

ANNUAL ENVIRONMENTAL REPORT

Bord na Móna Resource Recovery
Drehid Waste Management Facility

January 2010
Through
December 2010

**Waste License
Registration Number:** W0201-03

Licensee: Bord Na Móna Resource Recovery
Drehid Waste Management Facility

Location of Activity: Killinagh Upper,
Carbury,
Co. Kildare

Attention: Office of Environmental Enforcement,
EPA Headquarters, PO Box 3000,
Johnstown Castle Estate, Co. Wexford

Prepared by: Bord na Móna



REVISION CONTROL TABLE

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TABLE OF CONTENTS

	PAGE
1. INTRODUCTION	3
2. SITE DESCRIPTION.....	4
2.1 SITE LOCATION AND LAYOUT.....	4
2.2 WASTE TYPES & VOLUMES.....	4
2.3 WASTE ACTIVITIES	5
2.4 WASTE RECEIVED, RECOVERED & CONSIGNED.....	5
2.5 LANDFILL CAPACITY.....	6
2.6 METHOD OF DEPOSITION OF WASTES	6
2.6.1 Waste Acceptance.....	6
2.6.2 Working Face.....	6
3. ENVIRONMENTAL MONITORING.....	8
3.1 GROUNDWATER MONITORING.....	8
3.1.1 Baseline Groundwater Conditions.....	8
3.1.2 Groundwater Quality.....	8
3.2 SURFACE WATER MONITORING.....	9
3.2.1 Visual Assessment	9
3.2.2 Chemical Assessment.....	9
3.3 LEACHATE.....	10
3.4 LANDFILL GAS (LFG)	10
3.4.1 Outside the Waste Body.....	10
3.4.2 Inside the Waste Body	10
3.5 FUGITIVE EMISSIONS SURVEY	10
3.6 NOISE SURVEY.....	11
3.7 DUST MONITORING.....	12
3.8 METEOROLOGICAL MONITORING.....	12
3.9 BIOLOGICAL MONITORING	12
4. SITE DEVELOPMENT WORKS.....	13
4.1 TANK, PIPELINE AND BUND TESTING	13
4.2 SUMMARY OF RESOURCE & ENERGY CONSUMPTION.....	13
4.3 SITE DEVELOPMENTS	13
4.4 STABILITY ASSESSMENT	14
5. EMISSIONS.....	15
5.1 LANDFILL GAS.....	15
5.2 SURFACE WATER.....	15
5.3 LEACHATE.....	15
6. NUISANCE CONTROL.....	16
6.1 ODOUR.....	16
6.2 VERMIN / FLIES / INSECTS.....	16

6.3	BIRDS	16
6.4	DUST & LITTER	16
7.	ENVIRONMENTAL INCIDENTS AND COMPLAINTS	18
7.1	INCIDENTS	18
7.2	REGISTER OF COMPLAINTS	18
8.	ENVIRONMENTAL MANAGEMENT SYSTEM	19
8.1	MANAGEMENT STRUCTURE.....	19
8.1.1	<i>Site Management Structure</i>	19
8.1.2	<i>Staff Training</i>	20
8.2	EMP.....	20
8.2.1	<i>Schedule of Objectives 2010</i>	20
8.2.2	<i>Schedule of Objectives 2011</i>	20
8.3	COMMUNICATIONS PROGRAMME.....	20
9.	OTHER REPORTS	24
9.1	FINANCIAL PROVISION	24
9.2	CONTRIBUTIONS TO COMMUNITY FUND	24
9.3	STATEMENT ON COSTS OF LANDFILL	24
9.4	EUROPEAN POLLUTANT RELEASE AND TRANSFER REGISTER	24
9.5	WASTE RECOVERY REPORT.....	24

APPENDIX 1	-	Topographic Survey
APPENDIX 2	-	Monitoring Location Maps / Monitoring Results 2010
APPENDIX 3	-	Bund and Leachate Tanks Testing Reports
APPENDIX 4	-	Dust & Litter Plan
APPENDIX 5-		Training Procedures
APPENDIX 6	-	Programme for Public Information
APPENDIX 7	-	EPRTR (European Pollutant Release and Transfer Register)

1. INTRODUCTION

The following document is the 2010 Annual Environmental Report (AER) for Bord na Mona Waste Management Facility at Drehid, County Kildare. It covers the period from 1st January 2010 to 31st December 2010. The facility is a non-hazardous residual landfill and is also authorised to carry out composting of biodegradable wastes, however construction of the composting plant has not yet been completed.

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. In April 2009, the Agency issued a revised Waste Licence (W0201-02), which increased the annual waste acceptance limit to 350,000 tonnes for a seven year period or until the end of 2015, whichever is sooner. In March 2010, the Agency issued a revised Waste Licence (W0201-03), which was primarily aimed at ensuring the landfill is operating in compliance with all relevant requirements of the Landfill Directive (1999/13/EEC) including the need to divert biodegradable municipal waste from landfill.

The content of this 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 in County Kildare and is within the confines of the Bord na Mona owned Timahoe bog. The site encompasses a total area of approximately 179 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 39 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 construction 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 2010 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 2010

WasteType	Description	Tonnes
Commercial and Domestic	Mixed Commercial and Domestic	291,112.70
Industrial	Non Hazardous Industrial Solid Waste	191.44
Compost	Compost	36925.92
Total Disposed to Landfill		328,230.06
Construction and Demolition	Inert Soil and Fines Material	58266.37
Construction and Demolition	Shredded Timber	6,624.74
Agriculture	Inert material	723.62
Construction and Demolition Rubble	Mix of C&D concrete, brick, tiles and ceramic	24,770.33
Total recovered on-site		90,385.06
Total Accepted onsite including Inert Waste		418,615.12

Table 2.2 Waste Consigned 2010

Description	Tonnes
Engine, Gear & Lub Oils	1.26
Leachate	28,308.28
Paper & Cardboard	1.39
Total Consigned	28,310.93

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 4,080,000m³. It is estimated that approximately 916,755 m³ of void space has been used. The remaining capacity is approximately 3,163,245 m³. 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 Móna 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 on Figure 3.1.

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 Móna 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 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.

BOD, Ammonia and Total Suspended Solids (TSS) levels were compared to their relevant emission limit values (ELV's). BOD did not exceed its ELV at any time throughout the 2010 monitoring period. 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 2 occasions at SW-6 and 3 occasions at SW-5. The reasons for the exceedances are most likely due to heavy rainfall prior to the monitoring events.

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 50m intervals around the landfill footprint and two per hectare within the cells. The locations of the 17 external wells (LG-01 – LG-17), which were agreed in advance with the Agency, are shown on the monitoring location map included in Appendix 2.

3.4.1 Outside the Waste Body

The concentration limit for methane (1% v/v) was not exceeded in any of the monitoring wells in 2010.

The concentration limit for carbon dioxide (1.5% v/v) was exceeded at LG-07 in July 2010. Exceedances of carbon dioxide levels were also measured in 2009 naturally and in the baseline survey prior to the deposition of waste in 2008. The carbon dioxide arises naturally due to the breakdown of compounds within the peat.

3.4.2 Inside the Waste Body

Methane levels varied from 0.9 to 63.6 % v/v, carbon dioxide levels varied from 0.9 to 54.3 % v/v, while oxygen levels varied from 0.1 to 21.7 % v/v. These levels are typical of those in an operational non-hazardous waste landfill

3.5 Fugitive Emissions Survey

An investigation of fugitive emissions was conducted at the Drehid Facility to evaluate potential areas of landfill gas release/flux from the surface of the landfill cap. The survey involved landfill cap source monitoring using a portable Photo Ionisation Detector (PID) and a portable Flame Ionisation Detector (FID) to detect VOC's and Methane. A Global Positioning System (Trimble GPS) was used to mark areas sampled using a grid system. During the monitoring survey carried out on the 10th and 15th June 2010, all areas which received elevated levels of methane (>1000) and VOC (>0.5ppm) were marked clearly with yellow paint on the surface of the landfill capping. It was recommended that these areas were coated with further capping to ensure that fugitive emissions from these points were eliminated. Areas of weak capping along the southern boundary of phase 1 were also earmarked for further capping.

3.6 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.

3.7 Dust Monitoring

Dust deposition is monitored monthly at five monitoring locations (D1, D2, D5, D6 and D8) as shown on the monitoring location map in Appendix 2. With the exception of monitoring location D6 in August all of the monitoring results were less than the deposition limit set in the licence (350 mg/m²/day). The exceedance at D6 was due to its location beside an internal haul road which was busy with loader traffic carrying earth removed from the newly engineered landfill cell to the clay borrow area.

3.8 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 – 2010

Rainfall	
Total Annual	716 mm
Maximum month (November)	102.7 mm
Minimum month (April)	32.7 mm
Temperature	
Mean	8.5°C
Mean Maximum (July)	15.7°C
Mean Minimum (December)	0.3°C
Wind (Knots)	
Prevailing direction	South West
Prevailing sector	South West

The total annual rainfall is 716 mm. The winds are predominantly from the south west sector.

3.9 Biological Monitoring

The annual biological assessment of the Cushaling River was carried out in accordance with Condition 8.11 of the Licence on the 22nd of July 2010. 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 bunds at the facility was carried out by Fehily Timoney and Co in December 2010. An inspection and integrity testing of the leachate tanks was carried out by Irish Industrial Tanks Ltd in January of 2011. Each bund and tank was passed fit for purpose. Copies of the reports are included in Appendix 3.

4.2 Summary of Resource & Energy Consumption

Table 4.1 presents an estimate of the resources used on-site in 2010. 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)	284,217 litres
Electricity	341,250 kWh

4.3 Site Developments

Phase 3 of the landfill was completed in 2009 and work began in 2010 on the construction of phase 4 of the landfill. Construction of the composting plant also began in quarter 4 of 2010 with a predicted completion date being in quarter 4 of 2011.

4.4 Stability Assessment

The Drehid Facility is currently within Phase 4 of construction works, which together with Phases 1, 2 and 3 are subject to a stringent Construction Quality Assurance (CQA) programme. This programme ensures 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 input data were site specific values, i.e. size of the site, operational period, quantity and type of waste.

The model estimates that approximately 1522m³ / hour of landfill gas (methane and carbon dioxide) was generated at the facility over the reporting period. The total estimated methane generated as per the GasSim model was 4,447,469 Kg/year. The total estimated carbon dioxide generated as per the GasSim model was 1,3179,314 Kg/year.

5.2 Surface Water

Rainfall from the landfill cap and hard stand areas of the landfill discharges firstly into a regulated settlement lagoon, the outlet of which (SW-6) is continuously monitored. The discharge then flows to the extensive manmade drainage network across the Bord na Móna landholding formed by the surface water drains between areas referred to as “Peat fields”. The drain connect to a central culvert, which flows towards the south, where it passes through settlement ponds, before discharging to the Cushaling River.

5.3 Leachate

The amount of leachate taken offsite in 2010 was 28,308.28 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 Móna 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 Móna have developed a site specific "Odour Management Plan".

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 Móna 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 Móna has prepared a Dust and Litter Control Plan, a copy of which is included in Appendix 4.

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 twenty-nine (29) 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 levels, and two to the exceedance of the TSS limit at SW-4 and SW5. The remaining incidents related to two Flare breakdowns and a Flare shutdown for maintenance. All of these incidents were reported to the Agency.

7.2 Register of Complaints

Bord na Móna 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 Móna are available at the facility. A total of 70 complaints were received in the reporting period relating to odour, litter, flood lights, traffic, flies and security (graffiti/"boy racers"), at the facility. All of the complaints were addressed by facility staff and were resolved.

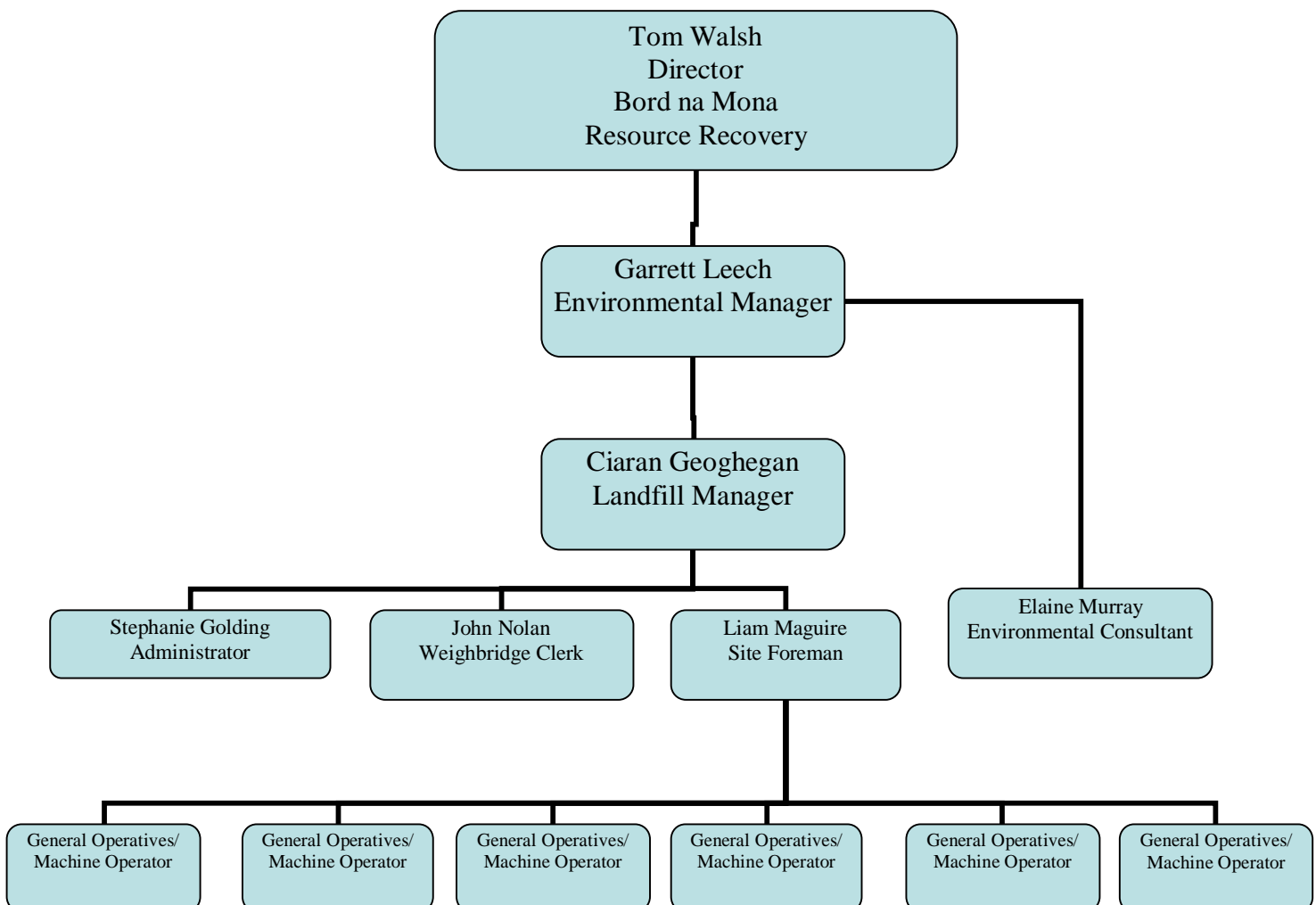
8. ENVIRONMENTAL MANAGEMENT SYSTEM

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

The staff training carried out in 2010 is shown on the training matrix for the facility which is included in Appendix 5.

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.

8.2.1 Schedule of Objectives 2010

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

8.2.2 Schedule of Objectives 2011

Bord na Mona has set a schedule of targets and objectives for 2011. 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.

