Report on
Objections & Oral Hearing

Indaver (Ringaskiddy)
Waste Licence Register 186-01

Volume 1

Main Report and Recommendation

Written by: Dr Jonathan Derham

Assisted by: Mr Michael Owens

Date: 13/07/2005

Contents

Page No:

ERRATA

pp 19: middle para., last sentence. Delete first appearance of 'Indeed'.
pp 108: 2nd para., second line – insert word 'incinerator' before 'emissions'.
pp 112: 1st para., last sentence – delete the word 'convincing'.
pp 130: last para., first sentence. Exchange word 'was' for 'were'.
pp 150: middle para., third sentence. Replace text 'carried out' with 'assessed'.
pp 151: middle para., last sentence. Delete second appearance of the word 'not'.
pp 182: middle para., first sentence. Delete second appearance of word 'Figures'.
pp 198: first line. Delete first appearance of word 'the'.
pp 228: footnote 128. Case reference should be C-458/00.
pp 247: first para., second last line. Replace word 'not' with 'nor'.
pp 253: first two lines of Section 4.8.2. Replace text ' The issue of waste acceptance and handling was addressed in Part 4.8.1 of this report. Further' with 'Some'.
pp 255: third last line. Replace text 'is' with 'are'.
pp 255: last line. Insert text '; however' after text 'applicant'.

Abbreviations / Acronyms

ABP	An Bord Pleanála
AOD/OD	Above Ordnance Datum
AQS	Air Quality Standard
BAT	Best Available Techniques
BPEO	Best Practicable Environmental Option
BREF	BAT Reference Document (EU)
b/w	Body weight
CACA	Cobh Action for Clean Air
CASE	Carrigaline Area for a Safe Environment
CEA	Cork Environmental Alliance
CHASE - City	Cork Harbour Area for a Safe Environment, City Group
CHASE - PWGMB	Cork Harbour Area for a Safe Environment, Passage West-Glenbrook-Monkstown Branch
CHASE	Cork Harbour Area for a Safe Environment
CHP	Combined Heat & Power
ECSE	East Cork for a Safe Environment
EC	European Community
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
ELV	Emission Limit Value
EMS	Environmental Management System
EPA	Environmental Protection Agency ('the Agency')
EPAA's	Environmental Protection Agency Acts 1992 & 2003
EU	European Union
GEP	Good Engineering Practice
GLC	Ground Level Concentration
HSA	Health & Safety Authority
IPPC	Integrated Pollution prevention and Control
KEW	Kinsale Environment Watch
LOD	Limit of Detection
MARI	Maximum At Risk Individual
MBM	Meat and Bone Meal
MBSC	Monkstown Bay Sailing Club
MSW	Municipal Solid Waste
NHWMP	National Hazardous Waste Management Plan
NOx	Nitrogen Oxides
OD	Ordinance Datum
OEE	EPA Office of Environmental Enforcement
PAH	Polycyclic (or Poly-) Aromatic Hydrocarbons
PCB's	Poly-chlorinated biphenyls

PCDD	Poly-chlorinated dibenzo-para-dioxins
PCDF	Poly-chlorinated dibenzofurans
PD	Proposed Decision
$PM_{2.5}$ & PM_{10}	Fine particulate matter (dust) of a size less than 2.5 micrometers, & 10 micrometers respectively
POP's	Persistent Organic Pollutants
PSD	Prevention of Significant Deterioration (US EPA Clean Air Act regional air quality classification system)
PWTC	Passage West Town Council
QA/QC	Quality Assurance / Quality Control
RD	Recommended Decision
RDRA	Ringaskiddy and District Residents Association
SAC	Special Area of Conservation
SCR	Selective Catalytic Reduction
SNCR	Selective non-Catalytic Reduction
TDI	Tolerable Daily Intake
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
WID	Waste Incineration Directive
w.r.t	With respect to
WMA's	Waste Management Acts 1996 to 2003
WTE	Waste to Energy
§	Refers to 'Section' in legislative Acts.

Summary & Recommendation

This report presents an assessment of the written and oral objections to an Environmental Protection Agency waste licence application Proposed Decision – dated 26th October 2004 - for a municipal and hazardous waste facility (comprising two incinerators, a Transfer Station and a Recycling Park) to be operated by Indaver Ireland Ltd., at Ringaskiddy, Co Cork. I have been assisted in the making of this report by Mr Michael Owens, EPA.

The objection to the Proposed Decision (draft licence) comprises 15 No. written objections received between 17th and 22nd November 2004 as well as testimony and supporting documentation received during the course of an Oral Hearing of objections opened on 14th February 2005 and closed on 1st March 2005. This report includes detailed assessment of, and response to, the issues raised in the objections, including those objections made by the applicant, with reference as necessary to national, EU and international; laws, agreements, standards, texts, documents and published experiences.

Having considered all the matters raised in the objections and the Oral Hearing I am recommending that a final licence be granted in respect of the Indaver application (First Party), subject to amendment of the Proposed Decision as detailed in the attached report. Not-with-standing the strongly held, passionately delivered and cogently put Third Party objections, I am not satisfied that the reasons and argument advanced in these objections and at the Oral Hearing, to the granting of the proposed licence, are sufficient – individually or collectively – to lead me to recommend that a final licence be refused or substantially altered. There is, however, sufficient reason advanced in the said objections to cause me to recommend variation of, and addition to, the draft licence: the extent of which – in my view – will clarify matters, as well as reinforce and amplify the protection of the environment and public health in relation to the execution of the final licence. The full detail of my assessment and recommendations are set out in the following pages, supported as appropriated by the cited references and attached appendices.

Signed

Dr Jonathan Derham, Chairman.

Date: 13 July 2005

Acknowledgements

I would like to express my sincere gratitude to Mr Michael Owens (Inspector EPA) who acted as assistant Chairman at the Oral Hearing and helped in the making of this report. His integrity and first class technical abilities were of significant assistance to me.

I would also like to thank the administrative staff of the EPA Licensing Unit who organised the Oral Hearing, disseminated all the necessary information, and carried out all the other associated tasks, which made the Hearing and the preparation of this report, a comfortable and successful undertaking. In particular; Yvonne Clooney, Ana Bolger, Sonja Smith, Eve O'Sullivan, Fiona McCoole, Tracey Berney, Ann Bosley & Catherine O'Keffee.

Finally I would like to thank Indaver and the communities and people of Cork who were represented at the Oral Hearing, for their courtesy, commitment and contributions. The quality and professionalism of the contributions from the objectors representing the communities of the harbour area was exceptionally high, particularly given that their efforts are all privately financed and time given was voluntary. This huge personal sacrifice and commitment is humbly recognised and applauded.

CHAPTER 1 AUTHORSHIP AND BASIS FOR REPORT

I, Dr Jonathan Derham, was on 4 February 2005, appointed to conduct an Oral Hearing of objections to a Proposed Decision in relation to the granting, by the Environmental Protection Agency (EPA), of a waste licence to Indaver Ireland, for a waste management facility at Ringaskiddy, Co Cork (Licence Register 186-01). Mr Michael Owens was appointed to assist me. Refer Appendix A for letters of appointment.

This report is prepared by me, with the assistance of Mr Michael Owens. It fulfils the obligations falling to me under Section 44(3) of the Waste Management Acts 1996 – 2003 (WMA's), as the appointed person; to make a written report on the objections made under Section 42(3) of the WMA's *and* the Oral Hearing.

This report was made as dated below, and had regard to all objections received; the record of the Oral hearing; Waste Application documentation of Waste Licence Register 186-01; relevant national and EU statute; and such guidance, documents and references as are cited in the objections or otherwise considered herein where deemed relevant to the matters under consideration.

Signed: J Derham Date: 13 July 2005

Dr Jonathan Derham

CHAPTER 2 INTRODUCTION

2.1 The Waste Licence Application

Indaver Ireland[1], on 23rd April 2003, made an application[2], including and Environmental Impact Statement, to the Environmental Protection Agency to operate a waste management facility at Ringaskiddy, Co Cork (Figure 1). The operation comprises a Community Recycling Park, a Waste Transfer Station and two incinerators to burn hazardous and non-hazardous waste and to recover energy in the form of steam and electricity (incineration plant) (Figure 2). The facility covers an area of approximately 12 hectares.

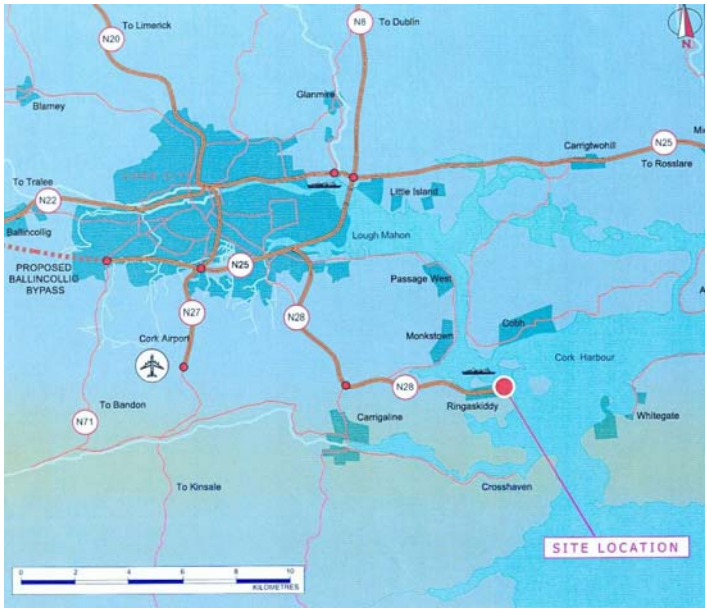

Figure 1: Location of Indaver Waste Management Facility (Waste Register 186-01)

The Community Recycling Park consists of a "Bring Bank" where the public can bring material including cardboard, glass, aluminium cans, textiles, batteries, waste oil and fluorescent tubes for recycling. The Community Recycling Park is designed to accept in the region of 260 tonnes of waste per annum.

[1] May also be referred to as 'The applicants'
[2] May also be referred to in the text as 'this application' or 'this licence application' as may be relevant.

