INSPECTORS REPORT

WASTE LICENCE REGISTER NUMBER 145-1
APPLICANT: Gleneden Trading Limited
FACILITY: Healthcare Waste Treatment Facility, Raffeen Ind Est., Rafeen, Monsktown, Co. Cork
INSPECTOR'S RECOMMENDATION: That the waste licence be granted subject to conditions.

(1) Introduction:

Gleneden Trading Limited have applied to operate a new Healthcare Waste Treatment Facility at Raffeen Industrial estate, Raffeen, Monkstown, Co. Cork. The Southern Health Board holds a waste licence for the system which was operated under contract by Gleneden Trading Limited in the grounds of Cork University Hospital (reg. no. 38-1). The system is at present being decommissioned. Gleneden Trading Limited are proposing to transfer the equipment and operate it at Raffeen, Monkstown. The proposed facility will be part of a new industrial development of 9 light industrial units. There are 7 residences within 250m and 28 within 500m of the proposed development. **A plan showing the location of the facility to which the application relates is provided in Appendix 1**.

The applicant has applied to accept 1,600 tonnes per annum of healthcare waste for treatment at the facility. This will consist of waste arising from healthcare activities in the Southern Health Board region (i.e. waste arising from acute hospitals, long term care facilities, community health facilities, and general practitioners).

The following categories of healthcare waste will be treated at the site; used sharp instruments, infected or potentially hazardous health care risk waste, laboratory waste, and potentially offensive material. The following waste will not be accepted at the site for treatment or storage; Recognisable body parts, animal tissue, pharmaceutical waste, chemical or cytotoxic wastes and domestic waste. Healthcare waste from dental surgeries will not be accepted at the facility until such time as the Agency is satisfied that it will not have a negative impact on the treatment process.

The plant will normally operate from Monday to Friday inclusive between the hours of 7a.m. and 10 p.m. To deal with emergencies the plant may be operated on Monday to Saturday inclusive between the hours of 7 a.m. and 10p.m. However, there is an hourly and daily maximum throughput on the facility set in Condition 1.5. Security at the facility is provided for under Condition 3.4 of the proposed decision.

DATE OF VISIT	PURPOSE	PERSONNEL	OBSERVATIONS
05/01/01	Site notice check	M. McHugh	No site notice erected
26/01/01	Site notice check	S. McMahon	Site notice compliant

(2) Facility Development:

- **Facility Equipment**

The following equipment will be used at the facility; weigh-station, inspection conveyor, mechanical lifting equipment; primary and secondary shredders, enclosed waste conveyor belts for both treated and untreated waste, heating unit or holoflite, air filter and condenser, compactors for the treated waste and computer systems for process control. All equipment with the exception of an on-site wastewater treatment

plant will be operated and maintained within the waste processing building. The processing building covers an area of approximately 1400m^2.

It is proposed to transfer facility equipment operated at the Cork University Hospital facility to the proposed facility. New equipment to provide 50% standby capacity and back-up in the event of critical plant breakdown is required by Condition 3.9.

- **Facility Operation**

Incoming waste is to be contained in 400 gauge sealed plastic bags or in sealed UN approved bins in wheeled carts. Once recorded and weighed, waste containers are to be placed on the waste inspection conveyor and be visually inspected prior to entry into the shredder.

The bins will be emptied into a fully enclosed shredder hood and subjected to shredding to a non-identifiable material. The waste will then be transferred in an enclosed conveyor to the heating unit or Holoflite. The Holoflite comprises of a double walled cylinder in between which hot oil (which will be indirectly heated to approximately 180^{o}C by a 470kW gas fired heating unit) circulates. This provides a heat transfer surface for heating the shredded waste to >106^{o}C thus removing moisture and ensuring disinfection. The conveying of waste through the unit will stop when the temperature goes outside a temperature range to be set after commissioning trials are completed. An alarm will sound and the process will not re-start until the temperature levels required to achieve disinfection are achieved (Condition 5.4.2). Once the waste has passed though the disinfecting unit it is to be conveyed in a series of enclosed screw conveyors to an enclosed compacting unit. Waste loads containing sharps are heat treated as normal and will then be sent through a second shredder prior to dispatch to the compactor. The waste will be held, prior to landfill disposal, in this unit pending results of the microbiological and physical testing.

Followng a fire incident at the Cork University Hospital facility a temperature log was maintained, as recommended in subsequent consultants reports, to ensure that the midpoint temperature of the holoflite was below 100^{o}C prior to operators leaving the site at night. Condition 5.4.11 specifies that a similar log be maintained at the proposed facility.

- **Air Abatement**

Vapour removed from the main processing unit is to be condensed in a shell and tube heat exchanger using mains cooling water (Condition 3.12 specifies that no mains water used in the process shall re-enter the mains water system). Process air from the shredder hood and the condensate system is to be filtered via a three-stage filter configuration (i.e. coarse filter, HEPA filter, and activated carbon). Condition 5.7.2 and Schedule D.5 requires monitoring and maintenance of the filter system. Spent filters are to be treated as hazardous waste and (i) either treated in the disinfection system or (ii) sent for disposal off-site using an approved hazardous waste disposal contractor.

- **Plant Commissioning**

Prior to acceptance of waste at the facility the applicant is required to submit a report on commissioning trials to the Agency for agreement. The scope of the commissioning trials is to be agreed in advance with the Agency but a number of minimum requirements are set out in Condition 5.3 of the proposed decision. The minimum requirements specified include efficacy testing using surrogate loads (waste loads that do not contain actual healthcare waste but which resemble it in composition

and moisture content) and suitable carriers (receptacles/methods for introducing biological indicators into the treatment system).