Table 8.1 Progress Report on Schedule of Objectives and Targets for 2010

Ref.	Objective	Target	Timescale	Responsibility	Progress
1	Completion of Construction Strategy	Construction of further engineered landfill cells along with associated infrastructure in line with the phased construction management plan. (Phases 4-8)	Ongoing	C. G	Ongoing
2	Waste Minimisation ongoing target (2020)	Re-use where possible materials used on site.	Ongoing	C. G	Ongoing
		Minimise import of materials from off site	Ongoing	Team	Ongoing
3	Upkeep of Environmental Management System	Maintain EMS to ISO 14001 standard/certification	Ongoing	Team	Ongoing
		Implement work Instructions as project develops	Ongoing	L.M	Complete
		Upload of EMS to ViewWise Document Management System	Jul-10	S.G	Ongoing
		Maintain Policy for control of the office waste	Ongoing	S.G	Ongoing
4	Raise awareness with contractors of Environmental Policy of the site	Contractors Induction	Ongoing	J.N	Ongoing
5	Environmental Monitoring	Noise, Weekly surface water, Annual & Monthly Groundwater, Monthly Landfill Gas and Dust Monitoring	Dec-10	Technical Services/EM	Complete
6	Environmental Training and Awareness	Continue internal training programme and assessment of training needs for all operational staff during 2010	Dec-10	C. G	Complete
7	Review effectiveness of Nuisance Control measures	For: Litter dust, birds and vermin	Ongoing	Team	Ongoing
8	Meteorological monitoring	Maintain log of Meteorological data- <i>Continuous</i>	Ongoing	C. G	Ongoing
9	BMW conversion rate (in line with EU Landfill Directive)	Reduce BMW content going to landfill to 47%	Jul-10	E.M	Complete
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	Ongoing
11	Review Aspects Register to reflect Composting Plant and Construction Phases 4-8.	Assess risks associated with new construction phases	Ongoing	Team	Ongoing
12	Review Communication section of Waste Licence W0201-03	Ensure compliance with licence condition	Dec-10	Team	Complete
13	Environmental Compliance	Review licence conditions outlined int W0201-03	Ongoing	E.M/C.G	Complete
14	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	Ongoing
15	Review Aspects Register to reflect Composting Plant and Construction Phases 4-8.	Assess risks associated with new construction phases	Ongoing	Team	Ongoing
13	Review Communication section of Waste Licence W0201-03	Ensure compliance with licence condition	Dec-10	Team	Complete
14	Environmental Compliance	Review licence conditions outlined int W0201-03	Ongoing	E.M/C.G	Complete

Table 8.2 Schedule of Objectives and Targets for 2011

Ref.	Objective	Target	Timescale	Responsibility
1	Completion of Construction Strategy	Construction of additional phases 4-8	Ongoing	C.G.
2	Completion of Construction Strategy	Construction of further engineered landfill cells along with associated infrastructure in line with the phased construction management plan. (Phases 4-8)	Ongoing	CG
3	Waste Minimisation ongoing target (2020)	Re-use where possible materials used on site.	Ongoing	CG
		Minimise import of materials from off site	Ongoing	Team
4	Upkeep of Environmental Management System	Maintain EMS to ISO 14001 standard/certification	Ongoing	Team
		Implement ISO 16001 at the Facility	Ongoing	Team
		Roll out of the Environmental Management System at the Composting Plant	Sep-11	SG/EM/CG
		Roll out Oof ISO 9001	Nov-11	Team
		Maintain Policy for control of the office waste	Ongoing	SG/EM/CG
5	Raise awareness with contractors of Environmental Policy of the site	Contractors Induction	Ongoing	JN
6	Environmental Monitoring	Noise, Weekly surface water, Annual & Monthly Groundwater, Monthly Landfill Gas and Dust Monitoring	Dec-11	Technical Services/EM
7	Environmental Training and Awareness	Continue internal training programme and assessment of training needs for all operational staff during 2011	Dec-11	CG
8	Review effectiveness of Nuisance Control measures	For: Litter dust, birds and vermin	Ongoing	Team
9	Meteorological monitoring	Maintain log of Meteorological data- <i>Continuous</i>	Ongoing	CG
10	BMW conversion rate (in line with EU Landfill Directive)	<i>Condition 8.1.2 of Waste Licence W0201-03</i> 'From 1st July 2010 to 30th June 2013 inclusive, a mazimum of 47% by weight of municipal solid waste (MSW) accepted for disposal to the body of the landfill shall comprise biodegradable municipal waste (BMW), measured on a calendar year basis or, in 2010 and 2012, part thereof'	Dec-11	EM
11	Completion of Construction of the Composting Plant	Construction of the Composting Plant began in the last quarter of 2010. This facility id due to be completed in the third quarter of 2011.	Sep-11	PON
12	Review outstanding Energy Efficiency Audit recommendations	Assess recommendations and introduce where possible. Investigate and implement possible measures for the reduction of diesel consumption.	Dec-11	CG

Table 8.2 Schedule of Objectives and Targets for 2011 (continued)

Ref.	Objective	Target	Timescale	Responsibility
13	Review Aspects Register to reflect Composting Plant and Construction Phases 4-8.	Assess risks associated with new construction phases	Ongoing	Team
14	Intermediate Liner Installation	Installation of an intermediate liner to minimise leachate generation and fugitive emissions from the landfill	Ongoing	CG
15	Environmental Compliance	Review licence conditions outlined within W0201-03	Ongoing	EM/CG
16	Environmental Auditing	Carrying out audits of customers to establish environmental compliance	Ongoing	EM/CG/SG

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 €369,701.43 was made to the community fund in 2010 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 Móna 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 7.

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: -

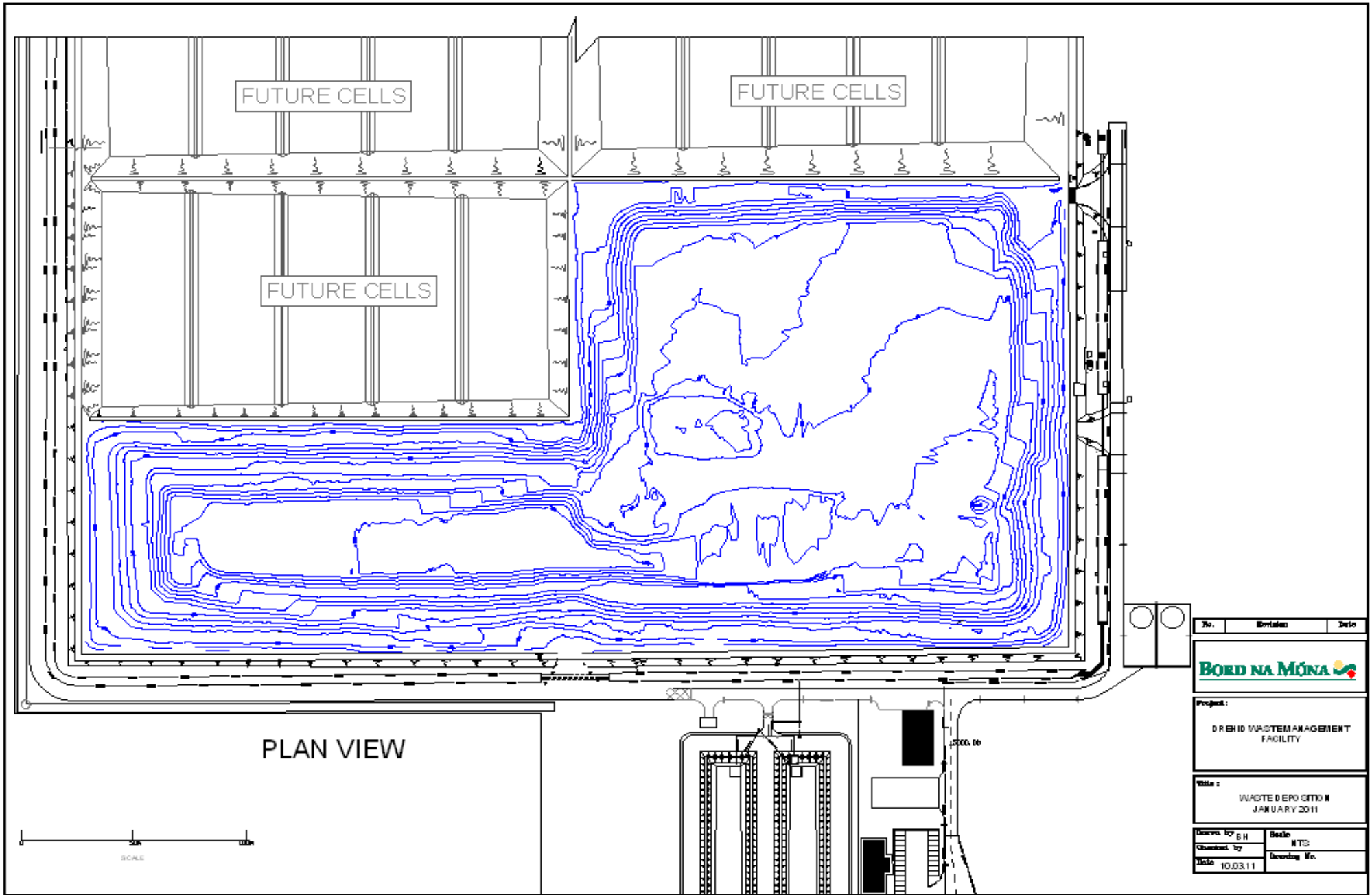
- Prevention,
- Minimisation,
- Reuse,
- Recycling,
- Energy Recovery,
- Disposal.

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 2010, Bord na Móna accepted 90,385.06 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

PLAN VIEW

SCALE

No.	Revision	Date

BORD NA MÓNA

Project:
DREHD WASTE MANAGEMENT FACILITY

Title:
WASTE DEPOSITION
JANUARY 2011

Drawn by S.H.	Scale N.T.S.
Checked by M.T.S.	Drawing No.
Date 10.03.11	

Mass Balance Calculation

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

Assume Density of 0.88t/ m³ for General Solid waste.

Assume Density of 1 .8t/ m³ Non Hazardous soils + Sludge

Etc. (as in Table 1 below)

Total void space consumed by General Waste in 2010 = **288,842** m³

Total void space consumed by Inert material in 2010= **157,798.** m³

Total void space consumed in 2008 = **164,167**m³

Total void space consumed in 2009 = **305,947**m³

Total void space consumed in 2010 = **446,641**

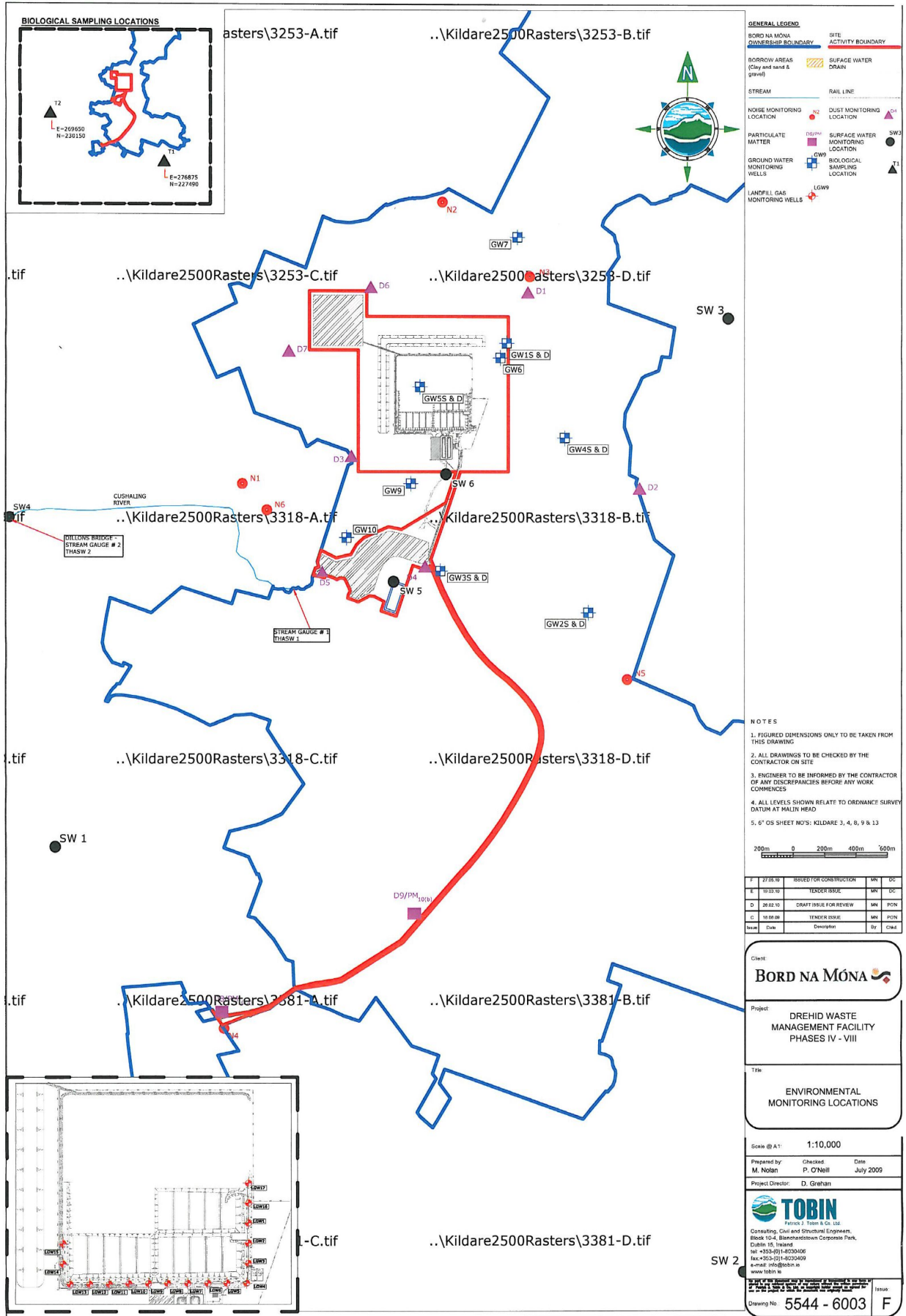
Total void space remaining = 3,163,245 m³

Table 1 Mass Balance 2010

Waste Types	Tonnage Intake	Density Tonnes / m ³	Volume Intake m ³
General Solid Waste	328,230.07	0.88	288,842.46
Inert Soil and Fines Material	6,179.54	1.6	9,887.26
Shredded Timber	6,624.74	0.7	4,637.32
Minerals eg. sand, stone	52,086.82	1.8	95,052.27
Municipal and Agricultural Compost	723.62	1.6	1,157.79
Construction and Demolition Rubble	24,770.33	1.9	47,063.63
Total Waste	418,615.12		446,640.73

APPENDIX 2

Monitoring Location Maps / Monitoring Results



GENERAL LEGEND

BORD NA MÓNA OWNERSHIP BOUNDARY	SITE ACTIVITY BOUNDARY
BORROW AREAS (Clay and sand & gravel)	SURFACE WATER DRAIN
STREAM	RAIL LINE
NOISE MONITORING LOCATION	DUST MONITORING LOCATION
PARTICULATE MATTER	SURFACE WATER MONITORING LOCATION
GROUND WATER MONITORING WELLS	BIOLOGICAL SAMPLING LOCATION
LANDFILL GAS MONITORING WELLS	

- 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 NOS: KILDARE 3, 4, 6, 9 & 13

No.	Date	Description	By	Check
T	27.05.09	ISSUED FOR CONSTRUCTION	MM	DC
E	19.05.09	TENDER ISSUE	MM	DC
D	20.02.09	DRAFT ISSUE FOR REVIEW	MM	PCN
C	16.09.08	TENDER ISSUE	MM	PCN

