Septic Tank Waste	R3	M	Weighed	Offsite in Ireland	Kildare County Council Waste Water Treatment Plant,WWDA D004-01	Lexslip,Co. Kildare,.,.,Ireland		

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