

INSPECTORS REPORT

WASTE LICENCE REGISTER NUMBER: 74-1

FACILITY: Donohill Landfill, Garryshane, Donohill, Co. Tipperary

APPLICANT: Tipperary (South Riding) County Council

INSPECTOR'S RECOMMENDATION: That a waste licence be granted subject to conditions.

(1) Introduction:

Donohill landfill is a municipal waste landfill located on a former sand and gravel quarry. It is currently the only landfill operated by Tipperary (South Riding) County Council. It has been in operation since 1989 and was designed on the "dilute and disperse" principle. All waste deposited at the facility has been deposited in unlined areas. The facility, comprising approximately 3.85 hectares, accepted in the region of 14,000 tonnes per annum of waste at the time of making the waste licence application. This was the prescribed date for such a facility (5,000-20,000 tonnes per annum). The fact that the application relates to the acceptance of greater quantities (up to 40,000 tonnes per annum) is not considered to alter compliance with the prescribed date.

The applicant proposed to operate the facility up to the end of 2002. Initially the application related to an existing waste deposition area, a marshy area to the south east of the existing waste area and an area to the south of the existing waste area, which was proposed to be lined. During the course of the application the applicant amended the application boundary to include a new area of marsh adjacent to the other one and taking out the area to the south of the original waste area. The current area of waste deposition is the initial marsh area referred to above (see Figure A.16.1 dated 5th June 2001 as part of Article 16(1) response) which is unlined.

Donohill landfill is located approximately 7km north of Tipperary town and 0.5km south of Donohill village. It is surrounded on all sides by agricultural land. A small stream runs parallel to the southern and western boundaries of the landfilled areas. This stream flows in a northerly direction meeting the Cauteen River just north of Donohill village.

The application identified thirteen houses, a shop/post office, a public house, a school and a church within 500m of the facility. Of these three of the houses are within 250m of the facility, identified as being 190m, 200m, and 240m from the landfill area. A number of new houses are being developed to the north west of the facility, in the region of 300m from the facility.

The classes of activity applied for by the applicant are;

Disposal Activities

- Class 1.** Relates to the continued disposal of waste in unlined areas.
- Class 2.** Relates to the disposal of treated de-watered sludges in the landfill.
- Class 4.** Relates to the use of a leachate lagoon for storage prior to disposal off-site.
- Class 5.** Relates to the disposal of waste in new lined cells.

Recovery Activities

- Class 2.** Relates to the composting of green waste and other compostables on-site.
- Class 3.** Relates to the diversion of metals such as scrap cars and white goods from the waste stream for recovery.
- Class 4.** Relates to the use of inert waste for use as road making material, daily cover, components
- Class 10.** Relates to windrow composting on site and the use of the subsequent compost with the topsoil in the final cap.
- Class 11.** Relates to the use of inert waste for use as road making material, daily cover, components
- Class 13.** Relates to the storage of inert waste on site prior to use.

The activities proposed to be allowed are Classes 1 and 4 of Disposal Activities and Classes 3, 4, 11 and 13 of Recovery Activities while the activities proposed to be refused are Classes 2 and 5 of Disposal Activities and Classes 2 and 10 of Recovery Activities.

Appendix 1 contains a number of maps (including a site location map and a layout plan).

Description of Principal Activity	Deposit on, in or under land (including landfill)
Quantity of waste (tpa)	40,000
Environmental Impact Statement Required	Yes. Received on 21/7/99
Number of Submissions Received	One
Date application received	30/09/98

SITE VISITS:

DATE	PERSONNEL	PURPOSE
27/10/98	Donal Howley	Site visit and to check site notice
30/09/99	Donal Howley	Site visit and to check site notice
13/06/01	Donal Howley	Site visit

(2) Facility Development

Infrastructure

Site security requirements in the recommended Proposed Decision are as proposed by the applicant (Condition 3.4). The facility includes a site access road which runs from the main Tipperary-Donohill Road (R497) for approximately 190m to the landfilling area. A waste quarantine area is required under Condition 3.7 of the recommended Proposed Decision. There are facility buildings and a weighbridge on site, which are controlled by Conditions 3.6 and 3.8 of the recommended Proposed Decision respectively.

Lining

All areas used for the deposit of waste at the facility are unlined. Waste has been primarily deposited onto clayey sand/silt which is underlain by gravelly sand and then gravel. The applicant had originally proposed to provide lined cells in an area to the south of the facility, but subsequently removed this area from within the boundary of the facility. The current operational area (see *Figure A.16.1* dated 5th June 2001 as part of Article 16(1) response) is located on an area of marsh comprising of peat (approx. 1-3m) underlain by very soft organic clay (proved to depth of approx. 4.5-5.5m) which in general is underlain by sand, gravel or gravelly clay.