Client: **BORD NA MÓNA**

Project: **DREHID WASTE MANAGEMENT FACILITY PHASES IV - VIII**

Title: **ENVIRONMENTAL MONITORING LOCATIONS**

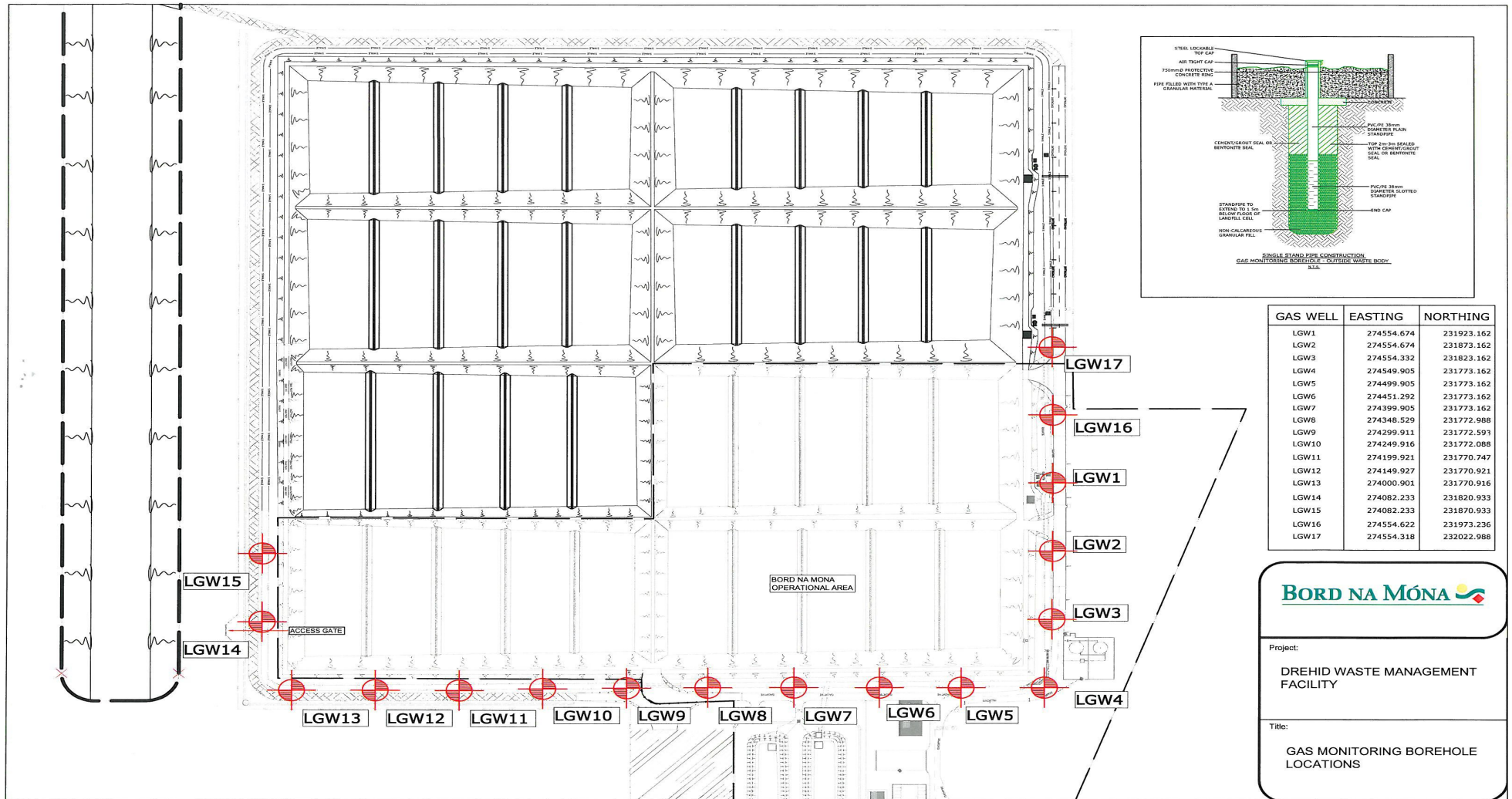
Scale @ A1: **1:10,000**

Prepared by: **M. Nolan** Checked: **P. O'Neill** Date: **July 2009**

Project Director: **D. Graham**

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Drawing No: **5544 - 6003** Issue: **F**



Groundwater Results

Parameter	Units	GW1s											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.2	7.3	7.2	7.3
Conductivity	µS/cm	778	772	774	755	683	786	781	795	805	796	830	831
Ammoniacal Nitrogen	mg/l	7.5	7.6	7.9	8.1	8.2	8.2	8.2	8.5	8.2	7.8	8	7.2
Visual / Odour		Clear, few S.S, slight odour	Clear, few S.S, slight odour	Cloudy, few S.S, no odour	Cloudy, few S.S, foul odour	Cloudy / grey, few S.S, slight odour	Clear, no S.S, no odour	Cloudy, few S.S, slight odour	Cloudy, very few S.S, slight odour	Light brown/ Cloudy, few S.S, slight odour	Cloudy, slight odour, some ss	Cloudy/ grey, few S.S, slight odour	Cloudy, no S.S, no odour
Chloride	mg/l	13	14	14	13	14	13	14	14	12	13	13	12
Total Phosphorus	mg/l										0.78		
N03-N	mg/l										<0.2		
P04-P	mg/l										<0.01		
SO4	mg/l										1.02		
Boron	µg/l										14		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										85		
Arsenic	µg/l										62		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										474		
Chromium	µg/l										6		
Cadmium	µg/l										<2		
Cobalt	µg/l										3		
Manganese	µg/l										294		
Nickel	µg/l										22		
Copper	µg/l										<2		
Tin	µg/l										<2		
Lead	µg/l										5		
Antimony	µg/l										<2		
Selenium	µg/l										<2		
Zinc	µg/l										49		
Calcium	mg/l										186		
Iron	mg/l										12		
Potassium	mg/l										1.4		
Magnesium	mg/l										9.6		
Sodium	mg/l										10		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										3		
e.Coli	CFU/100mls										0		

Parameter	Units	GW1d											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.5	7.5	7.5	7.4	7.5	7.5	7.4	7.4	7.3	7.4	7.4	7.4
Conductivity	µS/cm	742	737	721	728	677	780	779	875	771	778	724	751
Ammoniacal Nitrogen	mg/l	8.4	8.4	8.6	8.3	8.6	8.5	8.5	8.8	8.5	8	8.2	7.8
Visual / Odour		Clear, no odour, no/few S.S	Clear, no odour, few S.S	Clear, no odour, no S.S	Grey, no slight odour, some S.S	Clear, no odour, no S.S	Cloudy, few S.S, no odour,	Cloudy, no S.S, no odour,	Cloudy, few S.S, no odour,	Cloudy, few S.S, no odour	Clear, no odour, no SS	Cloudy/grey few S.S, no odour	Cloudy, no S.S, no odour
Chloride	mg/l	13	13	13	12	13	13	13	13	13	13	12	12
Total Phosphorus	mg/l										0.96		
N03-N	mg/l										<0.2		
P04-P	mg/l										<0.01		
SO4	mg/l										0.86		
Boron	µg/l										13		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										70		
Arsenic	µg/l										416		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										382		
Chromium	µg/l										4		
Cadmium	µg/l										<2		
Cobalt	µg/l										13		
Manganese	µg/l										169		
Nickel	µg/l										44		
Copper	µg/l										20		
Tin	µg/l										<2		
Lead	µg/l										3		
Antimony	µg/l										<2		
Selenium	µg/l										<2		
Zinc	µg/l										80		
Calcium	mg/l										151		
Iron	mg/l										8.9		
Potassium	mg/l										1.4		
Magnesium	mg/l										7.6		
Sodium	mg/l										13		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										0		
e.Coli	CFU/100mls										0		

Parameter	Units	GW2s											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.2	7.3	7.2	7.3	7.2	7.4	7.3	7.4	7	7.3	7.1	7.5
Conductivity	µS/cm	876	845	840	832	755	855	890	1,013	903	813	842	867
Ammoniacal Nitrogen	mg/l	1.2	2.29	1.41	1.26	1.45	1.71	2.22	2.33	1.5	1.86	1.04	1.57
Visual / Odour		Brown, high S.S, strong odour	Light brown, high S.S, slight odour	Yellow, no S.S, slight odour	Yellow, few S.S, slight odour	Yellow, few S.S, no odour	Brown/ Cloudy, some S.S, no odour	Light brown, few S.S, no odour	Pale yellow/ brown, few S.S, no odour	Light brown, few S.S, no odour	Cloudy / Grey, no odour, few ss	Light brown, few S.S, no odour	Dull, cloudy, no S.S, no odour
Chloride	mg/l	12	13	12	11	13	12	12	13	12	24	11	11
Total Phosphorus	mg/l										0.38		
N03-N	mg/l										<0.2		
P04-P	mg/l										<0.01		
SO4	mg/l										12.05		
Boron	µg/l										48		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										124		
Arsenic	µg/l										21		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										530		
Chromium	µg/l										9		
Cadmium	µg/l										<2		
Cobalt	µg/l										6		
Manganese	µg/l										437		
Nickel	µg/l										26		
Copper	µg/l										3		
Tin	µg/l										<2		
Lead	µg/l										4		
Antimony	µg/l										<2		
Selenium	µg/l										<2		
Zinc	µg/l										33		
Calcium	mg/l										220		
Iron	mg/l										5.6		
Potassium	mg/l										0.7		
Magnesium	mg/l										25		
Sodium	mg/l										7.6		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										0		
e.Coli	CFU/100mls										0		

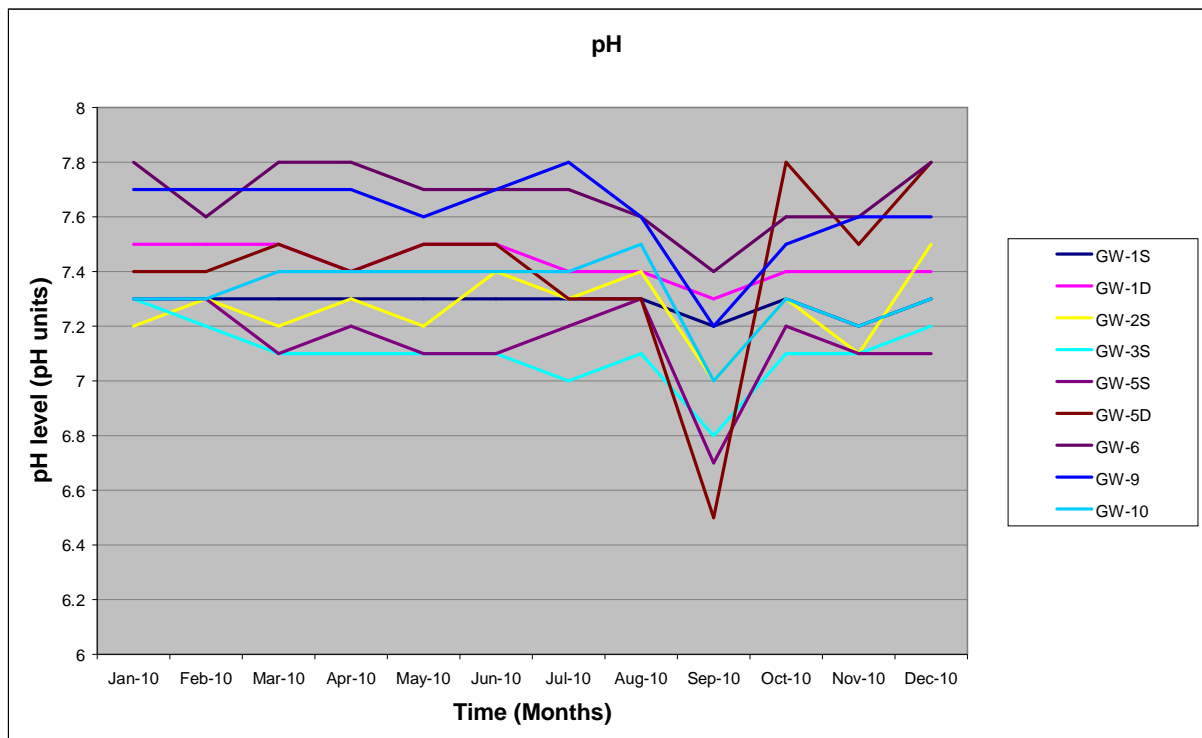
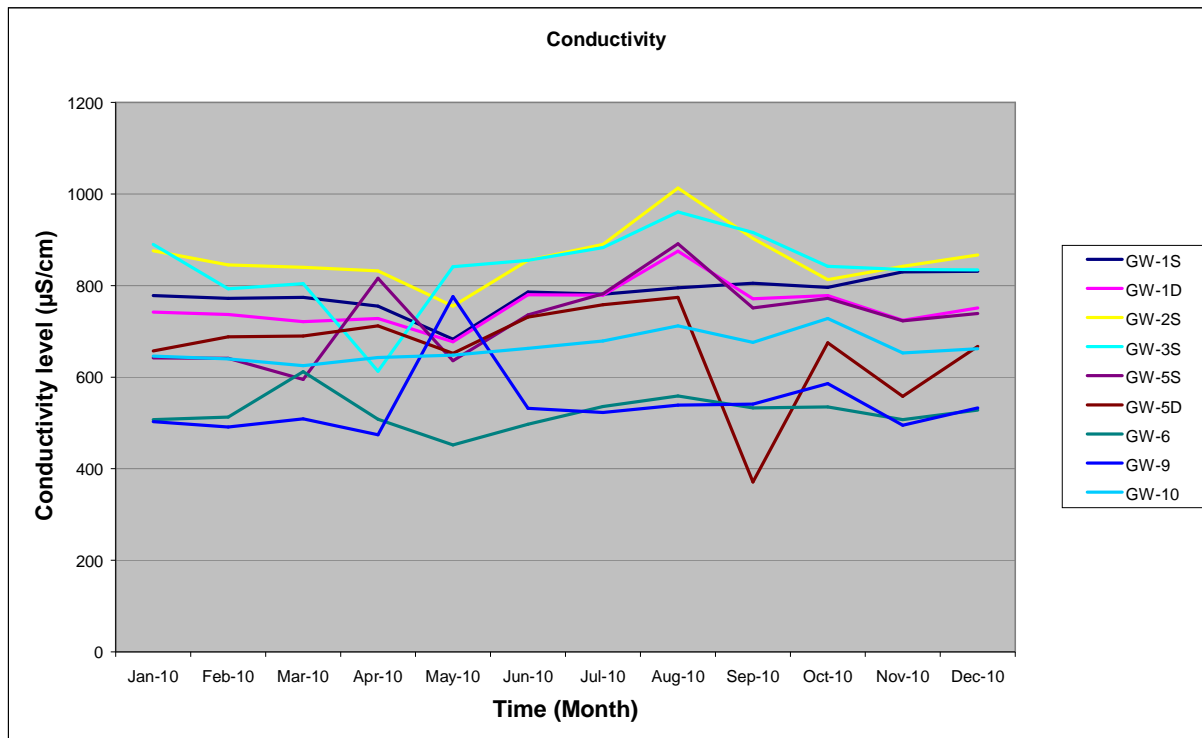
Parameter	Units	GW3s											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.3	7.2	7.1	7.1	7.1	7.1	7	7.1	6.8	7.1	7.1	7.2
Conductivity	µS/cm	890	793	804	613	841	855	883	961	916	842	835	834
Ammoniacal Nitrogen	mg/l	1.69	4.54	4.43	4.13	5.2	5.1	5.2	5.4	5.2	4.84	2.11	2.64
Visual / Odour		Brown, high S.S, strong odour	Brown, high S.S, strong odour	Light brown, some S.S, foul odour	Yellow, high S.S, faint odour	Cloudy / grey, few S.S, strong odour	Cloudy, few S.S, foul odour	Cloudy, few S.S, foul odour	Cloudy/pale brown, few S.S, slight odour	Cloudy/pale brown, few S.S, slight odour	Cloudy / Grey, foul odour, few ss	Light brown, few S.S, no odour	Pale, no S.S, no odour
Chloride	mg/l	17	15	15	15	15	15	15	15	14	15	14	14
Total Phosphorus	mg/l										0.67		
N03-N	mg/l										<0.2		
P04-P	mg/l										0.07		
SO4	mg/l										2.98		
Boron	µg/l										22		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										124		
Arsenic	µg/l										<2		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										504		
Chromium	µg/l										6		
Cadmium	µg/l										<2		
Cobalt	µg/l										<2		
Manganese	µg/l										314		
Nickel	µg/l										4		
Copper	µg/l										<2		
Tin	µg/l										<2		
Lead	µg/l										4		
Antimony	µg/l										<2		
Selenium	µg/l										<2		
Zinc	µg/l										28		
Calcium	mg/l										178		
Iron	mg/l										12		
Potassium	mg/l										1.6		
Magnesium	mg/l										13		
Sodium	mg/l										12		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										>100		
e.Coli	CFU/100mls										>100		