The Waste Transfer Station has been designed to handle 15,000 tonnes of industrial hazardous and non-hazardous waste per annum. Industrial hazardous and non-hazardous waste will be sorted and repackaged where necessary. Material will either be exported for treatment off site or transferred to the incineration plant for on-site incineration.

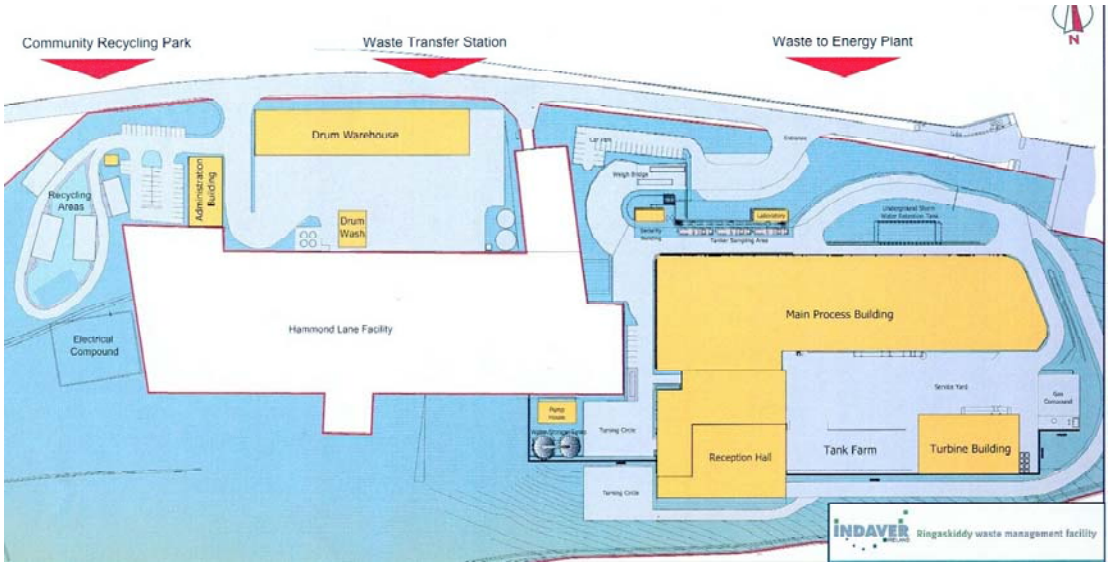

Figure 2: Indaver Ringaskiddy Waste Management Facility - Site Layout

The Incineration Plant consists of two incinerators, a fluidised bed incinerator with post combustion chamber for the treatment of hazardous and non-hazardous solid and liquid waste, and a moving grate incinerator for the treatment of residual non-hazardous solid industrial, commercial and household waste. The combined throughput of the incinerators is 200,000 tonnes of waste per year.

Infrastructure for the incineration plant includes, waste reception area, furnace, boiler, energy recovery system, facilities for the treatment of exhaust gases, on-site facilities for handling and storage of residues and waste water, stack, devices and systems for controlling, recording and monitoring the incineration process. The heat produced from the

process will be used to generate approximately 18MW of electricity with a planned 14MW being exported to the national grid.

2.2 Proposed Decision on the waste Licence Application

On 26th October 2004 the EPA notified its decision, with reasons, regarding a proposal to grant a licence with conditions in respect of the application.

It has to be noted that my name appears on the licence as the authorised officer (last page of Proposed Decision). At the opening of the Oral Hearing I identified my role in authorising the document; and explained that my role was of a clerical nature - authenticating the document as an Agency document – and for the record stated that I had no part what-so-ever in the assessment of the application; the drafting of the Inspectors Report (Appendix B-1); formulation of the recommended decision (Appendix B-2); or the agreement of the Proposed Decision (Appendix B-3 & B-4).

2.3 Objections

Fifteen valid written objections to the Proposed waste licence were received. One of these was from the applicant. Viz:

1. Ms Audrey Hogan, for Ringaskiddy & District Residents Association
2. Mr Derry Chambers, for Cork Environmental Alliance
3. Ms Mary Hurley, for Cobh Action for Clean Air
4. A.J Navratil, for East Cork for a Safe Environment
5. Ms Roma Fulton, for Kinsale Environment Watch
6. Mr Michael McDonnell, Monkstown Bay Sailing Club
7. Mr Dan Boyle TD
8. Mr S.G O'Croinin, An Taisce Cork

9. Mr Eric Hurley, Chairman, Carrigaline Area for a Safe Environment
10. Mr Ger Clancy, for Cork Harbour Alliance for a Safe Environment City
11. Ms Marcia D'Alton, for Cork Harbour Alliance for a Safe Environment
12. Mr Niall O'Keeffe, for Passage West Town Council
13. Mr Ian Lumley, An Taisce Dublin
14. Ms Mary O'Leary, for Cork Harbour for a Safe Environment
15. Ms Jackie Keaney, for Indaver

These objections are included as Appendix C in Volume 2 of this report. For convenience in reference throughout this report, the applicant's objection is termed the '*First Party Objection*' and the remaining 14 objections from the public are collectively termed '*Third Party Objections*'.

Copies of all objections were circulated to all parties to the objection (EPA letter dated 17th December 2004 – Appendix D), and each objector was asked if they wished to make a submission on the objections received. This opportunity was not availed of by any of the 15 objectors.

2.4 Request for an Oral Hearing

The WMA's legislation provides that an Objector can request an Oral Hearing of their objection. There were 11 such valid requests (out of the 15 objections received). Viz:

1. Ms Audrey Hogan, for Ringaskiddy & District Residents Association
2. Mr Derry Chambers, for Cork Environmental Alliance
3. Ms Mary Hurley, for Cobh Action for Clean Air

4. A.J Navratil, for East Cork for a Safe Environment
5. Ms Roma Fulton, for Kinsale Environment Watch
6. Mr Dan Boyle TD
7. Mr Eric Hurley, Chairman, Carrigaline Area for a Safe Environment
8. Mr Ger Clancy, for Cork Harbour Alliance for a Safe Environment City
9. Ms Marcia D'Alton, for Cork Harbour Alliance for a Safe Environment
10. Mr Niall O'Keeffe, for Passage West Town Council
11. Ms Mary O'Leary, for Cork Harbour for a Safe Environment

These requests are included in Appendix C in volume 2 of this report.

On 17 December 2004 the EPA notified all objectors by letter that an Oral Hearing of objections was to be held (Appendix E-1): and by letter dated 13th January 2005 the EPA confirmed the date, time and venue for the hearing (Appendix E-2).

2.5 Oral Hearing

The legislation provides that all objectors and the applicant, as well as the Local Authority (Cork County Council) are entitled to be present and heard at an Oral Hearing. All 15 of the objectors exercised this right: the Local Authority did not. The Hearing Process also allowed for members of the public to participate in both the examination, and presentation, of testimony. The Hearing commenced on 14th February 2005 and closed on 1st March 2005 – twelve working days in all. A full digital record of the hearing is to be found at Appendix F in Volume 2 of this report.

Any reference to a section of the Audio record will follow a general format as follows:

DR/15-2-05/D +5 - means: Digital Recording/Date of hearing/Audio Track D, oral testimony commences approximately 5 minutes in from start of track.

DR/22-2-05/Q,R,S - means: Digital Recording/Date of hearing/Audio tracks Q, R & S

Documentation submitted in support of testimony presented, or cross-examination of same, during the hearing is included as Appendix G of Volume 2 of this report, and is referenced as *Oral Hearing Records*.

The audio record and the documents submitted (Appendix F & G) are unedited and appear as heard or presented. Their reproduction herein - and where not challenged in this report or at the Hearing - is not to be taken as acceptance by either Mr Owens or me that this testimony is accurate or fair in all cases. I disown all testimonial comments hurtful to the person or character of any individual or party to the objection, or other person as maybe mentioned therein.

All parties to the objection as well as members of the public were given opportunity to present or examine testimony. The planning of each day of the Hearing did, in-so-far as was reasonable and practical, accommodate the availability of parties to the Objection and their witnesses. Furthermore, and in the case of technical testimony, the hearing process endeavoured to ensure that all notified parties present at the hearing were given a minimum of 24 hours notice of the presentation of this testimony by any party, and any supporting documentation was similarly notified in advance. This permitted all

parties present opportunity to review testimony in advance of it being presented.

All parties to the Oral Hearing process were issued (13th January 2005) with a copy of the Agency guidelines for Oral Hearings in advance of the hearing. A copy of these guidelines is included in Appendix E-3.

The construction of the Oral Hearing process is that the applicant does not have to necessarily present testimony or evidence to the Oral Hearing in support of their application or an objection. However, as a corollary to this position, it was in my view not helpful for the applicants to represent the whole EIS and Waste Licence Application at the Oral Hearing, as this would not have been an efficient use of time and resources. There were key areas of concern in relation to the proposed project, that were problematic for the Third Party objectors and identified in their objections, and it was important for the success of the Oral Hearing that these aspects of the application and EIS be brought forward to the Hearing for examination. To that end, I indicated to the applicant (DR/17-02-05/T+7) that I was intending to avail of the provisions of Article 29(1) of the Waste Management (Licensing) Regulations 2004 (SI 395) and give notice to the applicant – as a party to the objection – to bring forward certain technical aspects/information of their application to the hearing. The formal procedure is that a written Notice be issued for this purpose, however as the applicant was already present at the Oral Hearing, and indicated they had no difficulty with the request as delivered orally and would comply with said request, I did not see the need to follow up with a written notice. The applicants indicated they were willing to bring forward any evidence on any aspect of the application that would serve to assist the Chairman and the process.

