

Integrated Pollution Control Licence Application Reg. No. 155

The site is 56 acres in extent, with over 10,000 trees, and slopes steeply to the river. Since 1981 considerable expansion has taken place, and there are now five production buildings (P1, P2, P3, P4 and P5), an R & D pilot plant, and a Q.A facility in addition to a large number of support facilities including a tank farm, drum store, warehouse, boiler house and waste water treatment plant

Activities: The company produces a large range of sophisticated pharmaceutical bulk actives, though in relatively small volumes (typical site output is below 5 tonnes/week). The application lists some 120 products and intermediates including anti-inflammatories, antihistamines, antihypertensives, tranquillisers, antifungal agents and analgesics. The intermittent batch nature of the production results in great variations as to where on site various emissions arise.

Class I

Organics: The following Class I Organics are in use:

Methyl chloride	Benzyl butylamine
Dichlorobenzene	Ethyl diamine
Dimethylamine	Bromopropane
Dimethyl sulphate	Chloropyridine
Pyridine	Formaldehyde
Formic acid	

List 1 Substances and priority candidate black list substances:

The following List 1 and priority candidate black list Substances are in use:

Dichloromethane	Toluene
Xylene	Dimethylamine
Chloroaniline	Dichlorobenzene
Benzylchloride	Dichloroethane

Carcinogens: The following substances with R45 classification are in use:

Dimethyl sulphate
p-Chloroaniline
Propylene oxide

Current IPC Licence: The current IPC licence (Reg. No. 15) was issued on appeal on the 18/10/95.

The compliance history of the above licensee is as follows:

Requests for information (x3)
Notification of non-compliance (1) - exceedence of sulphate to river
Incidents (8)
Complaints (2) - noise
Non-compliances reported (11)

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The above may be characterised as follows

- Bursting disc failures (3)
- Temperature exceedences in water discharge (7)
- Air emission exceedences (8)
- Smoke emissions (2)
- Burst drum (1)

The majority of the non-compliances relate to conditions in the existing licence which concern air emissions and effluent temperature, and are expected to cease with the new PD. Complaints to the facility have been rectified by the licensee. The reporting of the licensee was comprehensive during the Audit of the facility. Overall the compliance of the facility has been satisfactory but should improve greatly upon revision of the existing licence.

Emissions:

Air: The initial application contained over 300 air discharge vents, of which some 67 were considered significant process emissions. Control was by means of reactor condensers and by the use of scrubbers (34 on site).

Estimates of maximum hourly emissions to air for total organics were as follows:

P1	-	22 kg/h
P2	-	33 kg/h
P3	-	57 kg/h
P4	-	24 kg/h (plus 60 kg/h butane)
P5	-	10 kg/h (plus 85 kg/h butane/ isobutene)
R & D	-	6 kg/h

Due to the low volumes associated with most emissions, BATNEEC concentration limits were exceeded in all plants, except the newer P5.

The current IPC licence permitted the existing discharges but required a vent reduction programme (along with reduced emissions to BATNEEC levels) to be completed by 1/6/98. The present review was requested by the licensee in order to incorporate into the IPC licence the company's plans for the installation of a thermal oxidiser together with vent reductions to a total of 11 significant emissions. When completed the maximum hourly licensed emissions of total organics from the site will be 25kg/h (compared with 297 kg/h previously). In addition a number of minor changes in the interim ELV's have been included as requested, in order to prevent unavoidable non-compliances (resulting from the original limits which had been largely based on estimations rather than measurements). The existing, interim and final emissions have all been modelled and worst case ground level concentrations have been shown to be within acceptable criteria. In particular for dioxins, the maximum predicted ground level daily average concentration is

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0.0099 pg/m³ which is less than 1% of the ambient dioxin level for rural areas quoted by Jones and Bennet (1989).

Odour complaints had represented 48% of all environmentally related complaints received since 1961. Progress has been made in the effluent treatment area by covering the equalisation basin and extracting it to a dedicated scrubber. Odour complaints have not featured in the past year.

The new plant boiler, installed 1990, has also been a source of complaint. Running on HFO (1% S) it may be oversized as it appears to make excessive numbers of start-up and shut downs. Two problems of excessive smoke emission have been noted during the past year.

Chlorine Content and Combustion Temperature

There are some chlorinated vapours arising in the waste gas stream which will vent to the thermal oxidiser. These have been estimated by the licensee at less than 0.1% of the design mass flow of the thermal oxidiser (i.e. <0.4 kg/h) for all but 814 h/a. For these 814 hours, the average chloride loading will be 0.8 kg/h, with a peak (for at most 20 h/a) of 8 kg/h. Where solid or liquid waste is being incinerated, the BATNEEC guidelines for the waste sector require a temperature of 1100°C and a reaction chamber residence time of 2 seconds (for waste containing >1% halogenated substances, expressed as chlorine). The application states that these conditions are appropriate for solid and liquid hazardous halogenated wastes and are not necessary for the destruction of the gaseous halogenated process gases flowing to the proposed thermal oxidiser. It further states that it is the experience of suppliers of thermal oxidisers that a temperature of 850°C and a residence time of 0.6 seconds is sufficient to ensure complete destruction of much higher concentrations of halogenated hydrocarbons in the gaseous form than those present here and that the 30% increase in the thermal load required to achieve 1,100°C requires a costly increase in gas oil consumption. While the 2 second residence time will be provided as part of the design, the applicant proposes to operate at a temperature of 850°C instead of 1100°C in order to conserve non-renewable resources. The Proposed Determination as drafted requires 1,100°C but allows for a lower temperature (but never less than 850°C) where the licensee demonstrates that such a reduction will not result in emissions exceeding the limits.