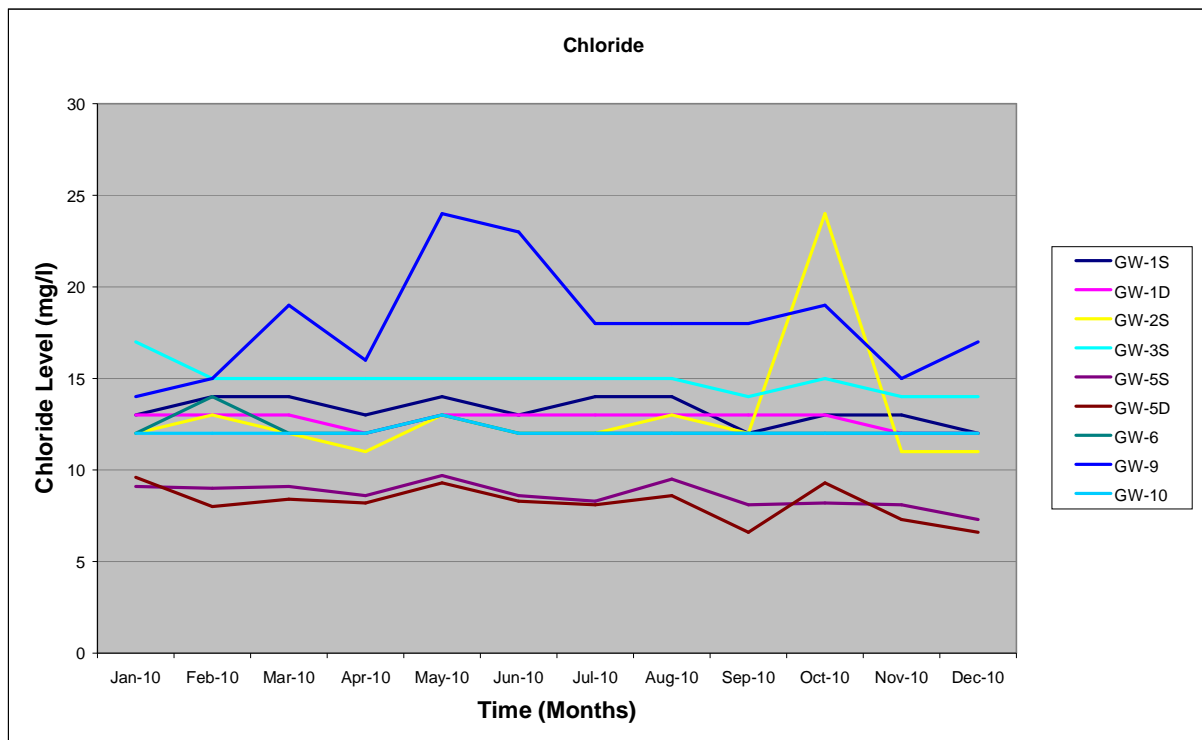
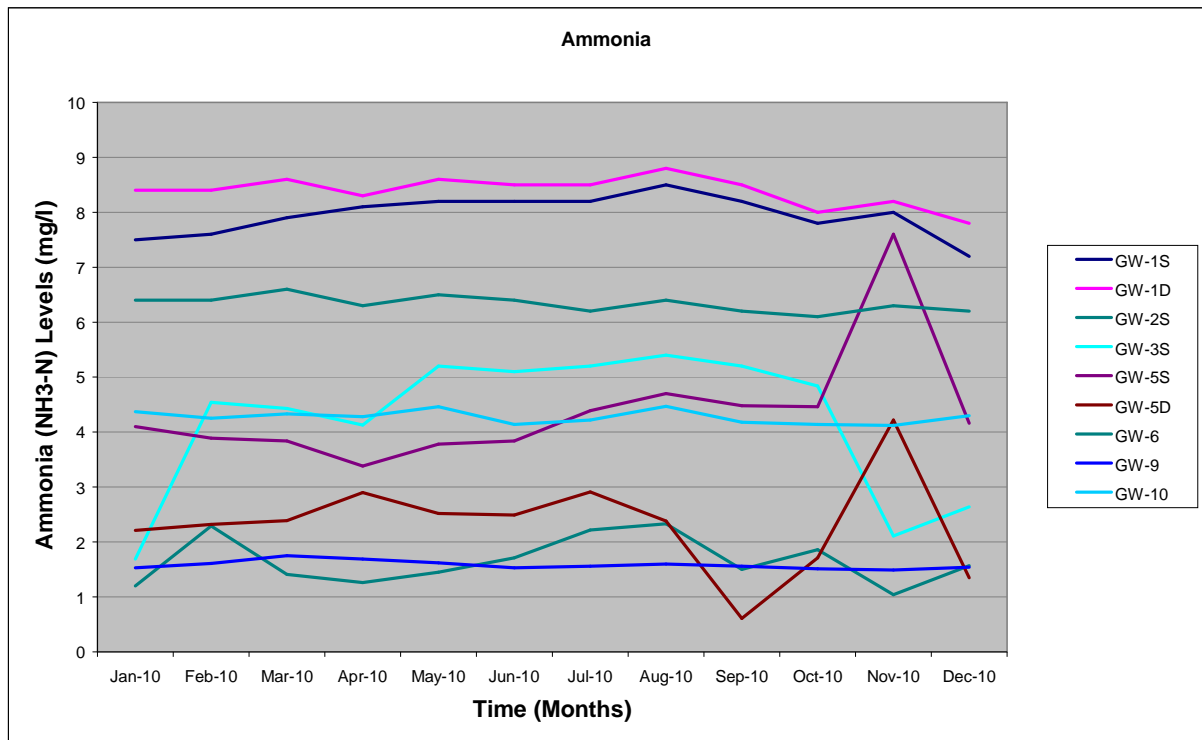
Parameter	Units	GW5s											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.3	7.3	7.1	7.2	7.1	7.1	7.2	7.3	6.7	7.2	7.1	7.1
Conductivity	µS/cm	642	641	595	816	636	736	782	891	751	772	723	739
Ammoniacal Nitrogen	mg/l	4.1	3.89	3.84	3.38	3.78	3.84	4.39	4.7	4.48	4.46	7.6	4.16
Visual / Odour		Brown, high S.S., strong odour	Brown, high S.S., slight odour	Light brown, some S.S., no odour	Light brown, high S.S., slight odour	Cloudy / grey, few S.S., slight odour	Clear, no S.S, no odour	Light brown / cloudy, high S.S, no odour	Pale brown / cloudy, high S.S, no odour	Light brown / cloudy, some S.S, no odour	Cloudy, no odour, some ss	Light brown, some S.S, no odour	Cloudy/ light grey, few S.S, no odour
Chloride	mg/l	9.1	9	9.1	8.6	9.7	8.6	8.3	9.5	8.1	8.2	8.1	7.3
Total Phosphorus	mg/l										0.48		
N03-N	mg/l										<0.2		
P04-P	mg/l										<0.01		
SO4	mg/l										1.73		
Boron	µg/l										6		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										176		
Arsenic	µg/l										43		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										445		
Chromium	µg/l										9		
Cadmium	µg/l										<2		
Cobalt	µg/l										5		
Manganese	µg/l										434		
Nickel	µg/l										33		
Copper	µg/l										3		
Tin	µg/l										<2		
Lead	µg/l										6		
Antimony	µg/l										<2		
Selenium	µg/l										<2		
Zinc	µg/l										50		
Calcium	mg/l										222		
Iron	mg/l										16		
Potassium	mg/l										1.1		
Magnesium	mg/l										2.9		
Sodium	mg/l										4.9		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										6		
e.Coli	CFU/100mls										6		

Parameter	Units	GW5d											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.4	7.4	7.5	7.4	7.5	7.5	7.3	7.3	6.5	7.8	7.5	7.8
Conductivity	µS/cm	657	688	690	712	652	731	758	774	371	675	558	667
Ammoniacal Nitrogen	mg/l	2.21	2.32	2.39	2.9	2.52	2.49	2.91	2.38	0.61	1.71	4.22	1.35
Visual / Odour		Cloudy/ pale brown, some S.S, slight odour	Cloudy, few S.S, no odour	Cloudy, some S.S, no odour	Cloudy/ pale yellow, some S.S, no odour	Cloudy, few S.S, no odour	Cloudy, few S.S, no odour	Cloudy/ light brown, some S.S, slight odour	Cloudy, few S.S, no odour	Cloudy, few S.S, no odour	Light brown, no odour, high ss	Brown, high S.S, no odour	Milk brown, high fine S.S, no odour
Chloride	mg/l	9.6	8	8.4	8.2	9.3	8.3	8.1	8.6	6.6	9.3	7.3	6.6
Total Phosphorus	mg/l										0.97		
N03-N	mg/l										1.97		
P04-P	mg/l										<0.01		
SO4	mg/l										7.88		
Boron	µg/l										15		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										593		
Arsenic	µg/l										54		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										297		
Chromium	µg/l										27		
Cadmium	µg/l										<2		
Cobalt	µg/l										3		
Manganese	µg/l										700		
Nickel	µg/l										16		
Copper	µg/l										16		
Tin	µg/l										<2		
Lead	µg/l										12		
Antimony	µg/l										<2		
Selenium	µg/l										<2		
Zinc	µg/l										45		
Calcium	mg/l										242		
Iron	mg/l										2.6		
Potassium	mg/l										0.9		
Magnesium	mg/l										8.4		
Sodium	mg/l										19		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										16		
e.Coli	CFU/100mls										1		

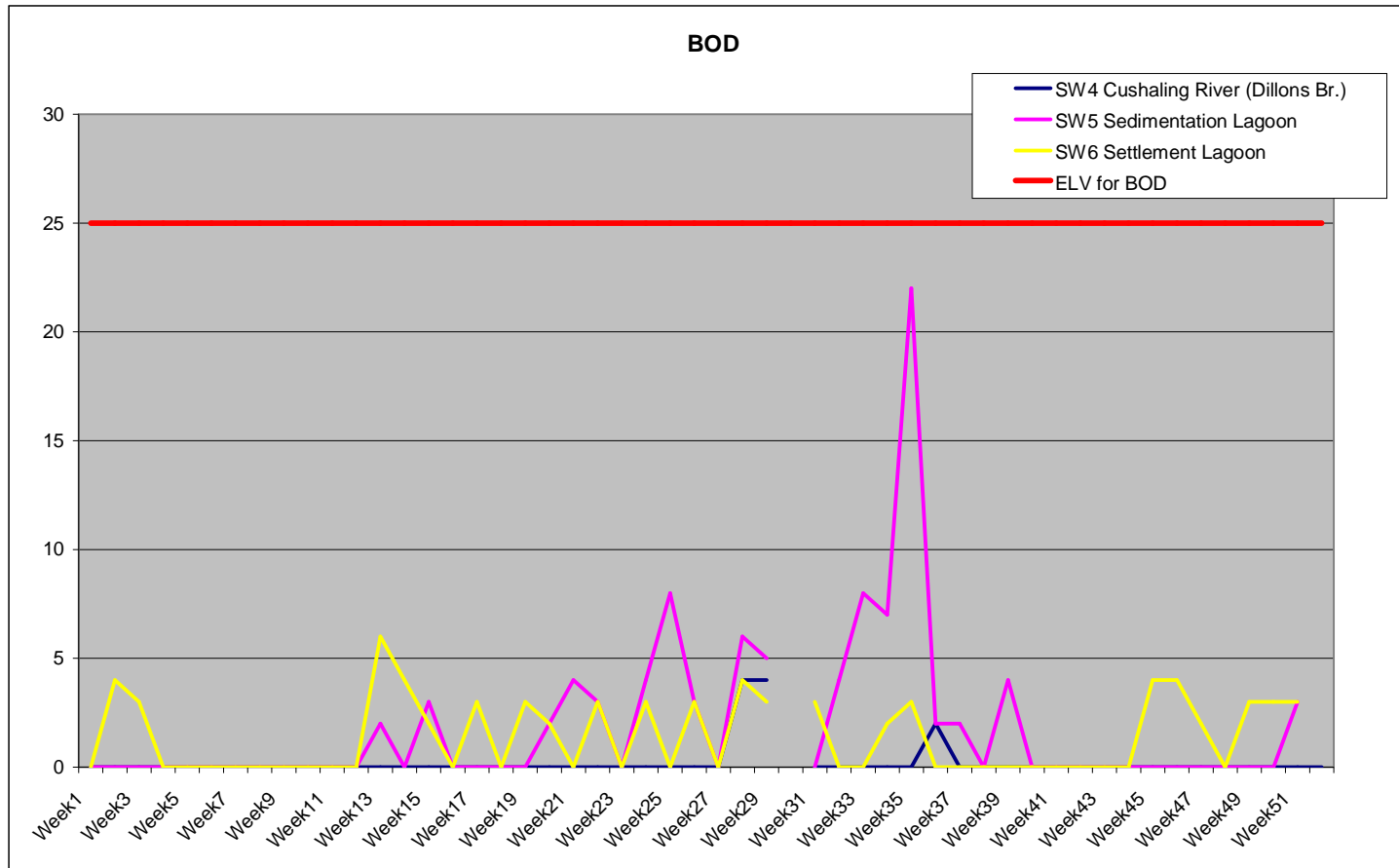
Parameter	Units	GW9											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.7	7.7	7.7	7.7	7.6	7.7	7.8	7.6	7.2	7.5	7.6	7.6
Conductivity	µS/cm	503	491	509	474	776	532	523	539	541	586	495	533
Ammoniacal Nitrogen	mg/l	1.53	1.61	1.75	1.69	1.62	1.53	1.56	1.6	1.56	1.51	1.49	1.54
Visual / Odour		Light brown, some S.S., strong odour	Light brown/yellow, some S.S., faint odour	Cloudy/grey, some S.S., no odour	Yellow/brown, few S.S., faint odour	Cloudy / light brown, some S.S., no odour	Light brown, some S.S., slight odour	Light brown / cloudy, few S.S., no odour	Pale brown / cloudy, few S.S., slight odour	Light brown / cloudy, some S.S., slight odour	Light brown, slight odour, some ss	Light brown, some S.S., no odour	Cloudy/brown, high S.S., no odour
Chloride	mg/l	14	15	19	16	24	23	18	18	18	19	15	17
Total Phosphorus	mg/l										0.70		
N03-N	mg/l										<0.2		
P04-P	mg/l										0.06		
SO4	mg/l										3.97		
Boron	µg/l										11		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										384		
Arsenic	µg/l										15		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										152		
Chromium	µg/l										9		
Cadmium	µg/l										<2		
Cobalt	µg/l										4		
Manganese	µg/l										656		
Nickel	µg/l										20		
Copper	µg/l										7		
Tin	µg/l										<2		
Lead	µg/l										8		
Antimony	µg/l										<2		
Selenium	µg/l										2		
Zinc	µg/l										94		
Calcium	mg/l										246		
Iron	mg/l										4.7		
Potassium	mg/l										0.9		
Magnesium	mg/l										15		
Sodium	mg/l										13		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										0		
e.Coli	CFU/100mls										0		

