



Environmental Protection Agency  
An Ghníomhaireacht um Chaomhnú Comhshaoil

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8 September 2006

Reg No: W0231-01

Dear Mr. Howell

I am to advise you that the Agency has received an application for a Waste Licence from Fingal County Council, for a facility located at Fingal Landfill, Nevitt, Lusk, County Dublin.

The applicant proposes, as part of this application, to provide for the discharge of process effluent to a sewer, which the applicant has stated is vested in, or controlled by, your Council. Process effluent includes trade effluent or other matter (other than domestic sewage or storm water). I enclose copy extracts from the application form, which detail proposed discharges.

The provisions of Section 52 of the Waste Management Acts, 1996 to 2005, provides that the Agency shall obtain the consent of the sanitary authority to the proposed discharge from an activity which involves the discharge of trade effluent or other matter (other than domestic sewage or storm water), to a sewer vested in or controlled by a sanitary authority.

In order to expedite the Agency's consideration of this waste licence application, I am to request your authority's consent to the proposed discharge/s. It should be noted that, your authority's consent may be subject to such conditions as your authority considers appropriate as provided for in Section 52 of the Waste Management Acts, 1996 to 2005 and Section 99E(3) of the Environmental Protection Agency Acts, 1992 and 2003. Your attention is drawn to paragraphs (3) and (4) of the attached copy of the relevant section of the Act. For your convenience please find attached a reply form including a list of draft conditions compiled by the Agency.



In accordance with paragraph (2) of this section of the Act, you are requested to forward your response within 5 weeks of the date of this letter. Please note that any decision given after the expiry period shall be invalid and in those circumstances the Agency may proceed to determine the application concerned as if consent was obtained. Ian Marnane is dealing with this matter and can be contacted at the Licensing Unit, Office of Licensing & Guidance, EPA Headquarter, PO. Box 3,000, Johnstown Castle Estate, Wexford, (Tel. No. 053 9160600) if you have any queries.

Your co-operation in this matter is appreciated.

Yours sincerely,

*pl Catherine O'Keeffe*

Sonja Smith

**Programme Officer**

**Licensing Unit**

**Catherine O'Keeffe Office of Licensing & Guidance**

**Section 99E (3) & (4) of the Environmental Protection Agency Acts, 1992 and 2003**

- (3) Subject to subsection (4), a consent under subsection (1) may be granted subject to or without conditions and if it is granted subject to conditions the Agency shall include in the licence or revised licence concerned conditions corresponding to them or, as the Agency may think appropriate, conditions more strict than them.
- (4) The conditions that may be attached to a consent by a sanitary authority under this section are the following and no other conditions, namely conditions-
- (a) relating to-
    - (i) the nature, composition, temperature, volume, level, rate, and location of the discharge concerned and the period during which the discharge may, or may not, be made,
    - (ii) the provision, operation, maintenance and supervision of meters, gauges, manholes, inspection chambers and other apparatus and other means for monitoring the nature, extent and effect of emissions,
    - (iii) the taking and analysis of samples, the keeping of records and furnishing of information to the sanitary authority,
  - (b) providing for the payment by the licensee to the sanitary authority concerned of such amount or amounts as may be determined by the sanitary authority having regard to the expenditure incurred or to be incurred by it in monitoring, treating and disposing of discharges of trade effluent, sewage effluent and other matter to sewers in its functional area or a specified part of its functional area,
  - (c) specifying a date not later than which any conditions attached under this section shall be complied with,
  - (d) relating to, providing for or specifying such other matter as may be prescribed.

## SANITARY AUTHORITY RESPONSE

re: SECTION 52 OF THE WASTE MANAGEMENT ACTS, 1996 to 2005

**Name & Address of Sanitary Authority:** Fingal County Council, P.O. Box 174, Fingal County Hall, Swords, County Dublin.