The applicant considers that the material in these marsh areas is unsuitable for the provision of an engineered liner. The applicant does not propose to provide a liner in the proposed new area (second marsh area), but contends that the low permeability of the existing materials (in the order of 10^{-10} m/s) provides a suitable natural liner. This proposal is not considered to be in keeping with the requirements for BATEEC. The recommended Proposed Decision therefore does not allow for the landfilling of waste in the second marsh area (Condition 5.1)

Leachate/Surface Water Management

The applicant estimated that maximum leachate generation at the facility to be in the region of 30,000m³/year, reducing to 3,500m³/year with the installation of final capping. Leachate management at the facility currently comprises of the following;

- a clay lined lagoon near the facility building
- some leachate collection drainage along the western side of the original landfill area which runs into the lagoon
- some leachate seepage from the original landfill area is also directed by channels towards the existing lagoon
- earth bunds along part of the eastern and southern perimeter of waste filled areas. Leachate/contaminated water which collects at these locations is intermittently pumped to a pit within the waste. Subsequently leachate from this pit is tankered at intervals to the waste water treatment plant at Tipperary Town or an alternative.
- leachate from the above mentioned lagoon is similarly tankered off site at intervals.

The applicant proposed to provide for leachate collection/abstraction and to store leachate in a lagoon prior to transport off-site to the waste water treatment plant in Tipperary Town. Conditions 3.11 and 5.11 of the recommended Proposed Decision set out leachate and surface water management requirements for the facility. This includes requirements for;

- installation of a leachate collection toe drain around the waste filled areas,
- provision of adequately sized lined leachate storage (lagoon/tank),
- suitable access to such lagoon/tank,
- provisions to ensure clean surface water is kept separate from contaminated surface water/leachate and that contaminated surface water/leachate be directed to the leachate collection system,
- installation of two additional boreholes within the existing working area, which are capable of the measurement of the level of leachate and its subsequent removal,
- the establishment of trigger levels for leachate removal in the boreholes within the waste as well as frequency of leachate removal from the leachate storage lagoon, and
- a prohibition on leachate recirculation.

Landfill Gas Management

The site is located primarily on an old sand and gravel quarry with underlying layers of clayey sand/silt, gravel sand and gravel. The applicant proposed to passively vent landfill gas by means of installing gas vents at spacings of 40-50m when installing the final capping system. Landfill gas generation rates were conservatively estimated by the applicant to be a maximum of just under one million cubic metres per annum. The recommended Proposed Decision requires the applicant to provide an active gas collection system and gas flare (Condition 3.12). The licensee is also required to install perimeter landfill gas monitoring points around the footprint of the landfill, at intervals of no greater than 50m (Condition 3.15.1). Passive landfill gas management is to be carried out at the facility prior to the use of the active gas collection and flaring system (Condition 3.12.4).

Capping System

The final capping system to be installed at the facility is specified under Condition 4.3 of the recommended Proposed Decision.

Restoration and Aftercare

The restoration and aftercare of the facility is specified by Condition 4 of the recommended Proposed Decision, such that it will be progressively restored for future agricultural use (grazing), with the final profile to be dome-shaped.

Recycling Activities

The applicant does not propose to install a civic waste facility on site. The Waste Management Plan for Tipperary (South Riding) County Council 1999 does not identify the facility for any further waste management activity once the landfilling activity has ceased. The recommended Proposed Decision requires the licensee to provide a Construction and Demolition Waste Recovery Area (Condition 3.13) and receptacles near to the facility buildings for collection of recoverable wastes (Conditions 3.14 and 5.10). Condition 5.10. also requires a proposal from the licensee stating how they intend to achieve the recovery targets as set out in the Government document "Changing Our Ways".

(3) Waste Types and Quantities

At the time of the application the facility was estimated to have taken in approximately 86,000 tonnes with an acceptance rate of in the region of 14,000 tonnes per annum. However at that time the acceptance rate increased to the region of 40,000 tonnes per annum, due to the closure of other landfills in the functional area of the applicant. The applicant has proposed to accept waste up to the end of 2002.

Condition 1.4 controls the quantities and types of waste to be accepted at the facility to an overall quantity of no more than 40,000 tonnes per annum of non-hazardous waste. Condition 1.5 prohibits the disposal of hazardous waste, liquid waste and untreated sludges.