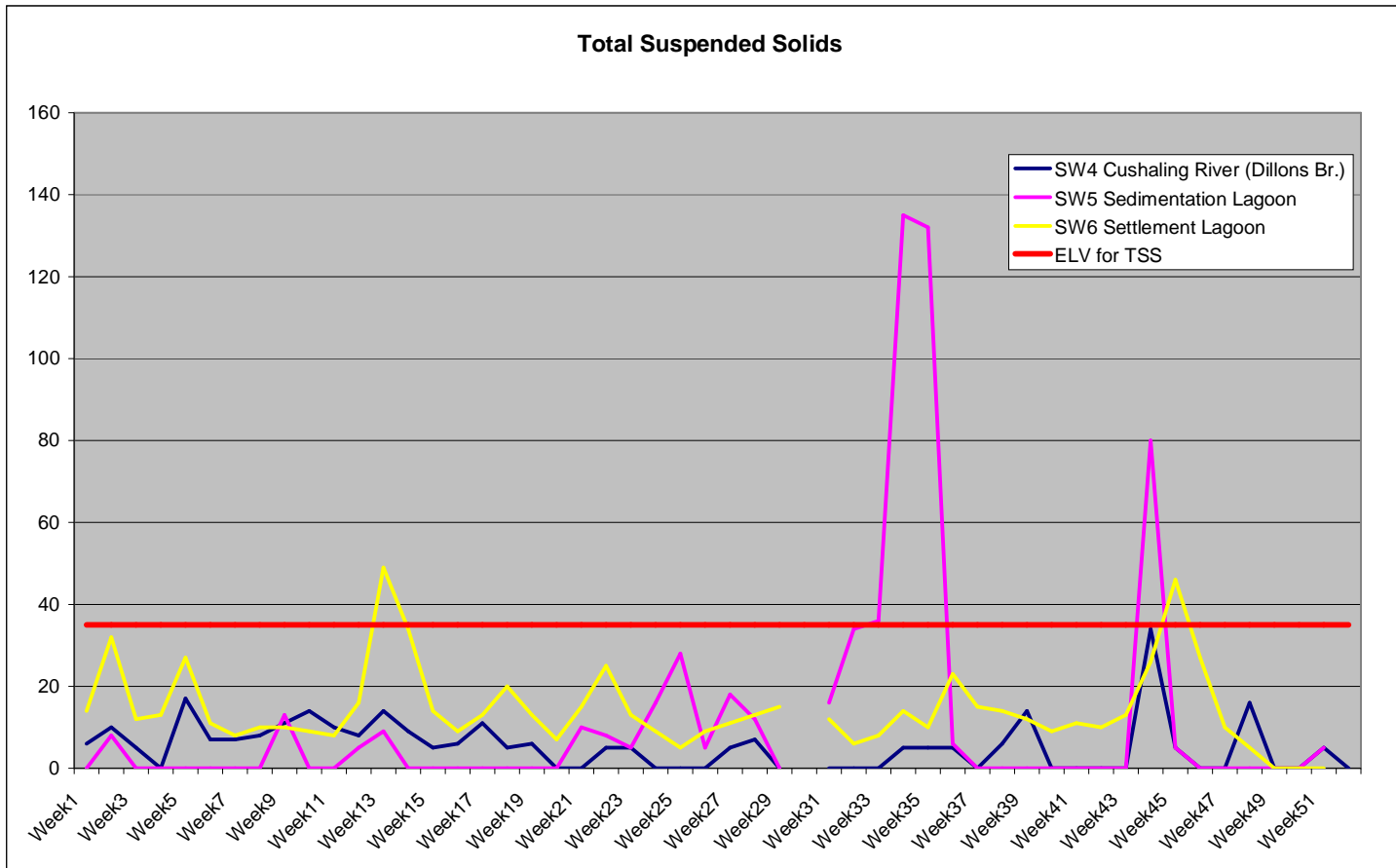
Parameter	Units	GW10											
		January	February	March	April	May	June	July	August	September	October	November	December
pH	pH Units	7.3	7.3	7.4	7.4	7.4	7.4	7.4	7.5	7	7.3	7.2	7.3
Conductivity	µS/cm	646	640	625	643	648	663	679	712	676	728	653	662
Ammoniacal Nitrogen	mg/l	4.37	4.25	4.33	4.28	4.46	4.14	4.22	4.47	4.18	4.14	4.12	4.3
Visual / Odour		Cloudy yellow, some S.S, no odour	Yellow, some S.S, slight odour	Yellow, few S.S, slight odour	Green tint, few S.S, slight odour	Yellow / light brown, few S.S, no odour	Cloudy, few S.S, no odour	Pale yellow, few S.S, slight odour	Pale yellow, few S.S, slight odour	Pale yellow, few S.S, slight odour	Light Brown, no odour few ss	Light brown, few S.S, no odour	Cloudy/ light brown, some S.S, foul odour
Chloride	mg/l	12	12	12	12	13	12	12	12	12	12	12	12
Total Phosphorus	mg/l										0.21		
N03-N	mg/l										<0.2		
P04-P	mg/l										0.09		
SO4	mg/l										0.64		
Boron	µg/l										6		
Comb Pesticides	µg/l										<0.01		
Mercury	µg/l										<1		
Aluminium	µg/l										73		
Arsenic	µg/l										6		
Silver	µg/l										<2		
Beryllium	µg/l										<2		
Barium	µg/l										121		
Chromium	µg/l										6		
Cadmium	µg/l										<2		
Cobalt	µg/l										<2		
Manganese	µg/l										213		
Nickel	µg/l										3		
Copper	µg/l										<2		
Tin	µg/l										<2		
Lead	µg/l										3		
Antimony	µg/l										<2		
Selenium	µg/l										<2		
Zinc	µg/l										16		
Calcium	mg/l										140		
Iron	mg/l										4.4		
Potassium	mg/l										0.7		
Magnesium	mg/l										8.4		
Sodium	mg/l										7.2		
VOC's USEPA	µg/l										<10		
SVOC'	µg/l										< detectable limit		
VOC's By GC-FID	µg/l										<0.5		
Total Coliforms	CFU/100mls										1		
e.Coli	CFU/100mls										1		

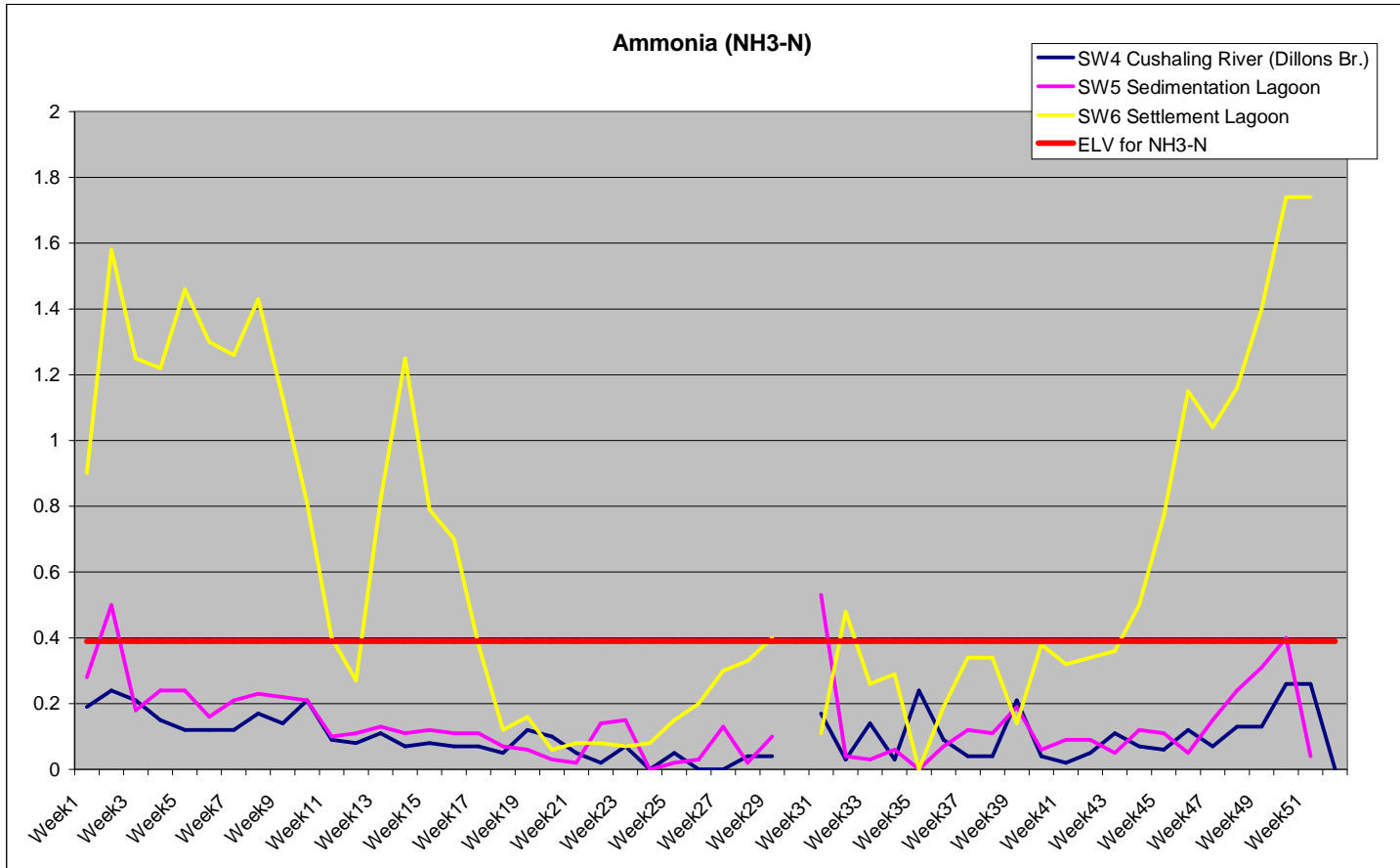




Surface Water Results

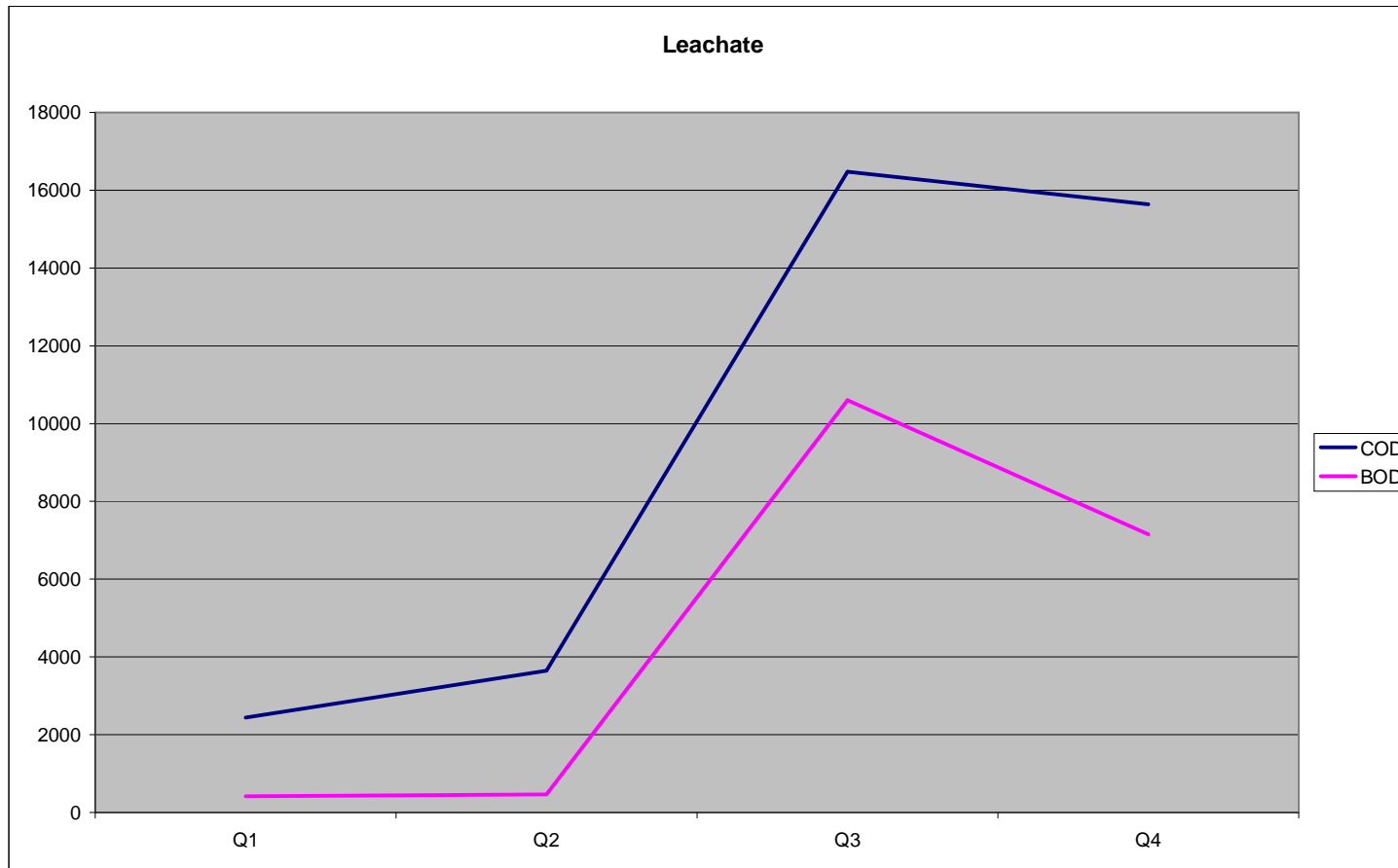






Leachate Results

Parameters	Units	LTI			
		Q1	Q2	Q3	Q4
		21/01/2010	14/05/2010	12/08/2010	26/11/2010
COD	mg/l	2438	3645	16475	15640
BOD	mg/l	413	463	10600	7150
pH	pH Units	7.8			
Conductivity	µS/cm	14330			
Ammonia-N	mg/l	1013			
Orthophosphate	mg/l	3.79			
Chloride	mg/l	1416			
Nitrate	mg/l	0.21			
TOC	mg/l	712			
Boron	µg/l	1649			
Mercury	µg/l	1			
Arsenic	µg/l	129			
Silver	µg/l	<2			
Aluminium	µg/l	652			
Beryllium	µg/l	<2			
Barium	µg/l	252			
Chromium	µg/l	168			
Cadmium	µg/l	<2			
Cobalt	µg/l	15			
Copper	µg/l	26			
Tin	µg/l	9			
Nickel	µg/l	130			
Lead	µg/l	21			
Antimony	µg/l	40			
Selenium	µg/l	9			
Zinc	µg/l	255			
Iron	mg/l	1.5			
Toluene	µg/l	24			
VOC's USEPA (all remaining)	µg/l	<10			
Acetone	mg/l	1.2			
Methanol	mg/l	<0.5			
Ethanol	mg/l	<0.5			
Isopropanol	mg/l	0.8			
Acetonitrile	mg/l	<0.5			
DRO	µg/l	2412			
Mineral Oil	µg/l	<10			



Dust Results

Noise Results

NIGHT-TIME NOISE MEASUREMENT RESULTS							
Location No.	Date	Sampling Time	Leq dB(A) (30min)	L ₁₀ dB(A)	L ₉₀ dB(A)	LAS Max dB(A)	Comments
N1	1 st September 2010	23:28 - 23:58	32	<32	<32	58	Dominant noise sources at N1 were dogs barking in the distance.
N2	2 nd September 2010	00:18 - 00:48	38	32	<32	61	Dominant noise sources were dogs barking in the distance along with the passing of cars on the L5025 road near-by.
N3	2 nd September 2010	00:50 - 01:20	<32	<32	<32	49	Dominant noise sources included dogs barking in the distance and two cars passing on the L5025 road near-by.
N4	1 st September 2010	22:39 - 23:12	47	49	<32	66	The dominant noise source at this location was passing vehicles on the R403 road. Dogs barking and Security chatting near the noise meter also contributed to noise levels.
N5	1 st September 2010	22:00 - 22:30	47	<32	<32	78	Noise sources included distant traffic and dogs barking. The most significant noise event was caused by the noise meter toppling over toward the end of the monitoring event.

DAYTIME NOISE MEASUREMENT RESULTS							
Location No.	Date	Sampling Time	Leq dB(A) (30min)	L ₁₀ dB(A)	L ₉₀ dB(A)	LAS Max dB(A)	Comments
N1	23 rd July 2010	11:45 - 12:15	34	36	<32	51	Dominant noise sources included a constant noise from crickets in the grass and distant reverse alarms from the Drehid site. Bird song, buzzing insects, mobile phone ringing, distant air traffic and very distant sound of loader bucket also contributed to noise levels.
N2	23 rd July 2010	13:48 - 14:18	47	48	31	68	Dominant noise sources included cars passing along the L5025 road, reverse alarms of loaders and noise of machinery engines from the Drehid site. Bird song and a lawnmower in the distance also contributed to noise levels.
N3	23 rd July 2010	14:29 - 14:59	42	43	32	60	Dominant noise sources included cars passing along the L5025 road and the movement and associated reverse alarms from excavators/loaders on the landfill. Two aeroplanes flying low overhead also contributed to noise levels.
N4	23 rd July 2010	11:03 - 11:33	54	57	39	72	Dominant noise source at this location was passing vehicles on the R403 road and waste truck entering and exiting the site (including 8 trucks, 4 cars & 1 van). Two airforce planes flying overhead, bird song and a dog barking loudly close to the meter also contributed to noise levels.
N5	23 rd July 2010	15:09 - 15:39	39	43	<32	61	Dominant noise sources included vehicles on the site road and site activity (reverse alarms). The single loudest noise was three airforce planes flying overhead.