**Waste Reg. No.** W0231-01

**Waste Facility:** Fingal Landfill, Nevitt, Lusk, County Dublin, ,

**Waste Licence Applicant:** Fingal County Council

**Consent:** Indicate Yes to one of the following statements:

Consent granted subject to the consent conditions outlined below	
Consent granted without conditions	
Consent refused <small>Note 1</small>	

**Note 1** Where it is proposed to refuse permission the reasons for the refusal should be clearly outlined in the response.

GENERAL CONSENT CONDITIONS	Condition to be included (Yes/No)
1. No specified emission from the installation shall exceed the emission limit value set out in <i>Schedule B: Emissions Limits to Sewer</i> . There shall be no other emission to sewer of environmental significance.	
2. The licensee shall carry out such sampling, analyses, measurements, examinations, maintenance and calibrations as out in <i>Schedule C</i> .	
3. Monitoring and analytical equipment shall be operated and maintained as necessary so that monitoring accurately reflects the discharge or emission.	
4. The licensee shall permit authorised persons of the Agency and the Sanitary Authority to inspect, examine and test, at all reasonable times, any works and apparatus installed, in connection with the process effluent, and to take samples of the process effluent.	
5. All automatic monitors and samplers shall be functioning at all times (except during maintenance and calibration) when the activity is being carried on unless alternative sampling or monitoring has been agreed in writing by the Agency for a limited period. In the event of the malfunction of any continuous monitor, the licensee shall contact the Agency as soon as practicable, and alternative sampling and monitoring facilities shall be put in place. Prior written agreement for the use of alternative equipment, other than in emergency situations, shall be obtained from the Agency.	
6. The licensee shall record all sampling, analyses, measurements, examinations, calibrations and maintenance carried out in accordance with the requirements of this licence.	
7. The licensee shall provide safe and permanent access to all on-site sampling and monitoring points and to off-site points as required by the Agency.	
8. The licensee shall at no time discharge or permit to be discharged into the sewer any liquid matter or thing which is or may be liable to set or congeal at average sewer temperature or is capable of giving off any inflammable or explosive gas or any acid, alkali or other substance in sufficient concentration to cause corrosion to sewer pipes, penstock and sewer fittings or the general integrity of the sewer.	
9. In the event of any incident which relates to discharges to sewer, having taken place, the licensee shall notify the Agency, Local Authority and Sanitary Authority as soon as practicable after the incident.	





## Frequency of Monitoring Process Effluent to Sewer

### Schedule C

Waste Licence application Register No. W0231-01

Emission Point Reference No: \_\_\_\_\_

Parameter <i>(delete parameters which are not applicable)</i>	Monitoring Frequency <i>(e.g. monthly, quarterly, annually)</i>	Sampling Type <i>(grab, composite)</i>
Flow to sewer		
Temperature		
pH		
BOD		
COD		
Suspended Solids		
<b>ADDITIONAL PARAMETERS</b>		
<i>(if required)</i>		

SANITARY AUTHORITY CHARGES	
Charge per cubic metre of process effluent (per s52 of the Waste Management Acts, 1996 to 2005)	
Payment Frequency	
Annual Monitoring Costs	

**Signed on behalf of Fingal County Council**

\_\_\_\_\_ Date \_\_\_\_\_



**E.2 Emissions to Surface Waters**

**Attachment E.2** Tables E.2(i) and E.2(ii) should be completed where relevant.

**Attachment E.2 Emissions to Surface Waters**

The only emissions to surface water from the proposed facility will be the discharge from the storm water attenuation pond and associated wetlands to the local drainage network. Foul drainage will be generated in the administration building only and will be discharged to the leachate treatment system.

Any leachate generated from the landfill will be contained and treated on site for discharge to a wastewater treatment plant where it will be further treated before discharge to receiving waters. No leachate treated or otherwise will be discharged to local surface waters.

The proposed location of the storm water attenuation pond is presented on Figure 2.1, Volume 2 of the EIS. The final location discharge point (SW1) from the attenuation pond will be defined under specified engineering works. Information regarding invert levels and pipe sizes will be undertaken at the detailed design stage and forwarded to the Agency.

