Attachment F: Control and Monitoring

Contents

Attachment F.1: Treatment, Abatement and Control Systems

Attachment F.1 (i) - To Atmosphere:

Dust

Dilligent monitoring in accordance with the EPA Waste licence together with good housekeeping practices and staff awareness will minimise dust emissions and will ensure that emissions to atmosphere are controlled effectively. Locations to be monitored are listed in Table F-1.

Odour

Odours from a landfill are inevitable however, good housekeeping practices and staff awareness along with procedures for handling complaints will ensure that odour emissions are controlled effectively.

Once the landfilling operations cease the potential for odours at the site will reduce. It is unlikely that there will be any additional emissions to air or generation of odours as a result of activities from the Transfer Station and Civic Amenity Area. Waste for disposal will be compacted within 12hrs of acceptance at the facility and all compacted mixed municipal waste or waste with the potential to cause odour nuisance, will be transferred to a licensed facility within 48hrs of being compacted at the site. The transfer and compaction of waste will occur in sealed containers. For these reasons, no further treatment, abatement or control of odour is required on the Derryconnell Landfill and Waste Recovery Facility.

Landfill Gas

An AFS enclosed gas flare unit is used to burn landfill gas emitted from the landfill and monitoring of the exhaust gases is also required. Monitoring of the emissions from the flare unit is undertaken for NO_x, SO_2, CO, HCl, HF, TA Luft Organics and particulate matter, either on an annual or biannual basis (depending on the parameter). Further information on the monitoring schedule is detailed in Attachment F.9.

The flarestack is equipped with the following equipment to ensure safe and efficient operation:

- a temperature indicator and recorder
- an automatic pilot restart system
- a failure alarm system with an automatic isolation system
- automatically controlled combustion air louvers
- a heat shield
- source test ports
- view ports
- duty and standby motors
- a flame arrestor

The proposed Transfer Station and Civic Amenity Facility will not produce any landfill gas therefore no additional treatment, abatement or control of odour is required at the Waste Recovery Facility.

Attachment F.1 (ii) - To Surface Water:

All surface water run-off from the site will be collected and diverted to a full retention Class I separator (oil interceptor) prior to being discharged to a stream flowing through the site. This separator is designed to achieve a maximum concentration of oil of 5mg/l in the effluent. The separator will be fitted with an oil probe and an oil level alarm to ensure the maximum storage volume is not exceeded.

Permeable areas, such as grass or landscaping adjacent to impermeable surfaces, will be kerbed to prevent run-off from the impermeable surfaces onto the ground. Operational procedures will be implemented to minimise the risk of contamination of surface water run-off and will include:

- Storage of waste in sealed containers
- Use of good housekeeping measures such as sweeping of hard standing areas
- Use of absorbent material to clean up and contain accidental spillages

Surface Water will be attenuated on site, downstream of the Class 1 full retention separator. A hydrobrake will be installed on the downstream site of the attenuation tank and throttled to allow a discharge of 2 l/s from the proposed Waste Recovery Facility into the stream adjoining the site.

Continuous monitoring of flow, electrical conductivity, pH and TOC is undertaken as per condition 9.5 of the licence. If these parameters are measured to be above the emission limits set out in the licence, flow is diverted to the leachate lagoon via a 80mm HDPE rising main and a 100mm HPDE rising main respectively.

Attachment F.1 (iii) - To Sewer:

There will be no emissions to sewer from this site as all foul sewage will be collected in the lagoon and sent to Bandon WWTP for treatment. Storm water will be discharged to surface water. For these reasons, no treatment, abatement or control will be required.

Attachment F.1 (iv) - To Groundwater:

The landfill area on the site comprises of an old cell and 3 no. new lined cells. All 3 no. new landfill cells are lined according to best practice and meet BAT. The liner is in accordance with the requirements of Waste Licence W0089-01 and prevents leaching of water contaminated by the landfill to contaminate the groundwater.

There will be no emissions to groundwater from the Transfer Station or Civic Amenity Facility due to the installation of hardstanding. Also, any area used for the storage of liquids or hazardous waste will be fully bunded according to the Agency Guidance, "IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities". For these reasons, there will be no need for treatment, abatement and control of discharges to groundwater.

In addition, an extensive programme of sampling and monitoring is undertaken as per licence W0089-01 to ensure a low risk of groundwater contamination.

Attachment F.2 – F.9: Monitoring and Sampling Points

The following sections describe the proposed and existing monitoring programme at the Derryconnell Landfill Site. Further monitoring points have been added to take into account the proposed Waste Transfer Station and Civic Amenity Facility.

All environmental monitoring is carried out under the conditions of the Waste Licence W0089-01 for the facility. Emission Limit Values (ELV) are set by the Agency for many of the parameters. Exceeding these values will be judged by the Agency to be a non-compliance with the Waste Licence. The primary aim of this programme is to comply with legislation and the requirements of the Agency and to monitor the quality of the environment in the vicinity of the Landfill and Waste Transfer Station and Civic Amenity Facility and identify any adverse impacts caused by the activities onsite.

As a condition of the Waste Licence, an Annual Environmental Report (AER) will be submitted to the Agency, which will collate and report all monitoring data each year. A comparative assessment will also be made with data from previous years.

Attachment F.2 Air

F.2.(i) Dust

Dust is currently monitored at 4 no. locations (D1, D3, D6 and D8). Further dust monitoring points (D9 to D12) have been added to take into account the proposed development. All sampling and monitoring is carried out by Cork County Council personnel according to the German Engineering Institute VDI 2119 document "Measurement of Dustfall Using the Bergerhoff Instrument (Standard Method)". The Bergerhoff gauges are located around the site at the locations shown on Drawing 2528-2616A. Grid references for the existing and proposed monitoring points are tabulated overleaf.

Figure F-1: NGR for Dust monitoring locations

	Easting	Northing
D1	96279	34068
D3	96191	33965
D6	96098	33811
D8	96343	33831
D9	96199	33805
D10	96314	33831
D11	96217	33741
D12	96152	33679

Dust monitoring currently takes place 3 times per annum, twice between the months of May and September during which period dust generation can be most problematic as per Schedule E of the Waste Licence.

In addition to the above the site and adjoining roads will be inspected on a daily basis for evidence of excessive generation of airborne dust.

F.2 (ii) - Landfill Gas

Landfill Gas is monitored at 14 no. locations as follows (L1, L2, L3, L4, L5, L6, L7 GW1, GW2, GW4, GW5, GW6, GW7, and the site office) as required by Schedule E of the licence. Landfill gas monitoring is discussed further in Attachment F.9.

Attachment F.3: Monitoring and Sampling of Surface Water

Surface water quality is monitored at 9 locations onsite (SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8 and SW9). Stations SW5 and SW9 are located upgradient of the landfill to its east and northwest respectively. All other stations are located on a number of watercourses downgradient of the landfill. No further monitoring points will be required for the proposed development. Surface water will also be monitored prior to the two discharge points for storm water runoff. The samples will be taken after the proposed oil interceptors, prior to discharge.

All surface water samples are collected by trained personnel from Cork County Council staff or by an approved firm of contractors retained by Cork County Council. During transport of the samples they are stored in a chilled cooler box. Certain parameters are measured on-site at the time of sampling using a separate DO meter (Hach portable LD meter), pH meter (WTW pH 330i) and a Conductivity meter (WTW LF 191). All analyses are carried out by an accredited laboratory.

Grid references for the existing monitoring points are tabulated below.

Table F-1: NGR for Surface water monitoring locations

	Easting	Northing
SW1	96335	33841
SW2	96112	33883
SW3	96507	33785
SW4	96140	33651
SW5	96450	34003
SW6	96292	34064
SW7	96290	33810
SW8	96187	33970
SW9	96086	33886

The surface water samples will be analysed for the list of parameters given in Table F-2 in accordance with the Landfill Monitoring Manual published by the EPA in December 1995 and SI 12, 2001, Water Quality-Dangerous Substances Regulations.

Table F-2: Parameters and frequency of monitoring

Parameter	Frequency
Visual Inspection / Odour	weekly
Ammoniacal Nitrogen	quarterly
BOD	quarterly
COD	quarterly
Chloride	quarterly
Dissolved Oxygen	quarterly
Electrical Conductivity	quarterly
pH	quarterly
Total Suspended Solid	quarterly
Temperature	quarterly
Cadmium	annually
Calcium	annually
Chromium (total)	annually
Copper	annually
Iron	annually
Lead	annually
List I/II Organic Substances	once
Magnesium	annually
Manganese	annually
Mercury	annually
Potassium	annually
Sulphate	annually
Sodium	annually
Total Alkalinity	annually
Total Phosphorus	annually
Total Oxidised Nitrogen	annually
Zinc	annually

The resulting data is currently and will continue to be collated, tabulated and reported with interpretation and comparison with the previous year's data. This information will continue to be presented in the AER, which will also be submitted to the EPA.

In the event of the facility closing down, surface water monitoring will continue until a closure license has been issued by the EPA. Aftercare and monitoring of the facility will continue biannually and will measure the level and composition at SW1, SW2, SW3 and SW7.

Attachment F.4: Monitoring and Sampling of Sewer Discharge

There are no discharges to sewer therefore no monitoring of sewer discharge is currently undertaken or proposed.

Attachment F.5: Monitoring and Sampling of Groundwater

Groundwater is currently monitored at 7 no. locations (GW1, GW2, GW4, GW5, GW6, GW7 and GW8) throughout the site. No further monitoring points will be required for the proposed development. Grid references for the existing monitoring points are tabulated below. The list of parameters, which are to be monitored at monthly and quarterly intervals at all groundwater stations are listed below.

Groundwater samples are collected by Cork County Council. The wells are purged of approximately 3.5 times their volumes before samples were taken. Certain parameters are measured on-site using a portable separate DO meter (Hach portable LD meter), pH meter (WTW pH 330i) and a Conductivity meter (WTW LF 191). The collected samples were delivered directly to Alcontrol Geochem Laboratories (Dublin) for analysis. During transport samples were stored in a chilled container.

Table F-3: NGR for Groundwater monitoring locations

	Easting	Northing
GW1	96302	33890
GW2	96215	33822
GW4	96294	34110
GW5	96336	33922
GW6	96135	33674
GW7	96104	33739
GW8	96085	33868

The groundwater samples are analysed for the list of parameters given in Table F-4.

Table F-4: Parameters and frequency of sampling

Parameter	Frequency
Visual Inspection / Odour	quarterly
Groundwater Level	monthly
Ammoniacal Nitrogen	quarterly
Chloride	quarterly
Dissolved Oxygen	quarterly
Electrical Conductivity	quarterly
pH	quarterly
Temperature	monthly
Boron	annually
Cadmium	annually
Calcium	annually
Chromium (total)	annually
Copper	annually
Cyanide (total)	annually
Fluoride	Annually
Iron	Quarterly
Lead	Annually
List I/II Organic Substances	Annually
Magnesium	Annually
Manganese	Annually
Mercury	Annually
Potassium	Quarterly
Sulphate	annually
Sodium	Quarterly
Total Alkalinity	annually
Total Phosphorus	annually
Total Oxidised Nitrogen	Quarterly
Residue on evaporation	Annually
Zinc	Annually
Phenols	Quarterly
Faecal Coliform	Quarterly
Total Coliform	Quarterly

The data is and will continue to be collated, tabulated and reported with interpretation and comparison with the previous year's data. This information will be presented in the AER, which will also be submitted to the EPA.

In the event of the facility closing down, groundwater monitoring will continue until a closure license has been issued by the EPA. Aftercare and monitoring of the facility, once it has closed down, will continue on a quarterly basis and will measure the level and composition at GW1, GW2, GW3, GW4, and GW5.

Attachment F.6: Monitoring and Sampling of Noise

An annual noise survey was performed as required by schedule E.4 of licence W00089-01at 4 no. locations (N1, N6, N8 and NSL1). Further locations (N9 to N12) have been added to include the proposed development. The NGR for monitoring points is included in the following table.

Table F-5 NGR for Noise monitoring locations

N1	96279	34068
N6	96098	33811
N8	96343	33831
NSL1		
N9	96124	33730
N10	96314	33831
N11	96217	33741
N12	96152	33679

Schedule F.1 of the licence specifies maximum noise levels, which are applicable to the noise sensitive location NSL1. The limits specified are 55 dB during daytime periods and 45 dB at night-time. The EPA document *Integrated Pollution Control Licensing – Guidance note for noise in relation to scheduled activities* (1995) states that daytime hours are those between 0800 and 2200 hours. The licence does not specify limits at the noise monitoring stations N1-N8.

All measurements were recorded in accordance with International Standard International Standard ISO 1996: 1982 *Acoustics – Description and measurement of environmental noise, Part 1: Basic quantities and procedures* and include 30 minute L_{Aeq}, L_{A10} and L_{A90} levels.

Attachment F.7: Meteorological Data

Activities at the proposed site will not have an impact on the local climatic conditions and therefore there is no intention to carry out routine meteorological monitoring. The nearest weather station with long-term data is Valentia Synoptic Weather Station. This station records meteorological elements on a daily basis.

Attachment F.8: Monitoring and Sampling of Leachate

The monitoring of leachate is currently undertaken at 4 no. locations: L1, L4, collection point in lined cell and leachate lagoon. No further monitoring points will be required for the proposed waste recovery facility as it will not produce leachate. The NGR for monitoring points is included in the following table. There is no need to propose additional monitoring point as the proposed waste recovery facility will not produce leachate.

Table F-6: NGR for Leachate monitoring locations

L1	96206	33964
L4	96181	33932

The leachate samples are analysed for the list of parameters given in Table F-7.

Table F-7: Parameters and frequency of sampling for leachate

Parameter	Frequency
Visual Inspection / Odour	quarterly
Leachate Level	weekly
Ammoniacal Nitrogen	monthly
BOD	monthly
COD	monthly
Chloride	quarterly
Electrical Conductivity	quarterly
pH	monthly
Temperature	quarterly
Boron	Annually
Cadmium	annually
Calcium	annually
Chromium (total)	annually
Copper	annually

Cyanide (total)	annually
Fluoride	annually
Iron	annually
Lead	annually
List I/II Organic Substances	once
Magnesium	annually
Manganese	annually
Mercury	annually
Potassium	annually
Sulphate	annually
Sodium	annually
Total Alkalinity	annually
Total Phosphorus	annually
Total Oxidised Nitrogen	annually
Zinc	annually
Faecal Coliform	annually
Total Coliform	annually

In the event of the facility closing down, leachate monitoring will continue until a closure license has been issued by the EPA.

Attachment F.9: Monitoring and Sampling of Landfill Gas

Landfill gas is currently monitored at 14 no. locations (L1, L2, L4, L5, L6, L7, L8, the site office and the landfill gas flare as well as all groundwater wells). Additional monitoring points will be added adjacent to all the proposed new buildings at the waste recovery facility. The NGR for monitoring points are included in the following table.

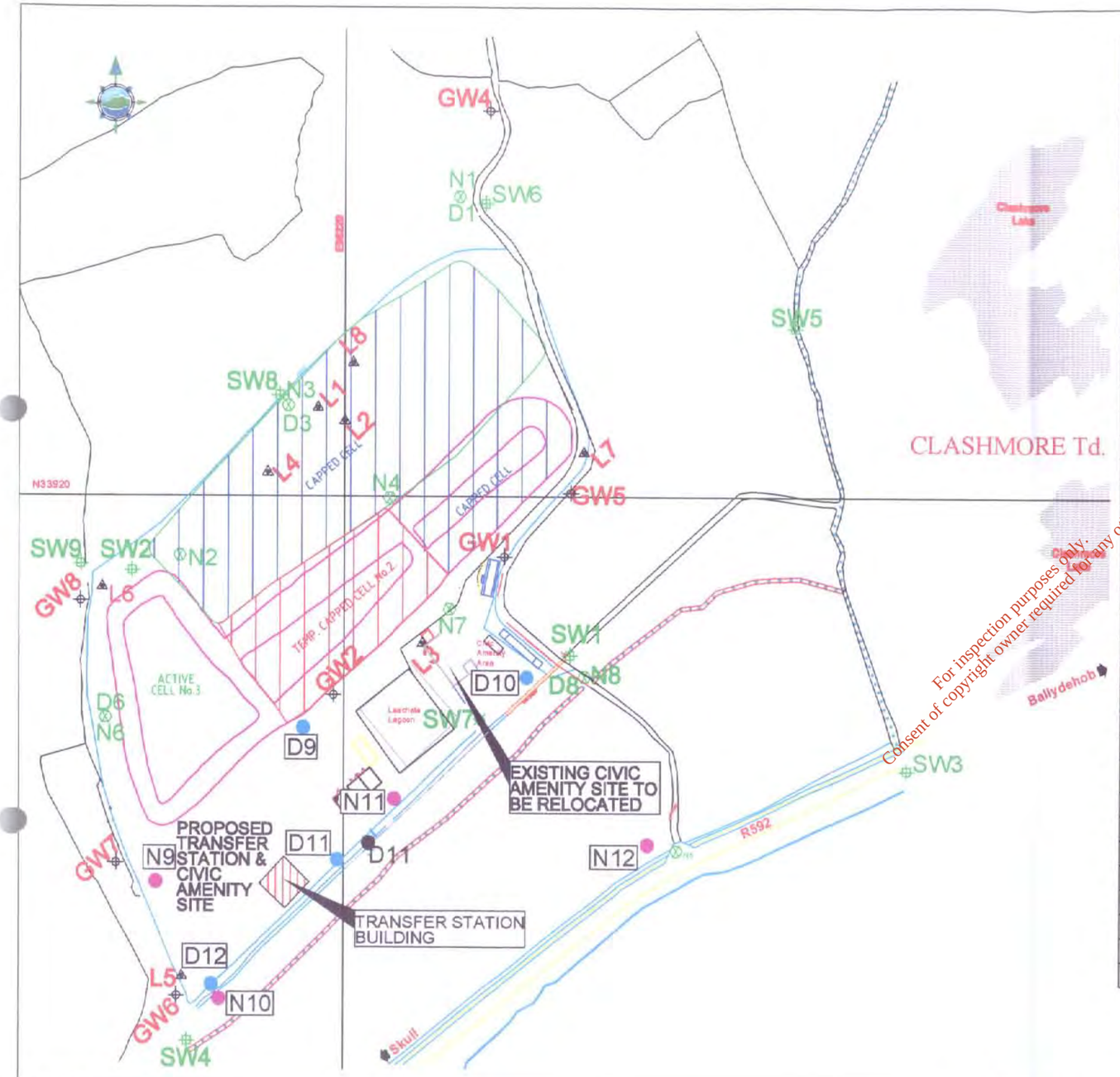
Table F-8: NGR for Landfill Gas monitoring locations

L1	96206	33964
L2	96220	33957
L4	96181	33932
L5	96138	33683
L6	96097	33875
L7	96342	33942
L8	96225	33986

Monitoring is undertaken monthly at all stations excluding the site office where weekly monitoring is required. Measurement of the following parameters is conducted: methane (CH_4), carbon dioxide (CO_2), oxygen (O_2), atmospheric pressure and temperature. The licence also specifies methane and carbon dioxide limits of 20% LEL (1% v/v) and 1.5% v/v respectively in any building on or adjacent to the landfill, including the site office.