Based on the most recent site inspection and an acceptance rate of 40,000 tonnes per annum the current working phase (green hatched area in Figure A.16.1 of Article 16(1) response dated 5th June 2001) has an estimated life-span of less than six months from the end of June 2001 based on the contours. There may be some additional capacity in the original landfill area (red hatched area in Drawing No. 98-02403.03 Rev. A – Site Plan) due to settlement and proposed final contours (referred to in Condition 4.2 of the recommended Proposed Decision). Condition 8.9 of the recommended Proposed Decision requires a topographical survey to be carried out within three months of the date of grant of licence, to include a measurement of the remaining available void space at the facility.

The applicant indicated hours of facility operation in the application which have been set as the hours of waste acceptance at the facility under Condition 1.6. A further 30 minutes either side of the hours for waste acceptance is allowed for operation of the landfill at the facility in order to facilitate preparatory and daily cover works.

(4) Emissions to Air

Emissions to air include landfill gas, landfill gas combustion products, odour, dust and noise.

Landfill Gas and Combustion Products of Landfill Gas

The recommended Proposed Decision requires the licensee to install an active landfill gas collection and flaring system at the facility (Condition 3.12). Prior to the implementation of this system passive landfill gas management is required to be carried out at the facility (Condition 3.12.4). Condition 8.1 of the recommended Proposed Decision sets out the monitoring requirements for landfill gas and also for emissions from the flare, with Condition 6.1 setting emission limit values for emissions from the flare.

Odour and Dust

A number of conditions of the recommended Proposed Decision provide for the control of odours and dust from the facility. Specifically Condition 7.1 requires the licensee to ensure that odours and dust do not give rise to nuisance at the facility or in the immediate area of the facility. Weekly site inspections of nuisances are required

(Condition 8.12) and records of such are required to be maintained (Condition 10.3(d)). The use of a water spray in dry weather is required to minimise airborne dust nuisance (Condition 7.4). Dust deposition limits are set in Condition 6.1 of the recommended Proposed Decision.

Noise

The noise sources identified on site are from on site vehicles such as a bulldozer, a compactor and the vehicles delivering waste to the facility. Noise monitoring was carried out at four location along the facility boundary and at two noise sensitive locations. Both of these sites are residential, with one located adjacent to the entrance road of the facility and approximately 190m north west of the landfill area and the other located approximately 200m north east of the facility. L_{Aeq} (60min.) results from the above noise monitoring at the site boundaries during normal site activities ranged between 49.8 to 51.0 dB(A). L_{Aeq} (60min.) results for noise monitoring at the two noise sensitive locations were both over 55 dB(A), which is considered to be due to the local traffic. Noise monitoring requirements are specified in the recommended Proposed Decision by Conditions 8.1 and 8.6 with noise emission limits set by Condition 6.1.

(5) Emissions to Groundwater/Hydrogeology

The facility lies on a predominantly limestone gravel deposit which was previously worked as a sand and gravel quarry and including two adjacent marsh areas (one of which is currently used for waste deposition). Underlying these areas in general is the following subsoil sequence - clayey sand/silt - gravelly sand - gravel - bedrock(unproven at depths of up to 10m bgl). The underlying bedrock is known as the Cappagh White Sandstone Formation.

Groundwater is present in the overburden material beneath the facility at typically 1m below ground level. While groundwater flow is considered to be generally in a north westerly direction, groundwater also discharges to the stream flowing around the southern and western boundaries of the facility and also to the marsh areas in the north east part of the facility. Leachate levels in the waste in the original landfill area indicate leachate perched in the waste with head differences of the order of 3-4m between the leachate and the groundwater.

The subsoil deposit of limestone gravel and sand is not considered extensive enough to constitute a regionally important aquifer. While the bedrock is unproven at the facility, GSI guidelines indicate that the facility lies over a locally important bedrock aquifer. The applicant referred to the vulnerability map for the region (County Tipperary SR Groundwater Protection Scheme) which indicates a vulnerability of Extreme(E). Monitoring carried out at the facility confirms this designation.

All dwellings within 500m of the facility are serviced by the mains water supply. Two wells were identified within 500m of the facility, both of which were said to be covered over and not used for a number of years.

Leachate analysis was carried out at five locations within the waste. Of the List I substances analysed for in the leachate, none were detected. List II substances which

were detected in the leachate were Nickel (LG2, LG3 and LG4 at levels of 40, 90 and 110 µg/l respectively) and Zinc (LG1, LG2, LG3 and LG4 at 10,30, 990 and 180 µg/l respectively).

