

INSPECTORS REPORT
WASTE LICENCE REGISTER NUMBER W030

(1) Summary:

Name of Applicant	Kilkenny County Council
Facility Name(s)	Dunmore Landfill Site
Facility Address	Dunmore, Co. Kilkenny
Description of Principal Activity	Landfill.
Quantity of waste (tpa)	Up to 40,000 tpa
Environmental Impact Statement (EIS) Required	Yes.
Number of Submissions Received	One.
INSPECTOR'S RECOMMENDATION	The proposed decision as submitted to the Board be approved

Notices	Issue Date(s)	Reminder(s)	Response Date(s)
Article 14 (2) (b) (i)	Not Applicable		
Article 14 (2) (b) (ii)	1. 19/06/98 2. 25/08/98		1. 31/08/98 2. 02/12/98
Article 14 (2) (a)	08/03/99		
Article 16	09/03/99		04/05/99 & 20/05/99

Applicant Address	County Hall, John Street, Kilkenny
For Local Authority applicants, is the facility within its own functional area	Yes
Is the facility an existing facility	Yes
Prescribed date for application	Prior to 1 st March 1998.
Date Application received	27 th February 1998.
Confidential Information Submitted	No
Location of EIS in Application	As reply to Article 14(2)(b)(ii) notice of 25 th August 1998

SITE VISITS:

DATE	PURPOSE	PERSONNEL	OBSERVATIONS
27/03/98	Check site notice and site visit.	Donal Howley	Site Notice complies with Article 8 of S.I. 133 of 1997 as amended by S.I. 162 of 1998
22/01/99	Check site notice (including reference to EIS) and site visit.	Donal Howley	Site Notice complies with Article 8 of S.I. 133 of 1997 as amended by S.I. 162 of 1998

(2) Class/Classes of Activity

The class(es) of activities for which the applicant has applied are marked below. The principal activity is indicated by (P).

Waste Management Act, 1996			
THIRD SCHEDULE Waste Disposal Activities		FOURTH SCHEDULE Waste Recovery Activities	
1. Deposit on, in or under land.	X	1. Solvent reclamation or regeneration.	
2. Land treatment, including biodegradation of liquid or sludge discards in soils.	X	2. Recycling or reclamation of organic substances which are not used as solvents.	
3. Deep injection of the soil, including injection of pumpable discards into wells, salt domes or naturally occurring repositories.		3. Recycling or reclamation of metals and metal compounds.	
4. Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons.	X	4. Recycling or reclamation of other inorganic materials.	
5. Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment.	P	5. Regeneration of acids or bases.	
6. Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in this Schedule.		6. Recovery of components used for pollution abatement.	
7. Physico-chemical treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in this Schedule.		7. Recovery of components from catalysts.	
8. Incineration on land or at sea.		8. Oil re-refining or other re-uses of oil.	
9. Permanent storage, including emplacement of containers in a mine.		9. Use of any waste principally as a fuel or other means to generate energy.	
10. Release of waste into a water body (including a seabed insertion).		10. Spreading of any waste on land with a consequential benefit for an agricultural activity or ecological system, including composting and other biological transformation processes.	X
11. Blending or mixture prior to submission to any activity referred to in this Schedule.		11. Use of waste obtained from any activity referred to in a preceding paragraph of this Schedule.	
12. Repackaging prior to submission to any activity referred to in this Schedule.		12. Exchange of waste for submission to any activity referred to in a preceding paragraph of this Schedule.	
13. Storage prior to submission to any activity referred to in this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.		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.	X

Class Description:

Third Schedule;

Class 1 & 5 refer to the operation of the landfill. Class 5 is the principal activity.

Class 2 refers to the deposition of treated de-watered sludges in the landfill.

Class 4 refers to the storage of leachate in leachate holding lagoon and to the acceptance of sewage sludge which is not lime treated for co-disposal with municipal solid waste.

Fourth Schedule;

Class 10 refers to the use of lime treated sewage sludge and the use of Christmas tree shreds as a soil conditioner mixed with topsoil in the reinstatement of the site.

Class 13 refers to the use of collection receptacles for recyclable materials such as glass, cans and textiles.