Landfill Gas Results

Sample Station	Jan-10			Feb-10			Mar-10			Apr-10			May-10			Jun-10		
	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
LG-1	0.0	0.2	21.7	0.0	0.2	21.1	0.0	0.2	20.7	0.6	0.9	19.5	0.3	0.8	20.6	0.2	0.5	19.5
LG-2	0.2	0.4	20.1	0.1	1.3	16.6	0.2	0.6	19.9	0.3	0.4	20.1	0.4	0.6	19.6	0.1	0.3	20.4
LG-3	0.2	0.2	19.2	0.2	0.9	20.7	0.1	0.4	20.1	0.8	0.8	19.6	0.2	0.8	20.1	0.4	0.6	19.7
LG-4	Note 1-	Note 1-	Note1-	Note 1-	Note 1-	Note1-	0.1	0.5	19.7	0.4	0.3	20.6	0.3	0.9	19.1	0.2	0.4	19.1
LG-5	0.1	0.8	18.3	0.3	0.7	18.5	0.2	0.9	18.9	0.3	0.9	19.2	0.6	0.7	20.6	0.5	1.0	18.9
LG-6	0.4	1.1	19.8	0.1	0.4	20.9	0.1	1.2	20.1	0.2	0.6	18.9	0.2	0.5	20.1	0.3	0.6	19.4
LG-7	0.2	0.7	17.2	0.3	0.6	21.1	0.3	0.7	19.4	0.3	0.8	19.3	0.4	0.8	18.6	0.2	0.9	18.2
LG-8	0.1	0.5	20.3	0.4	0.8	19.8	0.4	0.8	14.9	0.9	1.1	18.4	0.3	0.6	19.6	0.6	1.4	18.1
LG-9	0.1	0.3	19.1	0.2	0.4	21.0	0.2	0.6	20.7	0.7	1.3	18.1	0.2	0.7	20.1	0.3	0.5	19.7
LG-10	0.3	0.4	18.6	0.1	0.3	21.2	0.2	0.4	20.8	0.5	0.7	19.8	0.4	0.9	19.2	0.6	0.9	20.1
LG-11	0.1	0.4	20.7	0.4	1.3	20.3	0.1	0.7	20.6	0.3	0.4	20.4	0.2	1.1	19.9	0.3	0.7	19.2
LG-12	0.3	0.8	19.2	0.1	0.2	21.1	0.1	0.3	20.2	0.4	0.3	19.4	0.5	0.8	18.2	0.4	1.1	18.0
LG-13	0.8	1.3	17.6	0.9	0.8	19.4	0.6	0.5	19.6	0.8	1.3	19.9	0.8	1.3	17.8	0.8	1.3	17.8
LG-14	0.6	0.9	20.3	0.1	1.0	19.4	0.1	0.6	20.3	0.4	0.8	20.1	0.6	1.1	18.3	0.2	0.5	19.7
LG-15	0.1	1.2	19.8	0.1	1.1	19.8	0.0	0.5	20.5	0.3	1.2	20.4	0.4	0.9	19.7	0.3	0.6	20.1
LG-16										0.1	0.2	20.5	0.1	0.2	20.4	0.1	0.2	20.4
LG-17										0.1	0.3	20.9						
LFG-1A	56.2	38.1	0.9	40.0	34.2	0.9							56.8	42.4	0.4	55.9	41.8	0.1
LFG-5A							45.4	32.8	0.4	58.2	42.3	0.1						
LFG-14A																		
GV-1	38.5	41.1	0.6	25.5	26.6	2.4	51.2	47.1	0.6	20.9	15.2	13.1	57.6	42.5	1.1	23.1	17.9	11.7
GV-2	48.1	30.9	1.3	14.4	11.0	16.0	48.6	52.1	0.3	41.3	30.5	5.1	33.2	24.1	8.7	43.2	33.2	3.5
GV-3	51.1	38.1	4.2	2.7	1.9	20.6	50.7	40.2	0.6	8.2	5.7	17.7	5.4	3.9	19.1	4.6	4.1	18.3
GV-4	39.4	27.1	0.9	34.4	31.3	1.5	39.7	54.3	0.7	38.6	27.1	6.6	54.9	40.3	1.3	51.1	40.3	1.6
GV-5	50.6	37.5	1.8	61.1	41.1	0.3	42.1	52.2	0.3	1.7	0.9	20.2	0.9	1.1	21.0	Note 1-	Note 1-	Note1-
GV-6	45.7	39.2	4.0	47.5	32.9	4.0	50.8	46.8	0.5	51.1	35.5	4.4	Note 1-	Note 1-	Note1-	35.9	29.7	4.5
GV-7	31.7	21.4	3.2	24.5	18.4	1.7	43.2	31.5	0.7	13.1	9.2	15.8	8.7	6.0	17.8	5.8	4.8	18.2
GV-8	16.9	23.2	1.5	44.0	25.6	8.5	32.8	39.8	1.3	21.8	17.6	12.2	18.9	17.1	12.8	13.7	13.5	13.7
GV-9	Note 2	Note 2	Note 2	36.9	21.1	0.3	45.7	35.6	0.9	26.5	22.2	10.0	27.9	29.3	3.4	26.7	29.5	1.9

Note 1.: Not accessible due to construction / remedial works.

Note 2.: Not connected the main gas pipe system.

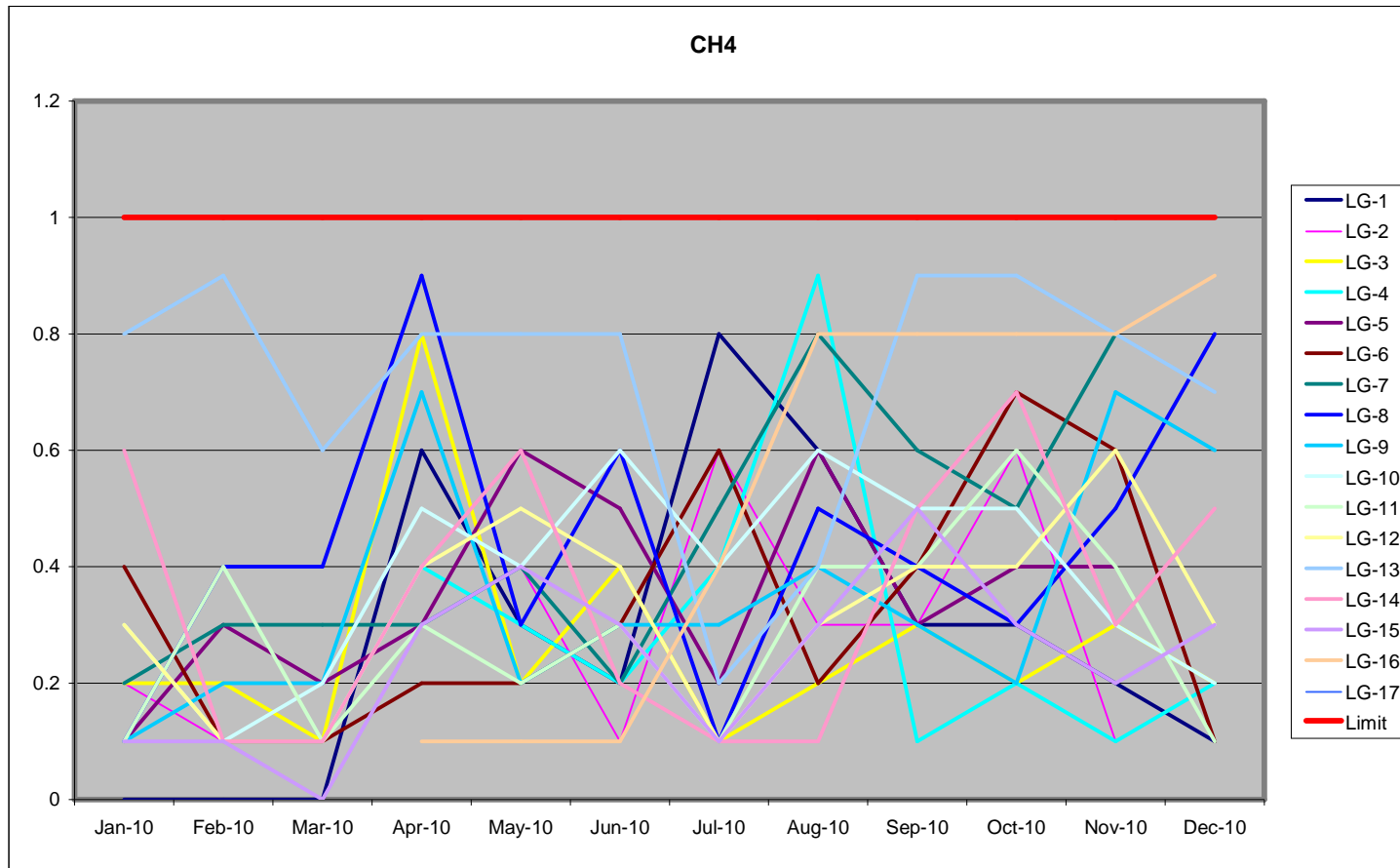
Sample Station	Jul-10			Aug-10			Sep-10			Oct-10			Nov-10			Dec-10		
	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)	CH4 (% v/v)	CO2 (% v/v)	O2 (% v/v)
LG-1	0.8	1.2	19.1	0.6	1.1	19.2	0.3	1.3	18.4	0.3	0.7	19.7	0.2	0.7	19.9	0.1	0.4	20.4
LG-2	0.6	1.0	20.3	0.3	0.8	20.4	0.3	1.4	17.8	0.6	0.9	18.4	0.1	1.1	20.5	Note 3	Note 3	Note 3
LG-3	0.1	0.6	19.5	0.2	1.0	19.0	0.3	1.1	19.8	0.2	0.5	19.1	0.3	0.4	18.8	0.2	0.5	19.3
LG-4	0.4	0.2	18.4	0.9	0.6	21.1	0.1	0.8	20.1	0.2	0.3	20.8	0.1	1.2	19.8	0.2	0.7	18.5
LG-5	0.2	1.3	17.9	0.6	0.5	19.4	0.3	0.5	18.5	0.4	1.1	18.7	0.4	0.8	20.1	Note 3	Note 3	Note 3
LG-6	0.6	0.9	18.1	0.2	0.8	19.8	0.4	0.6	20.3	0.7	0.8	20.4	0.6	1.2	19.7	0.1	1.2	18.2
LG-7	0.5	1.8	17.2	0.8	0.6	16.9	0.6	0.8	20.1	0.5	1.2	19.3	0.8	0.3	18.0	Note 3	Note 3	Note 3
LG-8	0.1	1.2	19.8	0.5	0.9	20.1	0.4	1.1	16.4	0.3	0.9	18.1	0.5	0.9	19.3	0.8	0.3	17.3
LG-9	0.3	0.9	20.3	0.4	0.7	20.3	0.3	1.3	19.1	0.2	1.3	20.3	0.7	1.1	18.6	0.6	1.1	19.7
LG-10	0.4	0.7	20.8	0.6	0.5	20.5	0.5	0.9	20.4	0.5	0.3	19.7	0.3	0.5	19.5	0.2	0.5	20.5
LG-11	0.1	0.1	20.4	0.4	0.4	20.7	0.4	1.2	20.3	0.6	0.4	18.8	0.4	0.7	20.4	0.1	0.4	19.6
LG-12	0.1	0.2	21.0	0.3	0.2	20.1	0.4	0.6	20.3	0.4	1.0	19.9	0.6	1.0	19.5	0.3	0.9	20.4
LG-13	0.2	0.9	20.1	0.4	0.4	19.4	0.9	0.7	19.4	0.9	1.3	20.4	0.8	1.3	18.3	0.7	1.3	19.7
LG-14	0.1	0.7	20.3	0.1	1.2	18.1	0.5	1.2	20.1	0.7	0.9	19.1	0.3	0.5	20.6	0.5	1.1	19.2
LG-15	0.1	0.4	19.9	0.3	0.9	17.1	0.5	0.3	20.6	0.3	0.7	20.2	0.2	0.7	19.2	0.3	0.4	18.6
LG-16	0.4	1.3	19.4	0.8	1.3	16.8	0.8	1.3	18.1	0.8	0.8	19.6	0.8	1.3	18.6	0.9	1.0	19.3
LG-17																		
LFG-1A	54.8	45.1	0.6	51.6	36.2	0.9	63.7	41.1	0.2	42.6	31.9	0.6	49.6	34.2	0.6	52.7	31.0	0.6
LFG-5A																		
LGF-14A	45.2	36.7	0.9	40.8	29.8	0.7	36.9	25.4	0.8	58.1	36.2	0.8	59.4	28.1	0.9	43.2	38.4	0.4
GV-1	48.5	32.8	8.7	51.8	16.8	9.1	60.5	43	0.1	61.2	19.3	3.8	36.0	25.4	8.2	48.3	17.8	1.3
GV-2	61.7	20.3	10.8	32.4	25.7	8.6	63	4.4	0.3	48.6	24.1	8.7	49.5	27.6	5.3	Note 4	Note 4	Note 4
GV-3	29.7	36.8	15.2	39.5	19.7	5.4	63.6	42.1	0	51.6	21.7	6.1	59.2	41.6	13.2	Note 4	Note 4	Note 4
GV-4	39.4	28.5	9.7	45.8	31.9	3.1	57.7	42	0.9	42.6	19.3	11.9	39.4	21.8	3.0	37.6	28.1	4.6
GV-5	23.1	19.4	20.4	10.1	1.9	20.1	18.7	15.1	14.3	39.6	25.8	17.9	11.6	8.4	21.7	16.8	8.9	18.4
GV-6	35.4	29.2	8.7	49.7	16.5	4.2	12.4	9.4	16.7	34.1	28.7	6.7	41.2	21.6	2.4	39.9	21.5	9.7
GV-7	60.8	38.4	0.9	27.4	15.1	10.7	32.7	24.4	8.2	56.4	31.5	5.1	31.0	19.4	2.0	53.4	38.1	5.2
GV-8	49.3	38.1	7.9	38.7	26.1	2.8	25.4	18.8	1.2	31.9	21.6	9.7	41.6	20.4	3.2	46.3	29.4	1.7
GV-9	42.8	29.4	0.9	48.2	30.2	3.8	34.6	25.2	5.1	38.1	25.9	12.8	56.8	25.6	1.3	38.4	24.5	8.6
GV-10	-	-	-	-	-	-	50.1	48.5	1.7	28.4	19.6	10.4	39.8	28.4	3.3	50.7	41.5	4.2