Groundwater analysis was carried out from seven boreholes as part of the application, of which one is located upgradient of the facility (GW1). Background levels from GW1 included high values for manganese (520 µg/l), fluoride (2.0 mg/l), and chloride (59 mg/l). Other background levels included the List II substances boron (0.02mg/l) and barium (0.19 mg/l).

Analysis of six other boreholes, adjacent to (GW2, GW3, GW5 and GW10) and downgradient of (GW7 and GW8) the landfill show signs of leachate from the landfill impacting on the groundwater. Nickel (List II) which was not detected in GW1 was detected in GW3 (150µg/l) and GW10 (10µg/l). Other List II substances detected in a number of the boreholes, but not in GW1 include; Selenium [GW3(190µg/l) and GW5(18µg/l)], and Silver [GW3(20µg/l), GW5(10µg/l) and GW7(20µg/l)]. Boron at GW2 was detected at significantly higher levels (2.3 & 3.0 µg/l) than in GW1. Ammonia was detected at three boreholes (GW5, GW8 and GW10 at levels of 0.4, 0.7 and 1.7 mg/l respectively), indicating some source of organic contamination. Monitoring requirements in the recommended Proposed Decision include annual monitoring of groundwater and leachate for nickel, selenium and silver (Condition 8.1).

While the leachate does appear to be impacting on the groundwater, I consider that the continued landfilling of waste in the limited areas prescribed under Condition 5.1 of the recommended Proposed Decision, and in accordance with the conditions of the recommended Proposed Decision, should not cause environmental pollution.

(6) Emissions to Surface Water

A small stream runs parallel to the southern and western boundaries of the facility. This stream, which flows to the facility from the south east, flows in a westerly direction from the western side of the facility ultimately meeting the Cauteen River just north of Donohill village. The Cauteen River ultimately flows into the Dead River north of Limerick Junction. The applicant indicated that there are no known users of surface water from the catchment area of the stream. While the Cauteen River is in the catchment area of the Lower Shannon, the stream itself is not included within the terms of the water quality management plan for that catchment.

Surface water analysis carried out as part of the application indicates that the landfill is having an effect on the surface water quality in the immediate vicinity of the facility, with increases in COD and BOD levels, although ultimately further downstream the quality is similar to that upstream. The applicant indicated that the preferential pathway for leachate was to surface water and proposed measures to reduce leachate production, intercept and collect leachate and ultimately to tanker it off-site to the waste water treatment plant at Tipperary Town. Leachate treatment on site was not proposed.

The recommended Proposed Decision prohibits the discharge of leachate to surface water (Condition 6.4.1). It requires leachate and surface water infrastructure to collect

leachate and contaminated surface water and provide for the separation of clean surface water from leachate/contaminated surface water (Condition 3.11). All leachate removed from the leachate storage lagoon/tank, required as part of the infrastructure, is required to be tankered off-site to Tipperary Town Waste Water Treatment Plant or an alternative agreed with the Agency (Conditions 5.11.3 and 6.6.1).

Condition 8.1 of the recommended Proposed Decision sets out the surface water monitoring requirements at four locations, one of which is required to be located upstream of the site near to Ballydonagh Marsh (Condition 8.7)

(7) Emissions to Sewer

There are to be no emissions to sewer from the facility.

(8) Other Significant Environmental Impacts of the Development

The final profile of the facility is proposed to be a dome-shaped mound with the highest point being no higher than 112mOD sloping to 99mOD in the landfilled areas. The surrounding topography is generally low-lying with few areas within 2-3km of the site over 100mOD. The profile of the facility is easily discernible from the R497 (Tipperary-Donohill Road) which runs northwards approximately 200m from the site at closest. Some of the adjacent land to the north of the facility does extend to heights of 100mOD up to 105mOD. It is noted in the Tipperary (South Riding) County Council Development Plan 1996 that a *Prospect of special amenity value* is identified in the neighbourhood of the landfill. Screening from other locations is by way of undulations in the topography and due to existing hedgerows. It is considered that the phased remaining filling and subsequent capping and restoration programme as specified in Conditions 4 and 5 of the recommended Proposed Decision should reduce the visual impact during operation.