The following surface water discharge limits will be adhered to;

Level (Suspended Solids mg/l)
35 mg/l

Refer to Table E.2 (i) and Volume 2, Section 3.8 of the EIS for additional information regarding emissions to surface waters.

**E.3 Emissions to Sewer**

**Attachment E.3** Tables E.3(i) and E.3(ii) should be completed, where relevant.

**Attachment E.3 Emissions to Sewer**

It is proposed to discharge treated effluent for final treatment at an off site municipal wastewater treatment facility owned and operated by Fingal County Council. This option involves two stages of treatment, a preliminary treatment process at the landfill site and a final treatment stage at an off site municipal treatment works.

The performance standards to be employed by the on site leachate treatment process shall ensure that the treated leachate conforms to or exceeds the standards applicable to trade discharges to the municipal sewer network. Fingal County Council discharge standards are presented in Table E.3(ii).

The treated leachate will be transferred by means of a pumped connection to a private sewer network for final treatment at the terminal wastewater treatment facility, which will be at the Portrane WWTW following completion of its design capacity upgrade to 60,000 PE. The biological load to undergo final treatment at the terminal works representing a small fraction of the design capacity of the plant will be easily accommodated within the operational





capacity of the upgraded works. A letter outlining Fingal County Council's agreement to accept the treated leachate at Portrane WWTW is attached.

In the event that either the upgrade to Portrane WWTW or the sewer connection are not available at the time of the landfill opening then tankered treated leachate will be accepted at either Swords WWTW or Malahide WWTW both of which are existing wastewater treatment plants owned and operated by Fingal County Council and have sufficient capacity to provide final treatment of the treated effluent from the Fingal landfill.

The on site preliminary treatment system will include:

- An enclosed 7 day capacity raw leachate balance tank
- A leachate treatment process,
- A sludge pre-treatment facility prior to disposal to the landfill,
- An enclosed 7 day capacity treated effluent buffer storage tank,
- Odour Control, and
- Pump station and pipeline to transfer treated effluent to the Sewer Network

The detailed design of all leachate treatment infrastructure proposed will be forwarded to the EPA for approval prior to construction as part of the Specified Engineering Works requirements.

#### ***E.4 Emissions to Groundwater***

Describe the existing or proposed arrangements necessary to give effect to Articles 3,4,5,6, and 7 of Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution by certain dangerous substances.

Table E.4(i) should be completed, as relevant, for each source.

Supporting information should form **Attachment E.4**

#### **Attachment E.4 Emissions to Groundwater**

There will be no direct discharges to groundwater. There are no percolation areas or soakaways proposed for the facility.

Prior to the acceptance of waste at the facility groundwater monitoring trigger levels will be submitted to the Agency for approval. These trigger levels will be in accordance with the requirements of Directive 1999/31/EC and based on a minimum of six monitoring events and will be reviewed annually as part of the AER.

The trigger levels parameters measured will include Ammonia, Chloride, Potassium, Sodium, pH and TOC.

Refer to Volume 2, Section 3.18 of the EIS for additional information regarding groundwater.



**TABLE E.3(i): EMISSIONS TO SEWER**(One page for each emission)

**Emission Point:**

Emission Point Ref. N <sup>o</sup> :	SE1
Location of connection to sewer:	Note 1
Grid Ref. (10 digit, 5E,5N):	Note 1
Name of sewage undertaker:	Note 2

Note 1: the location of the connection will be confirmed following detailed design

Note 2: The treated leachate will be transferred by means of a pumped connection to a private sewer network for final treatment at the terminal wastewater treatment facility which will be at the Portrane WWTW following completion of its design capacity upgrade to 60,000 PE. The private sewer network will connect to a public system prior to final discharge to the WWTW.