All Monitoring of landfill gas is undertaken directly by Cork County Council personnel and is carried out using a portable Gasdata LMSxi real-time infra red analyser.

In the event of the facility closing down, landfill gas monitoring will continue until a closure license has been issued by the EPA. Aftercare and monitoring of the facility, once it has closed down, will continue on a biannual basis and will measure the gas emissions at L1, L2, L3, L4, L5, L6 and L7.



(A) COMBINED LEACHATE AND GAS MONITORING.		
L1	96206 E	33964 N
L2	96220 E	33957 N
L3	96260 E	33847 N
L4	96181 E	33932 N
L5	96138 E	33683 N
L6	96097 E	33875 N
L7	96342 E	33942 N
L8	96225 E	33986 N
(B) SURFACE WATER		
SW1	96335 E	33841 N
SW2	96112 E	33883 N
SW3	96507 E	33785 N
SW4	96140 E	33651 N
SW5	96450 E	34003 N
SW6	96292 E	34064 N
SW7	96290 E	33810 N
SW8	96187 E	33970 N
SW9	96086 E	33886 N
(C) NOISE AND DUST		
N1, D1	96279 E	34068 N
N2	96136 E	33890 N
N3, D3	96191 E	33965 N
N4	96243 E	33919 N
N5	96390 E	33745 N
N6, D6	96098 E	33811 N
N7	96274 E	33864 N
N8, D8	96343 E	33831 N
(D) GROUNDWATER		
GW1	96302 E	33890 N
GW2	96215 E	33822 N
GW3	96225 E	33986 N
GW4	96294 E	34110 N
GW5	96336 E	33922 N
GW6	96135 E	33674 N
GW7	96104 E	33739 N
GW8	96085 E	33868 N

LEGEND

- N12 ● NOISE MONITORING POINTS (ADDITIONAL)
- D12 ● DUST MONITORING POINTS (ADDITIONAL)
- SW9 ⌖ SURFACE WATER MONITORING POINTS (EXISTING)
- GW8 ⌖ GROUND WATER MONITORING POINTS (EXISTING)
- L6 ▲ LEACHATE MONITORING POINTS (EXISTING)
- D6, N6 ⊗ DUST & NOISE MONITORING POINTS (EXISTING)

ADDITIONAL MONITORING POINTS

(C) NOISE AND DUST		
N9	096124 E	033730 N
N10	096156 E	033672 N
N11	096246 E	033770 N
N12	096375 E	033748 N
D9	096199 E	033805 N
D10	096314 E	033831 N
D11	096217E	033741 N
D12	096152 E	033679 N

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

Issue	Date	Description	By	Chkd.
A	JUNE 2007	WASTE LICENCE APPLICATION	JO'B	CD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES

Title: DERRYCONNELL MONITORING POINT LOCATIONS

Prepared by: JO'B
Checked: C.D
Date: JUNE '07
Project Director: B.DOWNES
Scale @ A3: 1:2500

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Drawing No.: 2528-2616

Issue: A

Attachment G: Resources Use and Energy Efficiency

Contents

Attachment G.1: Raw Materials, Substances, Preparations and Energy

	Landfill (2006)	Proposed Waste Transfer Station and Civic Amenity Facility
Water	Not available	1,000m^3
Electricity	26,832 kWh	30,000 kWh
Diesel	48,000 litres	20,000 litres
Hydraulic Oil	50 litres	25 litres

Landfill

The machinery currently onsite comprises of an excavator, compactor, forklift and a site dumper using approximately 48,000 litres of diesel fuel. An estimated 86 kWh/day of electricity is used for activities onsite. Small quantities of pesticides and insecticides are also used for the control and eradication of vermin and fly infestations at the facility.

Waste Transfer Station and Civic Amenity Facility

The list of raw materials and intermediates that will be utilised in the proposed waste recovery facility is minimal. No packaging will be used as waste will be compacted and transferred directly to containers.

Diesel fuel will be used to run the backhoe loader on site. This will be delivered as required rather than stored on site.

Small quantities of pesticides and insecticides will be used for the control and eradication of vermin and fly infestations at the facility.

The compactor, lighting and all other ancillaries will consume electrical energy. An estimate of the quanities of material used and generated onsite is shown above but more accurate figures will be included in the AER once the facility is operating.

Attachment G.2: Energy Efficiency

The energy utilised on site at present is as follows:

- Electricity for site lighting office accommodation, pumps and gas flare.
- Fuel for on site vehicles.

Once records are available for the proposed Waste Transfer Station and Civic Amenity Facility they will be forwarded to the agency as part of the Annual Environmental Report.

In the proposed facility, energy efficiency will be considered throughout the design process. Some measures considered include:

- Considering energy saving opportunities in storage areas, control rooms and offices specific to the activity conducted. (PIR sensors, compact fluorescent lights).
- Installing double-glazed low emmissivity windows
- Using low conductivity insulation
- Using energy efficient equipment whenever possible
- Installing solar panels for water heating
- Ensuring equipment is serviced and maintained regularly
- Ensuring equipment is switched off, if safe to do so, when not in use
- Investigating the use of heat pump for space heating
- Use of energy efficient light fittings throughout the site

Inserts here

Attachment H: Materials Handling

Contents

Attachment H.1: Waste Types and Quantities – Existing and Proposed

THIRD SCHEDULE Waste Disposal Activities

Class 1	Deposit on, in or under land (including landfill). *This activity is currently licensed.*
Class 4	Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons *This activity is currently licensed and relates to leachate management which will be an ongoing activity at the site.*
Class 5	Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment. *This activity is currently licensed and is currently the Principal Activity.*
Class 12	Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule. *This is a new activity which relates to the compaction of waste into sealed containers in the Transfer Station for disposal at another licensed waste facility. This will be the Principal Activity following closure of the Landfill and commencement of Transfer operations.*
Class 13	Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced. *This activity is currently licensed.*

FOURTH SCHEDULE Waste Recovery Activities

These activities all relate to the new Civic Amenity Area which will be developed.

Class 2	Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological processes).
Class 3	Recycling or reclamation of metals and metal compounds.
Class 4	Recycling or reclamation of other inorganic materials.
Class 13	Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced.

The facility consists of the landfilling area where a maximum of 14,000 tonnes of municipal waste is landfilled annually including 10,800 tonnes of domestic waste, 1,200 tonnes of commercial waste and 2,000 tonnes of C&D waste. The new development of the facility will include a Waste Transfer Station and a Civic Amenity Area accepting the following recyclable materials:

- Paper and cardboard
- Tetrapaks
- Textiles
- Scrap Metals
- Timber
- Furniture
- Household construction and demolition waste
- Garden waste
- Electronic and electrical waste
- White goods
- Drink and Food cans
- Glass bottles and jars
- Aluminium cans
- Plastics

Household Hazardous waste will also be accepted onsite and will include the following:

- Edible oils and fats
- Hydraulic oils
- Engine, gear and lubricating oils
- Oil containers
- Oil filters
- Batteries
- Paints, inks
- Pesticides
- Solvents
- Fluorescent tubes
- Household gas cylinders

Attachment H.2: Waste Acceptance Procedures

Waste Acceptance procedures are in accordance with the EPA's Manual on Waste Acceptance and Council Decision establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of the Directive 1999/31/EC.

Landfill/Waste Transfer Station

For Licensed Carriers

1. Waste will only be accepted on site during licensed hours.
2. All vehicles delivering and removing waste will be covered appropriately.
3. All licensed vehicles carrying municipal waste entering the site will be weighed at the weighbridge. The vehicle's weight will be recorded on entering and leaving the site.
4. Relevant information (date, name of carrier, weight, producer, waste description, etc.) will be recorded on entry by site staff who will also check that the customer account details correspond to the load against the contract authorisation quoted by the Driver
5. Site staff will inspect the Waste documentation, i.e. waste description, quantity and carrier registration details. The caretaker will inspect the load where possible to ensure that it complies with the waste transfer documentation. If no Waste Transfer Note is provided, the caretaker will ask the driver for the contract authorisation number and/ or a description of the waste load and check that it compares with the information on the Computer Data System. Any problem will be reported to the Landfill Engineer and the Quarantine procedure followed.
6. The caretaker will produce a weighbridge ticket for all waste types and materials paid by weight, which will be signed by the Driver and the caretaker.
7. The Caretaker will produce a hand written docket for all loads accepted on a pay-per load basis
8. The signature of the caretaker is to confirm that the waste has been checked as far as is possible at this stage, taking into account; the type of container, type of waste, the facilities available at the site
9. The caretaker will direct the Driver to the appropriate point to discharge the load either at the landfill until closure or into the hopper at the Transfer Station.
10. For waste loads that require particular handling, the caretaker will notofy the Landfill operatives of the arrival of the load, so that they can prepare for it. The landfill Operatives will tell the caretaker of any reason that the waste load cannot be operationally accepted for disposal at that time. If the load cannot be accepted, it will be held at the weighbridge/waiting area with the problem notified to the Landfill Engineer/ Manager
11. The waste on the working face will be spread and compacted as soon as is practicable and covered daily.

Civic Amenity Facility

At the Civic Amenity Facility, the public will dispose of recyclable waste, bulky waste (for example household construction and demolition waste, metals, timber, green waste) and residual mixed waste separated into containers, each for a different waste type. Clear signage on site will indicate the use of each container.

Waste accepted at the waste recovery area of the site will consist of:

- Domestic waste from private individuals
- Domestic hazardous waste
- Recyclable material

The acceptance and throughput of waste at the Civic Amenity Centre will be managed by the presence of site staff, who will be present on site at all times during normal operating hours. All staff involved in waste acceptance onsite will be trained in the acceptance procedures and will have good knowledge of the waste acceptance criteria. A process flow diagram is included in figure D-1 in Attachment D.

1. Private vehicles (cars, cars with small trailers and vans) will enter the site by the main entrance.
2. Individuals will be charged by weight for domestic waste accepted at the site.
3. The caretaker will complete a receipt of payment and a copy will be retained on site for record purposes.

4. Material brought to the site for recycling will be accepted free of charge and the site staff together with clear site signage will direct the individual to the recycling receptacles.
5. The caretaker of the site will have the responsibility of ensuring that only acceptable wastes are deposited at the Civic Amenity Site.
6. Any non-acceptable waste will be taken offsite by the original carrier.

Attachment H.3: Waste Handling

Municipal Waste, recyclable materials and household hazardous waste will be accepted onsite.

Attachment H.4: Waste Arisings

Any waste arising on site such as domestic waste from the office accommodation, waste packaging, green waste from landscaping activities will be deposited with in the appropriate receptacle at the facility.

Attachment I: Existing Environment and Impact to the Facility

Contents

Attachment I.1: Atmospheric Emissions

The existing landfill at Derryconnell is situated between Ballydehob and Schull on the Mizen Head Peninsula. The site is located to the North East of Schull Harbour, North West of Ballydehob Bay and approximately 3km inland of Roaringwater Bay.

The site is situated at an elevation of approximately 30m OD. The landfilling of waste takes place in naturally formed depressions between ridges of outcropping bedrock.

There are no major industrial facilities in the vicinity of the site. There are a number of private residences and farm houses within 1km of the site but air emissions from these would be minimal. The R592 is located 150m south of the site. The volume of traffic along this road is relatively small.

Due to the remote and exposed nature of the site and the absence of major industrial facilities in the region, the air quality is considered to be good.

I.1.(i) – Dust

Dust monitoring is conducted on site 3 times per year in accordance with licence W0089-01. The level of dust deposition was measured at four locations around the site as shown on drawing 2528-2616A. Results for 2006 are included in Table I-1 below.

Dust levels at three of the four monitoring locations were below the limit of 350mg/m²/day as specified in Schedule F.3 of the licence.

Table I-1: Dust monitoring results from December 2006

Monitoring point	Dust Deposition (mg/m²/day)
D1	258.7
D3	331.1
D6	318.5
D8	407

Table I-2: Dust monitoring results for Proposed Waste Recovery Facility for 2007

Monitoring point	Dust Deposition (mg/m²/day)
D9	585
D10	129
D11	124
D12	129

Further dust monitoring was conducted from the 14/03/07 to 12/04/07 at 4 no. points around the proposed site of the Waste Recovery Facility. These results are shown in Table I-2.

Dust levels around the proposed waste recovery facility were below the limit of 350mg/m²/day except for D9 (585 mg/m²/day) which may have been partially caused by rotary drilling occurring in the vicinity of the monitoring station.

In addition to the low level of dust, waste will be compacted on arrival at the site inside the Transfer Building and once compacted, it will be stored in sealed containers prior to transfer to a licensed landfill. Also, good housekeeping practices and road sweeping will help maintain low dust emissions. Due to the nature of the additional waste streams to be accepted on the site, the impacts on air quality due to dust from the proposed site are expected to be minimal.

I.1.(ii) – Odours

An odour assessment was conducted in 1999 which consisted of a full simulation of the landfill gas emissions and air dispersion modelling. The model determined that the worst case condition would arise in 2003 at a point 165 metres from the landfill. The predicted odours levels were all below the odour detection limits under this worst case scenario with a minimum safety factor of 2. It identified that the most significant odour problems were likely to arise from three landfill gas pollutants; ethyl mercaptan, hydrogen sulphide and methyl mercaptan which are likely to be emitted from the leachate lagoon. Following this report, a gas flare was installed which reduced the odours emitted from the site. The full report, prepared by EMK environmental

services, is included in attachment E.1. The report also includes a study of noise and dust. More up to date testing has been done for these parameters, therefore they are not discussed in this section.

The landfill operating on this site is expected to close in early 2008. Following closure and restoration, odour emissions will decrease and therefore the impact caused by these will decrease.

The Waste Transfer Station and Civic Amenity Facility proposed onsite is unlikely to generate of odours as recyclable waste received at the facility will be treated in the following way:

- waste for disposal shall be compacted within 12 hrs of acceptance at the facility.
- the waste will have undergone relatively little decomposition due to the quick turnaround times for the waste removed from the site and sent to landfill.
- all compacted mixed municipal waste or waste with the potential to cause odour nuisance, shall be removed from the facility within 48 hrs of being compacted at the site, with the exception of Bank Holiday weekends, when a limit of 72 hrs shall apply.
- the transfer and compaction of waste in sealed containers.
- the compacted waste will be stored in sealed containers.
- construction and demolition waste, dry recyclable materials and wood shall not be stored on site for a period longer than 3 months.

I.1.(iii) – Landfill Gas

An AFS gas flare unit is used to burn landfill gas emitted from the decaying landfill waste. Monitoring of the emissions to atmosphere from the flare unit is undertaken regularly for NO_x, SO_2, CO, HCl, HF, TA Luft Organics and particulate matter. The gas was tested in May 2006 for the listed parameters.

Table I-3: Landfill Gas Monitoring

Parameter	Emission Value	Emission Limit[1]
Nitrogen Oxides (mg/m^3)	36	150
Carbon Monoxide (mg/m^3)	6	50
Sulfur Dioxide (mg/m^3)	6	-
Temperature (oC)	877.2	-
TA Luft Class I	<1.90	20
TA Luft Class II	<1.90	100
TA Luft Class III	<1.90	150
HCl	2.66	50
HF	0.1	5
Particulate	2.54	130

[1] As specified in Schedule F.5 of Waste Licence W00089-01

All parameters tested in this monitoring event were found to be within the limits specified by the waste licence. The full report is attached subsequently.