Activities recommended for licensing:

It is recommended that all of the above activities, for which the applicant has applied for a waste licence, be licensed subject to the requirements of Conditions 1 to 11 of the proposed decision.

(3) Facility Location

Appendix 1 contains a Site Location Map.

The facility is located 5km north of Kilkenny City, approximately 230m west of the N77 Primary National Route from Kilkenny to Castlecomer. The site consists of 8.90 hectares, of which 5.26 hectares was a former sand and gravel pit. The remaining land, 3.64 hectares, is located between the site and the N77. The River Nore runs within 500m of the landfill. The area is rural and there are fifty-one dwellings within a 1000m radius of the site (twelve of which are located to the west of the River Nore and are on city water supply).

(4) Waste Types and Quantities

Total quantities and types of wastes accepted by the facility are shown below.

YEAR	NON-HAZARDOUS WASTE (tpa)	HAZARDOUS WASTE (tpa)	TOTAL ANNUAL QUANTITY OF WASTE (tpa)
1999	28,050	0	28,050

The expected life of the facility and the expected maximum annual tonnage, as of the date of application, are indicated below.

Expected Life of Facility (years)	3.5 (up to end of 2001)
Maximum Annual Tonnage (tpa)	35,000

(5) Activity Summary

Dunmore landfill is in operation since 1989 and is currently Kilkenny County Council's only operational landfill. Landfilling at the facility has consisted of deposition of waste into lined cells from the outset. Non-hazardous waste is disposed of at the facility consisting mostly of household waste, commercial wastes, inert materials, sewage sludge and small quantities of bonded asbestos. There is a weighbridge in operation with a control hut and also a portacabin containing toilet facilities and a canteen. Water supply, for washing purposes only, is provided from a well. Drinking water is brought to the site in individual containers by site personnel. Gas is currently controlled by means of gas vents.

The public are allowed access to the facility where they can deposit their waste in a container located near the site entrance. This container is then emptied at the working face of the working cell at various intervals. Located near this container are receptacles for the collection of recyclable materials, such as; brown, green and clear glass and textiles. CFC gas is also collected from fridges at the site. Other vehicles are weighed and then directed to the working cell. There is a septic tank on site which overflows to the leachate holding lagoon, where it mixes with leachate prior to removal off-site for treatment at the Water Treatment Plant in Purcellsinch. Leachate drains by gravity from the cells to the lagoon.

Monitoring of the facility indicates that some contamination of the groundwater has occurred from the landfill. Conditions included in the proposed decision to mitigate this are identified in Section 7 - *Infrastructure*.

(6) Facility Operation/Management

- **Waste Acceptance Procedures**

Conditions 5.1 & 5.2 control the waste types to be disposed of at the facility. These comprise household waste, commercial waste, sewage sludge, construction & demolition waste and a provision for the acceptance of up to five tonnes of bonded asbestos waste. Hazardous wastes and liquid wastes are prohibited. The facility is open to the general public.

There are no specific Waste Inspection or Waste Quarantine Areas on site. Current practice regarding waste inspection of suspect loads occurs on previously filled but not

completely restored cells. *Condition 5.3* requires the licensee to submit detailed waste acceptance procedures. *Condition 4.7* requires that proposals for a Waste Inspection Area and a Waste Quarantine Area be submitted to the Agency. All wastes shall be checked at the working face to ensure that they comply with the requirements of the licence (*Condition 5.4*).

- **Waste Handling**

Conditions 5.9 & 5.10 govern the provisions for acceptance and disposal of sewage sludge and bonded asbestos at the facility respectively.

- **Nuisance Control**

Condition 6 details the requirements for the control of any potential nuisances on site. *Conditions 5.11 & 5.12* detail requirements for the working area, compaction and the use of daily cover, which minimises the potential odour nuisance, the attraction for birds and vermin, nuisance caused by insects and litter problems.