Although the Oral Hearing is 'Chaired', it is not to be understood simply as a form of debate where the opposing arguments are presented and the Chairman ultimately deciding which was the strongest. The Chairman and Assistant Chairman have to read and listen to the objections presented and then reach a conclusion based on; the information on file, as well as that submitted to the hearing, or otherwise directed to, identified or researched. The conclusion has to be correct procedurally, technically and legally; and not just be a matter of who was most persuasive. All objectors are treated equally before the Chairman, indeed the seating layout for the Hearing (First Party and Third Parties together) was deliberate so as to avoid opposing 'flanks' in the room. On the point of 'equality' I am aware that the Third Party objectors are for the most part not professional witnesses, are giving time voluntarily, and their efforts are self-financed. So when a Third Party makes an objection or raises a specific concern than may need technical follow-up or research applied (e.g. obtaining reference documentation), that may serve to reinforce or support the objection, I have in many cases taken this effort onto myself and not expected the objectors to supply <u>all</u> cited documents as part of their objections. However, in order for this to be done, the Third Parties must at least present the Chairman with *sufficient cause* to warrant this effort, i.e., the matter must be of demonstrated or argued, as being of some significance. In some cases this *burden of proof*, so-to-speak, was not achieved. That is, I was not given good cause or reason to follow-up on matters raised (e.g. general statements of objection without sufficient specifics that would identify or underpin the core point or concern). Any such instance is recorded in this text as it occurs.

During the Oral Hearing a range of issues were raised which were outside the scope and purpose of the Hearing, but which were related to EPA operations/staff. Viz;

- Board of the EPA not present at the hearing to answer questions
- Agency Inspector who drafted licence and report for decision not present to answer questions
- EPA staff chairing the hearing
- Chairman of Hearing signed the proposed licence
- Independence of EPA Board, having regard to recent appointments
- EPA enforcement record and capabilities
- EPA not serving the interests of the people or abiding by its mission statement
- Immunity of EPA staff
- Two incinerator authorised by draft waste licence, but only one authorised by planning permission
- Third Party costs recovery
- EPA should stay its decision until outcome of Judicial Review of Planning Permission is completed
- An Bord Pleanála inspector rejected the application
- EPA/Oral Hearing Chairman should review the planning decision on this application before making their final decision
- EPA credibility lost if a licence is issued
- Oral Hearing a sham of a public consultation exercise
- Split competency between Local Authorities and EPA in relation to EIA process is flawed
- 'Leaking' of Proposed Decision to press, prior to local communities being advised

Most of these issues were substantially addressed in my opening statement on the first day of the hearing (DR/14-02-05/A+8, B, C, & D),

and in my address to the parties present on the third day of the hearing (DR/16-02-05/B+7). The points raised are beyond the ability of the applicant to cater for/respond to in their application: either through their EIS, or via information supplied in their waste application. It is therefore not reasonable nor procedurally appropriate to assess the application against these 'objections': they are matters for the EPA (the Agency). But rather than ignore these earnest concerns of the objectors/communities, and in-so-far-as they relate to the conduct of the hearing, the role of the Chairman and the draft decision before us; I believe a brief report of, and comment on, the points is merited.

2.5.1 Board of the Agency not present at the hearing to answer questions

The Chairman of an Oral Hearing has no legal authority to compel a Director of the EPA to attend an Oral Hearing. They are not employees of the Agency and therefore do not come within the scope of Article 29(1) of the Waste Management (Licensing) Regulations 1994[3]. An Oral Hearing as constituted under the Waste Management Acts 1996 to 2003, does not provide for the hearings to be conducted in a manner that would permit cross examination of EPA directors: that is not the primary function of a hearing of objections. Moreover, it is my view that it would be inappropriate for the Board of the EPA - Directors - who decided to hold this hearing and who have to decide on the report of it, to proceed to become part of it.

2.5.2 Agency Inspector who drafted licence and report for draft decision not present at the hearing

It was made clear that the legislation allowed the Chairman of the Hearing to require an officer of the EPA – such as the inspector who drafted the recommended licence, Mr K O'Brien – to attend

[3] SI 395 of 2004

the hearing. However, I noted at the Hearing that the Inspectors Report (Appendix B-1) was available to all, and this report included his assessment of the proposals and third party submissions, with recommendations. I was satisfied I could rely on the content of the report and had no good cause to call the Inspector for the application, to the Hearing.

2.5.3 EPA staff chairing the hearing

The parties present at the hearing were informed, on-the-record, that neither the Chairman, nor the assistant, had any part in the assessment of the application, drafting of the recommended decision and inspectors report, nor in the decision on the draft licence (Proposed Decision). I confirmed to the hearing that I believed there was no conflict of interest in my role as both an employee of the EPA and as the nominated Chairman for the oral hearing; and I believe I am objective and impartial. I advised the parties to the hearing that any issue with either my or Mr Owens' appointment as Chairman/Assistant Chair, respectively, were to be addressed to the Board of the EPA.

2.5.4 Chairman of Hearing signed the proposed licence

As noted previously, at the outset of the hearing I confirmed that I performed a minor clerical function by signing the Proposed Decision: this is an administrative task and is solely for the purpose of authenticating the document as an Agency publication. And as indicated in Part 2.5.3 above, I had no other role in the issuing of the draft licence.

2.5.5 Independence of EPA Board, having regard to recent appointments and published pro-incineration position

There was some concern expressed by parties to the hearing that the Board of the EPA was not independent, nor free of bias. The

composition of the Board of the EPA is a matter for the Government and the Public Appointments Commission, and not the Chairman of the Oral Hearing. The fact that members of the Board of the EPA were previously linked with the incineration industry, or favoured *in-principle* the development of incineration capacity in Ireland, is not significant or relevant as it does not remove the legal obligation of the Board of the EPA to comply with the provisions of §40(4) of the Waste Management Acts 1996 to 2003 (refer page 1 of the Proposed Decision). The licence application decision-making process is wholly transparent with all documents, reports, decisions and reasons placed on the public files. In the case of Ms L Burke (Director of the EPA) who was formally employed by the applicants, the record of the decision notes that she did not take any part in the making of the decision in relation to this application (Appendix B-3).

2.5.6 EPA enforcement record poor and enforcement capability questionable

Many of the Third Party objectors identified what they considered a poor historical record of EPA enforcement in the Cork Harbour area. It was also widely felt that the degree of expertise and experience necessary to certify final design and ongoing enforcement of the mass burn and hazardous waste incinerators was not evident within the current Agency staff compliment. It was asked, how the people of the harbour could have confidence that the EPA are ensuring the public are being protected if the EPA does not have the requisite skills to supervise such projects.

These are matters for the EPA's Office of Environmental Enforcement (OEE) to address and do not come within the principal remit of this report. Suffice it to say, that it is essential for

public confidence and the genuine execution of statutory functions, that competent authorities - regulators - are suitably organised, skilled, resourced, supported, and maintained, such that they can undertake their statutory responsibilities in an planned, professional, thorough, effective, efficient, and ethical manner.

2.5.7 EPA not serving the interests of the people or abiding by its mission statement: it is putting industry and economics before environment

The framework for EPA decision making is set out, generally, in §52 of the Environmental Protection Agency Acts 1992 & 2003; and specifically, in the case of waste licence applications, in Sections 40(2) & (4) of the Waste Management Acts 1996 to 2003. The authorisation, by the EPA, of waste infrastructure, having first satisfied itself regarding the requirements of §40(4) of the Waste Management Acts 1996 to 2003 - and however unpopular such decisions may be - is not, in itself, sufficient grounds to consider the organisation as not serving the people. Adequate national waste infrastructure; which will not pollute the environment or harm human health; which is appropriately and legitimately assessed and authorised; and which is correctly operated, is essential to the future sustainability of Irelands social, environmental and economic existence and future development. The EPA is an independent and highly professional organisation, which - in my view and to the best of its ability - is serving the people in relation to matters of environmental protection (including the protection of human health) in the execution of its functions. Regardless of economic or national policy arguments, the EPA is prohibited from issuing a licence to an activity whose emissions will result in pollution of the environment and harm to human health.

2.5.8 Immunity of EPA staff

The objectors raised concerns regarding the immunity offered to the Agency under the Environmental Protection Agency Act 1992 & 2003 (Section 15), asking what comeback would they have in years to come if it turns out that science – and Agency decisions - were wrong, and health was damaged due to the incinerators. In the unlikely event of such an occurrence, redress or compensation is likely to be a matter for the Attorney General; and in any case advanced under the direction of appropriate legal counsel. Similar immunities are offered to planning officials.

2.5.9 Municipal Solid Waste (MSW) Incinerator as well as Hazardous Waste Incinerator authorised by draft waste licence: Planning permission for only the Hazardous Waste Incinerator exists

The Third Party objectors were concerned that the EPA authorisation of two incinerators would negate the formality of the applicant going back for planning permission for the second incinerator. Although there is provision for dialogue between the determination processes, the Waste Licence Application procedures are independent of Planning Permission procedures. The grant or otherwise of any waste licence authorisation for a facility or operations at same, does not negate the legal responsibility of operators/developers to secure all other appropriate permissions (Condition 1.3 of the draft decision (Appendix B-4) refers).

2.5.10 Third Party costs recovery

A number of the parties to the oral hearing formally notified their requests to seek their costs for the Oral Hearing and related activity, in accordance with Article 6 of the European Convention on Human Rights. Any decision on, or consideration of, such an

application is outside the legal remit of a Chairman of an Oral Hearing as constituted under the Waste Management Acts - with the exception of any application for expenses as may be reasonably incurred following issue of a notice under Article 29(1) of the Waste management (Licensing) regulations 1994[4] (Article 29(2) refers). Any claim for costs under the Convention is likely best addressed to the Office of the Attorney General.

2.5.11 EPA Should stay their decision until outcome of Judicial Review of Planning Permission completed, Planning Inspector rejected application

Although the planning permission and waste licence application processes do dialogue with each other (formal notifications, requests for comment, shared EIS assessment responsibilities) they are separate legal processes that can be determined independently of each other.

2.5.12 EPA/Oral Hearing Chairman should review the planning file and planning hearing report before making final decision

The Oral Hearing into the Proposed Decision for the waste licence is not intended to be a rehearing of the planning application. A number of the objectors asked that the EPA Hearing Chairman consider the report of the An Bord Pleanála planning inspector. I have neither the authority nor legal remit to have regard to the recommendations of the ABP planning inspector, or the final decision of ABP itself. That said, where objectors refer to specific paragraphs or issues of the ABP inspectors report that deal with matters of relevance to the EPA's statutory function, then these have been considered in the making of my report. The separation of the roles between ABP and EPA, and the matters not

[4] SI 395 of 2004

considered by ABP - and which in the view of the ABP inspector fall to EPA for consideration - are articulated on pages 15, 16 & 17 (*Legal Provisions*) of the ABP inspectors report[5]. An area of common interest for ABP and the EPA is that concerning accidents. In relation to accidents, ABP have Seveso II [6] obligations (c.f. page 16 of ABP inspectors report) and the EPA have obligations under §40(4)(c) & (h) of the WMA's. The formers brief concerns best practice from a land-use planning point of view: the EPA's concerns rest with the prevention, preparedness and response to/control of, accidental emissions such that environmental pollution is avoided and impact of such emissions mitigated.