The landfill operating on this site is expected to close in early 2008. Following closure, the landfill gas produced will continue to be burned as set out in the restoration plan. However, since less gas will be produced as the decomposition of the landfilled material occurs, the impact caused by the production of landfill gas will decrease.

The development proposed for the site will not produce any landfill gas. For this reason, there will be no additional impacts on air quality caused by landfill gas from the proposed Waste Transfer Station and Civic Amenity Facility

Attachment I.2: Assessment of Impact on Receiving Waters

Surface water onsite is managed in two sections. First, surface water collecting in the perimeter drain along the western and southern boundaries of the site shall drain to pump sump no. 1. Second, the surface water collecting in the perimeter drain along the eastern and northern boundaries of the site shall drain to the monitoring sump adjacent to the reception area. A silt trap is installed upstream of both monitoring sumps in accordance with licence condition 4.17.2 and 4.17.3 before being discharged to surface water at SW4.

Surface water from skip collection area, ramp and basement area of the Waste Recovery Facility is collected in a surface water attenuation tank and pumped up to Manhole S1. The remainder of the surface water from the proposed facility is gravity fed to S1, through the Oil Interceptor and into an attenuation tank before being discharged into the stream at a max flow rate of 2 l/s.

Continuous monitoring of flow, electrical conductivity, pH and TOC is undertaken as per condition 9.5 of the licence. If these parameters are measured to be above the emission limits set out in the licence, flow is diverted to the leachate lagoon via a 80mm HDPE rising main and a 100mm HPDE rising main respectively. Contaminated surface water runoff from the waste quarantine area and waste inspection area is discharge to pump sump no.2 and pumped to the leachate lagoon. Foul sewage from the activities onsite is currently treated in a Septic Tank and percolation area.

Surface water is currently monitored at 9 no. locations (SW1, SW2, SW3, SW4, SW5, SW6, SW7, SW8 and SW9) throughout the site on a quarterly basis as specified by Licence W0089-01. The parameters monitored are listed in Table F-2. Stations SW5 and SW9 are located up gradient of the landfill to its east and northwest respectively while all other stations are located on a number of watercourses down gradient of the landfill.

In compliance with Licence W0089-01, surface water samples are collected on a quarterly basis. Monitoring results for November, 2004 and November, 2006 are compared in Table I.4. A number of sampling stations are located on watercourses with minimal flow in dry weather (i.e. SW2, SW6, SW8 and SW9) and in some cases have a strong algal growth (SW2 and SW8). High suspended solids, ammoniacal nitrogen levels and low levels of dissolved oxygen are likely to be related to the low flows and high algal growth. Elevated levels of manganese and iron are likely to be related to the underlying geology and low pH may be due to local land use including coniferous forestry. Based on the monitoring results in Table I-4, there is no evidence of a significant decline in water quality from the activities onsite.

All storm water collected from the new waste recovery area of the site will pass through a full retention separator (oil Interceptor) prior to being discharged to adjoining boundary stream. Foul emissions will be treated in a new package treatment plant and will be discharged to the leachate lagoon.

Since no changes to the landfill itself are proposed at this time (only an expansion and relocation of the waste recovery facility) it is unlikely that the additional waste streams to be accepted onsite will contribute to a decline in water quality. Monitoring of surface water will continue as per the licence conditions at current monitoring locations. There is no need for additional surface water monitoring points as the current monitoring locations take into account the location of the proposed development.

Table I-4: Comparison of SW monitoring from 2004 and 2006

			SW1		SW2		SW3		SW4		SW5	
PARAMETER	UNITS	LIMITS	30/11/04	24/11/06	30/11/04	24/11/06	30/11/04	24/11/06	30/11/04	24/11/06	30/11/04	24/11/06
Ammoniacal N	mg/l N	0.82[1]	<0.2	0.8	<0.2	<0.2	<0.2	0.2	<0.2	0.6	<0.2	<0.2
BOD	mg/l	5[2] 7[3]	2	<2	2	5	3	2	4	<2	2	<2
COD	mg/l	40[3]	19	21	40	76	16	<15	22	24	18	19
Chloride	mg/l	250[4]	35	33	26	23	37	31	40	33	38	31
DO	mg/l	>7[5]	8.2	9.2	6.6	8.6	7.4	8.8	7.6	7.7	8.9	8.9
Conductivity	µs/cm	1000[4]	301	193	412	148	340	239	192	161	143	191
pH		6.0-9.0[1]	7.44	7.1	6.40	7.4	7.02	7.5	6.97	7.4	7.21	7.6
Total susp. sol.	mg/l	50[2]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Temperature	°C	25[4]	10.9	8.8	12.2	8.7	11.3	8.9	10.0	8.8	9.0	8.8

			SW6		SW7		SW8		SW9	
PARAMETER	UNITS	LIMITS	30/11/04	24/11/06	30/11/04	24/11/06	30/11/04	24/11/06	30/11/04	24/11/06
Ammoniacal N	mg/l N	0.82[1]	41.2	2.2	<0.2	0.7	0.2	1.1	<0.3	<0.2
BOD	mg/l	5[2] 7[3]	7	2	<2	<2	3	<2	3	<2
COD	mg/l	40[3]	91	37	19	23	43	34	42	33
Chloride	mg/l	250[4]	109	62	34	34	26	23	51	28
DO	mg/l	>7[5]	3.1	7.1	9.1	8.8	7.4	7.9	9.0	8.8
Conductivity	µs/cm	1000[4]	2955	345	241	187	259	142	200	156
pH		6.0-9.0[1]	7.2	7	7.01	7.3	6.50	7.4	6.0	7.4
Total susp. sol.	mg/l	50[2]	<10	<10	<10	<10	<10	11	<10	<10
Temperature	°C	25[4]	11.0	8.7	8.2	8.7	7.8	8.8	7.4	8.8

[1]Freshwater Fish Directive – salmonid & cyprinid waters

[2]Surface Water Directive – A1 waters

[3]Surface Water Directive – A3 waters

[4]Surface Water Directive – A1-A3 waters

[5]Freshwater Fish Directive – cyprinid waters

[6]No limits specified in Surface Water or Freshwater Fish Directives

Attachment I.3: Assessment of Impact of Sewer Discharge

There are currently no emissions to sewer from the facility, as foul sewage generated on the site is not discharged to a municipal foul sewer. With the addition of the proposed Waste Transfer Station and Civic Amenity Facility, foul sewage quantities will remain similar to those generated currently and these will be treated on site before being pumped to the leachate lagoon.

Attachment I.4: Assessment of Impact Groundwater and Soils

The Geological survey of Ireland Cork Sheet 199 (Scale 1" to 1 mile) shows the bedrock underlying the site as comprising of Old Red Sandtones described as "purplish grey argillaceous slates and gritstones". The bedrock is generally steeply dipping typically at angles greater than 60 degrees. Geological Survey of Ireland 1:10,560 field sheets were available for the study area. Outcropping bedrock is plentiful in the area immediately surrounding the landfill In this area of West Cork the structure of the bedrock is characterised by east west trending ridges of outcropping bedrock (synclines and anticlines). Bedrock dips northwards at 60-75 degrees in the area immediately adjacent to the site. South of R592 the bedrock dips southwards at 50-75 degrees.

On the edge of the existing landfill site bedrock is generally close to the surface. Beneath the central portion of the old landfill and the lined cells several metres of overburden comprising of peat and clay is found overlying the bedrock. Excavation of peat and clay has been occurring on site for the provision of cover material. These excavations have penetrated several metres of overburden. Due to the boggy nature of the ground access to much of the site has proved inaccessible to the drilling rig.

The potential emissions to groundwater from the landfill are likely to be from the base of the unlined portion of the landfill, which was capped for the duration of 2005 and 2006. It is expected that the emissions from the unlined section of the landfill are probably relatively low however due to the impermeability of the underlying bedrock and that the groundwater originating from the unlined portion of the site is probably having a greater impact on surface water than on ground water. This may be due to the movement of contaminated groundwater along the interface between the relatively impermeable old red sandstone and the waste body. Previous work on emissions to groundwater at Derryconnell Landfill was prepared by MCOS and O Neill Groundwater Engineering in May 2005. They estimated a volume for emissions to groundwater from the old landfill ares to be approximately 12,965 m^3. This is based on the assumption that a relatively small proportion of effective rainfall will percolate through the protective cap. This figure does not include leachate generated from the lined cells at Derryconnell landfill. This also does not include the volume of leachate produced as a plume from beneath the unlined portion of the landfill due to movement of groundwater. The full report is attached subsequently.

Groundwater monitoring results from 2006, also do not indicate that leachate from the old portion of the landfill is affecting groundwater quality. These results are shown in Table I-5.

Monitoring of groundwater quality is undertaken at 7 no. locations: GW1, GW2, GW4, GW5, GW6, GW7 and GW8 on a quarterly basis as per Schedule E of licence W00089-01. No further monitoring points will be added as the proposed development will be located within the area covered by the existed monitoring wells.

There will be no emissions to groundwater from the proposed development due to the installation of hardstanding on all exposed surfaces. Also, any area used for the storage of liquids or hazardous waste will be fully bunded.

For these reasons, the proposed development will not cause adverse impacts to groundwater and soils onsite.

Table I-5: Comparison of GW monitoring from 2005 and 2006

PARAMETER	UNITS	LIMITS	GW1		GW2		GW4		GW5		GW6		GW7		GW8	
DATE			5/10/05	24/11/06	5/10/05	24/11/06	2/3/05	24/11/06	2/3/05	24/11/06	5/10/05	24/11/06	5/10/05	24/11/06	5/10/05	24/11/06
Ammoniacal nitrogen	mg/l N	0.5[1]	<0.3	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	5.4	3.4	<0.2	<0.2
Conductivity	µs/cm	2500[2]	402	421	456	611	412	428	545	566	413	371	1050	954	236	573
pH		6.5-9.5[2]	6.76	6.5	6.76	6.5	7.10	6.6	7.20	6.7	6.27	6.1	7.16	6.4	6.5	6.8
Chloride	mg/l	250[2]	29	24	14	21	58	37	45	28	35	44	46	51	36	36
DO	mg/l	-[3]	5.9	3.2	5.21	3.6	4.9	3.8	6.0	6.1	5.30	3.6	6.4	3.1	5.9	6.3
Potassium	mg/l	-[3]	1.5	1.4	1.9	2.3	3.2	0.9	12.6	1.3	1.2	3.9	10.4	13	0.5	0.3
Sodium	mg/l	200[2]	22.5	17	13.5	11	27	22.5	28	14.5	23.8	30	41.5	42	19.5	23
Total oxidised nitrogen	mg/l	-[3]	<0.3	2.3	<0.3	<0.3	<0.3	<0.3	<0.3	2.6	<0.3	<0.3	<0.3	0.8	<0.3	<0.3
Total organic carbon	mg/l	No change[5]	10	7	10	4	6	8	11	29	19	12	20	15	3	19
Phenols	µg/l	0.2[4] 2000[6]		<0.01		<0.01	<0.01	<0.01	<0.01	<0.01		<0.01		<0.01		<0.01
Iron	mg/l	0.2[2]		<0.002		<0.002	<0.001	<0.002	0.031	0.148		0.993		<0.002		0.203
Faecal coliforms	cfu/100ml	0[2]	20	<1	2590	2	<1	<1	<1	<1	<1	<1	1	2	4	30
Total coliforms	cfu/100ml	0[2]	1298	210	46100	3600000	<2	480	250	420	3	<1	14	144	1100	160

[1]Drinking water directive – limit presented as 'ammonium'

[2]Drinking water directive

[3]No groundwater limit available

[4]Dutch target & intervention list – target value

[5]Drinking water directive – 'No abnormal change'

[6]Dutch target & intervention list – intervention value

[7]US National Academy of Science, 'Water quality criteria', 1972

[8]Drinking Water Regulations, 1988 (now superseded), parameter = 'phosphorous'

Attachment I.5: Ground and/or Groundwater Contamination

As discussed previously, the Derryconnell Landfill has been operating since 1985 years but due to lack of available space, it is likely to close in early 2008. A small waste recycling facility is also currently located on this site. No changes to the landfill itself are being made at this time, the development proposed consists of a Waste Transfer Station and Civic Amenity Facility.

The landfill consists of the old unlined landfill with an area of approximately 6,000m^2 and 3 no. lined cells each with areas of 1,080m^2, 3,069m^2 and 2,550m^2 respectively. Further details on the assessment of the ground and groundwater contamination onsite are covered in Attachment I.4.

Attachment I.6: Noise Impact

Drawing 2528-2606A indicates the location of the main sources of noise on site. These include the compactors and site vehicles. A noise survey is undertaken annually as specified by licence W0089-01. The monitoring of noise levels is undertaken at 3 no. locations on and adjacent to the landfill site: N1, N6, and N8. One additional monitoring point is located offsite at a noise sensitive location situated 400m west of the landfill and designated NSL1.

Each location is monitored at a 30 minute noise interval and the L_{Aeq}, L_{A10} and L_{A90} parameters are to be determined. One third octave band frequency analysis is also required.

A limit of 55 dB during daytime periods and 45 dB at night-time at any noise sensitive location is set by the agency (daytime hours are between 08:00 and 22:00). The licence does not specify limits at the noise monitoring stations N1-N8.

A noise survey of the landfilling area was undertaken on Monday 20/11/2006 and is attached subsequently. Noise results recorded are included below. Recorded 30 minute L_{Aeq}, L_{A10} and L_{A90} levels are presented in Table 1. All noise data are presented as decibels (dB) relative to 2x10^{-5}Pa.

The $L_{Aeq\ 30min}$ recorded at points N1, N6, N8 and NSL1 ranged from 43 to 64 dB and are typical of a rural environment during the daytime. The highest noise level measured was 64 dB which was recorded at station N8 on the site access road. Noise levels here were significantly affected by traffic using the access road and by site users creating noise in the unloading area. The $L_{Aeq\ 30min}$ recorded at noise sensitive location NSL1 was 49 dB and thus the 55 dB daytime limit specified in licence W00089-01 was not exceeded. No noise was audible from the landfill at this location. No persistent audible tones were noted during the survey. Frequency analysis on recorded one third octave bands indicated the absence of any tones of significance at the measurement stations.

Table I-6: Landfill Noise Monitoring Locations

Location	TIME	$L_{Aeq\ 30min}$ dB(A)	COMMENT
N1	1232-1302	43	Excavator in landfill site occasionally audible on breeze. Road traffic audible to SW. Birdsong.
N6	1307-1337	46	Excavator shut off during lunch. Restarted 1335. Audible at low level. Noise from gulls and crows significant. Road traffic noise from SW dominant. Rustling vegetation. Water audible in nearby drain. No noise audible from landfill site apart from excavator.
N8	1342-1412	64	Vehicles entering/manoeuvring/departing landfill site dominant and intermittent. Tractor idling on weighbridge 1346-1351, 30 m from SLM. Rusting vegetation significant. Excavator audible at low level at 200 m. Traffic noise from SW significant.
NSL1	1418-1448	49	Landfill not audible. Rustling vegetation significant. Traffic noise from SW. Local car x1.

Table I-7: Noise monitoring of Proposed Waste Recovery Facility

Location	Time	$L_{eq,30mins}$ dB(A)	Comments
N9	10.45	45.4	Dominant noise sources include landfill machinery and hovering birds above landfill site. Other noise sources included passing traffic on road to south (R592) and bird song.
N10	11.22	47.2	Dominant noise sources include hovering birds above landfill site and traffic to south on adjacent road (R592). Other noise sources included landfill machinery and birdsong.
N11	12.00	46.7	Dominant noise sources include hovering birds above landfill site and traffic to south on adjacent road (R592). Other noise sources included landfill machinery and birdsong. Activity within the existing amenity site was also audible at this location.
N12	12.42	69.4	Dominant noise sources include traffic on adjacent road (R592). 118 vehicles were recorded to pass the noise monitor during the survey period. Hovering birds above landfill site were audible and contributed to noise levels.

Further noise monitoring, taking into account the new waste recovery facility was conducted on 18th April, 2007. Results ranged from 45.4 dB(A) to 69.4 dB(A). The highest noise level measured was 69.4 dB which was recorded at station N12 located near the main road (R592). Noise levels here were significantly affected by traffic using the road and 118 vehicles were recorded during the 30 minute period.

Based on the results of the latest noise surveys, noise onsite is not an issue. Monitoring of noise will continue as specified by the licence with the development of the facility and additional points, N9 to N12, will be monitored to take into account the extension of the site. It is not expected that the activities from the proposed waste facility will adversely impact on noise emissions onsite.

Attachment I.7: Assessment of Ecological Impacts and Mitigation Measures

A report was prepared by Roger Goodwillie and Associates in February 1999 (attached here) to determine the impact of the site on the ecology of the area. The report concluded that at that time, there was slight evidence of habitat damage on the adjacent land and that the effluent discharged to the stream was causing eutrophocation on the bankside vegetation and deoxygenation of the water. It also suggests that better management and facilities to treat leachate onsite will reduce the impact on downstream habitats. These measures have been adopted

Document Amendment Record

Client:	**Cork County Council**
Project:	**West Cork Waste Management Facilities**
Title:	**Baseline Noise Surveys**

Project Number: 3127			**Document Ref:** 3127 Noise Report		
		AA	MMcK	DG	8-05-07
Revision	**Purpose / Description**	**Originated**	**Checked**	**Authorised**	**Date**
		TOBIN Patrick J. Tobin & Co. Ltd.			