There are no specific bird control measures at the site, although large flocks of seagulls and crows often visit the site. *Condition 6.2* requires a review of bird control at the site. An annual pest control and maintenance contract is carried out whereby a specialist contractor visits the site eight times per year to control rats and mice. In summer if fly infestation occurs a proprietary insecticide spray is used. Regular commercial depositors whose waste consists of light papers have to bale or bag these loads prior to acceptance at the landfill.

- **Hours of Operation**

The applicant has included the following hours for acceptance of waste; Monday to Friday 8.00 a.m. to 4.30 p.m. and Saturday 8.00a.m. to 12.00 p.m. Any changes in these hours are subject to the prior written agreement of the Agency.

(7) Facility Design

- **Infrastructure**

There are security gates at the site entrance along with security fencing along the frontage of the site with the public road, along the temporary road and on the southern boundary and western corner of Roche's Pit. The remainder of the site boundaries are a combination of existing hedgerows, with some post and wire fencing, 1.2 metre concrete post and rail fencing and the common stone boundary wall with Dunmore Cottage lands. The leachate lagoon is enclosed by a 2 metre high wire mesh fence. *Condition 4.3* requires a review of the site security arrangements.

A 1500 litre, plastic fuel storage tank is provided in a lockable steel container on site. It is located close to the area of operation and is moved as required. *Condition 4.13.1* requires that a proposal for a fuel storage area or for a bunded mobile fuel storage tank be submitted to the Agency.

Traffic control internally on site is achieved by the site layout, with only one open access point off the public road. The weighbridge location facilitates any on site

queuing of vehicles depositing waste at the site. In general the vehicles using the landfill access it along Bleach Road from the Kilkenny side. The road is subject to frequent flooding, and in these instances access is achieved from the north via Heneberry's Cross. Both roads are narrow and have a number of bad bends. Some surfacing of both roads has been undertaken. Kilkenny County Council intend to implement further surfacing and minor improvements of the road from the Heneberry's Cross direction. *Condition 6.4* requires proposals for maintenance/improvements of these access roads.

- **Liner Details**

A brief description of the lining systems used in the various cells are given below;

- (i) Cells 1 to 3 Floor liner comprising two layers of 2mm HDPE liner separated by a layer of polyfelt fabric with a 300mm leachate collection layer over. Bunds and side slopes lined with a single layer of 2mm HDPE liner.
- (ii) Cells 4 to 7 Floor liner comprising a primary liner of 2mm HDPE on 300mm sand layer complete with leak detection drainage system on secondary 2mm HDPE liner. A 300mm leachate collection layer is provided over the primary liner. Bunds and side slopes lined with a single layer of 2mm HDPE liner.
- (iii) Cell 8 Floor liner as per (ii). Bund and side slopes lined with a double layer of 2mm HDPE with a layer of geocomposite drainage material (TNT 600) between the two liners.
- (iv) Cell 9 Floor liner and bund comprising a primary layer of 2mm HDPE on Bentomat on 500mm of clay. A 500mm leachate collection layer is provided over the primary liner. Side slopes lined with a single layer of 2mm HDPE with a layer of geocomposite drainage material (TNT 500)
- (v) Cell 10 Subject to *Condition 4.16*.
(proposed)

- **Leachate Management**

Leachate from Cells 1-7 drains through a leachate collection pipe network in the base of each cell and discharges to a header collection pipe. The header collection pipe in turn discharges to a leachate holding lagoon.

Leachate from Cell 8 discharges along a main collection pipe into an adjacent manhole outside the cell, which in turn joins up with a leachate collection manhole located in Cell 9. This manhole also connects to the drainage network within the cell. The drainage system from this manhole ultimately discharges to the leachate lagoon already mentioned.

The leachate holding lagoon has a capacity of 394 m³ and is HDPE lined (*Drawing No. DLS/99/11 - Leachate Tank*). A 3000 gallon truck mounted tanker and driver are

assigned to the site on a full time basis to tanker the leachate to the Council's WWT Plant in Purcellsinch (*Condition 7.9*). The quantity of leachate transported off site is in the region of 10,800 cubic metres per annum which compares closely to the quantity estimated to be produced.

Condition 4.17 relates to the management of the leachate system on site and requires that two boreholes should be backfilled and integrity testing be carried out on that part of the system that exists outside of filled cells.