2.5.13 EPA credibility lost if a licence is granted

As articulated previously the EPA has to ensure the environment, including public health, is protected and assured before it decides to grant a waste licence. The making of an unpopular decision cannot be a measure of credibility. Indeed, if the Agency's decision-making process were to be led by popular, political or industrial pressure/influence, then indeed there would be a credibility issue.

2.5.14 Oral Hearing a sham public consultation exercise

The terms and scope of an Oral Hearing are set out in statute and further articulated in Agency guidance. An Oral Hearing plays a very specific role in the decision-making process. It is not to be confused with public consultation in respect of a project at pre-planning/EIS scoping stages; it is not to be confused with the legal

[5] Report of Inspector Philip Jones for An Bord Pleanála dated 5-1-04 for planning application reference PL04.131196. This report is included as an attachment to the written objection of CHASE (c.f. Section 13 of Chapter 3 of this report, and Appendix C)

[6] Council Directive 96/82/EC of 9 December 1996 *on the control of major-accident hazards involving dangerous substances.* As amended. (Seveso II Directive).

obligations to publicise the making of such applications or the making of decisions; nor the acceptance of written comment or observation or objection to said application/decision. An Oral Hearing as constituted under the Waste Management Act's, and when held, grants the special right to any party who wishes it, to have their objections heard orally. It is in fact a very transparent, wholly accessible and relatively informal (non-judicial) forum for the oral presentation, and subsequent examination, of objections and concerns; and is open to any member of the public. The basis for an EPA licence application Proposed (draft) Decision is clearly articulated, with reasons, in the Inspectors Report; the minutes of the Board; and the Proposed Decision itself. These documents are available for public scrutiny and consultation; the Proposed Decision being further circulated to all parties who made submissions on an application. An Oral Hearing in itself cannot alone be considered to constitute the *public consultation* component of environmental decision-making: there are – as articulated in the preceding text - very many aspects to such consultation, with all parts playing a unique but integrated role.

2.5.15 Split competency between EPA and Local Authorities/ABP for EIA of a proposal is flawed

There has been much debate in recent years regarding the transposition of the EIA Directive[7] into national legislation and the alleged flawed aspect of competency for assessment of an EIS being split between the EPA and Planning Authorities/An Bord Pleanála for certain projects. The main argument levied is that an integrated assessment cannot take place where more than one body is involved in the decisions.

[7] Council Directive 85/337/EEC, 27 June 1985, as amended.

The idea of split competency is not alien to the EIA Directive. Indeed the directive in Articles 1(3), 4(4), 9(1), and 10, for example, includes the text '*authority or authorities*' when referring to the competent body for EIS assessment; indicating that the Directive acknowledges that more than one body may be involved in the duties set out in the directive. In Irish statute, Environmental Impact Assessment for projects where a licence from the EPA is required, is split between the planning code and the environmental pollution authorisation codes (Local Authorities/An Bord Pleanála and the EPA). The roles of the competent authorities in relation to EIA are established in statute: the legal validity of these statutory provisions is not for this author to question. Such an analysis is for another place. However, any deficiency in the EIS preparation and assessment in-so-far-as-it relates to the making of the proposed decision (subject of this report) and which is within the statutory competency of the EPA, will - where raised - be examined and concluded upon in this report.

2.5.16 Alleged 'Leaking' of Proposed Decision to Press prior to community being advised

This is not a matter for this report: this complaint should be taken up directly with the EPA.

2.6 Structure of this report

This report is in two parts. Volume 1 is the main report, which considers the written objections received, and those presented at the Oral Hearing, and makes conclusions and recommendations. Volume 2 contains the Annexes where key documentation is held, including the record of the Oral Hearing. The Appendix containing the

recommended final licence is included with Volume 1 so-as to assist readability of the recommendations herein.

Having read all the Objections, and conducted the Oral Hearing it is apparent that, with the exception of the applicant, the majority of objections could be categorised as *issue* based (e.g. suitability of site, health, accidents, etc.,). Therefore, the consideration of objections will take these issues, consider the testimony and concerns raised, and formulate a response. Following on from the consideration of objections, recommendations will be presented in relation to the granting of a final licence with conditions.

Chapter 3 looks at all the third party objections and identifies the key issues raised within each third party objection. That chapter also considers any residual matters raised by Third Parties in their objections that do not fit into the 'issue' clusters considered. Chapter 4 assesses the *issues* and 'residual' matters identified in Chapter 3. Chapter 5 looks at the applicant's objections. Chapter 6 presents my recommendations.

CHAPTER 3 THIRD PARTY OBJECTIONS

Fourteen valid third party objections were received. These are considered below in order of receipt. Any information brought forward by the third parties at the Oral Hearing of objections in relation to their concerns (given directly and under cross examination), is also considered herein. As noted earlier the following examination of objections – both written and oral – tries to identify common areas of concern or 'issues' for the third party objectors, as well as identifying other residual matters which do not fit the issues list. These issues and residual matters, as deemed relevant and critical to the validity of the EIA process and related Proposed Decision, are assessed in detail in Chapter 4, and responded to. Only those matters of relevance to the application in hand and within the legal framework of the Agency to consider - as defined under the Environmental Protection Agency Acts (1992 & 2003)(Section 52(2)), and the Waste Management Acts 1996 to 2003) - are identified. Therefore, and in addition to those general process matters identified in Part 2.5 of this report, any objections that do not come within the legal remit of the EPA waste licensing process (e.g. Planning matters such as; off-site traffic impact, rights of way issues, compatibility with County Development Plans, visual aspects, ...) are not considered in this report.

Many of the grounds for objection could be placed into the area of EIS adequacy (i.e. as sub-sets of the EIS), however for clarity of assessment, structure and discussion on some of the key points of repeated objection (e.g. site flooding, health impact assessment, etc.,), these objections are separated out to into relevant issue headings or clusters.

Additionally, it is apparent that some of the same or similar points of objection appear under different issue clusters. This is largely

influenced by the context in which they are presented by the objector. The following summary attempts to capture the main points raised by objectors in their submitted or cited documents and in oral testimony. In some cases a third party objector may have made passing reference to other concerns. Such concerns may not have found their way into the summary of that Party's principal objection if I have found that another Party has better developed that particular point of objection. The number of references to a particular point of objection does not have a bearing on the technical consideration of that point.

3.1 Ringaskiddy and Districts Resident Association Ltd (RDRA)

This objection comprises a letter received 17 November from Ms Audrey Hogan for RDRA (Appendix C); and testimony submitted by Mr Walter, Ms Hogan, Mr Kelleher and Ms Forde for RDRA at the Oral Hearing. The testimony at the hearing was supported by documents - Oral Hearing Records #5, 7 & 32 respectively for Mr Walter, Ms Hogan & Mr Kelleher: these documents are attached as Appendix G. Refer also to Audio record *DR/15-2-05/U+8,V,W,X; DR/16-2-05/C+3,D; DR/22-2-05/A+11,B,C,D; DR/22-2-05/HH+4,JJ;* and *DR/1-3-05/U+9,V*.

Issues Identified:

- *Site Suitability*
  - Flooding of site
  - Costal erosion
  - Gas main runs through site
  - Proximity to occupied centres (residential, academic,..)
- *Safety concerns*
  - Accidents & Emergencies
  - Evacuation Plans
  - SEVESO classification

- *Competency of applicants*
  - Proper appreciation of critical operational considerations
  - Incident notification procedures
  - Contingency plans.
- *Suitability of Technology*
  - BAT not yet defined for waste incineration
  - Produces a toxic ash
  - No identified disposal route for hazardous ash
  - Inefficient energy yield
- *Need*
  - Waste hierarchy
  - Alternatives to mass burn
  - Policy driven licence rather than environmental
  - Token recovery
  - National & Regional Waste Plans
  - Over capacity for waste available
  - Outdated technology
  - Public & political opposition
  - No Planning Permission for second incinerator
- *Legal Basis for licence*
  - Non-compliance with EPA Act, EPA policy & Mission
  - No medical expert for EPA
  - EIS validity (health assessment, interactions)
  - Applicant not Fit & Proper Person.
- *Proposed Licence*
  - EPA does not have resources or experience to enforce solid waste incinerators
  - Glossary of terms in licence unclear
  - Licence conditions vague & ambiguous. Technical matters deferred.

- No continuous improvement objectives in licence.

- *Health Impact of Emissions*
  - No safe level of Dioxin
  - Incinerators harm health
  - Lack of knowledge of character of incinerator emissions (mixed input)
  - Fugitive emissions
  - Dust
  - Noise
  - Baseline Health monitoring
  - Existing environmental burden from industry
  - General Health & Environmental protection
  - Farming impact
- *Air Dispersion Modelling*
  - Baseline Meteorological Data used not representative
  - Meteorological conditions of harbour (inversions, wind, ..)

3.2 Cork Environmental Alliance (CEA)

This objection comprises a letter received 17 November from Mr Derry Chambers for CEA (Appendix C); and testimony given by Mr Chambers at the Oral Hearing. The testimony at the hearing was supported by documents - Oral Hearing Records #1 & 6 (Appendix G). Refer also to Audio record *DR/14-2-05/K+4, L, M, O, P, Q* and *DR/1-3-05/T+11, U* (Appendix F).