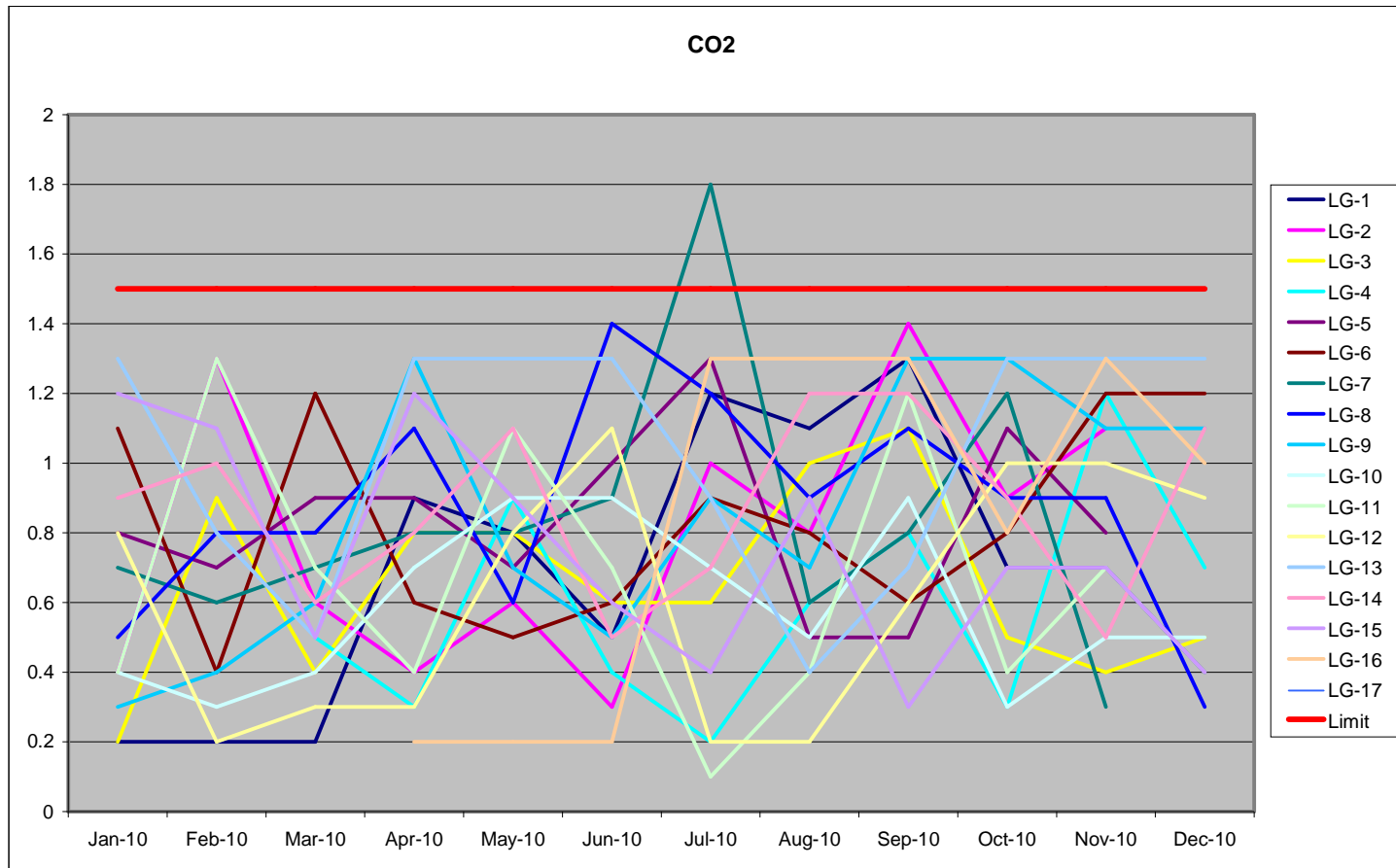
Note 1.: Not accessible due to construction / remedial works.

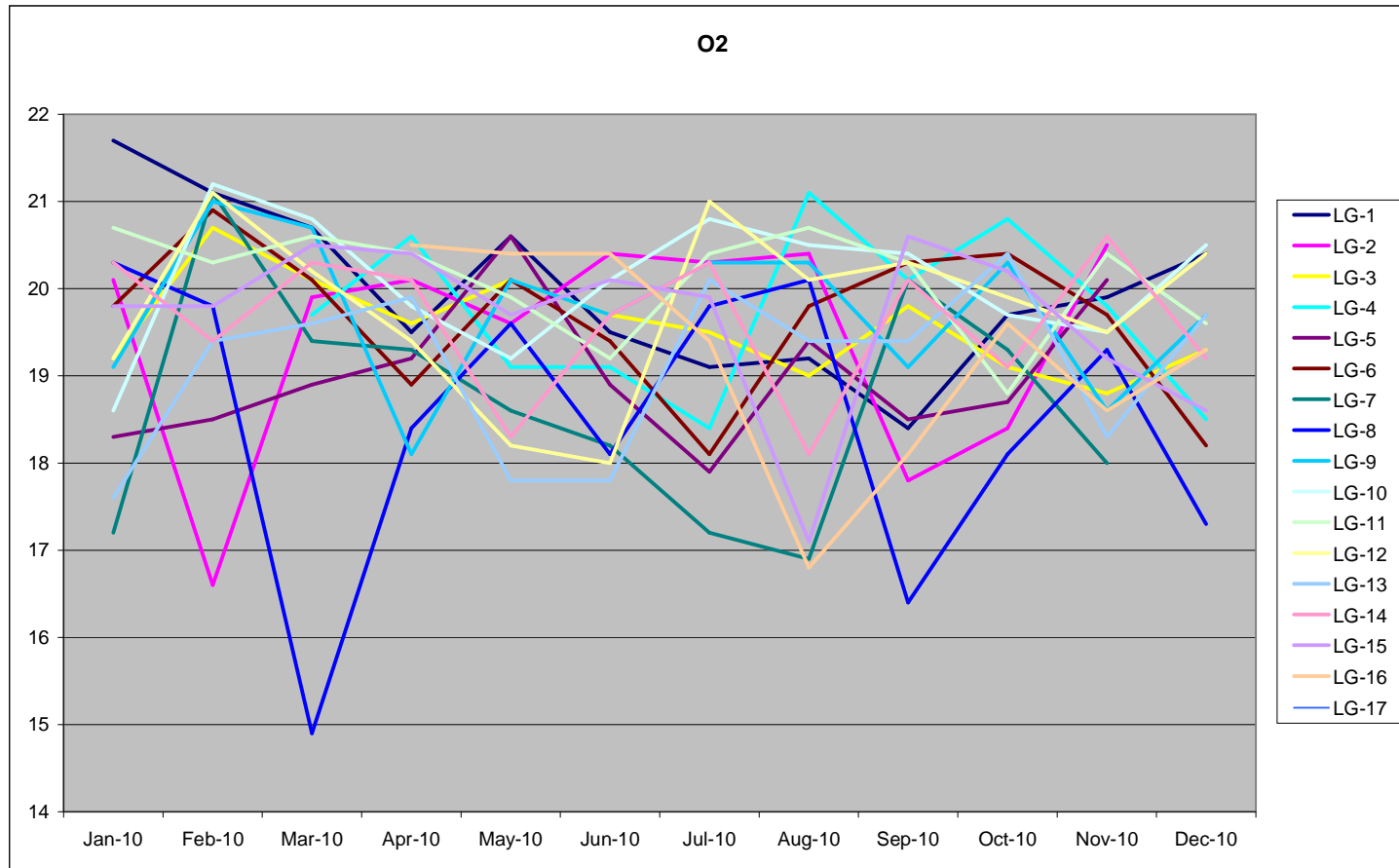
Note 2.: Not connected the main gas pipe system.

Note 3.: Landfill gas perimeter well frozen with ice

Note 4.: Unable to access the gas vents due to the laying of the intermediate liner.







APPENDIX 3

Leachate Tanks and Bund Testing Reports

Mr. Mark Conroy,
Thornton Recycling,
Drehid Landfill,
Co. Kildare

8th February 2011

Our ref: GMCN/L/011/079

RE: GLASS LINED STEEL TANK AT DREHID LANDFILL.

Dear Mr. Conroy,

Further to our visit to site recently, please find below our report on the tanks at Drehid Landfill.

Leachate Storage Tank No. 1 (Cat 28.15)

This tank was installed in 2005. The tank is a glass lined steel trifusion specification storage tank, with a diameter of 8.53m and a height of 4.26m.

The tank has a gross capacity of 237m³

The tank had some panels replaced in 2010, as a result of a machine colliding with the tank.

The damaged panels were replaced with trifusion grade glass lined steel panels, identical to the panels supplied for the tank installation.

As part of the repair, we installed a new perimeter seal to the affected area.

We also carried out an internal inspection of the tank, and found no other areas affected.

All panels passed the inspection.

During our site visit this month, we inspected the tank panels, roof, purlins, and tank connections.

We found no problem with any part of the tank.

Confined Spaces Regulations

This tank meets the requirements set out in the Confined Spaces Regulations. A low- level sidewall access manway was installed as part of the tank package.

Leachate Storage Tank No. 2 (Cat 28.15)

This tank was installed in 2005. The tank is a glass lined steel trifusion specification storage tank, with a diameter of 8.53m and a height of 4.26m.

The tank has a gross capacity of 237m³

During our inspection, we inspected the tank panels, roof, tank ancillaries and connections.

We found no problem with any aspect of this tank, during our inspection.

We would recommend an internal inspection take place on this tank during the first quarter 2013.

Confined Spaces Regulations

This tank meets the requirements set out in the Confined Spaces Regulations. A low- level sidewall access manway was installed as part of the tank package.

Recommendations

We would recommend that a barrier be placed around the tanks to prevent collisions with the tank structures.

Please schedule internal tank inspections for the first quarter of 2013.

The tanks will need to be drained down and empty for this.

Should you require any further information, please do not hesitate to contact us.

Yours sincerely,

Gerard Mc Namara
Tank Service Manager
Irish Industrial Tanks Ltd

Name of Original Client: Thorntons Recycling

Name of Current Client : As above.

9.6 Tank Type: GLS Tank Category: 28.15 Tank No 1

Year of installation : 2005

Date of inspection: 12/01/11

Tank Inspection Checklist

10. EXTERNAL CONDITION OF TANK SIDEWALL :

Good **Yes** Poor ____ Requires Work:

Details of work required:

External condition of mastic:

Good **Yes** Poor ____ Requires Work:

Details of work required:

11. EXTERNAL CONDITION OF TANK COVER:

Good **Yes** Poor __ Requires Work:

Details of work required:

Condition of ancillaries:

Ladder: Good **Yes** Poor ____ Requires Work:

Details of work required:

Pipe Brackets: Good **Yes** Poor ____ Requires Work

Details of work required:

Flanges: Good **Yes** Poor ___ Requires Work

Details of work required:

Overflow: Good **Yes** Poor ___ Requires Work

Details of work required:

Drains: Good **Yes** Poor ___ Requires Work

Details of work required:

Sidewall access: Good **Yes** Poor _____ Requires Work _____

Details of work required:

Hatches: Good **Yes** Poor _____ Requires Work

Details of work required:

Walkway: Good **Yes** Poor ___ Requires Work:

Details of work required:

Name of Original Client: Thorntons Recycling

Name of Current Client : As above.

11.1 Tank Type: GLS Tank Category: 28.15 Tank No 2

Year of installation : 2005

Date of inspection: 12/01/11

12. EXTERNAL CONDITION OF TANK SIDEWALL :

Good **Yes** Poor ____ Requires Work:

Details of work required:

External condition of mastic:

Good **Yes** Poor ____ Requires Work:

Details of work required:

13. EXTERNAL CONDITION OF TANK COVER:

Good **Yes** Poor __ Requires Work:

Details of work required:

Condition of ancillaries:

Ladder: Good **Yes** Poor ____ Requires Work:

Details of work required:

Pipe Brackets: Good **Yes** Poor ____ Requires Work

Details of work required:

Flanges: Good **Yes** Poor ___ Requires Work

Details of work required:

Overflow: Good **Yes** Poor ___ Requires Work

Details of work required:

Drains: Good **Yes** Poor_ ___ Requires Work

Details of work required:

Sidewall access: Good **Yes** Poor _____ Requires Work _____

Details of work required:

Hatches: Good **Yes** Poor _____ Requires Work

Details of work required:

Walkway: Good **Yes** Poor ___ Requires Work:

Details of work required:

Bund Report



ENVIRONMENTAL BALANCE IN DESIGN AND CONSTRUCTION

THORNTONS RECYCLING LIMITED

REPORT ON BUND TESTING

DECEMBER 2010



BORD NA MÓNA 





THORNTONS RECYCLING LTD.

REPORT ON BUND TESTING

REVISION CONTROL TABLE

User is Responsible for Checking the Revision Status of This Document

Rev. Nr.	Description of Changes:	Prepared by:	Checked by:	Approved by:	Date:
0	Issued to Client	TFM/MG	SM 	AS 	06.01.2011

Employer: Thorntons Recycling Ltd.

Keywords: Bund Testing

Abstract: This document presents the results of bund testing carried out by Fehily Timoney and Company at Drehid waste management facility, Drehid, Timahoe, County Kildare.

TABLE OF CONTENTS

	<u>Page</u>
1. INTRODUCTION.....	1
2. BUND IDENTIFICATION.....	2
3. METHODOLOGY.....	3
4. RESULTS OF BUND INSPECTIONS AND TESTS.....	4

LIST OF TABLES

Table 2.1: Details of Bunds on Site.....	2
Table 4.1: Summary of Bund Inspections	4

LIST OF APPENDICES

Appendix A: Bund Inspection Reports

1. INTRODUCTION

Bord na Mona plc operate a waste management facility at Drehid, Timahoe, County Kildare in accordance with the conditions of a waste licence (WL0201-03).

Condition 6.11 of the licences states that

'The integrity and water tightness of all underground pipes, tanks, bunding structures and containers and their resistance to penetration by water or other materials carried or stored therein shall be tested and demonstrated This testing shall be carried out by the licensee at least once every three years thereafter and reported to the Agency on each occasion. This testing shall be carried out in accordance with any guidance published by the Agency. A written record of all integrity tests and any maintenance or remedial work arising from them shall be maintained by the licensee.'

Bord na Mona plc have contracted Thortons Recycling Ltd to manage the liquid waste at the site which includes maintenance of bunds etc. Thortons Recycling Ltd. have contracted Fehily Timoney & Co. to carry out the testing of the bunds associated with the storage of the petrochemicals on the site. This report presents the findings of the bund integrity testing carried out at the site in December 2010 by Fehily Timoney & Co on behalf of Thornton's Recycling Ltd.

2. BUND IDENTIFICATION

A total of 5 no. bunds were identified for testing by the licensee on site. Table 2.1 below provides the number and name of each of these bunds.

Table 2.1: Details of Bunds on Site

Bund Number	Description	Inspected/ Tested	Date of Inspection/Test
1	Diesel tank bund beside waste quarantine area	Yes	December 2010
2	Storage tank in waste quarantine area	Yes	December 2010
3	Grease bund in waste quarantine area	Yes	December 2010
4	Spill pallet 1 in maintenance building	Yes	December 2010
5	Spill pallet 2 in maintenance building	Yes	December 2010

3. METHODOLOGY

The EPA Guidance Note on 'Storage and Transfer of Materials for Scheduled Activities' provides guidance on the inspection and testing of both new and existing bunded structures.

New bunds are tested in accordance with the requirements of the standards they were designed to, BS8007 in the case of concrete structures. However, the bunds on the subject site are 'existing bunds' and therefore it is generally not possible to carry out the testing to BS8007. The site was 'live' during the testing period and flooding the bunds for static water tests for extended periods was generally not permissible from an operational or Health and Safety viewpoint.

Therefore, for the subject site, hydrostatic tests were carried out on bunds where possible. The test period was 24 hrs. Where hydrostatic tests were not practical or safe FTC carried out a visual inspection of the bunds and the results are noted in the associated Bund Inspection Record Sheet.

4. RESULTS OF BUND INSPECTIONS AND TESTS

A summary of the results of the bund inspections is provided in Table 4.1 below. The record sheets for the individual bunds are provided in Appendix A of this report.

Table 4.1: Summary of Bund Inspections

Bund Number	Description	Inspection/Test Result (see note 1)	Material Stored	Test Method
1	Diesel tank bund beside waste quarantine area	Pass	Marked Gas Oil	Hydrostatic
2	Waste oil tank in waste quarantine area	Pass	Waste engine oil	Visual
3	Grease bund in waste quarantine area	Pass	Greases & quarantined drums	Hydrostatic
4	Spill pallet 1 in maintenance building	Pass	Engine oil	Visual
5	Spill pallet 2 in maintenance building	Pass	Hydraulic oil and miscellaneous lubricants	Visual

Note 1 Please see the individual test record sheets for the findings of each bund inspection and the recommendations arising from same.