- **Landfill Gas Management**

Landfill gas is vented to atmosphere through a network of gas vents, the locations of which are shown on *Drawing No. DLS/98/05revD*. Peripheral gas monitoring points are also shown on this drawing. A GA-94 Gas Analyser is used for monitoring purposes. Site offices [portacabin or containers] are raised off the ground. The weighbridge is an open pit type. Proposals regarding the utilisation of landfill gas as an energy resource or alternatively the flaring of the gas are required under *Condition 4.18.2* and *4.18.3*

- **Capping Systems (note also Restoration Scheme)**

The capping system detailed by the applicant does not include a flexible membrane liner or other low permeability layer in the capping system. The capping system is not considered adequate and *Condition 4.19* requires a proposal for a revised capping system to be sent to the Agency for its agreement, to include provisions for a flexible membrane liner, a drainage layer for surface water and also a gas collection layer. These provisions are considered necessary: to provide drainage for the overlying topsoil and subsoil; increase the slope stability by reducing the pore water pressures in the overlying soil materials; to control leachate generation and minimise the head of water on the barrier layer. The restoration scheme indicates that much of the site will be planted with trees the roots of which would cause infiltration problems in the absence of a geomembrane.

(8) Restoration and Aftercare

There are two phases in the restoration of the landfill. Phase I of the Restoration Scheme comprises the final capping layer and topsoiling of Cells No. 1 to 7 where landfilling was completed in 1997. The land leased by Kilkenny County Council (approximately 1.2 hectares) will be fenced off with a stock-proof fence and grassed. Phase II of the Restoration Scheme comprises the initial capping of Cells No. 8 to 10 as they are filled. Final capping and topsoiling will be undertaken when these cells are filled.

Condition 8.2 requires that an archaeological assessment be carried out prior to the commencement of the Restoration Scheme for Phase II.

(9) Hydrogeology

In terms of bedrock geology, the facility is located along the axis of a major Carboniferous syncline structure. The Kiltorcan Formation is considered to be a regionally important groundwater aquifer. The overlying limestone units including the Sub-Reef, Reef and Cloneen Formations are much less productive and of significantly less groundwater potential on a regional scale. The Cullahill Formation overlying these units is classed as a major regional aquifer.

The facility is located at the site of a previous sand and gravel quarry. Overlying the bedrock there is up to 20m of saturated outwash deposits lying beneath the facility. These glacial deposits, which infill the Nore Valley, constitute a regionally important aquifer. The River Nore is in direct hydraulic continuity with these deposits. The gradient of the water table is low; 0.2% from east to west towards the River Nore.

Monitoring results from sampling of groundwater from wells adjacent to the facility indicate levels of organic pollution throughout, possibly due to local agricultural/residential activities. There are also indications that some contamination from the landfill is occurring, with results downgradient of the landfill showing elevated levels of ammonia (7.6 mg/l N), manganese (0.093 mg/l), a high K:Na ratio (0.977), with conductivity and chloride levels seen to fluctuate in line with changes in the levels of ammonia.

One incident, which occurred in April 1997, is known to have caused some groundwater pollution. Following the deposition of a quantity of sewage sludge in Cell No. 7 there was significant movement which caused the liner of Borehole No. 12 to crack approximately 2-2.5 metres below the finished level of the site. Borehole No. 12 was one of the original investigative boreholes and extends through the lining system into the underlying strata. As a result of this damage, sludge and leachate would have entered the borehole and consequently the groundwater below. Following this incident Borehole No. 12 was excavated to below the crack in the liner and was sealed with a cement bentonite mix.

Section 7 - Infrastructure above details provisions and conditions relating to leachate management at the facility, including the requirement to carry out integrity testing of the parts of the leachate collection system outside of the cell areas and also to provide proposals for a capping system to minimise rain infiltration and thus leachate generation.

Groundwater monitoring requirements, controlled by *Condition 9.1*, includes three boreholes upgradient of the facility and six at various stages downgradient. The application and accompanying documentation included details regarding twenty-two boreholes, three of which are in the landfill area. *Condition 4.17.6* requires that these boreholes be backfilled where relevant.