Issues Identified:

- *Site Suitability*
  - Dioxins in soil on site
  - Site selection process
  - Flooding
- *Competency of applicants*
  - Applicants not credible

  - Poor international record on incidents
  - Incident notification procedures
- *Legal Basis for licence*
  - No medical expert for EPA
  - EPA did not consider Health Impact in draft licence decision
  - Were Health Authorities consulted on application
  - EPA 'denies' role in health protection
  - Baseline studies (i.e. EIS) inadequate (site selection, risk assessment, flooding, site contamination, character and quantity of emissions, dispersion modelling, health)
  - EPA failed to provide a reason for the Proposed Decision
  - Precautionary Principle not applied
- *Proposed Licence*
  - EPA does not have resources or experience to enforce solid waste incinerators
  - No mention of health in licence
  - No confidence in EPA enforcement
  - Granting of Proposed Decision prejudices High Court case on planning permission
- *Health Impact of Emissions*
  - Incinerator emissions harm health
  - Lack of knowledge of character of incinerator emissions (incl. products of incomplete combustion)
  - Synergistic effects of emissions
  - Fugitive emissions
  - Baseline Health monitoring
  - Reliance on default EU emission limits flawed (not site specific)

  - What body liable for health in cases of emissions exceedance?
  - Existing environmental burden from industry
  - Cannot predict constituents of 'toxic' ash
- *Air Dispersion Modelling*
  - Meteorological conditions of harbour (inversions)
- *Need*
  - Political & Public opposition
  - No visible industrial base support for project
  - Not sustainable, compromise future
  - No Planning Permission for second incinerator
  - Will negatively impact on National Waste Management Policy
- *Other Matters*
  - Ability of public to prosecute
  - Cumulative impact of wrong environmental decisions on survival of planet

3.3 Cobh Action for Clean Air (CACA)

This objection comprises a letter received 19 November from Ms Mary Hurley for CACA (Appendix C); and testimony given by Mr Crowley, Ms Hurley & Ms Daly at the Oral Hearing. The testimony at the hearing was supported by documents - Oral Hearing Records #9 & #11. Refer also to Audio record *DR/15-2-05/X+8, Y, Z; DR/15-2-05/Z+11, AA, BB, CC;* DR/22-2-05/GG+10, HH; and *DR/1-3-05/T+2.*

Issues Identified:

- *Site Suitability*
  - Proximity to college & residential areas
  - Flooding
- *Competency of applicants*
  - Applicants not trusted

- *Safety concerns*
  - Accidents & Emergencies
  - Evacuation Plans
- *Health Impact of Emissions*
  - Incinerator emissions harm health
  - Baseline Health monitoring required
  - Existing environmental burden from industry
- *Air Dispersion Modelling*
  - Meteorological conditions of harbour (inversions, poor dispersion)
  - Baseline Meteorological Data used not representative
- *Need*
  - Public & political opposition
  - No justification for size of incinerators applied for
- *Legal Basis for licence*
  - EIS validity (baseline health assessment not done)
- *Proposed Licence*
  - Grant of PD for two incinerators (and requiring by condition that the plant is put in place) obviates need for planning on second incinerator

3.4 East Cork for a Safe Environment (ECSE)

This objection comprises a letter received 19 November from Mr AJ Navratil for ECSE (Appendix C); an attachment to the CHASE 22 November 2004 objection – this attachment being written by Mr North (dated Nov 2004)(Appendix C); and testimony given by Mr Navratil, Mr North, Ms Harty & Mr O'Neill at the Oral Hearing. The testimony at the hearing was supported by documents - Oral Hearing Records #3, 4, 8, 12, 15, 20 & 38 (Appendix G). Refer also to Audio record *DR/14-2-05/S+1, T*; *DR/15-2-05/A+14, B, C, D; DR/15-2-05/D+9, E, F, G, H, J, K, L, M, N, Q, R;* DR/15-2-05/O+3, P, Q;

DR/15-2-05/R+13, S, T ; and *DR/1-3-05/Q+11, R, S* (Appendix F). In this objection reference is also made to previous submissions on the application; in particular to a submission from Mr North (prepared for ECSE and CHASE, document dated Sept 2004, received 13-9-04). This submission has been consulted in so far as was necessary to understand or further define any particular point of objection presented.

Issues Identified:

- *Site Suitability*
  - Gas main under the site
  - Site flooding
  - Costal erosion risk
- *Competency of applicants*
  - The use of feed crane drivers at the incinerator to detect fire is inadequate
  - Applicants not qualified, experienced or competent to run such a plant
  - Applicants plants in EU have failed emission limits
- *Safety concerns*
  - Accidents & Emergencies
  - No viable emergency plan
  - Explosives in feed to incinerator
- *Legal Basis for licence*
  - Precautionary Principle not applied
  - EIS validity
  - Greenhouse gas emissions (e.g. CO_2) not properly calculated
  - Non-incinerator based options not considered in EIS
  - EIS description of area flawed
  - Seveso II classification incorrect
  - Why no application for an IPPC licence?

- Site map references confused
- No valid assessment of impact of proposals
- Health grounds not considered by EPA in grant of draft licence
- Incineration contrary to government policy (Reduce-Reuse-Recycle)
- Decision contrary to Stockholm Convention on persistent organic pollutants & Kyoto Protocol
- Licence application incomplete
- Inaccuracies/flaws in application
- EPA did not properly address the issues raised in technical submission on licence application
- Modelling of accidental emissions not undertaken
- Waste acceptance/checking details inadequate

▪ *Need*

- Public & political opposition
- There are alternatives for identified feed streams to incinerator
- All recovery opportunities need to be explored first
- Availability of incineration will hinder recovery/recycling initiatives: decisions will be made based on immediate cost to dispose versus recover, rather than on total environmental cost
- Incineration cannot destroy matter, just converts it
- No facility for hazardous incineration ash in Ireland
- The most-hazardous waste still to be exported (not acceptable at incinerator)
- Proposal contrary to Local Authority Waste Plans, as well as national waste plans
- Inappropriate application of proximity principle

▪ *Proposed Licence*

- Grant of proposed licence contravenes EPA mission statement
- Licence does not deal with health & safety concerns
- Incinerator emissions will raise the level of some of the background pollutants by a factor of 100
- Condition 1.4 :- each incinerator should be restricted to 100,000t/a
- Condition 1.5 :- The Agency should clarify the position with regard to solvent recovery on site.
- Condition 2.1.1 :- Qualifications of management for incinerator not defined.
- Condition 2.3.3(i) :- The EMP should be prepared prior to start-up of activity.
- Condition 2.3.3(iii) :- The EMP and the AER reports should be publicly accessible.
- Condition 2.3.7 :- A communications programme should be defined from the outset. As written the public protection under this condition will fade in time. The terms of the public communication programme should be defined by the Agency and not the applicant.
- Condition 3.5.3 :- If radioactive scanner not working, then waste acceptance should cease. Scanner should be tested daily.
- Condition 3.7.5 :- The five-year interval for bund testing is inadequate; should be every 2 to 3 years.
- Condition 3.8 :- Ash storage should be fully enclosed; ash should be considered hazardous until proven otherwise.

- Condition 3.10.3 :- Many of the solvents accepted are miscible with water or denser and will not be catered for by the interceptor.
- Condition 3.12.2(c):- The objection believes that concerns over the maintenance of adequate post-combustion chamber temperature raised in Mr North's submission on the licence application are not adequately dealt with by this condition. They refer back to that submission.
- Condition 3.12.3 :- The Incinerator test programme proposal should be available for public inspection.
- Condition 3.14.4(i) to (vi):- The objection queries what controls are proposed to ensure that specified – in the condition – pollutants are limited as defined. How is this to be achieved?
- Condition 3.14.8 :- The bottom ash should be vitrified so-as to reduce contamination.
- Condition 3.14.15:- The objection believes that the use of the word 'minimise' in this condition in relation to the reformation on dioxins and furans in the boiler, indicates the EPA believe such formation will occur. The objection develops this point by asking what monitoring will be in place during the 361 days when there is no EPA specified monitoring (PD specifies four time a year), to ensure protection during failure.
- Condition 4.1.1.3 :- The ability to discard 10% of measurements is excessive.
- Condition 4.1.2.1 :- It would be more conservative to add the uncertainty error in calculation of compliance.

- Condition 6.5 :- Equipment maintenance should be done by external specialists.
- Condition 6.6 :- What does representative mean in this context?
- Condition 6.8 :- The Agency does not seem to know what standards exist.
- Condition 6.9 :- Equipment should have auto calibration capabilities.
- Condition 6.10:- The objection believes a back-up or reserve, set of monitoring equipment should be specified.
- Condition 7.4 :- Study of heat recovery efficiency should be done prior to build as retrofitting difficult.
- Condition 8.3:- The objection believes the proposed licence is unclear on how wastes are to be deemed unsuitable for processing at the facility, and furthermore, asks what is to happen to unsuitable wastes.
- Condition 8.9:- The objection asks who/how is the clinical waste being received to be deemed 'infectious' or not. The objection further suggests the requirements of the condition cannot be met due to the incinerator feed design.
- Condition 9.4.1:- The objection considers that the terms of the PD in relation to the diversion of waste from the facility – in the event of incinerator shutdown – is not adequately dealt with in the PD, and needs advance planning.
- Condition 9.4.3:- The objection believes that the reference to 'appropriate authorities' to be notified in the event of a fire is vague.