Table of Contents

1 INTRODUCTION

Cork County Council is proposing to develop waste management facilities at 4 No. locations in West Cork. TOBIN Consulting Engineers have been commissioned by Cork County Council to carry out baseline noise monitoring at 4 No. Council premises to establish existing noise levels at these sites.

The site locations are described as follows:

- Existing waste recycling facility at Skibbereen
- Site adjacent to landfill and recycling facility at Derryconnell
- Greenfield site at Bantry
- Existing waste recycling facility at Dunmanway

This report details the results of all noise monitoring surveys that were carried out at the 4 No. Council premises.

2 NOISE MONITORING SURVEY

The noise surveys were completed between the 18th and 19th of April, 2007. Weather conditions during monitoring were dry with a calm to slight breeze. (The recorded wind speed at nearest Synoptic Station (Valentia Observatory) was 1.44m/s on 18/04/07 and 1.39m/s on the 19/04/07). The following conditions were adhered to in undertaking the survey:

- Measurement of noise levels from the works was undertaken using Type 1 instruments.
- Cognisance was taken of the EPA's 'Environmental Noise Survey Guidance Document' 2003.
- The survey was carried out in accordance with ISO 1996 Acoustics - Description and Measurement of Environmental Noise: Parts 1/2/3.

The noise monitoring locations at each site are described overleaf in Table 1.

Table 1 Noise monitoring Locations

Site	Location	Description
Skibbereen	SN –N1	Eastern site boundary
Skibbereen	SN –N2	North-western site boundary adjacent the site entrance
Skibbereen	SN –N3	South-western site boundary
Derryconnell	DL –N1	Eastern boundary of the proposed site
Derryconnell	DL –N2	South-eastern boundary of the proposed site
Derryconnell	DL –N3	Southern boundary of the proposed site
Derryconnell	DL –N4	At existing site entrance adjacent R592 road
Bantry	BY – N1	North-eastern boundary of proposed site
Bantry	BY – N2	South-eastern boundary of the proposed site
Bantry	BY – N3	Adjacent a residence to the south-western boundary of the proposed site
Bantry	BY – N4	Adjacent a residence to the south of the proposed site
Dunmanway	DY – N1	North-western boundary of the proposed site
Dunmanway	DY – N2	North-eastern boundary of the proposed site
Dunmanway	DY – N3	South-western boundary of the proposed site
Dunmanway	DY – N4	Adjacent a residence outside the site boundary to the southwest
Dunmanway	DY – N5	South-eastern boundary of the proposed site
Dunmanway	DY – N6	Adjacent a residence outside the site boundary to the southeast

Skibbereen
This site is located to the immediate north of Skibbereen town centre. It is an existing bring site open to the public. The noise surveys were carried out during operational hours.

Derryconnell
This site is located to the south west of Ballydehob town in the townland of Derryconnell. On these premises there is an existing operating landfill and a bring centre. The noise surveys were carried out during operational hours.

Bantry
This site is located to the immediate east of Bantry Enterprise Centre. It is currently poor agricultural ground with a newly built road running along the western boundary from the site entrance. This road is currently used by a local farmer to enter the adjacent farmland.

Dunmanway
This site is located to the east of Dunmanway town centre. It is located to the immediate north of the existing Dunmanway bring site which Cork County Council operate. The site is currently waste ground and used to store larger waste materials such as pipes and road signs. It is also used as a carpark for worker's vehicles and machinery.

3 INSTRUMENTATION USED

The following instrumentation was used in the baseline survey:

- One Larson Davis 824 Precision Integrating Sound Level Analyser/Data logger with *Real-Time* Frequency Analyser Facility
- Wind Shields Type: Larson Davis 2120 Windscreen
- Calibration Type: Larson Davis Precision Acoustic Calibrator Model CAL200.

4 MEASUREMENT PROCEDURE

Noise surveys were carried out between the 18th and 19th April 2007. Measurements were taken over 30 minute intervals at the each of the four locations (see Appendix 1). All the environmental noise analysers had data logging facilities set on real-time, the logged data was later downloaded via a personal computer using software.

At each noise measurement point the Sound Level Meter (SLM) was mounted on a tripod so that the microphone was maintained at 1.5 metres above ground level and at least 3.5 metres from any potential noise reflecting surfaces. All noise monitoring is carried out in accordance with ISO 1996 Part 1 (Description and Measurement of Environmental Noise – Part 1: Basic Quantities and Procedures). All acoustic instrumentation was calibrated

before and after the survey (calibration level 114 dB at 1000 Hz) and no drift calibration was observed.

The equipment was manned throughout the sampling intervals and comments were recorded in order to aid the interpretation of data.

At each site location the following data is recorded:

- $L_{(A)eq}$: Equivalent Continuous A-weighted Sound Level. The continuous steady noise level, which would have the same total A-weighted acoustic energy as the real fluctuating noise measured over the same period of time
- $L_{(A)10}$: The noise level that is equalled or exceeded for 10% of the measurement period
- $L_{(A)90}$: The noise level that is equalled or exceeded for 90% of the measurement period, also known as the 'background noise level'
- $L_{(A)max}$: The instantaneous maximum sound level recorded over the sample period
- $L_{(A)min}$: The instantaneous minimum sound level recorded over the sample period

5 RESULTS OF NOISE SURVEY

The results of the noise surveys are given in Tables 2-5. Monitoring locations are indicated on Drawing No. 2528-2616 A.

Table 2 Background Noise Monitoring Results at Skibbereen

Date	Location	Time	$L_{eq,30mins}$ dB(A)	$L_{90,30mins}$ dB(A)	$L_{10,30mins}$ dB(A)	L_{min} dB(A)	L_{max} dB(A)	Comments
18th April 07	SN- N1	8.04-8.34h	51.2	42.3	54.0	38.1	73.3	Dominant noise sources included traffic on the adjacent road to the west of the site and birdsong. Other noise sources included distant traffic to the east and north east of the site and occasional dog barking.
18th April 07	SN- N2	9.19-9.49h	62.3	45.4	66.2	40.6	84.2	Dominant noise sources included traffic on the adjacent road to the west and birdsong. Other noise sources included vehicles entering the site to use the waste facilities.
18th April 07	SN- N3	8.41-9.11h	63.7	46.3	68.4	41.5	79.4	Dominant noise sources included traffic on the adjacent road to the west, cars entering the site to use the waste facilities and birdsong. Other noise sources included occasional dog barking and vehicles at adjacent premises.

Table 3 Background Noise Monitoring Results at Derryconnell

Date	Location	Time	$L_{eq,30mins}$ dB(A)	$L_{90,30mins}$ dB(A)	$L_{10,30mins}$ dB(A)	$L_{min,}$ dB(A)	$L_{max,}$ dB(A)	Comments
18th April 07	DL-N1	10.45-11.15h	45.4	38.7	48.8	34.2	62.2	Dominant noise sources included landfill machinery and hovering birds above the landfill site. Other noise sources included passing traffic on the road to south (R592) and bird song.
18th April 07	DL-N2	11.22-11.52h	47.2	40.4	50.2	33.4	68.6	Dominant noise sources included hovering birds above the landfill site and traffic to south on adjacent road (R592). Other noise sources included landfill machinery and birdsong.
18th April 07	DL-N3	12.00-12.30h	46.7	40.5	49.7	35.1	64.0	Dominant noise sources included hovering birds above the landfill site and traffic to south on adjacent road (R592). Other noise sources included landfill machinery and birdsong. Activity within the existing amenity site was also audible at this location.
18th April 07	DL-N4	12.42-13.12h	69.4	40.4	72.4	33.0	92.5	Dominant noise sources included traffic on adjacent road (R592). Hovering birds above the landfill site were also audible.

Table 4 Background Noise Monitoring Results at Bantry

Date	Location	Time	$L_{eq,30mins}$ dB(A)	$L_{90,30mins}$ dB(A)	$L_{10,30mins}$ dB(A)	L_{min} dB(A)	L_{max} dB(A)	Comments
18th April 07	BY- N1	14.00-14.30h	40.9	32.6	45.2	31.7	54.9	Dominant noise sources included passing traffic on road to the south of the site and birdsong. Occasionally farm animals in adjacent fields and construction activity to the distant north were audible.
18th April 07	BY- N2	14.42-15.12h	47.0	33.3	51.0	31.9	64.9	Dominant noise sources included passing traffic on adjacent road to the south of the site and birdsong. Construction activity to the northeast and traffic was audible.
18th April 07	BY- N3	15.19-15.49h	54.7	34.0	56.4	31.7	77.3	Dominant noise sources included passing traffic on the adjacent road and traffic entering/exiting the Enterprise Centre. Birdsong in surrounding vegetation and a barking dog also contributed to noise levels.
18th April 07	BY- N4	15.57-16.27h	65.8	32.8	63.4	31.7	90.7	Dominant noise source was from passing traffic. Birdsong and human speech were also audible.

Table 5 Background Noise Monitoring Results at Dunmanway

Date	Location	Time	L_{eq}, dB(A)	L_{90}, dB(A)	L_{10}, dB(A)	L_{min} dB(A)	L_{max} dB(A)	Comments
19th April 07	DY- N1	9.00-9.30h	47.7	37.2	49.1	34.1	79.8	Dominant noise sources included machinery to south of site inside existing bring site, and traffic passing on adjacent road. Other noise sources included birdsong, machinery exiting the site, traffic to distant east in Dunmanway town and occasionally a dog barking.
19th April 07	DY- N2	9.35-10.05h	43.6	35.1	46.0	33.4	70.9	Dominant noise sources included traffic passing on adjacent road to south of site, construction activity to the distant east and birdsong. Other noise sources included machinery entering / exiting the site and occasional traffic to the north.
19th April 07	DY- N3	10.51-11.21h	51.3	35.9	51.4	32.7	73.5	Dominant noise source was from members of the public using the existing bring centre, vehicle movement within site and birdsong. Traffic passing on roads to the north and south of the site was audible and contributed to recorded noise levels.
19th April 07	DY- N4	12.08-12.38h	55.4	43.0	58.2	38.3	80.6	The dominant noise source was a construction site opposite the residence. Noise sources included vehicle movement, voices and a radio. Frequent passing traffic on the adjacent road and birdsong also contributed to noise levels.

Table 5 (continued) Background Noise Monitoring Results at Dunmanway

Date	Location	Time	$L_{eq,30mins}$ dB(A)	$L_{90,30mins}$ dB(A)	$L_{10,30mins}$ dB(A)	L_{min} dB(A)	L_{max} dB(A)	Comments
19th April 07	DY- N5	10.14-10.44h	42.6	37.1	45.1	34.8	65.1	The dominant noise sources included birdsong and an engine running to the east of the residence. Occasional traffic on the road to the south of site, vehicles entering / exiting the site and over-flying aircraft were also audible.
19th April 07	DY- N6	11.30-12.00h	62.6	38.7	61.9	35.4	87.3	The dominant source of noise was from passing traffic on the adjacent road. Bring centre activity, activity in surrounding premises and birdsong were also audible.

6 DISCUSSION OF RESULTS

6.1 SKIBBEREEN

Table 2 presents the results of the noise survey at Skibbereen. The noise monitoring locations are described in Table 1 and indicated on Drawing No. 2528-2670 A.

Noise Monitoring Location 1

At SN-N1 the Leq was 51.2 dB(A). The dominant source of noise was from passing traffic on the adjacent roads to the west and east. Site activities were occasionally audible due to members of the public using the bring centre facilities, i.e. vehicles entering and exiting the site. Other noise sources included constant birdsong and occasionally a dog barking. The background noise level (L_{A90}) recorded at SN-N1 was 42.3dB(A).

Noise Monitoring Location 2

The Leq at SN -N2 was 62.3 dB(A). The dominant noise source at SN -N2 was from passing traffic on the adjacent road to the west. Site activities were audible due to members of the public using the bring centre facilities, i.e. vehicles entering and exiting the site. The background noise level (L_{A90}) recorded at N2 was 45.4 dB(A).

Noise Monitoring Location 3

At SN -N3 the Leq was 63.7 dB(A). The dominant noise source was from passing traffic on the adjacent road to the west. Site activities were audible due to members of the public using the bring centre facilities, i.e. vehicles entering and exiting the site. The background noise level (L_{A90}) recorded at SN -N3 was 46.3 dB(A).

6.2 DERRYCONNELL

Table 3 presents the results of the noise survey at Derryconnell. The noise monitoring locations are described in Table 1 and indicated on Drawing No. 2528-2616 A.

Noise Monitoring Location 1

At DL-N1 the Leq was 45.4 dB(A). The dominant noise source at DL-N1 was from landfill activities to the north including hovering birds. Other sources of noise included passing traffic on the R592 and birdsong. The background noise level (L_{A90}) recorded at DL –N1 was 38.7dB(A).

Noise Monitoring Location 2

The Leq at DL-N2 was 47.2 dB(A). The dominant noise sources at this location were the

hovering birds above the landfill site and passing traffic on the R592. Landfill machinery and birdsong from within surrounding vegetation also contributed to noise levels. The background noise level (L_{A90}) recorded at DL –N2 was 40.4dB(A).

Noise Monitoring Location 3

At DL-N3 the Leq was 46.7 dB(A). The dominant noise sources at this location were the hovering birds above the landfill site and passing traffic on the R592. Birdsong from within the surrounding vegetation was also audible. At DL-N3 the existing bring centre facilities generated audible noise as members of the public disposed of their waste. At DL-N3 the background noise level (L_{A90}) recorded was 40.5 dB(A).

Noise Monitoring Location 4

At DL-N4 the Leq was 69.4 dB(A). The dominant noise source at this location was passing traffic on the R592 and 118 passing vehicles were recorded during this monitoring period. The hovering birds over the landfill site were also audible. At DL-N4 the background noise level (L_{A90}) recorded was 40.4 dB(A).

6.3 BANTRY

Table 3 presents the results of the noise survey at Bantry. The noise monitoring locations are described in Table 1 and indicated on Drawing No. 2528-2650 A.

Noise Monitoring Location 1

At BY-N1 the Leq was 40.9 dB(A). The dominant noise source at BY-N1 was from passing traffic on the adjacent road to the south. Occasional traffic at the Enterprise Centre, farm animals in the surrounding fields, birdsong and construction activity to the distant north were audible. At BY-N1 the background noise level (L_{A90}) recorded was 32.6 dB(A).

Noise Monitoring Location 2

The Leq at BY-N2 is 47.0 dB(A). The dominant noise source at BY-N2 was from passing traffic on the adjacent road to the south. Occasional traffic at the Enterprise Centre, birdsong and construction activity to the northeast were audible. At BY-N2 the background noise level (L_{A90}) recorded was 33.3dB(A).

Noise Monitoring Location 3

At BY-N3 the Leq was 54.7dB(A). The dominant noise source at this location was the passing traffic on the adjacent road and vehicles entering and exiting the Enterprise Centre. 19 vehicles were recorded entering and exiting the Enterprise Centre during the monitoring period. Other noise sources included a dog barking at the adjacent residence

and birdsong. At BY-N3 the background noise level (L_{A90}) recorded was 34.0dB(A).

Noise Monitoring Location 4

At BY-N4 the Leq was 65.8dB(A). The dominant noise source at this location was the passing traffic. 47 vehicles were recorded passing during this monitoring period. Birdsong and human speech contributed to noise levels. At BY-N4 the background noise levels (L_{A90}) recorded were 32.8 dB(A).

6.4 DUNMANWAY

Table 5 presents the results of the noise survey at Dunmanway. The noise monitoring locations are described in Table 1 and indicated on Drawing No. 2528-2630 A.

Noise Monitoring Location 1

At DY-N1 the Leq was 47.7dB(A). The dominant noise sources at this location were machinery movement within the site, traffic on the adjacent road to the south and traffic to the east in Dunmanway town centre. Other sources of noise included birdsong and occasionally a distant dog barking. At DY-N1 the background noise levels (L_{A90}) recorded were 37.2 dB(A).

Noise Monitoring Location 2

At DY-N2 the Leq was 43.6 dB(A). The dominant noise source at this location was the passing traffic on the adjacent road to the south, construction activity to the east and birdsong. Traffic passing on a road to the north of the site was also audible. At DY-N2 the background noise levels (L_{A90}) recorded were 35.1dB(A).

Noise Monitoring Location 3

At DY-N3 the Leq was 51.3dB(A). The dominant noise sources at this location were occasional machinery movement within the site and activity at the existing bring centre. Birdsong was also audible throughout the monitoring period. At DY-N3 the background noise levels (L_{A90}) recorded were 35.9 dB(A).

Noise Monitoring Location 4

At DY-N4 the Leq was 55.4 dB(A). DY-N4 is located in a field to the east of the residence. The dominant noise source at this location was from a construction site opposite the residence including vehicle movement, voices and a radio. Other audible noise sources included passing vehicles, occasional activity at the residence and birdsong. At DY-N4 the background noise levels (L_{A90}) recorded were 43.0 dB(A).