(10) Emissions to Air

Emissions to air include dust and landfill gas.

The nearest building, a disused farmhouse, is located 80m from the nearest point of the site. The nearest occupied house is 150m from the site boundary.

Dust and landfill gas requirements are set out under *Condition 9.1*. Proposals regarding the utilisation of landfill gas as an energy resource or alternatively the flaring of the gas are required under *Condition 4.18.2* and *4.18.3*

(11) Noise Emissions

The operation of plant and machinery is the main source of noise associated with the facility. Noise monitoring was carried out at three locations; two on site and one representative of a noise sensitive receptor. The noise produced by the facility would be similar to some of the surrounding agricultural noise sources and is considered unlikely to give rise to any noise problems. Noise monitoring of the facility is required by *Condition 9.1* and a review of noise monitoring proposals, to include at least one other noise sensitive location south west of the facility, is required by *Condition 9.4*. *Condition 7.4* requires that there be no clearly audible tonal component in noise emissions from the facility. Noise emission limits are established by *Condition 7.1*.

(12) Emissions to Sewer

There are no emissions to sewer from this site. Leachate is transported from the site to the Kilkenny Main Drainage Treatment Plant at Purcellsinch, Kilkenny.

(13) Emissions to Surface Waters

The immediate area of the facility is drained by a small stream (dry much of the year) that rises to the east of the Kilkenny/Ballyragget road, and which passes between the two phases of the development in SW direction. It cascades down to the flood plain via a pipe laid beneath the access road to Phase I (Cells 1-7). The possible emissions to surface waters from the landfill site are via this stream and via the groundwater. The River Nore acts as the main sump in the region for both surface and groundwater discharges.

The Nore flows within 500 metres of the facility and most surface water drains directly into the main channel. Surface water monitoring requirements are controlled by *Condition 9.1*.

(14) Other Significant Environmental Impacts of the Development

- Cultural Heritage

Both the waste licence application and EIS refer to a possible enclosure that would have been located in the south eastern corner of Cell No. 8. This area had been partially excavated for sand and gravel before the development of the landfill. Also referred to is the stone wall on the western boundary of the site which probably formed part of the Dunmore Estate boundary. *Condition 8.2* requires that a qualified archaeologist be engaged to assess the potential archaeological implications of the

proposed Restoration Scheme on these features, with a view to recommending any necessary changes to the Restoration Scheme.

- Ecological

The ecological report included in the application made two recommendations regarding the following: (i) the retaining of the rarest plant on site - *Picris hieracioides*; and (ii) the planting of two less common trees of the area - *Sorbus hibernica* and *Prunus avium*. **Condition 8.2.3** provides for implementation of these recommendations.

(15) Waste Management, Air Quality and Water Quality Management Plans

No relevant waste management or air quality plans exist. The requirements of the Water Quality Management Plan for the Nore Catchment 1985 have been considered in the evaluation of this licence application.

(16) Submissions/Complaints

One submission from Dúchas, The Heritage Service (Ms. Maeve O'Callaghan - National monuments & Historic Properties)

(Appendix 2 contains a copy of the submission - Date Received 28/06/99)

A summary of all issues raised in the submission is provided.

The submission recommends that an archaeologist be employed to carry out a detailed archaeological assessment of the above proposed development and that the report of this be submitted to Dúchas The Heritage Service prior to the granting of a licence.

RESPONSE

It should be noted that the part of the site in question was previously quarried. The area containing the wall forms part of the site boundary and the quarrying activities may possibly have affected the supporting ground. The development of cells for Phase II would have improved the stability of the nearby underlying ground. The possible enclosure referred to has not been impinged upon in the landfilling of Cell 8. **Condition 8.2** requires that an archaeological assessment be carried out prior to the commencement of the Restoration Scheme for Phase II. This assessment and any revisions recommended shall be agreed with the Agency. **Conditions 4.3 & 4.19** relating to site security and the capping system are required have regard to the above considerations.

Signed _____

Dated:

Name

APPENDIX 1
LOCATION PLAN

APPENDIX 2
SUBMISSIONS