- Condition 11.1(a) :- The objection states that the operator should inform the Agency within 1 hour of an incident.
- Condition 11.3.2:- The objection questions the use of the term 'if appropriate' in this condition (where it twice appears), in relation to the recording of waste delivery permit details; and query the possible circumstances where such waste records would not be required.
- Condition 11.7:- The objection requires that records of waste transactions should be kept for at least six years and preferably twenty; and not two as suggested.
- Schedule B:- Emission limits set are too high and will not protect the local environment
- ELV's not conservative enough given meteorological conditions in harbour
- Dioxin ELV should be 0.01ng/m^3 as this is now BAT (Stockholm Convention Dec 2004 BAT document); also the applicants say they can do this.
- Schedule C:- The objection considers the quarterly monitoring of stack emissions to be inadequate. The objection requests continuous monitoring. Ambient air quality monitoring should be included in Schedule C; also, waste input to the fluidised bed should be monitored.
- Inspectors Report to the Board (Mr K O'Brien, Appendix B-1, Volume 2):- In reference to page 4 of the Inspectors Report, it is suggested that the Inspectors description of the process is different to that provided by the applicants

- Inspectors Report to the Board (Mr K O'Brien, Appendix B-1, Volume 2):- In reference to page 18 of the Inspectors Report and the response to a submission from Passage West Town Council, the objection believes that the non consideration of documents submitted to the Planning Hearing, as directed by the Town Council was not proper
- Inspectors Report to the Board (Mr K O'Brien, Appendix B-1, Volume 2), page 19:- The objection also believes that the inspectors response to submissions from Ms D'Alton and Mr North was inadequate
- If licence to be granted then only if:
    - Stack raised to min 110mAOD
    - Site levels raised by 2m
    - Bunkers are double contained
    - Rotary kiln for hazardous waste
    - Separate treatment for bio-solids and MBM
    - Reclassification of site to SEVESO II Tier 1
    - SCR abatement is employed
    - Vitrification of MSW and ashes
    - Real-time monitoring of dioxin pre-cursers
    - Health impact assessment carried out
    - EPA inspector on site virtually full time

- *Health Impact of Emissions*
    - EPA Board communications on incineration (Council Review 2003 – M Kelly, EPA: 'Incineration may pose a risk to health but you cannot establish cause and effect')
    - Safety of short term excursions above TDI for dioxins not proven

- Incinerator emissions harm health & environment
- Emissions are highly toxic
- There are no safe levels for Dioxin
- Unpredictable impact risks
- Risks to unborn
- No health monitoring in place
- Cumulative emissions impact/risks
- Dioxins can enter the food chain through milk and meat.
- Lack of knowledge of character of incinerator emissions (mixed input)
- The EPA Inspectors Report [Appendix B-1, Volume 2] to the Board of the Agency with the recommended decision refers on page 12 to WHO and Tolerable Daily Intake of dioxin & furans. The objection states that this reference is out of date and invalid, and refer to Dr V Howard and Dr P Johnson.
- The objectors also state that the use of the MARI (maximum at risk individual) in health risk assessment (refer Inspectors Report) is outdated and based on arbitrary assumptions.
- The objection argues that on page 15 of the Inspectors Report reference is made to emissions 'not presenting a serious risk'[to health]. The objection asks what level of risk is considered not serious. A similar point of objection is presented for a statement on page 17 of the same report which states that emissions from the incinerator will not result in 'a significant environmental impact'. The objection asks by what criteria is significance assessed.
- The reliance on EU emission limits is not risk assessment

- Background levels of air pollutants will be significantly increased

- *Air Dispersion Modelling*
  - Meteorological conditions of harbour (inversions poor dispersion)
  - No explanation for variation in metals and dioxin levels measured
  - Baseline Meteorological Data used not representative
  - PSD classification (as Class 3) incorrect; should be 2
  - Maximum emission figures should have been calculated rather than just using directive limits
  - Impact on existing air quality is considerable and comparison with AQS's is not appropriate for the area
  - Sensitivity analysis not carried out on models
  - Accuracy not estimated for models used
  - Models are steady state (not dynamic)
  - Models do not account for inversion events
  - Models do not account for alteration of pollutants in atmosphere after release
  - Models only considered a 3km radius (should have been 8 to 10 km)
  - Inversion events should be measured not discussed
  - Models were inapplicable
  - Most models do not handle inversions
  - Pollution levels would be increased by meteorological conditions but models used won't show this
  - Stack velocities for cumulative air impact assessment are not normal
- *Suitability of Technology/Techniques*
  - What controls are there for operational failure/malfunction to prevent emissions

- What level/quality of supervision will be available 24hours?
- Operating temperatures should be minimum 1100°C at all times
- Waste bunkers should be double lined
- Bulk tanks should be stainless steel
- Location of bulk ammonia and bulk hydrochloric acid in same building is poor practice
- Contaminated fire-water retention tank smaller than fire-water tank.
- Incinerators, globally, have a poor safety record
- Hazardous ash produced
- Incineration leaves about 30% of municipal solid waste as 'toxic' ash which has to be landfilled, producing a sustainability crisis
- Potential for asbestos in ash: Ash vitrification should thus be considered BAT
- No testing of ash for asbestos
- BAT for energy recovery from solvents is in a simple boiler or CHP
- Energy efficiency of recovery system questionable
- There should be at least 2 and preferably 3 radioactive material detectors
- There should be explosive scanners
- Technology outdated – there is a better way
- Pipe transfer of waste from transfer station to incinerator preferable to tanker
- Technology selected generates dioxins
- BAT needs to be applied, the proposed technology is not

- A full stand-by flue gas cleaning system should be in place
- Waste mixing prior to incinerator chute should be by screw and not crane
- Proposed quenching system for combustion gases too slow, and it will lead to additional dioxin formation
- There are no details on how incompatible/reactive materials will be handled and segregated in the facility, particularly in bunker and incinerator charge chute
- Pre-shredding of reactive wastes risky
- There are no details on how infectious material is to be handled
- There are alternative technologies to Incineration
- BAT for thermal treatment is an integrated pyrolysis system or pyrolysis followed by incineration in a cement kiln
- Pyrolysis & gasification is preferable to moving grate for municipal waste
- Contrary to applicants claim, pyrolysis & gasification is commercially available
- Water cooled grate preferable to simple grate
- Fluidised bed incineration will not be able to cater for solid toxics in drums
- Fluidised bed not BAT for hazardous waste: whereas rotary kiln is
- Selective non-catalytic reduction (SNCR) is proposed by the applicants for NOx control in emissions; BAT is SCR (selective catalytic reduction)

- *Other Matters*
  - EPA not technically competent to consider this proposal
  - No one person (i.e. Oral Hearing chairman) capable of dealing with the range and complexity of issues
  - EPA surveys of Dioxin in the environment flawed and cannot be relied upon in impact assessment
  - EPA inventory of Dioxins flawed, and cannot be relied upon in impact assessment
  - Potential impact on farming activities not acceptable
  - The high level of air emissions from the incinerator are such that new industry may be prevented from coming to area due to inadequate assimilative capacity of the ambient air
  - Ireland currently has a low level of dioxin
  - Zero Waste policy not explored (Canberra, Australia cited as example)
  - Damage to clean image of agricultural exports

3.5 Kinsale Environment Watch (KEW)

This objection comprises a letter received 19 November from Mesdames Fulton & Boyle (Appendix C); and testimony given by Ms Cargin at the Oral Hearing. The testimony at the hearing was supported by documents - Oral Hearing Records #14 & 17 (Appendix G). Refer also to Audio records *DR/16-02-05/D+14, E, F, G; and DR/01-03-05/P+14, Q* (Appendix F).

Issues Identified:

- *Site Suitability*
  - Flooding of site
  - Costal erosion
  - Gas main runs through site

  - Proximity to occupied centres (residential, academic,..)
  - Harbour is a bowl, emissions will not disperse
- *Safety concerns*
  - Accidents & Emergency risks
  - Adjacent Hammond Lane site has frequent fires: what risks are thus posed for the application
  - Evacuation Plans
  - History of accidents at other incinerator plants
  - Accidents do happen
- *Competency of applicants*
  - No confidence in applicants to operate site
  - Applicants plant in Belgium had serious emissions control failure
  - Applicants have no experience in design, nor construction, nor operation of an incinerator
- *Legal Basis for licence*
  - Precautionary Principle not applied
  - Not enough knowledge about health effects of emissions to make a decision
  - EIS validity, baseline flora & fauna surveys deficient
  - Proposal contrary to Kyoto Protocol agreements
  - Incineration contrary to City & County Development Plans and strategies
  - No planning permission in place
- *Need*
  - Alternatives to mass burn
  - Policy driven licence rather than environmental
  - Not enough 'toxic' waste in Ireland to warrant such a proposal

- Incinerators will harm recycling and 'alternatives' initiatives
- Emphases should be on prevention, reduction, and cleaner technology
- Should be moratorium on incineration until proper waste strategies put in place
- Ringaskiddy does not need any more polluting industry

- *Health Impact of Emissions*
  - Incinerator emissions harm health
  - Dioxins and other incinerator pollutants bio-accumulate
  - Testimony of Dr ten Tusscher is that dioxins harm health even at permitted emission levels
  - Emission levels based on what is technologically achievable and not what is necessary for health protection
  - Published health effects of incinerator type emissions
  - No health monitoring system in place
  - Health impacts of interaction of chemicals not considered
  - Most incinerator stack emissions are unknown as are the 'cumulative' effects of same
  - WHO Tolerable Daily Intake (TDI) limits are based on adult, and not a child
  - The Maximum at Risk Individual (MARI) used by applicants for health impact calculations does not cater for pre- or post-natal child, the elderly or frail.
- *Suitability of Technology*
  - Produces a toxic ash, and there is no suitable disposal site identified for the ash

- Incinerators destroy resources and consume energy, not sustainable

- *Air Dispersion Modelling*
  - Meteorological conditions of harbour (inversions)
  - Use of Cork Airport Meteorological data unrepresentative
- *Proposed Licence*
  - Self monitoring not acceptable
  - Once per year dioxin monitoring not acceptable
- *Other Matters*
  - EPA wrong to accept Applicants own assessments
  - Damage to Irelands clean image

3.6 Monkstown Bay Sailing Club (MBSC)

This objection comprises a letter received 19 November from Mr M McDonell (Appendix C); and testimony given by Ms O'Reilly at the Oral Hearing. In the oral testimony on behalf of the sailing club, it was said that the objection was also being made on behalf of the Monkstown Amenity Association. The testimony at the hearing was supported by documents - Oral Hearing Records #19 (Appendix G). Refer also to Audio records *DR/21-02-05/A+9, B; and DR/01-03-05/P+4.*

Issues Identified:

- *Site Suitability*
  - Geology unsuitable
  - Topography unsuitable
  - Local climate unsuitable
  - Hydrology unsuitable (flooding)
  - Costal erosion risk
  - Fails WHO guidelines for site selection
  - Proximity to occupied centres (residential, academic,..)