Noise Monitoring Location 5

At DY-N5 the Leq was 42.6 dB(A). DY-N5 is located to the southeast of the site at the closest point to the adjacent residence. A mature hedgerow forms the boundary between the site and the residence. The dominant noise sources at this location were from birdsong in the hedgerow and an engine running to the east of the residential premises. Other noise sources were vehicle movement within the site, vehicle movement within the adjacent premises and activity in the existing bring centre. At DY-N5 the background noise levels (L_{A90}) recorded were 37.1dB(A).

Noise Monitoring Location 6

At DY-N6 the Leq was 62.6 dB(A). DY-N6 is located outside the site boundary to the southeast of the site at the front of the adjacent residence. The dominant noise sources at this location were from passing traffic on the adjoining road. 56 vehicles were recorded passing during this monitoring period. Activity at the bring site and activity in the surrounding premises were also audible. At DY-N6 the background noise levels (L_{A90}) recorded were 38.7 dB(A).

7 CONCLUSION

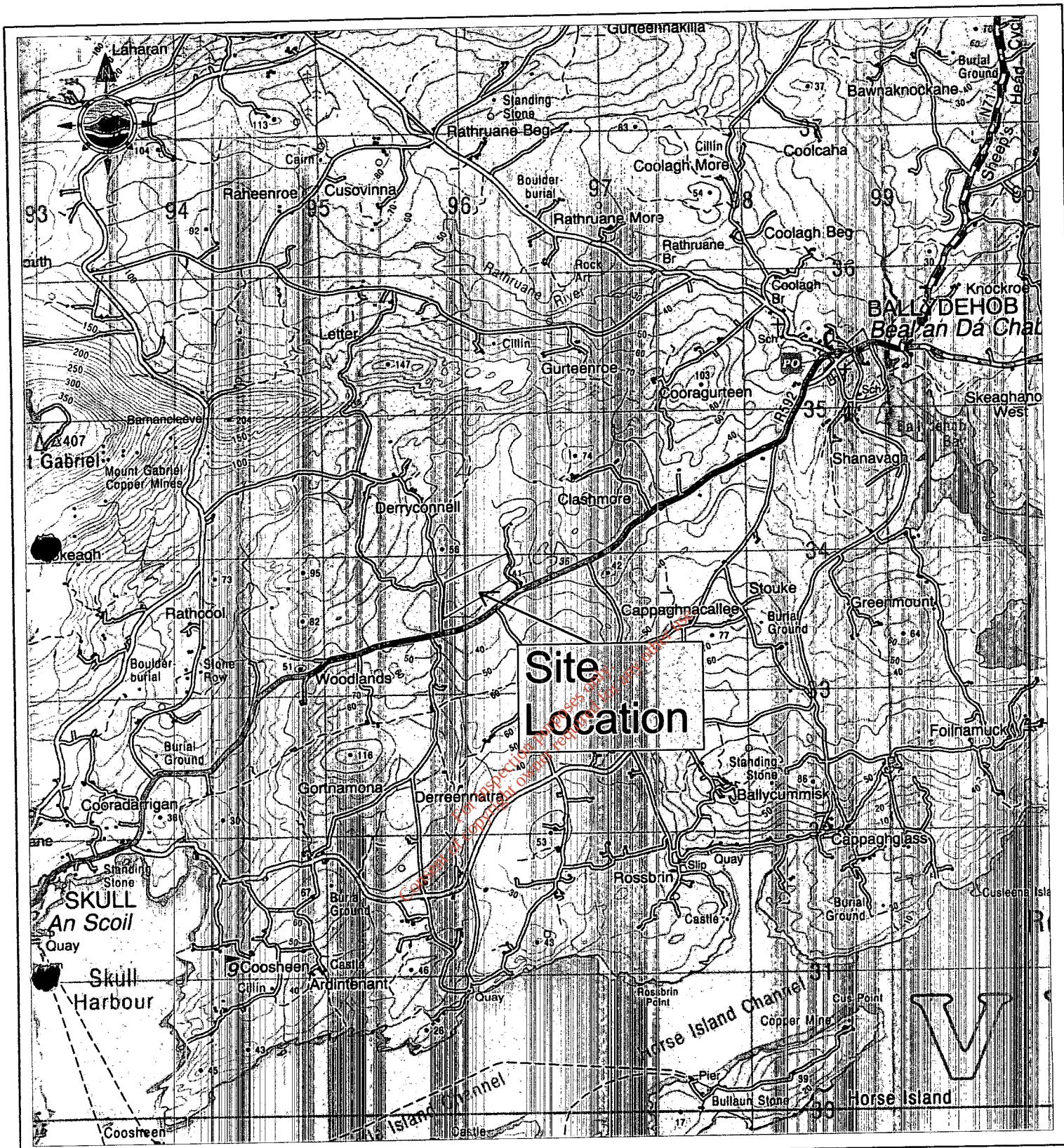
Noise monitoring was carried out at the proposed location of 4 No. waste management facilities in West Cork (Skibbereen, Derryconnell, Bantry and Dunmanway) on behalf of Cork County Council. Where existing facilities existed, monitoring was undertaken during operational hours. Noise monitoring was also undertaken at the nearest noise sensitive receptor to each site where appropriate.

At present there are no statutory limits for environmental noise levels, however, the EPA recommend that ideally, on sites of industrial nature or similar, if the total noise level from all sources is taken into account, the noise level at sensitive locations should be kept below an L(A)eq value of 55dB(A) by daytime (08.00 to 22.00) and 45 dB(A) at night-time (22.00 to 08.00).

The results of the noise surveys show that some of the monitoring locations have a higher L(A)eq value than 55dB(A) but these noise levels are predominantly influenced by external noise sources, specifically passing traffic.

At all monitoring locations background noise emissions (L_{A90}) are much lower than 55dB(A) and are typical of a rural to semi- urban setting with dominant noise sources including traffic, work activities and birdsong.

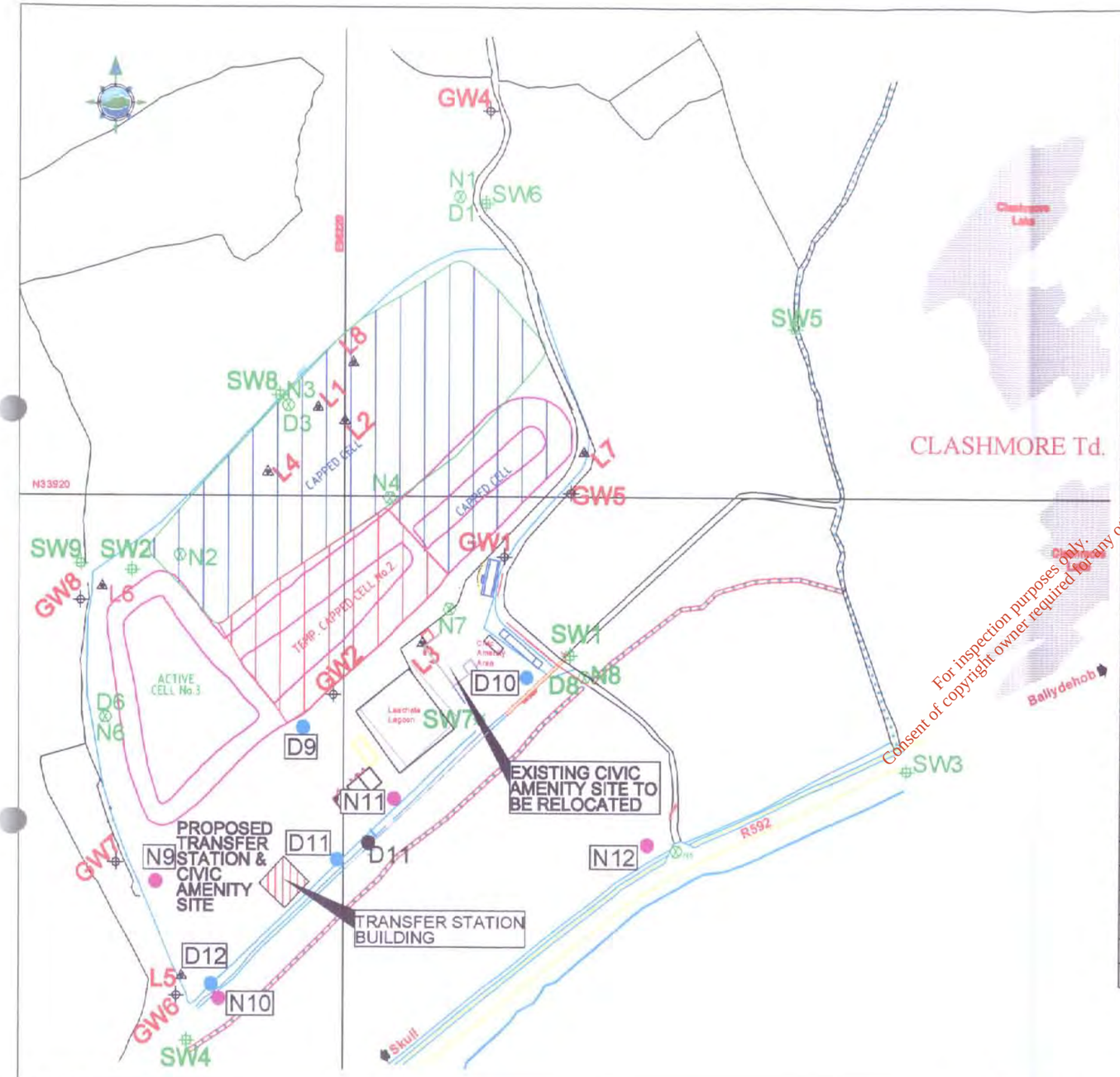
APPENDIX 1 – SITE LOCATION



Client: CORK COUNTY COUNCIL	Prepared by: JO'B	TOBIN Consulting Engineers, Bedford Place, Howley's Quay, Lower Shannon Street, Co. Limerick, Ireland. tel: +353-(0)61-415757 fax:+353-(0)61-409378 e-mail: info@tobin.ie www.tobin.ie
Project: WEST CORK WASTE MANAGEMENT FACILITIES	Checked: C.D	TOBIN Patrick J. Tobin & Co. Ltd.
	Date: MAR '07	
Title: DERRYCONNELL SITE LOCATION MAP	Project Director: B.DOWNES	
	Scale @ A4: NTS	

Drawing No. 2528-2605

Issue: A



(A) COMBINED LEACHATE AND GAS MONITORING.		
L1	96206 E	33964 N
L2	96220 E	33957 N
L3	96260 E	33847 N
L4	96181 E	33932 N
L5	96138 E	33683 N
L6	96097 E	33875 N
L7	96342 E	33942 N
L8	96225 E	33986 N
(B) SURFACE WATER		
SW1	96335 E	33841 N
SW2	96112 E	33883 N
SW3	96507 E	33785 N
SW4	96140 E	33651 N
SW5	96450 E	34003 N
SW6	96292 E	34064 N
SW7	96290 E	33810 N
SW8	96187 E	33970 N
SW9	96086 E	33886 N
(C) NOISE AND DUST		
N1, D1	96279 E	34068 N
N2	96136 E	33890 N
N3, D3	96191 E	33965 N
N4	96243 E	33919 N
N5	96390 E	33745 N
N6, D6	96098 E	33811 N
N7	96274 E	33864 N
N8, D8	96343 E	33831 N
(D) GROUNDWATER		
GW1	96302 E	33890 N
GW2	96215 E	33822 N
GW3	96225 E	33986 N
GW4	96294 E	34110 N
GW5	96336 E	33922 N
GW6	96135 E	33674 N
GW7	96104 E	33739 N
GW8	96085 E	33868 N

LEGEND

- N12 ● NOISE MONITORING POINTS (ADDITIONAL)
- D12 ● DUST MONITORING POINTS (ADDITIONAL)
- SW9 ⌖ SURFACE WATER MONITORING POINTS (EXISTING)
- GW8 ⌖ GROUND WATER MONITORING POINTS (EXISTING)
- L6 ▲ LEACHATE MONITORING POINTS (EXISTING)
- D6, N6 ⊗ DUST & NOISE MONITORING POINTS (EXISTING)

ADDITIONAL MONITORING POINTS

(C) NOISE AND DUST		
N9	096124 E	033730 N
N10	096156 E	033672 N
N11	096246 E	033770 N
N12	096375 E	033748 N
D9	096199 E	033805 N
D10	096314 E	033831 N
D11	096217E	033741 N
D12	096152 E	033679 N

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

Issue	Date	Description	By	Chkd.
A	JUNE 2007	WASTE LICENCE APPLICATION	JO'B	CD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES

Title: DERRYCONNELL MONITORING POINT LOCATIONS

Prepared by: JO'B
Checked: C.D
Date: JUNE '07
Project Director: B.DOWNES
Scale @ A3: 1:2500

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Drawing No.: 2528-2616

Issue: A

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environmental consultants

Project	
	Dust survey at 4 no. proposed waste management facilities in West Cork
Client	
	Tobin Consulting Engineers

Project ref	Report no	Client ref	Pages
07003	07003.1	John O'Brien	9

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Report format 2006 v1

Date	Rev	Status	Prepared by	Issued
26.04.07	0	Issue to client	Damian Brosnan	26.04.07

Contents

1. Introduction

1.1 DixonBrosnan Environmental Consultants were commissioned by Tobin Consulting Engineers (the client), on behalf of Cork County Council, to undertake a dust deposition survey at four sites in West Cork. The sites are located at Bantry, Derryconnell (Ballydehob), Dunmanway and Skibbereen. The site locations are indicated in appendix 2. Cork County Council proposes to develop a waste management facility at each site.

1.2 The objective of the survey was to record current background dust deposition rates at the sites, prior to development.

2. Survey locations

2.1 Four monitoring stations were specified by the client at each site, located around the boundaries. The stations are listed in table 1 and indicated in the drawings in appendix 2.

Table 1. Dust monitoring stations.

Site	Tobin ref.	Location	DixonBrosnan analysis ref.
Bantry	D1	SW boundary	07003.B1
	D2	N boundary	07003.B2
	D3	S boundary	07003.B3
	D4	E boundary	07003.B4
Derryconnell	D9	N point of development area	07003.L1
	D10	Existing civic amenity area, NE of development area	07003.L2
	D11	SE boundary of development area	07003.L3
	D12	S point of development area	07003.L4
Dunmanway	D1	NW corner	07003.D1
	D2	NE corner	07003.D2
	D3	SE corner	07003.D3
	D4	SW corner	07003.D4
Skibbereen	D1	NE corner	07003.S1
	D2	SE corner	07003.S2
	D3	NW corner	07003.S3
	D4	SW corner	07003.S4

3. Methodology

3.1 As specified by the client, monitoring was undertaken in accordance with *Standard Method VDI2119 Measurement of dustfall: Determination of dustfall using Bergerhoff Instrument (Standard method), German Engineering Institute (Technical Instructions on air quality control, TA Luft, 1986).* The survey was conducted by Damian Brosnan on behalf of DixonBrosnan.

3.2 *Standard Method VDI2119* provides for the measurement of dust deposition by collection of dust in jars over approximately 30 days. The jars are supported 1.5-2.0 m above ground level by a 'Bergerhoff' gauge. A Bergerhoff gauge was set up at each of the 16 monitoring stations at the start of the survey period. Local conditions at each station are summarised in table 2.

Table 2. Local conditions are each site.

Site	Conditions
Bantry	Greenfield/brownfield site. No local obstacles.
Derryconnell	D9 close to existing landfill operations and directly adjacent to access track. D10 located adjacent to existing civic amenity site. D11 and D12 within 5 m of hedgerows.
Dunmanway	D1 and D2 exposed. D3 and D4 adjacent to existing Council yard. Obstacles present within 5 m, including vegetation.
Skibbereen	D1 and D3 within 5 m of walls/vegetation. All stations adjacent to chicken wire fencing.

3.3 The survey was commenced on Wednesday 14.03.07. Collected dust samples were removed on Thursday 12.04.07 following an exposure period of 29 days. Samples were recovered from all 16 locations. No evidence of tampering was evident at any of the stations.

3.4 On collections, the sample jars were sealed and stored overnight in chilled dark containers. All samples were dry on collection. The samples were delivered on Friday 15.03.07 to Bodycote Consultus Ltd. in Cork for measurement of gravimetric dust deposition.

4. Weather

4.1 The 2006-2007 winter period was exceptionally wet in Ireland. Precipitation levels began to reduce around mid-March. Towards the end of March, weather conditions began to improve. Dry and sunny conditions returned for the first time in 2007 in April. Thus the survey period coincided with the end of the wet spell and the onset of pleasant weather. Conditions throughout the survey period are summarised in table 3.