A proposed Natural Heritage Area (pNHA) – Ballydonagh Marsh, is located approximately 150m south west of the facility. The groundwater flow is identified as being north westerly towards the facility. The stream which flows along the southern and western boundaries of the facility also flows in a north westerly direction from the south west of the site from the direction of the Ballydonagh Marsh. The water regime of the Ballydonagh Marsh is consequently not considered to be under threat from the facility. Any other potential effects of the facility on the Ballydonagh Marsh such as nuisance from litter from the facility or arising from birds using the facility are considered to be controlled by conditions of the recommended Proposed Decision. One of the surface water monitoring locations required by the recommended Proposed Decision is to be located adjacent to Ballydonagh Marsh (Condition 8.7).

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

Consideration was given to the Waste Management Plan for Tipperary (South Riding) County Council 1999, the Water Quality Management Plan for the Lower Shannon

Catchment 1990, and the Tipperary (South Riding) County Council Development Plan 1996. There is no Air Quality Management Plan for Tipperary (South Riding).

(10) Submissions/Complaints

One submission from Dúchas, The Heritage Service (Ms. Treasa Langford – Development Applications Section)

(Appendix 2 contains a copy of the submission - Date Received 01/06/01)

The submission refers to the pNHA – the Ballydonagh Marsh, the boundary of which is located within 150m of the site. The submission does not object in principle to the application but expresses concern that there might be underground seepage that would affect the pNHA and recommends that a hydrological report be carried out.

Response

As indicated in Sections (5), (6) and (8) above the direction of flow of both groundwater and surface water is more or less away from the pNHA and towards the facility. Various conditions of the recommended Proposed Decision set out how leachate from the facility is to be collected and transported off-site and also which will ensure minimisation of leachate generation at the facility. A surface water monitoring location is required to be located upstream of the facility and adjacent to the pNHA under Condition 8.6.1.

(11) Reasons for the Recommendation

I recommend that a waste licence, subject to conditions, be **granted** for the waste activities outlined below;

- **Class 1 - 3rd Schedule** [*Deposit on, in or under land (including landfill)*] - This is for the purposes of the disposal of non-hazardous wastes in specified areas which have already been used for such disposal.
- **Class 4 - 3rd Schedule** [*Surface impoundment, including placement of liquid or sludge discards into pits, ponds or lagoons*] - This is for the purposes of installing and maintaining leachate collection and storage infrastructure on site.
- **Class 3 - 4th Schedule** [*Recycling or Reclamation of Metals or Metals Compounds*] - This for the purposes of the recovery of metals such as scrap cars/white goods/drinks cans.
- **Class 4 – 4th Schedule** [*Recycling or Reclamation of Other Organic Materials*] - This relates to the recovery of inert waste for use as road making material, daily cover and components of the cap. **Also for the recovery of glass bottles and similar through the provision of glass collection receptacles.**
- **Class 11 – 4th Schedule** [*The use of waste obtained from any activity referred to in a preceding paragraph of this Schedule*] - This relates to the use of inert waste, where suitable, for use as road making material, daily cover and components of the cap.
- **Class 13 – 4th Schedule** [*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*] - This relates to the storage or stockpiling of inert waste prior to use.

In coming to this recommendation, I consider that the continued landfilling of non-hazardous waste in specified areas at the facility and the associated activities and works would, subject to the conditions of the recommended Proposed Decision, comply with the requirements of Section 40(4) of the Waste Management Act 1996.

I recommend that the following waste activities be **refused**:

- **Class 2-3rd Schedule** [*Land treatment, including biodegradation of liquid or sludge discards in soils*]
Reason: The deposit of treated de-watered sludges in the landfill is considered to be covered by Classes 1 & 4 of the 3rd Schedule
- **Class 5 - 3rd Schedule** [*Specially engineered landfill, including placement into lined discrete cells which are capped and isolated from one another and the environment*]
Reason: The area originally proposed to be lined was removed from within the facility boundary during the course of the application. The proposed new area for future landfilling is not considered viable by the applicant for lining purposes, as per the Landfill Directive, as would be required in accordance with the BATNEEC requirements of section 40(4)(c) of the Waste Management Act. Consequently no new areas are to be developed for landfilling.
- **Class 2 – 4th Schedule** [*Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)*]
and
Class 4 – 4th Schedule[*The treatment of any waste on land with a consequential benefit for an agricultural activity or ecological system*]
Reason: The applicant applied with regard to the possibility of carrying out windrow composting on site and for use of the subsequent compost on site. However, in an Article 16(1) response received on 9th April 2001 the applicant reconsidered the possibility of developing infrastructure for such activity and stated that it no longer intended to pursue this matter.

Signed: _____

Dated: _____

Donal Howley
Inspector, Environmental Management & Planning

APPENDIX 1

SITE LOCATION, AND LAYOUT PLANS

APPENDIX 2
SUBMISSION