- *Safety concerns*
  - Accidents & Emergency risks
  - History of accidents at other international plants shows up public safety issues
  - Proximity to Hammond Lane site and fire risk
  - No evacuation / rescue plan
  - Safety risk due to proximity to other industrial developments storing dangerous chemicals
- *Suitability of Technology*
  - There is no suitable disposal site identified for the hazardous waste ash
  - Incineration is a dirty industry
- *Legal Basis for licence*
  - EIS validity
  - Incineration contrary to County Development Plan
- *Need*
  - Scale of proposal in excess of that needed
  - Future is in recycling and reuse
  - Incinerators will harm recycling and prevention initiatives
  - No provision in Cork Waste Management plan for an incinerator
  - There already is a Civic Amenity recycling facility in Rafeen, another one in Ringaskiddy is not needed
  - Ireland is currently exporting its hazardous waste to areas of EU already polluted: this is therefore dealing with our waste acceptably; and in doing so we are not polluting our own environment
- *Competency of applicants*
  - Applicants have poor safety record
- *Proposed Licence*

- Self monitoring not safe

- *Health Impact of Emissions*
  - Incinerator emissions harm health
  - Even with an incinerator operating efficiently the emissions will undermine health
  - No health monitoring system in place
  - Decision to grant premature as no health monitoring in place
  - Huge population at risk from emissions
  - Wrong to create fear in communities, contrary to civil rights
  - People are entitled to clean air
  - Safety (health) of recreational users of harbour, particularly children
  - Historical incidences of sickness in school children due to factory emissions
- *Air Dispersion Modelling*
  - Meteorological conditions of harbour (inversions)
  - Local wind conditions fluky due to geography of harbour, this will impact on dispersion
  - Use of Cork Airport Meteorological data unrepresentative
  - What of dispersion risk in accident situations?
- *Other Matters*
  - Risk to local agriculture, flora, and fauna

3.7 Mr Dan Boyle TD

This objection comprises a letter received 22 November from Mr Boyle (Appendix C); and testimony given by Mr Boyle and Ms Wipfler (for Mr Boyle) at the Oral Hearing. Refer to Audio records *DR/14-02-05/E+8, F, G, H & J; and DR/01-03-05/O+10, P.*

Issues Identified:

- *Site Suitability*
  - Site floods
  - Topography unsuitable
  - Ringaskiddy area has had enough industries
- *Legal Basis for licence*
  - Incineration contrary to Local Government Policies & strategies
  - Incinerators conflict with Kyoto obligations
  - Precautionary principle dictates that risks outweigh benefits
  - More studies of site hydrogeology and topography needed
  - Project not sustainable
- *Need*
  - Scale of proposal in excess of that needed
  - Incinerators will harm waste minimization initiatives
  - Proposal contrary to waste hierarchy
  - Waste management policy should be 'prevent-reduce-recycle' with residual to landfill
  - Incineration contrary to opposition-government policy
  - Proposal not supported by community or local politicians
  - Cork region not the largest producer of waste
- *Competency of applicants*
  - Applicants EU plants have poor safety record
- *Safety concerns*
  - Accidents & Emergency risks
  - History of accidents at other international plants shows up public safety issues
  - Cork emergency plan cannot cope with an accident at the facility

- *Proposed Licence*
  - Self monitoring not acceptable
- *Suitability of Technology*
  - Fluidized bed technology is unsafe
  - Incinerators do malfunction
  - Incineration is 'end-of-pipe' technology
  - Technology not BAT
  - Is it really energy recovery?
  - Too much emphasis on 'NEEC' element of BATNEEC
  - Single stream incineration OK, but mixed stream incinerators problematic
- *Health Impact of Emissions*
  - No health monitoring system in place
  - EPA dioxin inventory a 'guess-timate'

3.8 An Taisce

This objection comprises letters received 22 November from Mr S O'Croinin for An Taisce Cork (including a cited attachment received by email 22 November 2004), and from Mr I Lumley for An Taisce Dublin (both in Appendix C); and testimony given by Mr Sweetman and Mr O'Croinin at the Oral Hearing. Refer to Audio records *DR/21-02-05/D+7, E, F, G, & H; and DR/01-03-05/N+6,O* (Appendix F).

Issues Identified:

- *Site Suitability*
  - Flooding/water-logging
  - Erosion
  - Too close to population centres and other facilities
  - Too close to Naval College
  - Existing site may already be contaminated

- Siting of incinerators near food production is objected to by US food manufactures

- *Legal Basis for licence*
  - Incineration conflicts with international treaties (Kyoto, POP's)
  - The incineration process produces '39,000tpa' of solid waste, this is unsustainable and contrary to Articles 3(b) & (c) of the IPPC Directive[8]
  - EIA process flawed (interaction of direct and indirect effects not considered by EPA, impact on bats not assessed, assessment of indirect effects not done, interaction of development impact on residents not done)
  - The applicants do not have legal control of all the land for the site as there is a right of way through the site
  - No IPPC licence applied for
  - Requirement in Incineration Directive[9] regarding fire-water retention not considered in application of licence
  - EIS flawed (site selection flawed; studies not independent; impact on bats not considered; odour impact not done; interaction with Hammond Lane site not done; site selection flawed; misrepresentation of data in the EIS; impact assessment on groundwater & surface water inadequate; Contamination status of the site not presented in EIS; site development noise; impact on local fauna not adequate; no bat survey; no flora & fauna survey for land adjacent to the site provided; An Bord Pleanála Inspector considered the

[8] 96/61/EC
[9] 2000/76/EC

EIS to be inadequate; the Non-technical Summary is flawed as it contains unexplained scientific terms; no risk assessment included; no evidence of co-ordination between competent authorities in permit consideration/decision)

- Deferral of agreement of technical matters to licence conditions seeking 'agreement' with the operator, are contrary to public consultation (Ash disposal, EMS, …)
- Municipal solid waste incinerator not applied for in planning
- Recycling park excluded in An Bord Pleanála decision
- No evidence of integrated approach to issuing IPPC permit (contrary to Article 7 of IPPC Directive[10])

- *Competency of applicants*
  - Applicants are not competent
  - Applicants have no experience in incineration
  - Applicants not financially stable
  - No information available on applicants staff, their experience and qualifications
  - Financial ability to underwrite closure is questioned
- *Air Dispersion Modelling*
  - Meteorological conditions of harbour (inversions, poor dispersion); stack Height inadequate.
  - Emissions risk to Cobh unacceptable
  - No ambient air quality monitoring station in Ringaskiddy is a failing by EPA/others
  - Baseline Meteorological Data used not representative

[10] 96/61/EC

- *Need*
  - Incineration is contrary to Zero Waste initiatives and other waste prevention/reduction objectives
  - Indaver will have a monopoly
  - There are other non-dioxin forming treatment technologies for the proposed feed-stock for the incinerator (e.g. chemical remediation techniques; neutralization; biodegradation; gas phase hydrogenation; electro chemical oxidation)
  - Proximity Principle wrongly applied
  - Incinerator ashes will add to landfill problems in Cork
  - National Hazardous Waste Management Plan (NHWMP)[11] talks about the requirement for Thermal Treatment: incineration does not equal thermal treatment
  - Too early in development of NHWMP to determine need for an incinerator
  - Capacity of incinerator is significantly in excess of demonstrated need (in NHWMP)
  - Hazardous waste not a national priority (due to small volumes)
  - Existing export practices for hazardous waste are fine
  - Proposal contravenes 1999 County Cork Waste Management Plan: no mention in plan of requirement for incineration
  - Cork pharmachem industry reducing hazardous waste production and moving to cleaner technology, thus reducing the need for the incinerator
- *Suitability of Technology*

[11] Irish EPA, 2001.

- NOx reduction technology for proposed incinerator is not BAT.
- The proposal for annual monitoring of emissions is inadequate given the range of waste expected
- There is no suitable disposal site identified for the hazardous waste ash
- Proposed technology is outdated
- Combustion of spent activated carbon is environmentally questionable
- Incineration is wasteful
- Energy recovery is poor
- Incineration is not the sole technology solution for hazardous waste (e.g. Cosmo Robo solution – high temperature gas plasma pyrolysis)
- Incineration only converts waste to greenhouse gases, acid gases, flue-gas abatement residues and ash
- Is the proposed NOx removal technology considered BAT?
- The electro-static precipitators proposed for dust capture will not deal with carbon dust (carbon is uncharged)
- What is the risk of 'flash-backs' during direct liquid injection (to incinerator)

▪ *Proposed Licence*

- Re. Inspectors Report and Noise: which may be a nuisance even if within licence limits
- Waste screening & categorisation procedures are inadequate to ensure compliance with Condition 3.4.1

- Deferral of agreement of energy efficiency of unit under Condition 7 is inappropriate
- Deferral of agreement of fate of incineration ashes (Condition 8.13) is inappropriate
- Conflict between development of the structures required by proposed facility and the provisions of Condition 3.4.1 (re. fence)
- ELV's for PAH's not given, contrary to IPPC Directive[12] requirements
- Application needs to be authorised as an IPPC activity applying BAT
- No provision is made for compliance with Water Framework Directive[13] requirements in relation to water emissions
- Reject application OR severely curtail the scope and nature of the waste accepted along with realistic and enforceable safety conditions

▪ *Safety concerns*

- Site of proposal should be classed as Upper Tier (Tier 1) Seveso II
- Explosion risk to Maritime College
- Accidents & Emergency management & evacuation risks
- Adjacent Hammond Lane site poses risk because of frequent fires
- IPPC Directive[14] requirements (Article 3(e)) in relation to accident prevention and safety measures would suggest that a site located away from population centres would be better

[12] 96/61/EC
[13] 2000/60/EC
[14] 96/61/EC

- Inadequate water supplies are a safety concern
- Fire water storage inadequate
- History of accidents/incidents at incinerator sites

- *Health Impact of Emissions*
  - Incinerator emissions harm health

3.9 Carrigaline Area for a Safe Environment (CASE)

This objection comprises a letter received 22 November from Mr E Hurley for CASE (Appendix C); and testimony given by Ms Masson and Mr Allen at the Oral Hearing. The testimony at the hearing was supported by documents - Oral Hearing Records #10 & #16 (Appendix G). Refer to Audio records *DR/16-02-05/G+5, H, J, K, & L; DR/16-02-05/N+1, O, P & Q; and DR/01-03-05/M+12 & N* (Appendix F).