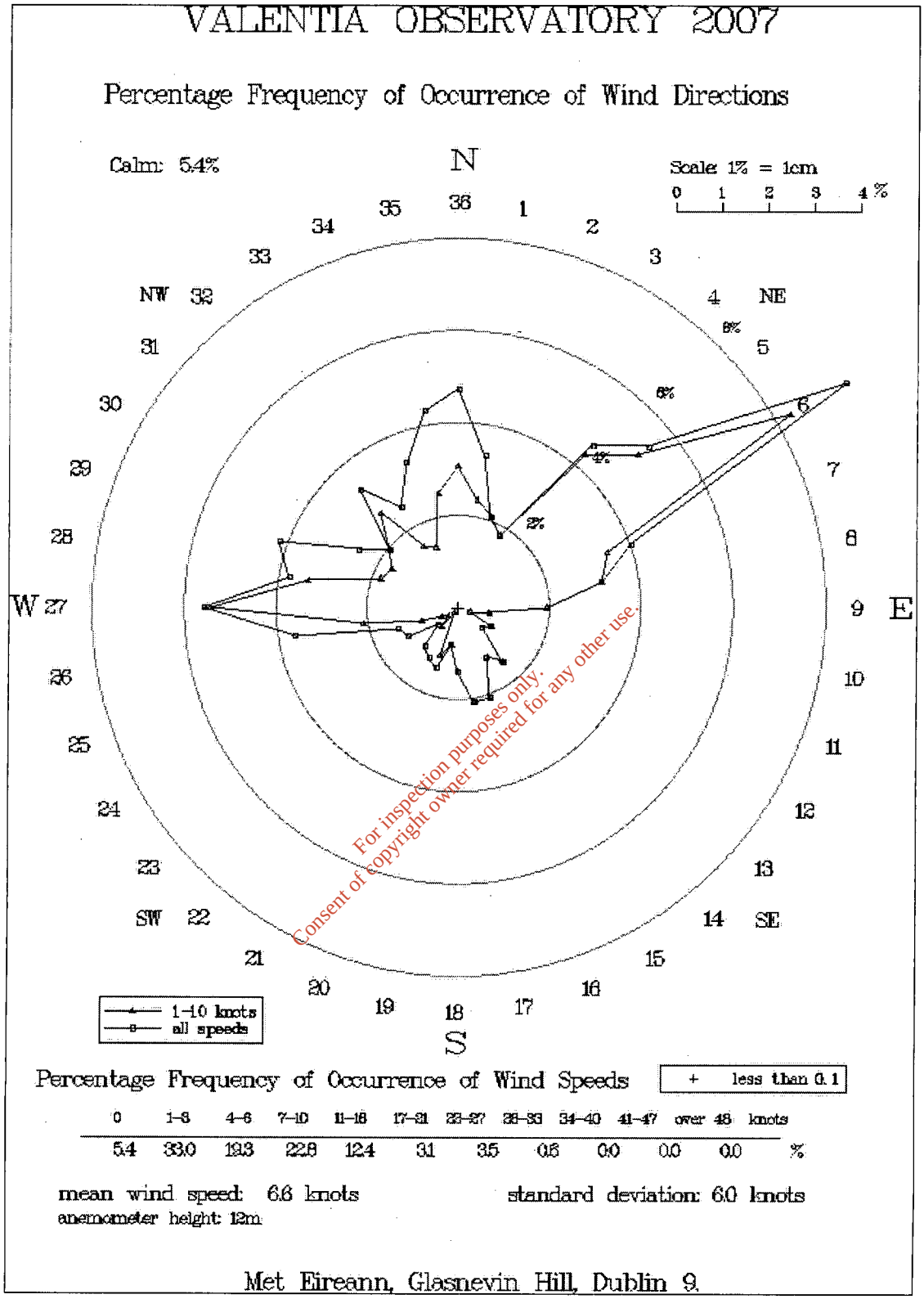
Table 3. Weather summary during survey period.

Week	Weather
March 12-17	Dry for most of week. SW breezes.
March 19-24	Rain at start of week. Dry thereafter. Fresh NW breezes throughout week.
March 26 – April 1	Light showers midweek. Dry otherwise. Light-moderate breezes all week, usually N or E.
April 2-8	Dry and sunny all week. NE breezes, often fresh.
April 9-15	Dry and sunny all week. Generally calm, with some light S/SW breezes.

4.2 Met Eireann maintains a number of synoptic weather stations throughout the country. While the closest station is located at Cork Airport, it is considered that weather data recorded at Valentia, Co. Kerry, provide a more representative assessment of conditions in West Cork due to their similar southwest coastal geography. Data obtained from the Valentia station indicate that there were 9 wet days (on which greater than 1 mm precipitation fell) during the survey period, all of which arose in March, chiefly during the first 10 days.

4.3 Wind conditions throughout the survey period are summarised by the wind rose recorded at Valentia (figure 1). The rose indicates that northeast breezes predominated during the survey period, with some westerly and northerly breezes on occasion.

Figure 1. Valentia Observatory wind rose 14.03.07 – 12.04.07.



5. Dust deposition results

5.1 The condition of the recovered samples, as noted in the field prior to sealing, is indicated in table 4. Results of analysis undertaken by Bodycote Consultus Ltd. is presented in table 5. Table 5 also includes the calculated daily dust deposition level. The Bodycote Consultus certificate of analysis is presented in appendix 1.

Table 4. Condition of samples on collection.

Site	Station	Condition
Bantry	D1	OK. Some small insects.
	D2	OK. Some small insects.
	D3	OK. Some small insects.
	D4	OK. Some small insects.
Derryconnell	D9	OK. V. high dust deposition on gauge and bottle. D1 adjacent to landfill entrance. Rotary drilling at 25 m at time of collection also generating some dust.
	D10	OK. Some insects.
	D11	OK.
	D12	OK.
Dunmanway	D1	OK
	D2	OK. Small insects in sample.
	D3	OK.
	D4	OK.
Skibbereen	D1	OK. Some small insects.
	D2	OK. Some small insects.
	D3	OK. Heavy dust deposition noted.
	D4	OK.

Table 5. Results of analysis and calculated dust deposition levels.

Site	Station	Analysis ref.	Gravimetric dust g	Dust deposition level* mg/m²/day
Bantry	D1	07003.B1	0.0263	146
	D2	07003.B2	0.0407	226
	D3	07003.B3	0.0201	111
	D4	07003.B4	0.0307	170
Derryconnell	D9	07003.L1	0.1054	585
	D10	07003.L2	0.0233	129
	D11	07003.L3	0.0224	124
	D12	07003.L4	0.0233	129
Dunmanway	D1	07003.D1	0.0183	101
	D2	07003.D2	0.0114	63
	D3	07003.D3	0.0186	103
	D4	07003.D4	0.0231	128
Skibbereen	D1	07003.S1	0.0279	155
	D2	07003.S2	0.0229	127
	D3	07003.S3	0.0565	313
	D4	07003.S4	0.0323	179

*Calculated as follows:

Dust deposition = Gravimetric dust / area of collection vessel opening / exposure period = mg/m²/day

Internal diameter of collection vessel opening = 89 mm

Exposure period = 29 days

6. Conclusions

6.1 Dust deposition levels recorded ranged from 63 mg/m²/day (site D2 Dunmanway) to 585 mg/m²/day (site D10 Derryconnell).

6.2 Generally values were within the expected range with the exception of the exceptionally low and high values noted above. It is noted that the value of 585 mg/m²/day detected at Derryconnell is significantly higher than the 350-mg/m²/day limit often specified by EPA licences for waste facilities. However the elevated result may be partially caused by rotary drilling in the vicinity of the monitoring station.

7. Appendices

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environmental consultants

Appendix 1: Bodycote Consultus Ltd. certificate of analysis

Bodycote CONSULTUS
Health Sciences
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Tel: +353 (0)21 48 222 88 Fax: +353 (0)21 48 560 42 Email: info.consultus@bodycote.com

Customer ID : DB

MR DAMIAN BROSNAN
DIXON,BROSNAN
SHRONAGREEHY
KEALKILL
BANTRY
CO CORK

No. Of Samples : 10
Sample Type : Dustfall
Order Number : N/A

Report No : 6324P
Date of Receipt : 13/04/07
Delivery Mode : Hand
Date testing Initiated : 17/04/07
Date of Report : 23/04/07
Sample Condn. on Receipt : Satisfactory

TEST REPORT

Sample No : 6324P1
Customer Ref. : 07003.B1

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0263	g	GER.ENG.IN.VDI2119

Sample No : 6324P2
Customer Ref. : 07003.B2

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0407	g	GER.ENG.IN.VDI2119

Sample No : 6324P3
Customer Ref. : 07003.B3

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0701	g	GER.ENG.IN.VDI2119

Sample No : 6324P4
Customer Ref. : 07003.B4

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0307	g	GER.ENG.IN.VDI2119

Sample No : 6324P5
Customer Ref. : 07003.D1

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0183	g	GER.ENG.IN.VDI2119

Continued

Bodycote CONSULTUS laboratories
Health Sciences
Bodycote Consultus Ltd, Glenmire Industrial Estate, Glanmire, Co.Cork, Ireland
Tel: +353 (0)21 48 222 80 Fax +353 (0)21 48 663 42 Email: info.consultus@bodycote.com

Customer ID : DB

MR DAMIAN BROSNAN
DIXON BROSNAN
SHRONAGREEHY
KEALKILL
BANTRY
CO CORK

Report No : 6324P

Date of Receipt : 13/04/07
Delivery Mode : Hand
Date testing Initiated : 17/04/07
Date of Report : 23/04/07
Sample Condn. on Receipt : Satisfactory

No. Of Samples : 16
Sample Type : Dustfall
Order Number : N/A

TEST REPORT

Sample No : 6324P6
Customer Ref. : 07003.D2

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0114	g	GER.ENG.IN.VDI2119

Sample No : 6324P7
Customer Ref. : 07003.D3

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0186	g	GER.ENG.IN.VDI2119

Sample No : 6324P8
Customer Ref. : 07003.D4

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0231	g	GER.ENG.IN.VDI2119

Sample No : 6324P9
Customer Ref. : 07003.L1

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.1054	g	GER.ENG.IN.VDI2119

Sample No : 6324P10
Customer Ref. : 07003.L2

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0233	g	GER.ENG.IN.VDI2119

Continued.....

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Customer ID : DB

MR DAMIAN BROSNAN
DIXON BROSNAN
SHRONAGREEHY
KEALKILL
BANTRY
CO CORK

No. Of Samples : 16
Sample Type : Dustfall
Order Number : N/A

Report No : 6324P

Date of Receipt : 13/04/07
Delivery Mode : Hand
Date testing Initiated : 17/04/07
Date of Report : 23/04/07
Sample Condn. on Receipt : Satisfactory

TEST REPORT

Sample No : 6324P11
Customer Ref. : 07003.L3

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0279	g	GER.ENG.IN.VDI2119

Sample No : 6324P12
Customer Ref. : 07003.L4

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0233	g	GER.ENG.IN.VDI2119

Sample No : 6324P13
Customer Ref. : 07003.S1

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0279	g	GER.ENG.IN.VDI2119

Sample No : 6324P14
Customer Ref. : 07003.S2

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0229	g	GER.ENG.IN.VDI2119

Sample No : 6324P15
Customer Ref. : 07003.S3

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0565	g	GER.ENG.IN.VDI2119

Continue

Bodycote Health Sciences

CONSULTUS

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Customer ID : DB

MR DAMIAN BROSNAN
DIXON,BROSNAN
SHRONAGREEHY
KEALKILL
BANTRY
CO CORK

No: Of Samples : 16
Sample Type : Dustfall
Order Number : N/A

Report No : 6324P
Date of Receipt : 13/04/07
Delivery Mode : Hand
Date testing initiated : 17/04/07
Date of Report : 23/04/07
Sample Condn. on Receipt : Satisfactory

TEST REPORT

Sample No : 6324P16
Customer Ref. : 07003.S4

Test	Test Description	Test Result	Unit	Method
281	DUSTFALL VALUE (bergerhoff)	0.0323	g.	GER.ENG.IN.VDI2119

Authorised By:

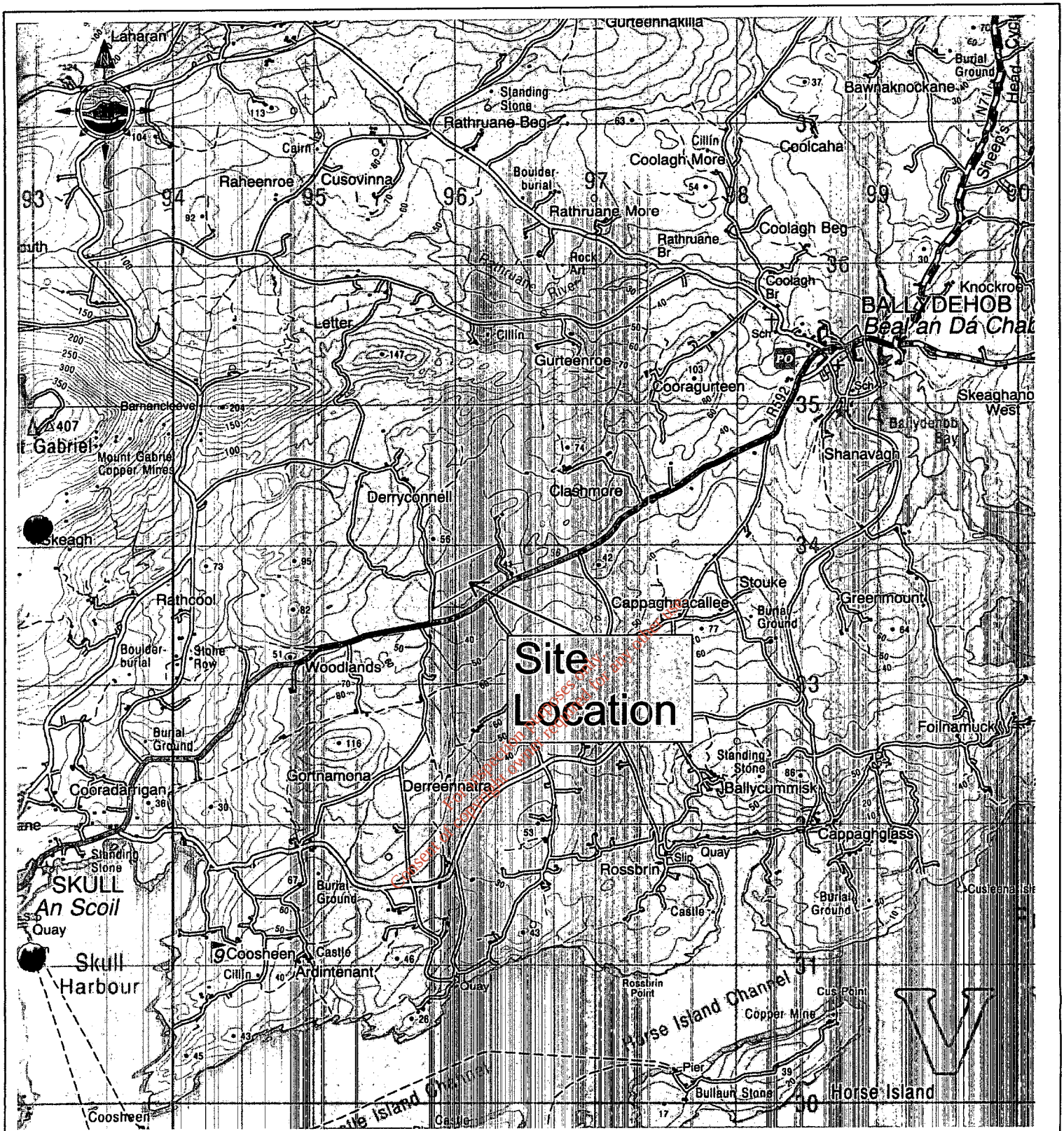
Dr Teresa Twomey
Manager Env. Services Div.