**Emission Details:**

(i) Volume to be emitted			
Normal/day	m <sup>3</sup>	Maximum/day	m <sup>3</sup>
Maximum rate/hour	m <sup>3</sup>		

(ii) Period or periods during which emissions are made, or are to be made, including daily or seasonal variations (*start-up /shutdown to be included*):

Periods of Emission (avg)	<u>60</u> min/hr	<u>24</u> hr/day	<u>365</u> day/yr
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WASTE Application Form

TABLE E.3(ii): EMISSIONS TO SEWER - Characteristics of the emission (1 table per emission point)

Emission point reference number : SE1

Parameter	Prior to treatment				As discharged				% Efficiency
	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	Max. hourly average (mg/l)	Max. daily average (mg/l)	kg/day	kg/year	
BOD						<100*			
COD						<500*			
Suspended Solids						<600*			
NH <sub>4</sub> --N						<100*			
pH						6-10*			

\* Note : Fingal County Council discharge standards to sewer

management system will be in accordance with the EPA Landfill Site Design Manual and any EPA Waste Licence granted for the facility.

### 2.6.7.1 Flaring of Gas

A fully enclosed landfill gas flare will be installed as part of the initial facility development. The size of the flare will depend on the quantity of landfill gas predicted to be generated at the landfill. Preliminary modelling of the landfill, in **Section 2.5.4** shows that a 2000m<sup>3</sup>/hr flare is predicted to be required to cover flaring of the gas before the utilisation system is operational. After this the flare will normally only be required to combust any excess gas that the engines may not be able to handle. If the capacity of flare is required to cover at least a portion of the engine capacity then the flare size will be suitably increased.

### 2.6.7.2 Utilisation of Gas

Landfill gas can be utilised as an energy source with the gas being burned in a gas engine to produce electricity. A number of sites in Ireland currently generate electricity from landfill gas which is then fed into the National Grid via a grid connection. Reuse of heat from the combustion process can greatly enhance the efficiency of the energy recovered from the gas and current technologies offer a potential for heat recovery in the leachate treatment process. Preliminary modelling of the Fingal Landfill indicates that there will be an electricity generating capacity of between 3MW and 6MW available from the landfill gas although this will vary depending on actual waste intakes and composition of the waste. Generating capacity is based on the assumption that 1MW of electricity can be produced from 580m<sup>3</sup> of gas. Any excess gas would be sent to the flare to be combusted. Additional engine or flare capacity will be provided to ensure that gas is managed efficiently and the impact on the surrounding environment is minimised.

## 2.6.8 Leachate Infrastructure

A leachate management system incorporating leachate extraction, recirculation, storage, treatment and discharge off site for final treatment will be operated at the site from the beginning of waste acceptance. Leachate will be collected from each individual cell and either recirculated back into filled cells or pre-treated on site. The various elements of the leachate management system are described below.

### 2.6.8.1 Leachate Collection

The leachate collection system proposed for the landfill development will consist of a series of slotted pipes installed in the leachate drainage blanket which is placed on top of the lining system. The cells will be constructed so that the leachate drains towards the lowest point within each cell in a leachate collection layer in accordance with **Section 2.5.7**. A leachate collection sump will be located at the lowest point in each cell. From this sump leachate will be pumped from the cell to the storage lagoon or treatment system. The basal shape and detailed design of each cell and the leachate collection system will take into account the following:

- Appropriate falls towards the leachate collection sump to promote self cleansing and reduce blockages in the leachate collection pipework,
- The drainage media of the leachate collection blanket will have appropriate drainage and chemical characteristics for the volumes and type of leachate being generated,

- The pipework will be selected so as to resist chemical attack by the leachate, have a crush strength suitable to withstand the depth of drainage blanket, waste, capping and leachate layers placed above it, and
- The design and spacing of the pipework will take into account the required capacity, maximum and minimum slopes, and percentage area of slots.

In order to protect the drainage blanket, the leachate pipework, the underlying geomembrane barrier layer and the low permeability clay layer or equivalent, the first 2m of waste placed within the cells will be free of bulky or sharp objects and will not be compacted.