- **Microbiological Testing**

Challenge tests against (i) an overnight culture of a vegetative organism (*Enterococcus faecalis*) and (ii) a spore former (*Bacillus subtilis)* are required daily and three times weekly, respectively. These challenge tests involve the controlled introduction into the system, of known indicator micro-organisms. When the test sample has passed though the system it is tested for its microbial content. A test is deemed to have passed when there is a minimum of log 6 reduction of *Enterococcus faecalis* and *Bacillus subtilis*. As an additional process validation measure testing of treated materials for pathogens (*salmonella/shigella*) is required monthly under Schedule D. An efficacy test using Mycobacterium species is also required within six months of the date of grant of the licence for process validation. The testing is to be carried out by a Laboratory to be agreed in advance with the Agency.

This is in accordance with the microbiological testing proposed in the Joint Waste Management's Board report on behalf of the Department of Health, Republic of Ireland, the Department of Health and Social Services and the Central Supplies Agency, Northern Ireland. The testing specified in the Proposed Decision has also followed guidance given by a US based working group, the State and Territorial Association for Alternative Treatment Technologies, in its Technical Assistance Manuals STAATT (I) 1994 and STAATT (II) 1998.

- **Nuisance Control**

All waste processed at the site is sealed in either 400 gauge sealed plastic bags or in sealed UN approved bins. These are in turn contained within closed waste carts. The treated material is contained within a dedicated enclosed compacting unit prior to disposal 10-12 times per month at a non-hazardous landfill.

- **Staff Training and Awareness**

It is proposed to accept 1,600 tonnes of hazardous waste per annum at the facility, hence I consider that all staff should receive training on operation of such a facility. A recent audit of the facility at Cork University Hospital reported that staff had not undergone training in recent years hence, training is required prior to acceptance of waste at the facility. Information with regard to personnel competence in the monitoring and interpretation of such results is required to be submitted for agreement with the Agency prior to acceptance of waste.

- **Financial provision**

Due to the hazardous nature of the waste proposed at the site I consider that waste should not accepted at the facility until an agreed proposal for financial provision is in place. Financial provision is dealt with under Condition 12 of the proposed decision.

(3) Waste Types and Quantities

The following types and quantities of waste have been provided for in the proposed decision; used sharp instruments (365 tpa), infected or potentially hazardous health care risk waste (625 tpa), autoclaved laboratory waste (240 tpa), potentially offensive material (320 tpa) and healthcare waste from dental practices, with the prior agreement of the Agency, (50 tpa).

(4) Emissions to Air

Atmospheric emissions from the facility arise from process exhaust emissions (emission point EP1) and from the natural gas fired process oil heat exchange unit (emission point EP2).

Analysis has been carried out on the process exhaust emission (after abatement) system which has been in operation at Cork University Hospital for Total Amines and TA Luft Organics Class II and Class III. The process exhaust emission contained a maximum total amine concentration of 3.5 mg/Nm^3 at a maximum flow rate of 0.0014 kg/h. TA Luft Organics Class II and III were present also but at concentrations and mass flow thresholds of 2% and 10% of their respective threshold limit set in the licence.

It is proposed to transfer the gas fired boiler (470kW) from the Cork University Hospital facility to the proposed facility. The purpose of this boiler is to heat the heat transfer oil within the holoflite. The gas consumption will be approximately 3,500m^3 per annum. Flue gas emissions were analysed at the Cork University Hospital facility boiler at the point of discharge for the following parameters: CO, NO, NO_2 and SO_2. The boiler has a history of inefficient operation hence the proposed decision requires that an independent boiler combustion efficiency report be submitted and to be to the satisfaction of the Agency prior to the waste being accepted at the site.

Emission limits of 45Leq dBA for night-time and 55Leq dBA for daytime have been specified in the proposed decision for noise emanating from the facility. The proposed decision also requires that a report on noise sources on-site be submitted to the Agency within six months of the date of grant of the licence.

(4) Emissions to Groundwater/ Hydrogeology

There will be no direct emissions to groundwater.

(5) Emissions to Waters

In accordance with planning permission clean yard and roof runoff will be diverted to a percolation area to be located at the south-eastern boundary of the site. Foul water generated at the site office and cart washings from the facility building will be diverted to an on-site wastewater treatment system and percolation area. Emission limits have been set in Schedule C of the proposed decision for discharges from the wastewater treatment plant to the percolation area. Condition 3.10.1 and 3.13.1 of the Proposed Decision requires that both percolation areas be constructed in accordance with EPA guidance.

Process effluent will be stored on-site in a fully enclosed tank within the bunded area prior to tankering off-site for treatment at an appropriate facility to be agreed in advance with the Agency.

(6) Other Significant Environmental Impacts of the Development

A study commissioned by the Agency under the RTDI programme entitled "*Small Scale Study on Microbiological Efficacy Testing for Healthcare-Risk Waste Facilities*" was carried out by Bio Treat, a UCC-based consultancy firm. This draft report made a number of recommendations regarding the microbiological testing for process validation. These included recommendations for suitable carriers for biological indicators, suitable temperature testing and microbiological procedures. These recommendations have been incorporated in the proposed decision.

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

The system, which operated at Cork University Hospital, is documented in the Cork County Waste Management Plan (1999) and in the National Hazardous Waste Management Plan (2001).

(8) Submissions/Complaints

No submissions have been received.

(9) Reasons for the Recommendation

The recommendation is that a waste licence be granted, subject to Conditions. It is not proposed to refuse any activities applied for. The operation of the proposed facility in accordance with conditions of the licence would pose a very low risk to the environment.

Signed _____ Dated:

Sinead McMahon
Inspector
Environmental Management & Planning.

Appendix 1

Facility Location Map