DixonBrosnan
environmental consultants

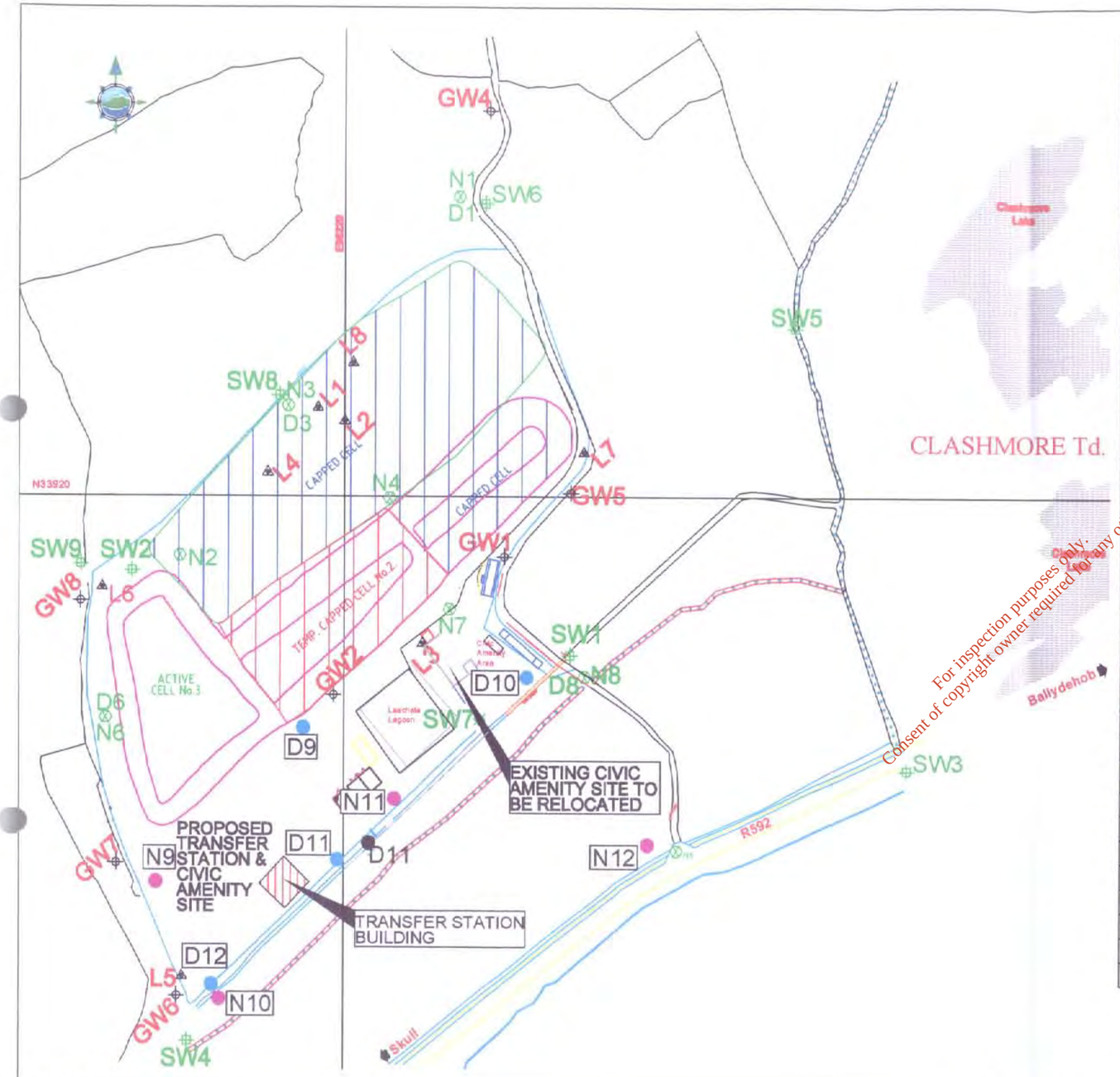
Appendix 2: Site location maps and drawings

List of drawings prepared by Tobin Consulting Engineers

Drawing no.	Title
2528-2601	Bantry Site Location Map
2528-2650	Monitoring Point Locations
2528-2603	Dunmanway Site Location Map
2528-2630	Monitoring Point Locations
2528-2605	Derryconnell Site Location Map
2528-2616	Derryconnell Monitoring Point Locations
2528-2607	Skibbereen Site Location Map
2528-2670	Monitoring Point Locations



Client: CORK COUNTY COUNCIL	Prepared by: JO'B	TOBIN Consulting Engineers, Bedford Place, Howley's Quay, Lower Shannon Street, Co. Limerick, Ireland. tel: +353-(0)61-415757 fax:+353-(0)61-409378 e-mail: info@tobin.ie www.tobin.ie
Project: WEST CORK WASTE MANAGEMENT FACILITIES	Checked: C.D	TOBIN Patrick J. Tobin & Co. Ltd.
	Date: MAR '07	
Title: DERRYCONNELL SITE LOCATION MAP	Project Director: B.DOWNES	
	Scale @ A4: NTS	Drawing No. 2528-2605
		Issue: A



(A) COMBINED LEACHATE AND GAS MONITORING.		
L1	96206 E	33964 N
L2	96220 E	33957 N
L3	96260 E	33847 N
L4	96181 E	33932 N
L5	96138 E	33683 N
L6	96097 E	33875 N
L7	96342 E	33942 N
L8	96225 E	33986 N
(B) SURFACE WATER		
SW1	96335 E	33841 N
SW2	96112 E	33883 N
SW3	96507 E	33785 N
SW4	96140 E	33651 N
SW5	96450 E	34003 N
SW6	96292 E	34064 N
SW7	96290 E	33810 N
SW8	96187 E	33970 N
SW9	96086 E	33886 N
(C) NOISE AND DUST		
N1, D1	96279 E	34068 N
N2	96136 E	33890 N
N3, D3	96191 E	33965 N
N4	96243 E	33919 N
N5	96390 E	33745 N
N6, D6	96098 E	33811 N
N7	96274 E	33864 N
N8, D8	96343 E	33831 N
(D) GROUNDWATER		
GW1	96302 E	33890 N
GW2	96215 E	33822 N
GW3	96225 E	33986 N
GW4	96294 E	34110 N
GW5	96336 E	33922 N
GW6	96135 E	33674 N
GW7	96104 E	33739 N
GW8	96085 E	33868 N

LEGEND

- N12 ● NOISE MONITORING POINTS (ADDITIONAL)
- D12 ● DUST MONITORING POINTS (ADDITIONAL)
- SW9 ⌖ SURFACE WATER MONITORING POINTS (EXISTING)
- GW8 ⌖ GROUND WATER MONITORING POINTS (EXISTING)
- L6 ▲ LEACHATE MONITORING POINTS (EXISTING)
- D6, N6 ⊗ DUST & NOISE MONITORING POINTS (EXISTING)

ADDITIONAL MONITORING POINTS

(C) NOISE AND DUST		
N9	096124 E	033730 N
N10	096156 E	033672 N
N11	096246 E	033770 N
N12	096375 E	033748 N
D9	096199 E	033805 N
D10	096314 E	033831 N
D11	096217E	033741 N
D12	096152 E	033679 N

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

Issue	Date	Description	By	Chkd.
A	JUNE 2007	WASTE LICENCE APPLICATION	JO'B	CD

Client: CORK COUNTY COUNCIL

Project: WEST CORK WASTE MANAGEMENT FACILITIES

Title: DERRYCONNELL MONITORING POINT LOCATIONS

Prepared by: JO'B
Checked: C.D
Date: JUNE '07
Project Director: B.DOWNES
Scale @ A3: 1:2500

TOBIN Consulting Engineers,
Bedford Place, Howley's Quay,
Lower Shannon Street, Co. Limerick, Ireland.
tel: +353-(0)61-415757
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e-mail: info@tobin.ie www.tobin.ie

Drawing No.: 2528-2616

Issue: A

Comhairle Chontae Chorcaí
Cork County Council

Old Mill,
Kent Street,
Clonakilty,
Co. Cork.

Tel. No: (023) 33328
Fax No: (023) 34315

Web: http://www.corkcoco.com/

Regina Campbell,
Inspector,
Environmental Protection Agency,
Inniscarra,
Co. Cork

27th May 2005.

Your Ref: 98-1/CL07RC

Re: Derryconnell Landfill Site WL 89-1, indirect emissions to groundwater in 2004.

I refer to your letter dated 14/02/05 regarding the above and attach report prepared by O'Neill Groundwater Engineering.

I trust that this is to the satisfaction of the Agency.

Liam Dromey,
Senior Executive Engineer.

O'Neill
ground water engineering

Monday, 23 May 2005

Carl Dixon,
Dixon.Brosnan Environmental Consultants,
7 The Cedars,
Bridewood,
Ovens,
Co. Cork,
Ireland

Derryconnell Landfill

Estimate Of Annual And Cumulative Quantity Of Indirect Emissions To Ground Water 2004

1.0 Introduction

2.0 O'Neill ground Water Engineering Ltd (OGE) were requested by Carl Brosnan of Dixon.Brosnan Environmental Consultants to provide technical assistance with the calculation of the emissions to ground water element of the Annual Environmental Return for the Derryconnell Landfill site.

3.0 Previous Emissions To Ground Water have been compiled by MCOS. The 2001 report summarised the geology and hydrogeology. Field work had been undertaken involving drilling and packer tests. The 2002 and 2003 reports have been described by Dixon.Brosnan as being similar. The two monitoring wells GW4 and GW5 were the principal sources of hydrogeological information. The conclusion was that ground water originating from the unlined portion of the site was having a greater impact on surface water quality than the ground water suggesting that contaminated ground water was moving along the interface between the overburden and the low permeability Old Red Sandstone.

4.0 Dixon.Brosnan provided hydrochemical results for ground waters and a table summarising the monthly predicted volume of leachate generated. A description of the predictive calculation was given and the discrepancy between the actual volume of leachate removed versus the predicted amount was

noted. There is a detailed summary of the surface water hydrochemistry for the year which provides a useful insight to the movement of water around the site.

5.0 The section on ground water summarises the hydrochemistry. The interpretation is within the context of whether any of the parameters exceeded the relevant limits. The emissions to ground water are qualified rather than quantified.

Approach

6.0 OGE propose to calculate the emissions to ground water through the unsaturated zone based on the modified form of the water balance equation. Emissions to ground water are being considered as a separate input to any movement off site of contaminated ground water as a plume. The volume of leachate produced as a plume from beneath the unlined portion of the landfill is a separate calculation. The input parameters to calculate emissions to ground water through the unsaturated zone are :

- P_e – Percolation below the base of the landfill
- P – Precipitation
- E_p – Actual evapotranspiration
- R_1 – Run in. (Surface run-off from surrounding land which discharges on to the landfill)
- R_2 – Shallow infiltration intercepted by layers of low permeability within the landfill and discharge laterally to drainage ditches which flow away from the landfill i.e. interflow
- R_3 – Surface runoff from the landfill
- L_d – Rate of liquid disposals to the landfill
- E_d – Actual evaporation from liquid disposals
- ΔS – change in moisture storage within the landfill and its cover

7.0 These parameters are summarised in the following equation :

$$P_e = P - E_p + (R_1 - R_2 - R_3) + (L_d - E_d) \pm \Delta S$$

8.0 The resultant percolation below the base of the landfill is multiplied by the area of the unlined landfill to give the total volume of emissions to ground water from that portion of the site.

Variables Used In The Percolation Equation

9.0 Runoff of surface water onto the landfill is not known but is considered to be very small as the landfill is surrounded by drainage ditches. Similarly runoff from the landfill is not known but as the landfill is not as yet fully capped, the volume is likely to be small.

10.0 It is not known if there is any disposal of liquid wastes on the site.

11.0 The change in storage over a year is assumed to be zero.

12.0 The precipitation (P) for Derrycomnell has been based on the 30 year (1961 to 1990) long term average for the rain gauge at Bandon Vocational School. The value adopted is **1265mm** per annum.

13.0 The 30 year (1961 to 1990) long term average for potential evaporation (PE) is based on the data from the synoptic station at Cork Airport. The value is 511.9mm. The actual evapotranspiration (E_p) is taken as **90%** of the potential evaporation as this takes account of the field constant. The adopted value for AE is **461mm**.

14.0 The annual amount of precipitation available for percolation through the unlined section of the landfill is :

1265 – 461 = 804mm

15.0 The area of the unlined section of the landfill is given as 16125m². Therefore the average amount of effective precipitation over the unlined section of the landfill is **12,965m³**.

16.0 The reported volume of leachate removed from the landfill during 2004 is reported to be 13,955m³. The difference of approximately 1000m³ between the predicted percolation volume through the unlined section of the landfill and the actual volume of liquid removed could be accounted for by run off from surrounding lands onto the landfill site. It could also be accounted for by through flow of ground water from upgradient of the landfill.

17.0 It is possible to calculate the potential through flow of ground water (Q) through the base of the unlined portion of the landfill based on certain assumptions.

18.0 The inputs and the adopted values are :

- Permeability of landfill material (K) of $9e^{-3}$ m/d
- Saturated thickness (B) of landfill taken to be 1m
- Width of landfill (W) is estimated to be 220m wide orthogonal to the direction of ground water flow
- Hydraulic gradient (*i*) across the site is estimated to be 0.003.

19.0 The annual ground water flow through the saturated portion of the landfill per unit thickness of saturated landfill material is :

$$Q = K \times B \times W \times i$$

$$Q = 9e^{-3} \times 1 \times 220 \times 0.005 = 5e^{-3}\ m^3/d$$

20.0 This value can be multiplied up by 365.25 to give the annual through flow of ground water of $2m^3$, per year, per unit of saturated landfill material, through the base of the unlined portion of the landfill.

21.0 This is a very small flow which would not account for the remaining $1000m^3$ of leachate removed from the landfill.

Conclusion

22.0 The emissions to ground water through the base of the unlined section of the landfill over the calendar year 2004 is an estimated $12,965m^3$.

Yours Sincerely

EurGeol Shane O'Neill PGeo Dip. CECLA

Landfill at Derryconnell, Schull, Co. Cork

EIS
Flora & Fauna

Report for M.C.O'Sullivan & Co. Ltd

February 1999

Roger Goodwillie & Associates
Lavistown House
Kilkenny
Tel/Fax 056-65145

1. INTRODUCTION

The site consists of undulating heathland with patches of blanket bog set amongst outcrops of rock. The rock type is the Old Red Sandstone of Ordovician age but some of the exposed beds are of fine texture and have a slatey cleavage. This is particularly noticeable where artificial channels have been dug to take leachate from the landfill. An abandoned farm occurs to the north-east and its few fields stretch away further in this direction. They are grazed on an extensive basis by wandering sheep and some cattle but the gorse and other scrub is tending to spread as animal numbers are low.

The current landfill is based on a small quarry and extends over a peaty area running south-west from the access road.

Habitats that occur on site and in the adjacent area may be listed as blanket bog, heath, acid grassland, tree clumps and disturbed soil (see map). Their vegetation will be described in this order with accounts of the vertebrate fauna grouped where appropriate.

The site was visited in February 1999 so this report has no first-hand information of summer birdlife. The survey method was basically a walkover covering the surroundings and the site itself insofar as it was accessible.

2. HABITATS

2.1 Blanket bog

The bog would be described as flushed rather than ombrotrophic since there is much outcropping rock and moving water. The vegetation reflects this with a mixture of bog and fen species. Basically the whole area is sloping, made up of a haphazard series of steps where water accumulates and becomes colonised by peat-forming species. A typical pond has a central area of aquatic species surrounded by *Sphagnum* mosses and rushes. Tracing an imaginary transect from the centre would give the following list

Potamogeton polygonifolius	bog pondweed
Hypericum elodes	bog St John's wort
Juncus bulbosus	bulbous rush
Sphagnum cuspidatum	moss
Sphagnum auriculatum var *auriculatum*	,,
S.recurvum	,,
S.subnitens	,,
Cladonia uncialis	reindeer lichen
S.auriculatum var *inundatum*	moss
S.palustre	,,
Aulacomnium palustre	,,
Cladonia portentosa	reindeer lichen
Narthecium ossifragum	bog asphodel
Eriophorum angustifolium	bog cottonn
Juncus acutiflorus	sharp-flowered rush
J.effusus	soft rush
Polytrichum commune	moss
Carex panicea	carnation sedge
Myrica gale	bog myrtle
Molinia caerulea	moorgrass
Succisa pratensis	devilsbit

Areas where water moves more noticeably have *Eleogiton fluitans* (floating clubrush), *Glyceria fluitans* (sweet grass), *Ranunculus flammula* (lesser spearwort), *R.hederaceus* (ivy-leaved crowfoot), *Eleocharis multicaulis* (spikerush) and *Carex viridula* (yellow sedge) while there is a limited amount of *Equisetum fluviatile* (water horsetail) and *Carex rostrata* (bottle sedge) in deeper water near the stream that flows from the landfill area. Some patches of grassland also occur which flood occasionally and consist of *Agrostis stolonifera* (creeping bent), *Anthoxanthum odoratum* (sweet vernal grass) and *Cirsium palustre* (marsh thistle).

Water flow through the site is NE-SW though there is a watershed on the old road to the north of the north-east corner of the site. This takes a small flow down to Clashmore Lough through rush-filled channels. The lake itself has little open water and is a sheet of floating fen plants including *Equisetum fluviatile* (water horsetail), *Carex rostrata* (bottle sedge), *Myrica gale* (bog myrtle), *Menyanthes trifoliata* (bogbean), *Typha latifolia* (bulrush) and *Phragmites australis* (reed). Groups of willows *Salix cinerea*, *S.aurita* are gathered at its edges.

As the peat becomes drier away from water *Erica tetralix* (cross-leaved heath), *Calluna vulgaris* (heather), *Sphagnum capillifolium* and *Pleurozium schreberi* (mosses), *Blechnum spicant* (hard fern) and *Salix cinerea* (grey willow) begin to colonise it and form the transition to the heath community described below.

2.2 Heath

This vegetation is developed over small areas as the outcrops of rock are limited in extent. *Ulex europaeus* (common gorse) and *U.gallii* (autumn gorse) are the most noticeable plants though there is a little *Cytisus scoparius* (broom) in places. These are joined by the more tolerant bog plants, *Calluna vulgaris* (ling heather), *Molinia caerulea* (moorgrass) and *Erica cinerea* (bell heather) and also by

Pteridium aquilinum	bracken
Rubus fruticosus	bramble
Jasione montana	sheepsbit
Carex binervis	green-ribbed sedge
Potentilla erecta	tormentil
Nardus stricta	mat grass
Galium saxatile	heath bedstraw
Hylocomium splendens	a moss
Hypnum jutlandicum	,,
Cladonia fimbriata	a lichen
C.floerkeana	,,
C.furcata	,,

2.3 Acid grassland

A small area of grassland occurs on sloping land north-west of the landfill between bushes of gorse. There is *Agrostis capillaris* (common bent), *Anthoxanthum odoratum* (sweet vernal grass), *Festuca rubra* (red fescue) and *Molinia caerulea* (moorgrass) with some *Digitalis purpurea* (foxglove), *Cirsium palustre* (marsh thistle), *Hypochaeris radicata* (catsear) and *Potentilla erecta* (tormentil).