All leachate management will be in accordance with Chapter 7 of the EPA Landfill Site Design Manual unless otherwise agreed with the EPA through the Specified Engineering Works procedure relevant in any EPA Waste Licence granted for the facility.

#### **2.6.8.2 Storage Capacity for Untreated Leachate**

Leachate will be collected and stored on site in a fully engineered enclosed storage tank.

This tank will serve to provide a mixing chamber for all the leachate collected from the site, thereby allowing varied ages of leachate to become mixed and resulting in a more homogenous leachate for the on-site primary leachate treatment system. The tank will also provide storage for surface water drainage from the paved areas of the waste quarantine and leachate treatment plant areas of the facility

It is proposed to size the tank to provide seven days storage capacity at maximum rate of production. This tank will typically operate with one to three days storage and will provide a further four day reserve emergency storage capacity in the event of a breakdown of the on site leachate treatment plant.

#### **2.6.8.3 Leachate Recirculation**

It is proposed to install a leachate recirculation system within the landfill as final capping progresses. If water intrusion is prevented through the complete surface sealing of the waste, decomposition of the waste can stop which is not desirable. The leachate recirculation system will be developed to work alongside the leachate collection system and the gas management system.

Some leachate generation is needed in the long term to continuing the decomposition processes in the waste. By installation of a leachate recirculation system, leachate generation and handling can be controlled and optimised.

The optimal means of recirculating leachate is by collecting leachate from younger cells (e.g. cells in operation) and recirculating to older cells (completed cells in methanogenic stage) where some pre-treatment of the young and concentrated leachate (high BOD content) can be achieved. Up to 70-80% reduction of BOD can be obtained and 20% reduction in total Nitrogen. Reduction in phosphorus and COD is limited.

Leachate for recirculation will be discharged to the waste after the capping is installed either by horizontal pipes/drains or by vertical pipes/boreholes and the approval for any proposed system will be sought from the EPA in line with the Specified Engineering Works procedure set down in any EPA Waste Licence granted for the proposed development by the EPA.

The preferred system at this stage is to distribute leachate in a drainage layer / trench between the low permeability capping layer and the waste. The spacing between each drainpipe/stonedrain will be typically 10-20 m.

During the detailed design and installation of the recirculation system the following will be considered:

- drainpipes will have wide slots (not less than 10 mm) or pipes will easily clog
- drainpipes will be located in coarse gravel/stones, to avoid clogging
- drainpipes/stone drain will be kept a good distance (>25 m) from the edge of the outer boundary of the cells to avoid water pressure building up on the capping low permeability layer where it is connected to the basal liner low permeability layer
- a layer of limestone below the drainpipes will avoid acid conditions in cells where leachate is recirculated

The system will consist of a rising main from the raw leachate storage lagoon to the high point in each discrete cell. The pipe will discharge leachate to a number of recirculation chambers located in each cell. An automated control system for monitoring and controlling the operation of the leachate management system will be installed with a graphical user interface and alarm system in the administration building.

#### 2.6.8.4 Leachate Treatment

In determining the leachate treatment strategy for the project development, two options were evaluated for their relative potential environmental impact:

- a) Treatment on site and discharge of treated effluent to local watercourse

Utilising this treatment option requires treatment standards to be set by reference to the quality standards and assimilative capacity of the receiving watercourse. Chemical and biological quality data for the receiving streams indicated that many of the sampled sites were moderately polluted with median molybdate reactive phosphorus concentrations greater than 0.03mgP/l and biological ratings, Q3 or less. The minimum flows during summer period were measured at 13l/s. From this data it was determined that the level of discharge standards required were such as to be technically challenging and with significant operational difficulty in maintaining the required performance standards with a potential risk of pollution to the riverine environment.

It was decided not to proceed with this option due to the potential of significantly pollution risk .

- b) Preliminary treatment on site and discharge of treated effluent for final treatment at an off site municipal wastewater treatment facility owned and operated by Fingal County Council.

This option involves two stages of treatment, a preliminary treatment process at the landfill site and a final treatment stage at an off site municipal treatment works.