Heat Recovery and Dioxin Formation

The applicant has requested that heat recovery down to 250°C be permitted in order to maximise energy recovery. He has supported his case that this can be carried out without significant formation of dioxins and furans by reference to published work (1990), indicating that the presence of fly ash with heavy metals, such as occur in municipal incinerators, is necessary for such formation. He has further stated that the equipment suppliers are satisfied that the required dioxin ELV can be achieved with heat recovery to 250°C. This has been accepted in drafting the PD.

Noise: The other major source of complaint relates to noise. A programme of identification of problem sources with appropriate remediation has been in place for a number of years but

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some of the progress in this regard has been lessened by the additional noise sources associated with a continuously expanding plant. Ambient day-time levels at the nearest residence are 42 L_{eq} dBA while the night time values are 32 L_{eq} dBA.

However, the area is very scenic and remote from other activities and could be regarded as a sensitive site in this regard. Two noise complaints were received in the past year, including one currently under investigation (see “comments” below).

Effluent:The plant generates up to 700 m³/d of wastewaters for treatment. Treated effluent is discharged to the Avonmore River. The wastewater treatment plant (WWTP) consists of twin biotowers, a fixed film tower for ammonia reduction and extended aeration basins. A fluoride precipitation plant for treating high fluoride streams is also in use.

The WWTP does not meet the BATNEEC Guidelines (which apply to new plant) for ammonia. The IPC licence proposed an ammonia limit of 70 mg/l, a value that can maintain the Water Quality Objectives within the receiving system.

Opportunities existed for further reducing ammonia at source and for better treatment. Consequently the existing IPC licence proposed a study programme to identify possible reductions in nitrogen and ammonia discharges. This has been incorporated into the PD for the new licence.

The toxicity (LC₅₀)of the treated effluent has declined significantly in recent years and now typically falls below 5 Toxic Units (TU) and always below 10 TU (10 TU is the BATNEEC value for new plant). Extensive biological surveys of the receiving river in the past show no evidence of any toxic effect.

When the existing IPC licence was issued, dilution of the final effluent by pumped river water was discontinued. However this has resulted in occasional excessively high temperatures in the discharge (above the licence limit of 25°C) with peaks to date of 29.4 °C. Surveys in the river have not shown any significant impact and the licensee has requested a higher discharge limit of 35°C. With a low- flow dilution of 60 fold (120 at 95% ile) this should not result in an unacceptable impact outside the mixing zone and has been incorporated into the PD.

Groundwater:Groundwater contamination was detected in 1991 during baseline work for an EIS. The contamination profile reflects ongoing processes within the plant. All contamination values are low and there are no known wells for abstraction of water for drinking or other purposes within the zone likely to be contaminated.

Groundwater remediation consists of pumping from four wells downgradient of the plant, to the WWTP. The optimum pumping rate established by the company’s consultant hydrogeologists is at up to 24m³/d. The WWTP can readily cater for this volume.

To prevent any recurring groundwater contamination a major construction programme for double containment of effluent lines and improved bunding arrangements has been completed. As part of these drainage works an extensive firewater diversion and retention system was also constructed.

Surface Water

Runoff: Whereas contamination of surface water runoff has not been a problem to date, the presence of a large and complex pharmaceutical plant on a sloping site adjacent to a small river poses a risk of accidental damage. However the Firewater Pond, and the ability to direct contaminated surface water to WWTP, are safeguards.

Solid Waste: The PD as drafted allows for disposal of hazardous wastes by Approved Waste Disposal Contractors. The issue of the existing (non-hazardous) WWTP biological sludge going to Ringsend S.W. has been left for resolution by the parties involved.

Submissions **Dept of the Marine (6/9/96)**

Suggested that levels of ammonia, oxygen, phosphorus, toxic units and BOD be minimised in the content of extremely low flows noted from time to time on the Avonmore River. They quote values of 0.11 m³/s (for 8th September 1959) and 0.5 m³/s (for 1976).

The licence has been drafted on the basis of the 0.49m³/s estimated dry weather flow for the Avonmore River at Rathdrum (P.40, Hydrological Data, EPA, July 1995). A lower value of 0.17 m³/s is also given, but this is at Laragh which is much further up-river.

Overall, the existing licence and the Proposed Determination continue to seek further reductions in effluent loadings under the EMP etc. In addition (i) this PD requires toxicity to be determined for four aquatic species (Condition 6.7) initially and thereafter to the two most sensitive species (Condition 6.8) and (ii) A biological survey of the Avonmore river immediately above and below the discharge point must be carried out every two years. Furthermore an ongoing study (required under the original licence and continued in the PD) aims to identify ways of reducing nitrogen and ammonia discharges. (Condition 6.11).

Comments: Comments were received from the Eastern Health Board seeking a response if the Agency had particular concerns about potential public health risks. The extensive dispersion modelling has not indicated such risks.

Mrs McDonnell (Copse Cottage) has written to the Agency concerning a “humming/buzzing” noise. The licensee has commissioned Forbairt to investigate the problem and a study is ongoing.

Confidential Information:

No confidential information was submitted as part of the review.

Recommendation: That the attached PD be approved as drafted.

Ken Macken