The abandoned pastures near the farm are somewhat similar though there is some *Holcus lanatus* (Yorkshire fog), *Poa trivialis* (rough-stalked meadowgrass), *Rumex acetosa* (sorrel), *Taraxacum officinale* (dandelion), *Cerastium fontanum* (mouse-ear) and *Bellis perennis* (daisy) mixed in, some of them persisting from a time of higher nutrient status.

2.4 Woodland

Coniferous woodland (sitka spruce) has been planted to the south and west of the site.. On the south side the trees are scattered and form part of the heathy communities whereas to the west a dense plantation exists. Generally there is *Molinia caerulea* (moorgrass) or

Pteridium aquilinum (bracken) in any gaps between the trees but ferns and woodland mosses are beginning to expand in the plantation.

A further tree group occurs beside the abandoned farm house where a few large pines, probably *Pinus radiata* join *Quercus petraea* (oak) and *Fraxinus excelsior* (ash). Willows and *Fuchsia* add to the cover at ground level but there is little development of woodland conditions.

2.5 Fauna - semi-natural habitats

The most conspicuous vertebrate is the common frog which had laid eggs extensively in the pools when visited. Conditions seemed suitable also for lizard, pygmy shrew and occasional hare though evidence of only the last one was found. Badgers had been visiting the farmland north-east of the landfill and there were signs of fox also. Rabbits were not seen but may be expected to occur at low density.

The birds seen associated with the heathland habitat were meadow pipit, robin, blackbird, wren, snipe, kestrel and raven though the latter is partly attracted by the landfill. In summer stonechat and willow warbler would be expected and there could be grasshopper warbler in the more bushy areas.

2.6 Disturbed soil

The landfill area is made up of piles of refuse and some cover material, especially at the eastern end. Some planting of shrubs - mostly *Escallonia* - has been done near the marginal fence but otherwise there is a small selection of ruderal species (weeds) that are more commonly seen in tilled soil. Frequent species are

Sonchus asper	prickly sow thistle
S.oleraceus	smooth sow thistle
Senecio jacobaea	ragwort
Cirsium vulgare	spear thistle
C.arvense	creeping thistle
Sinapis arvensis	charlock
Urtica dioica	nettle
Rumex obtusifolius	broad-leaved dock
R.acetosella	sheep's sorrel
Potentilla reptans	cinquefoil
Anagallis arvensis	scarlet pimpernel
Sagina procumbens	pearlwort
Cardamine hirsuta	bittercress

Coronopus didymus	swine's cress
Geranium dissectum	cut-leaved cranesbill
Cerastium fontanum	mouse-ear

2.7 Fauna - landfill

The mammal fauna associated with the landfill includes brown rat and fox which is seen sporadically. Otherwise birds predominate with corvids the most frequent type. When visited there were jackdaw (120), rook (50), hooded crow (24), magpie (4) and raven (4) though the latter were flying around the tree group for most of the time. A pair could nest there. Additional species at the landfill were starling (200) and pied wagtail (3) and there is some use by black-headed gull (c100) in winter, usually in stormy weather.

In autumn there are likely to be small flocks of redpoll and linnet with occasional goldfinch when there are weed seeds available.

3. EVALUATION

The landfill occurs in an area of heathland typical of many parts of the peninsula with no species of special interest (Declan O'Donnell, pers.comm.). The pool vegetation is well developed though with changes in drainage and nutrition caused by the development the communities are probably not completely natural. Most of the birdlife is of opportunistic species attracted by the waste disposal and there is no evidence of rare species like merlin.

3.1 Designations

No part of the site has been designated as of special interest as an Area of Scientific Interest or Natural Heritage Area. The nearest major pNHA is Roaringwater Bay (#101) with the heathland on parts of the shore and islands. However there is a small site beside the Schull road to the west of the landfill - Dereennatra cutover (#2105) - which is listed for the occurrence of *Eriophorum gracile* (a bog cotton). This species is protected under the Flora Protection Order 1987.

4. IMPACT OF LANDFILL

The terrain in which the landfill is sited gives rise to isolated pockets of peat held in a rocky matrix without much groundwater movement. This means that the nutrients produced by the decomposition of waste do not become dispersed widely except by the streams which drain the site itself. There is slight evidence of habitat damage on the adjacent land except for a little scattering of waste and very local enrichment by birds. The effluent stream however does have current impacts of eutrophication on the bankside vegetation and deoxygenation in the water itself.

The impact of future and possibly larger scale operation on flora and fauna is likely to be similar to the current landfill. While better management will reduce the impacts felt by the surroundings the larger amount of refuse deposited would tend to increase them. Facilities for treating the leachate will tend to stabilise or reduce this impact on the downstream habitat.

Attachment J: Accident Prevention and Emergency Response

Contents

Attachment J: Accident Prevention and Emergency Response

The Emergency Response Procedures for the existing Derryconnell Facility as agreed with the agency are attached here (part of the Environmental Management System). The plan will be updated to include the new development with one year of issue of the licence.

Attachment K: Remediation, Decommissioning, Restoration and Aftercare

Contents

Attachment K.1: Remediation, Decommissioning, Restoration and Aftercare

Attachment K.1(a) – Cessation of Activity

In the event of cessation of activities at the Derryconnell Landfill Cork County Council will ensure that the site is restored to the highest quality. As waste is only processed and stored in the Waste transfer and Civic Amenity , there are no plans to decommission this section of the site in the foreseeable future.

Landfill

A Residuals Management Plan was prepared and submitted to the Agency as part of the Environmental Management System in October 2001. The Plan follows the guidelines of the EPA's Landfill Manual on 'Restoration and Aftercare'.

It is estimated that the landfill will close in early 2008 and that Restoration Operations will then commence.

The landfilling of waste at the facility is likely to continue until early 2008 with the restoration of the site then commencing. Following the filling of cells, they will be capped according to EPA recommendations. The final capping of the landfill will consist of:

- 150mm of topsoil
- 850mm subsoil
- 300mm drainage layer having a minimum hydraulic conductivity of $1x10^{-4}$m/s
- 600mm compacted mineral layer with a permeability of less than $1x10^{-9}$m/s (or a geosythetic layer)
- 300mm gas collection layer of natural material (or a geosynthetic layer)

Once the cells are filled, they will be permanently capped to the specifications agreed with the Agency within 12 months. Following closure, the cells will be restored complying with the following measures:

- The storage of soils shall be in such a manner so as to maximise the preservation of the soil structure for future use within the facility. Any soils removed during site preparation other than those reused for site construction purposes shall be stored at a suitable location
- Any depressions arising after profiling shall be rectified by the emplacement of suitable capping or restoration material
- No material or object that is incompatible with the proposed restoration of the facility shall be present within one metre of the final soil surface levels.
- Where tree planting is proposed to be carried out above waste-filled areas, a synthetic barrier shall be used to augment the clay cap. Topsoil and subsoil depths shall be a minimum of 1m unless otherwise agreed in advance with the Agency.

Monitoring of groundwater, surface water, leachate and gas will continue onsite following closure based on the following frequencies.

Table K-1: Monitoring during Restoration and Aftercare

Medium	Parameter	Frequency	Monitoring Locations
Surface water	Level Composition	Biannually Biannually	SW1, SW3, SW4, SW7
Groundwater	Level Composition	Quarterly Quarterly	GW1, GW2, GW3, GW4, GW5
Landfill Gas	Gas emissions	Biannually	L1, L2, L3, L4, L5, L6, L7
Leachate	Level Composition	Monthly Biannually	L1, L2, L3, L4, L5, L6, L7
Stability and Settlement		Annually	Monitoring points to be established

Regular inspection (minimum biannually) of the following equipment is proposed during the aftercare period and maintenance will be carried out as required:

- Leachate pumps
- Leachate level monitoring
- Continuous surface water monitoring system
- Gas flarestack and abstraction system
- Fencing and gates

Cork County Council will ensure that funds are available for the restoration and aftercare of the Derryconnell Waste Facility.

Waste Transfer Station and Civic Amenity Facility

Cork County Council proposes the following closure and restoration measures:

- The equipment used at the site will be removed by Cork County Council
- Portable structures, such as recycling receptacles, will be removed from the site
- Street sweeper vehicles will be employed to clean the site
- Cork County will remove office equipment
- Cork County Council will provide the EPA with at least six months written notice of any intention to close the facility.

Activities in this area of the site are unlikely to result in either groundwater or land contamination as all activities will take place on constructed hardstanding. In the event of decommissioning of the facility, the civic amenity site would not require a special Residual Management Plan.

Attachment L: Statutory Requirements

Contents

Attachment L.1: Section 40(4) WMA

To comply with the requirements of the Waste Management Act 1996 as amended, the activity concerned must comply with Section 40(4) [(a) to (i)].

Section 40(4)(a) of the Waste management Act, 1996 requires that any emissions from the recovery activity in question will not result in the contravention of any relevant standard, including any standard for an environmental medium, or any relevant emission limit value, prescribed under any other enactment.

Noise: Noise emissions may arise from operational plant as well as traffic to and from the site. Compaction operations and traffic movements to and from the site will be limited to normal opening hours and so operations at the facility will not be expected to have a significant impact on existing background noise levels. The standards applicable for noise emissions at the site are as follows: BS5228 (1984 and 1987) 'Noise Control on Construction and Open Sites' Part 1. A noise emission limit of 55 dB(A)L (daytime) and 45 dB(A)L (night time) at locations on the boundary will be used. Monitoring results will be compared against these standards.

A noise monitoring survey is carried out annually around the existing landfill site. Further monitoring points have been added to establish background noise levels at the site of the proposed facility. Results indicate that noise levels are generally below the EPA recommended levels except for one location which is located adjacent to a busy road.

Odour: An odour assessment was conducted in 1999. The model determined that the worst case condition would arise in 2003 at a point 165 metres from the landfill. The predicted odours levels were all below the odour detection limits under this worst case scenario with a minimum safety factor of 2. It identified that the most significant odour problems were likely to arise from three landfill gas pollutants; ethyl mercaptan, hydrogen sulphide and methyl mercaptan which are likely to be emitted from the leachate lagoon. Following this report, a gas flare was installed which reduced the odours emistted from the site. It is unlikely that there will be any additional generation of odours as a result of the proposed waste recovery operations onsite. Recyclable waste received at the facility is unlikely to cause odours.

Dust: Ambient dust monitoring is carried out annually under the current Waste Licence. Further monitoring points were added to measure the effect of the waste recovery facility. A 30-day average dust deposition rate of 350 mg/m^2/day is recommended at the boundary of the site. All the results from the latest period of monitoring were found to be below the recommended deposition rate except for D9 which was found to be 585 mg/m^2/day (possibly due to drilling onsite). Results from regular dust monitoring will be compared against these standards. Further dust monitoring will be carried out as per the agency's recommendations.

Surface Water: Surface water run-off from areas of the facility, will be collected in the surface water drainage system and diverted via a Class 1 full retention separator before discharging to the adjacent river. Constant monitoring will ensure that no emission limits will be breached. If this occurs, the flow will be diverted to the leachate lagoon.

Groundwater: There are no emissions to groundwater from the 3 no. lined cells. Reports indicate that the unlined portion of the landfill is not affecting the groundwater quality. All exposed areas of the proposed waste recovery facility will be covered in hardstanding and all areas used for the storage of liquids or hazardous waste will be fully bunded. For these reasons, will be no emissions to groundwater from the proposed development at the site.

Section 40(4)(b) of the Waste management Act, 1996 requires that the activity concerned will not cause environmental pollution, which is defined as:
"The holding, transport, recovery and disposal of waste in the manner which would to a significant extend endanger human health or harm the environment, and in particular:

a) create a risk to waters, the atmosphere, land, soil, plants or animals
b) create a nuisance through noise, odours or litter

c) *adversely affect the Countryside or places of special interest."*

Monitoring of groundwater, surface water, leachate, landfill gas, noise, dust emissions in addition to ecology have been considered within the scope of this application. No significant environmental impacts were identified, therefore the requirements of Section 40(4)(b) of the Waste Management Act 1996 are deemed to be satisfied.

Section 40(4)(bb) of the Waste management Act, 1996 as amended in 2003 requires that the activity comply with Council Directive 1999/31/EC of the landfill of waste

The site operates and will be developed in accordance with the requirements of the Landfill Directive.

Section 40(4)(c) of the Waste management Act, 1996 requires that the BATNEEC (best available technology not entailing excessive costs) will be implemented to minimise the risk of potential emissions from the activity concerned.

Liquid Emissions: Leachate from the landfill cells is collected in engineered cells, designed in accordance with the Landfill Directive. Following the closure and capping of the cells, leachate generation will decrease significantly. Assessments have shown no significant impact on major watercourses away from the site and the environmental impact will be reduced progressively as the existing site is restored. The BATNEEC principle for modern landfill sites is generally accepted as being designed, operated and closed in accordance with the Landfill Directive.

Air Emissions: Landfill gases generated within the landfilled cells will be flared off in the landfill gas flare on site which will continue to be used following closure and capping of the site. Operational procedures such as the spreading, compaction and covering of wastes also exist to minimise odour and dust emissions from the site in addition to controlling wind blown litter and pests such as flies and vermin.

Section 40(4)(cc) of the Waste management Act, 1996 as amended in 2003 requires that the activity concerned is consistent with the objectives of the relevant waste management plan and will not prejudice measures taken or to be taken by the relevant local authority or authorities for the purpose of the implementation of any such plan.

The proposed site is consistent with the Cork Waste Management Plan prepared in accordance with the Waste Management Act 1996 and The Waste Management (Planning) Regulations 1997. This Waste Management Plan, adopted in 2001, sets out the proposed plan for the following 25 years.

The policy sets out the national targets, which will apply to waste management by local authorities. Included in the new waste recycling targets are:

- Diversion of 50% of overall household waste away from landfill
- Minimum of 65% reduction in biodegradable waste consigned to landfill
- Recycling of at least 35% of municipal waste

These national targets are to be achieved within fifteen years of development of The Waste Management Plan, and are intended to fulfil our obligations under EU legislation. According to Cork County's Waste Management Plan, the average household recycling rate for the Cork County in 2003 was only 11.4%. However, the introduction of a new Recycling Centre, such as the proposed Derryconnell Civic Amenity Facility, will help to achieve the above targets.

Section 40(4)(d) of the Waste management Act, 1996 requires that if the applicant is not a local authority, the corporation of a borough that is not a county borough, or the council of an urban district, subject to subsection (8), he or she is a fit and proper person to hold a waste licence.

Not applicable as the applicant is a Local Authority.

Section 40(4)(e) of the Waste management Act, 1996 requires that financial provisions are provided for the facility.

Cork County Council will provide funding to develop, operate and restore the Landfill, Transfer Station and Civic Amenity Facility in accordance with legislation. The necessary personnel will be employed and trained to manage the facility in compliance with legislation.

Section 40(4)(f) of the Waste management Act, 1996 as amended in 2003 requires that energy will be used efficiently in the carrying on of the activity concerned

The environmental management system for the facility will include the provision for the undertaking of an energy audit. Additionally, energy efficiency has been considered in all aspects of the design of the proposed development.

Section 40(4)(g) of the Waste management Act, 1996 as amended in 2003 requires that any noise from the activity concerned will comply with, or will not result in the contravention of, any regulations under section 106 of the Act of 1992.

Noise standards of 55dB(A)L_{Aeq} (daytime) and 45dB(A)L_{Aeq} (night time) at locations along the boundary will be observed. Consistent monitoring will be conducted and compared to these standards.

Section 40(4)(h) of the Waste management Act, 1996 as amended in 2003 requires that necessary measures will be taken to prevent accidents in the carrying on of the activity concerned and, where an accident occurs, to limit its consequences for the environment,

An Environmental Management System (EMS) has been developed for the installation and Cork County Council will update the plan to incorporate the proposed waste recovery facility in the first year of operation of this facility. The plan was submitted and approved by the Agency in October 2001. It was and will continue to be reviewed annually and submitted to the Agency in the AER.

An Accident and Emergency Response Plan for the existing Derryconnell Facility exists and will be updated to include the proposed development with one year of issue of the licence. Site personnel will be trained in first aid and appropriate emergency equipment provided on site. Emergency response procedure will include a management structure for the dealing with all emergencies on site.

Section 40(4)(i) of the Waste management Act, 1996 as amended in 2003 requires that necessary measures be taken upon the permanent cessation of the activity concerned (including such a cessation resulting from the abandonment of the activity) to avoid any risk of environmental pollution and return the site of the activity to a satisfactory state.

The site will be restored in accordance with the requirements of the Landfill Directive. The capping system will include a landfill gas collection layer with a geosynthetic clay liner, a surface water drainage layer and various sub-soil and topsoil finishing layers. The restored site will be subject to an aftercare period involving environmental monitoring, which will continue whilst the waste management licence is maintained. Following closure of the landfill area, the site will be used as a waste transfer facility where waste will be stored awaiting transfer to another licensed Landfill.

In the event of cessation of activities at the Facility, Cork County Council proposes the following closure and restoration measures:

- The equipment used at the site will be removed by Cork County Council
- Portable structures, such as recycling receptacles, will be removed from the site
- Street sweeper vehicles will be used to clean the site
- Office equipment will be removed
- Cork County Council will provide the EPA with at least six months written notice of any intention to close the facility.

There are no plans to decommission the Facility in the foreseeable future.

Attachment L.2: Fit and Proper Person

This section is not applicable as the applicant, Cork County Council, is a local authority.