APPENDIX A

Bund Test Record Sheets



Record Sheet for Bund Test

Company: Thortons Recycling Ltd.	IPC Reference No: WL0201-03	
Site: Drehid Waste Management facility, Drehid, Timahoe, Co. Kildare	IPC Category -----	
Bund Ref. No: Diesel tank bund (1)	Bund Type – Local, Remote, Combined: Local	
Bund Location: Adjacent to admin building	Bund Risk Classification 1,2, or 3: -----	
Bund Dimensions: 1m deep x 10.5m long x 3.7m wide	Primary Vessel(s) – Materials of Construction: 20m ³ metal tank & 5.3m ³ plastic tank	
Bund Materials of Construction: Reinforced Concrete	Primary Vessel(s) – Total Storage Volume: 25.307m ³ max	
Bund Lining Material: None	Primary Vessel(s) – 110% of Volume of Largest Vessel: 22 m ³	
Bund Retention Volume (local/Remote): Local = 33.2 m ³ (allowing for a 100mm freeboard)	Primary Vessel(s) – 25% of Total Storage Volume: 6.327 m ³	
Deemed practicable/safe to conduct hydrostatic test? Yes/No YES (see note below)		
If no, give reasons: Note a full height hydrostatic test not deemed safe for this test due to presence of low level electrical equipment. A shallow test was deemed acceptable so long as volume of test water is greater than 25% of total volume of material stored in the bund.		
Description and Results of Hydrostatic Test:	Date of Hydrostatic test: Start on 14 December 2010	
<p><u>TEST RESULT = PASS</u></p> <p>Details:</p> <ul style="list-style-type: none"> - On 14/12/10 Bund Filled to approx 269mm with water (equating to approx 8.8m³ of test water) - No drop in level after 1 day (15/12/10). 		
Description and Results of Visual Inspection:	Date of Visual Inspection: 14 & 15 December 2010	
Concrete Bund appears to be in Good condition. No repairs required.		
Recommendations: N/A		
Signed: Sean Meyler For and on behalf of Fehily Timoney & Company	Title/Position: BE, CEng, Senior Engineer	Date: 17 December 2010

Record Sheet for Bund Test

Company: Thortons Recycling Ltd.	IPC Reference No: WL0201-03	
Site: Drehid Waste Management facility, Drehid, Timahoe, Co. Kildare	IPC Category: -----	
Bund Ref. No: Waste oil tank in waste quarantine area (2)	Bund Type – Local, Remote, Combined: Local	
Bund Location: Waste quarantine area	Bund Risk Classification 1,2, or 3: -----	
Bund Dimensions: -----	Primary Vessel(s) – Materials of Construction: 2.5m ³ plastic tank	
Bund Materials of Construction: Plastic	Primary Vessel(s) – Total Storage Volume: 2.5m ³ max	
Bund Lining Material: None	Primary Vessel(s) – 110% of Volume of Largest Vessel: 2.75 m ³	
Bund Retention Volume (local/Remote): Integrated bund with electronic leak detection system	Primary Vessel(s) – 25% of Total Storage Volume: 0.625 m ³	
Deemed practicable/safe to conduct hydrostatic test? Yes/No: NO (see note below)		
If no, give reasons: Not practicable to perform hydrostatic test as the unit would require extensive dismantling and have to be put out of service causing interference to the ongoing day to day operations of the site. Electronic leak detection system could also be damaged in the process. Visual inspection deemed to be sufficient.		
Description and Results of Hydrostatic Test:	Date of Hydrostatic test: N/A	
Not applicable		
Description and Results of Visual Inspection:	Date of Visual Inspection: 14 & 15 December 2010	
Unit appears in Good condition. No visible signs of leaks or UV damage. No repairs required.		
Recommendations: - Determine bund capacity from manufacturer		
Signed: Sean Meyler For and on behalf of Fehily Timoney & Company	Title/Position: BE, CEng, Senior Engineer	Date: 17 December 2010

Record Sheet for Bund Test

Company: Thortons Recycling Ltd.		IPC Reference No: WL0201-03
Site: Drehid Waste Management facility, Drehid, Timahoe, Co. Kildare		IPC Category: -----
Bund Ref. No: Grease bund in waste quarantine area		Bund Type – Local, Remote, Combined: Local
Bund Location: Waste quarantine area		Bund Risk Classification 1,2, or 3: -----
Bund Dimensions: 700mm deep x 1.45m long x 1.45m wide		Primary Vessel(s) – Materials of Construction: Unknown
Bund Materials of Construction: Plastic		Primary Vessel(s) – Total Storage Volume: Unknown
Bund Lining Material: None		Primary Vessel(s) – 110% of Volume of Largest Vessel: Unknown
Bund Retention Volume (local/Remote): Local = 1.412 m ³ (allowing for a 100mm freeboard)		Primary Vessel(s) – 25% of Total Storage Volume: Unknown
Deemed practicable/safe to conduct hydrostatic test? Yes/No: YES		
If no, give reasons:		
Description and Results of Hydrostatic Test:		Date of Hydrostatic test: Start on 14 December 2010
<u>TEST RESULT = PASS</u> Details: - On 14/12/10 Bund Filled to top (700mm) with water No drop in level after 1 day (15/12/10).		
Description and Results of Visual Inspection:		Date of Visual Inspection: 14 December 2010
Unit appears in Good condition. No visible signs of leaks or UV damage. No repairs required		
Recommendations: - Place the unit indoors or fit a cover to prevent rainwater entering the bund.		
Signed: Sean Meyler _____ For and on behalf of Fehily Timoney & Company	Title/Position: BE, CEng, Senior Engineer	Date: 17 December 2010



Record Sheet for Bund Test

Company: Thortons Recycling Ltd.		IPC Reference No: WL0201-03
Site: Drehid Waste Management facility, Drehid, Timahoe, Co. Kildare		IPC Category: -----
Bund Ref. No: Spill pallet 1 in maintenance building		Bund Type - Local, Remote, Combined: Local
Bund Location: Maintenance building		Bund Risk Classification 1, 2, or 3: -----
Bund Dimensions: 220mm deep x 2.3m long x 0.6m wide		Primary Vessel(s) - Materials of Construction: Standard 200litre steel barrels
Bund Materials of Construction: Plastic		Primary Vessel(s) - Total Storage Volume: 0.8m ³
Bund Lining Material: None		Primary Vessel(s) - 110% of Volume of Largest Vessel: 0.22m ³
Bund Retention Volume (local/Remote): Local = 0.3 m ³		Primary Vessel(s) - 25% of Total Storage Volume: 0.2m ³
Deemed practicable/safe to conduct hydrostatic test? Yes/No: NO (see note below)		
If no, give reasons: A hydrostatic test not deemed to be practicable as the bund is in use and would cause interference to the ongoing day to day operations of the site.		
Description and Results of Hydrostatic Test:		Date of Hydrostatic test: N/A
Not applicable		
Description and Results of Visual Inspection:		Date of Visual Inspection: 15 December 2010
Unit appears in Good condition. No visible signs of leaks. No repairs required		
Recommendations:		
Signed: Sean Meyler _____ For and on behalf of Fehily Timoney & Company		Title/Position: BE, CEng, Senior Engineer Date: 17 December 2010



Record Sheet for Bund Test

Company: Thortons Recycling Ltd.	IPC Reference No: WL0201-03	
Site: Drehid Waste Management facility, Drehid, Timahoe, Co. Kildare	IPC Category: -----	
Bund Ref. No: Spill pallet 2 in maintenance building	Bund Type – Local, Remote, Combined: Local	
Bund Location: Maintenance building	Bund Risk Classification 1,2, or 3: -----	
Bund Dimensions: 140mm deep x 2.4m long x 1.2m wide	Primary Vessel(s) – Materials of Construction: Miscellaneous plastic oil containers ranging from 5litres to 23 litres	
Bund Materials of Construction: Plastic	Primary Vessel(s) – Total Storage Volume: 0.45m ³	
Bund Lining Material: None	Primary Vessel(s) – 110% of Volume of Largest Vessel: 0.025m ³	
Bund Retention Volume (local/Remote): Local = 0.4 m ³	Primary Vessel(s) – 25% of Total Storage Volume: 0.113m ³	
Deemed practicable/safe to conduct hydrostatic test? Yes/No: NO (see note below)		
If no, give reasons: A hydrostatic test not deemed to be practicable as the bund is in use and would cause interference to the ongoing day to day operations of the site.		
Description and Results of Hydrostatic Test:	Date of Hydrostatic test: N/A	
Not applicable		
Description and Results of Visual Inspection:	Date of Visual Inspection: 15 December 2010	
Unit appears in Good condition. No visible signs of leaks. No repairs required		
Recommendations: - Drums not to be stacked on top of each other on bund as they are more likely to fall over		
Signed: Sean Meyler _____ For and on behalf of Fehily Timoney & Company	Title/Position: BE, CEng, Senior Engineer	Date: 17 December 2010

APPENDIX 4

Dust & Litter Control Plan

Procedures Manual	 <p>BORD NA MÓNA</p> <p>Drehid Waste Management Facility</p> <p>Environmental Procedures Manual</p>	Document:	EP 25.0
Document Approved by: <hr/> Landfill Manager <hr/>		Revision: 0 Issue Date: 15/6/09 Page: Page 1 of 102	
Title <i>1.1.1.1</i>		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.

Procedures Manual	 <p>BORD NA MÓNA</p> <p>Drehid Waste Management Facility</p> <p>Environmental Procedures Manual</p>	Document:	EP 25.0
Document Approved by:		Revision: 0	
_____	Issue Date: 15/6/09		
Landfill Manager	Page: Page 2 of 102		
Title		Litter and Dust Control	
<i>1.1.1.1</i>			

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 5

Training Procedures

Procedures Manual	 <p>BORD NA MÓNA</p> <p>Drehid Waste Management Facility</p> <p>Environmental Procedures Manual</p>	Document:	EP 19.0
Document Approved by:		Revision: 2	Issue Date: 4/6/09
_____ Landfill Manager			
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.
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.

Procedures Manual	 <p>BORD NA MÓNA</p> <p>Drehid Waste Management Facility</p> <p>Environmental Procedures Manual</p>	Document:	EP 19.0
Document Approved by: <hr/> Landfill Manager <hr/>		Revision: 2 Issue Date: 4/6/09 Page: Page 2 of 102	
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
 - Awareness of the Emergency Response Procedures
 - Supplied with a description of activities on site
 - Reporting of environmental incidents to Environmental Team

Procedures Manual	 <p>BORD NA MÓNA</p> <hr/> <p>Drehid Waste Management Facility</p> <p>Environmental Procedures Manual</p>	Document:	EP 19.0
Document Approved by: <hr/> <hr/> Landfill Manager		Revision: 2 Issue Date: 4/6/09 Page: Page 3 of 102	
Title Training			

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 6

Programme for Public Information

Procedures Manual	 <p>BORD NA MÓNA</p> <p>Drehid Waste Management Facility</p> <p>Environmental Procedures Manual</p>	Document:	EP 18.0
Document Approved by:		Revision: 0	Issue Date: 01/01/09
<hr/> Landfill Operations Manager			
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

4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.

Procedures Manual	 <p>BORD NA MÓNA</p> <hr/> <p>Drehid Waste Management Facility</p> <p>Environmental Procedures Manual</p>	Document:	EP 18.0
Document Approved by:		Revision: 0	
_____	Issue Date: 01/01/09		
Landfill Operations Manager	Page: Page 2 of 102		
Title Programme for Public Information			

10. 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

11. 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 7

EPRTR

(European Pollutant Release and Transfer Register)



[PRTR# : W0201 | Facility Name : Dredged Waste Management Facility | Filename : W0201_2010.xls | Return Year : 2010]

[Guidance to completing the PRTR workbook](#)

AER Returns Workbook

Page 1 of 1

REFERENCE YEAR	2010
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1. FACILITY IDENTIFICATION

Parent Company Name	Bord na Mona Plc
Facility Name	Dredged Waste Management Facility
PRTR Identification Number	W0201
Licence Number	W0201-03

Waste or IPPC Classes of Activity

No	class_name
3.1	Deposition, in or under land (including landfill)
11.1	*****

Address 1	In the townlands of Parsonstown, Loughnacree, Hikeashin, Drummond
Address 2	Timahoe West, Coolcamgan
Address 3	Kilnagh Lower and Kilnagh Upper, Garbury
Address 4	County Kildare
Country	Ireland
Coordinates of Location	53.77721 54.1529
River Basin District	IEWE
NACE Code	3521
Main Economic Activity	Treatment and disposal of non-hazardous waste
AER Returns Contact Name	Gavan Geoghegan
AER Returns Contact Email Address	gavan.geoghegan@bnm.ie
AER Returns Contact Position	
AER Returns Contact Telephone Number	045 439477
AER Returns Contact Mobile Phone Number	0863890679
AER Returns Contact Fax Number	045 439488
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(1)	Landfill
5(2)	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?	

Sheet : Releases to Waters

AER Reports Workbook

16/03/11 14:28

4.2 RELEASES TO WATERS

LEAD RELEASES OVER EMISSIONS DATA

06/03/11 14:28

SECTION A - SECTION SPECIFIC WATER POLLUTANTS

POLLUTANT	RELEASES TO WATERS		POLYMERIZATION		POLYMERIZATION		POLYMERIZATION	
	Method Used	Quantity	Method Used	Quantity	Method Used	Quantity	Method Used	Quantity
NO _x (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
CO (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
SO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
PM ₁₀ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
PM _{2.5} (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₃ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
CO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
SO ₄ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₃ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
CO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
SO ₄ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00

* Select a new hydrocarbon on the Pollutant Name (Column B) from data file above

SECTION B - REMAINING WATER POLLUTANTS

POLLUTANT	RELEASES TO WATERS		POLYMERIZATION		POLYMERIZATION		POLYMERIZATION	
	Method Used	Quantity	Method Used	Quantity	Method Used	Quantity	Method Used	Quantity
NO _x (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
CO (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
SO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
PM ₁₀ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
PM _{2.5} (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₃ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
CO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
SO ₄ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00

* Select a new hydrocarbon on the Pollutant Name (Column B) from data file above

SECTION C - REMAINING POLLUTANT EMISSIONS (as required in your license)

POLLUTANT	RELEASES TO WATERS		POLYMERIZATION		POLYMERIZATION		POLYMERIZATION	
	Method Used	Quantity	Method Used	Quantity	Method Used	Quantity	Method Used	Quantity
NO _x (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
CO (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
SO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
PM ₁₀ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
PM _{2.5} (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₃ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
NO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
CO ₂ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00
SO ₄ (ppm)	CRM	0.00	CRM	0.00	CRM	0.00	CRM	0.00

* Select a new hydrocarbon on the Pollutant Name (Column B) from data file above

Sheet: Transferred Tonnes of Waste

AER Returns Workbook

1/6/2011 14:38

81/02/11 14:38

5. ON-SITE TREATMENT & OFF-SITE TRANSFERS OF WASTE (Please refer to Annex 5 and 6 for a description of codes. If necessary, please refer to the following: [Waste Transfer Regulations 2007](#))
Please enter all quantities in this column in Tonne

Transfer Date	Transfer Code	Description of Waste	Waste Transfer Operator	Waste Transfer Method		Location of Treatment	Licence No. (where applicable)	Name and Address of Waste Producer / Supplier	Name and Address of Waste Receiver / Disposer	Actual Address of Final Destination or Final Recovery / Disposal Site (EU/EEA/UK/US/Other)
				By Road	By Other					
Within the Country - 03/03/08	N6	Waste from sorting of paper and cardboard	RG	M	Weighted	On-site in Ireland	ATS/01/04/02	Kydalogue, Portlaoise County, Leix, ... Ireland	Eno Ltd 191004, 21/Cherrington Industrial Estate, Portlaoise Co. Leix, ... Ireland	Cherrington/Stockler Estate, Portlaoise Co. Leix, ... Ireland
Within the Country - 13/03/08	Y6	1.5k other engine, gear and spraying air	RG	M	Weighted	Off-site in Ireland	Eno/01/04/01	Cherrington Industrial Estate, Portlaoise Co. Leix, ... Ireland	Cherrington/Stockler Estate, Portlaoise Co. Leix, ... Ireland	Cherrington/Stockler Estate, Portlaoise Co. Leix, ... Ireland
Within the Country - 19/07/03	N4	Waste from sorting of paper and cardboard	DB	M	Weighted	Off-site in Ireland	Eno/01/04/01	Cherrington Industrial Estate, Portlaoise Co. Leix, ... Ireland	Cherrington/Stockler Estate, Portlaoise Co. Leix, ... Ireland	Cherrington/Stockler Estate, Portlaoise Co. Leix, ... Ireland

*Based on the waste transfer and description of waste from the site.