Within the on site preliminary treatment process leachate is initially balanced to remove volume peaks arising from rainfall peaks and to ensure a more uniform characterisation. The performance standards to be employed by the on site leachate treatment process shall ensure that the treated leachate conforms to or exceed the standards applicable to trade discharges to the municipal sewer network.

It is anticipated that the process will also result in the production of a biological waste sludge which will be dewatered to a manageable dry matter content material suitable to be disposed of within the engineered landfill.

The treated leachate will be transferred by means of a pumped connection to the Fingal County Council sewer network for final treatment at the terminal wastewater treatment facility which will be at the Portrane WWTW following completion of its design capacity upgrade to 60,000 PE. The biological load to undergo final treatment at the terminal works representing a small fraction of the design capacity of the plant will be easily accommodated within the operational capacity of the upgraded works.

In the event that either the upgrade to Portrane WWTW or the sewer connection are not available at the time of the landfill opening then treated leachate will be accepted at either Swords WWTW or Malahide WWTW both of which are existing wastewater treatment plants owned and operated by Fingal County Council and have sufficient capacity to provide final treatment of the treated effluent from the Fingal landfill.

This option has proven operational experience and offers a low risk of pollution to the environment and accordingly it has been decided to employ strategy option b) as part of the leachate management system for this landfill development.

The on site preliminary treatment system will include:

- An enclosed 7 day capacity raw leachate balance tank
- A leachate treatment process,
- A sludge pretreatment facility prior to disposal to the landfill,
- An enclosed 7 day capacity treated effluent buffer storage tank,
- Odour Control, and
- Pump station and pipeline to transfer treated effluent to the Sewer Network

The detailed design of all leachate treatment systems proposed and infrastructure will be forwarded to the EPA for approval before construction as part of the Specified Engineering Works requirements in any Waste Licence issued by the EPA.

#### **2.6.8.5 Leachate Monitoring System**

The leachate monitoring system will be installed in compliance with any EPA waste licence issued for the proposed facility and will be in accordance with the most recent version of the EPA landfill manual on 'Landfill Monitoring'. The purpose of the leachate management system will be as follows:

- To confirm that the leachate system is performing in accordance with the design
- To provide information on the progress of decomposition of waste
- To assess levels of leachate within the discrete cells
- To provide information for the Environmental Management Plan which may result in the potential revision of groundwater and surface-water monitoring parameters.

The EU Directive on the Landfill of Waste (99/31/EC), requires that sampling and measurement of leachate (both volume and composition) must be performed separately at each point at which leachate

is discharged from the site. In the case of Fingal Landfill the design at this stage allows for two leachate discharge points, one from the waste body located in the south-east corner of the development, and one from the site, post primary treatment to the pumping main.

The frequency of testing and location of monitoring points will be carried out in accordance with any EPA Waste Licence granted for the site but will be at a minimum in accordance with the following Table 2.5:

**Table 2.5: Leachate Monitoring Locations and Frequency**

Parameter	Monitoring Points	Monitoring frequency
Leachate Levels	At two points within each discrete cells  Within all leachate storage lagoons	At least weekly
Leachate Composition	At a sampling point which is agreed with the EPA and is representative of the landfill body  Within all leachate storage lagoons  Before discharge to the pumped main	At least quarterly
Leachate discharge volume	At the leachate discharge point from the landfill and before the pumping main	Continuous

The following parameters, in Table 2.6, for leachate composition will be monitored in accordance with the EPA landfill monitoring manual unless otherwise specified or agreed with the EPA through any waste licence issued.

**Table 2.6: Leachate Monitoring Parameters**

Parameter
Level
Temperature
PH
Electrical conductivity
Ammonia (as N)
Total oxidised nitrogen (as N)
Biochemical Oxygen Demand
Chemical Oxygen Demand
Metals
Sulphate
Chloride
Molybdate Reactive Phosphorus
Cyanide (total)
Fluoride
Trace organic substances