Issues Identified:

- *Site Suitability*
  - Too close to population centres
  - Proposed site is contaminated by dioxin (1991 survey)
  - Flooding risk
  - Erosion risk
  - Weather inversions common
  - Gas pipeline under the site
- *Legal Basis for Licence*
  - Municipal solid waste incinerator does not have planning permission
  - No baseline assessment of pollution in Cork Harbour prior to issuing licence
  - The granting of a licence in advance of an appropriate health assessment, is premature
  - EIS inadequate (firewater retention issues)

- Incineration conflicts with Stockholm Convention, Biological Diversity Convention & Kyoto Treaty obligations
- There is no disposal outlet in the State for the disposal of the 'toxic' waste by-products from the facility, so why issue a licence
- We do not yet know enough about the dangers of all the chemicals associated with incinerator emissions
- A licence cannot be issued prior to the running of test burns to establish destruction and removal efficiencies
- No proper evaluation of waste categories, classification and volumes, undertaken
- Noise and odour not adequately addressed

▪ *Need*

- Incineration is starting at the bottom of waste hierarchy
- Moratorium on incineration requested until alternatives tested
- Incinerators not being built in the USA
- Ireland too small for mass burn incineration
- Ireland does not produce the quantity or types of waste that justify incineration
- 60% to 70% of what we export is recoverable
- Advances in *cleaner production* and *Zero Waste* initiatives will reduce ongoing need for incineration
- Waste source reduction initiatives need to be implemented (implement mandatory pollution prevention; enforce clean production practice; establish a Toxic Release Inventory; implement product and process re-design; establish a centralised multi-technology waste treatment facility)

- Alternative treatment technologies need to be attached to site of waste production

- *Proposed Licence*
  - Proposed licence needs to be revoked
  - ELV's set in licence are inadequate, and not in compliance with Stockholm Convention
  - Condition 2.1 : There is no indication as to what constitutes a qualified person: who determines this aspect?
  - Condition 9.4.1 : In the event that the site has to shut down, there is no alternative location identified
  - Condition 8.8 : The objection questions the ability to check whether or not waste has been pre-mixed, contrary to the provisions of the condition
  - Condition 11.3 : The objection expresses concern whether or not waste will be imported to the State to feed this facility
  - Discharges to surface water and public sewer from the facility could cause flooding and contamination at Ringaskiddy and in bay
  - No mention in licence or Inspectors Report of legal compliance with EU Groundwater Directive[15] or the Water Framework Directive[16]
  - Inspectors report did not say why incineration was favoured
- *Suitability of Technology*
  - No validated study exists which illustrates the efficacy of thermal treatment as best practice option or solution for hazardous waste management

[15] 80/68/EEC
[16] 2000/60/EC

- There are other alternative technologies for hazardous waste treatment other than incineration (electrochemical oxidation; gas-phase chemical reduction; anaerobic digestion; plastics liquefaction; supercritical water oxidation; wet air oxidation; alkaline hydrolysis)
- The proposed SNCR process for NOx removal is not BAT
- The proposed electrostatic precipitator for dust abatement is not best practice give that the dust is primarily uncharged carbon
- Questionable technological safety regarding direct injection of hazardous waste to post combustion chamber
- Technology for proposed incinerator is not BAT (should be rotary kiln)
- Incineration is wasteful of resources
- The employment of Urea/Ammonia in the De-NOx is utilising a product that is highly energy intensive to produce: what is the overall energy efficiency of the incinerator project?
- Is incineration BAT for the management of spent activated carbon; what of remobilisation of volatile heavy metals?
- BAT for treatment of Hazardous Waste may not be incineration when regard is had to energy efficiency, residuals management, and resource consumption
- The storage of hazardous waste in the Transfer Station is a risky operation
- Will waste from abroad be imported to 'feed' this incinerator?

  - The gypsum produced by the air emissions abatement system is proposed to be used in construction projects: is this environmentally acceptable and in accordance with IPPC Directive[17] guidelines?
  - Incineration of MSW is one of the least favoured options for management of this stream
- *Competency of applicants*
  - Applicants have no experience in the incineration technology proposed
- *Health Impact of Emissions*
  - Incinerator air emissions produce toxic chemicals
  - Multiple chemical sensitivity is an issue with incinerator emissions
  - Continuing good health (including mental health) of population is not adequately addressed
  - POP's and PAH's are among the most toxic of synthetic chemicals
  - The objection suggests that incinerator emissions cause cancer
  - No appropriate health register in Ireland
  - There are no safe levels for POP's
- *Safety concerns*
  - Road network not helpful for access by emergency services
  - No information is provided on accident & emergency plans
  - Local emergency services inadequate to deal with incidents

[17] 96/61/EC

- Flash-backs or blockage risks in solvent direct injection lines
- Adjacent Hammond Lane site poses risk because of frequent fires
- Incineration Directive[18] requires adequate bunding capacity for fire water

- *Air Dispersion Modelling*
  - Statistical basis for modelling analysis is flawed
  - No standard deviation for air dispersion modelling which means the predictions are flawed
- *Other*
  - No independent evaluation or technical observations noted in EPA reports (between competent authorities – HSA, Health Authority, Local Authority)
  - Waste reuse and Zero Waste initiatives need to be legislatively supported
  - Irelands 'clean' image will be damaged

3.10 Cork Harbour Alliance for a Safe Environment – City Group (CHASE City)

This objection comprises a letter received 22 November from Mr G Clancy for CHASE City (Appendix C); and testimony given by Mr Clancy at the Oral Hearing. The testimony at the hearing was supported by a document - Oral Hearing Record #24 (Appendix G). Refer to Audio records *DR/17-02-05/G+11, H, J, K, L, M, N, O, P, Q, R, S & T; and DR/01-03-05/M+2* (Appendix F).

Issues Identified:

- *Site Suitability*
  - Flooding
  - Does not comply with WHO guidelines

[18] 2000/76/EC

- Gas main under site
- Salt content in air intake (adjacent to sea) will reduce efficiency and performance of fluidised bed incinerator

- *Competency of applicants*
  - I cannot trust applicants
  - Applicants have a poor compliance track record internationally
  - No current Indaver Ireland employee has the experience or skills to understand or control the design, construction or operation of the facility
- *Legal Basis for licence*
  - Too many unknowns, discrepancies and inaccuracies in application documentation for application to be considered legal
  - No health assessment of local population
  - No known characterisation of hazardous waste inputs
  - Data provided by applicants on waste inputs is theoretical or indicative
  - EIS flawed (particulate emissions information deficient)
  - Activity subject to VOC control under the Solvent Directive[19] and associated national regulations[20]
- *Need*
  - Incinerator development contrary to waste reduction initiatives
  - Mass incineration will negatively impact on recycling initiatives

[19] 1999/13/EC

[20] Emissions of Volatile Organic Compounds from Organic Solvents Regulations 2002 (S.I. No. 543 of 2002)

- *Suitability of Technology*
  - How can a facility that produces 30% hazardous waste itself be considered as contributing to waste minimisation
  - 'Mass burn' technology is not BAT for municipal waste incineration
  - Matter not destroyed, pollutants transferred to air and ash waste
  - Bag filter technology proposed is not effective as ultra-fine particles will pass through
  - Fluidized bed technology will add to fine dust generation and result in over-load of downstream filters
  - Why no catalytic destruction filters?
  - Dust from ash hopper a concern
  - No cooling jackets on storage vessels
  - A mass-spectrometer is needed to help characterise incoming waste
  - Incoming waste characterisation (No continuous or routine testing of waste inputs proposed; waste from known customers not verified)
  - Huge amounts of hazardous waste stored in 'buffer' to feed the incinerators represents an excessive risk
  - Fluidized bed has poor efficiency and containment of pollutants
  - Proposed Powdered Activated Carbon spray treatment of dioxin is inefficient and prone to fires
  - Contradiction in temperature control requirements (very high temperature needed to prevent acid corrosion, and low temperature needed for Powdered Activated Carbon abatement function)

- Powdered Activated Carbon technology can increase the potential for reformation of PCDD and PCDF's
- High efficiency dioxin filters have not been proposed (catalytic Destruction Filters), these are BAT
- Rotary Kiln incinerator better (i.e. BAT) than fluidised bed for hazardous wastes (especially for uncharacterised wastes)
- Incinerator technology selection process not clear
- Bottom ash is hazardous

▪ *Proposed Licence*

- ELV's for dust are in-sufficient, no limit for fine particulates, no program for continuous improvement in fine dust prevention/control
- No monitoring of $PM_{2.5}$
- Condition 3.11.1: Trucks holding hazardous waste will be queuing on public roads waiting for site to open
- Condition 3.14.9: No higher temperature specified for the burning of MBM, such temperatures are needed to destroy the prions
- Condition 5.1: Condition says there should be '*no other emission of environmental significance*', how is this to be measured/discovered/proved
- Condition 5.3: Same concern as per Condition 5.1, how will external impact be assessed
- Condition 6.4: Condition requires monitoring of '*any emission',* the system proposed will not permit such a confidence level
- Condition 8.8: This condition prohibits mixing of waste; the objection states that the condition will be

impossible to comply with as wastes do have to be mixed in the kiln feed

- Condition 9.4: Where will waste go in the event of the site being temporally closed
- No ELV's for fugitive emissions from Transfer Station
- Various conditions & Self Monitoring: The objection believes that Self Monitoring will not work, applicants cannot be trusted
- Not satisfied that licence conditions will protect the environment and public health

- *Health Impact of Emissions*
  - Air quality in the Harbour Area will deteriorate, existing ground level contaminant concentrations will increase
  - Rights to clean air outweigh profit
  - What about cumulative air quality impact with proposed extension to Aghada Power Station
  - Fine particulates ($PM_{2.5}$ and PM_{10}) pose a real heath concern
  - Incinerator emissions will add to heavy metal contamination in area
  - Because the incoming waste is uncharacterised then emissions cannot be classified/characterised
  - High background levels of VOC
- *Safety concerns*
  - Applicant has not addressed failure of more than one tank, fire and explosion, leachate run-off from waste handling areas, spillages of 'toxic' ash
  - Site should be Seveso tier II
  - This is not a highly regulated industry

  - Risk of fire/explosion due to 'swarf fires' in adjacent Hammond Lane
  - Risk of site has to consider cumulative or knock-on effects due to other activities in the area
  - Uncharacterised waste is a huge risk
  - Waste incompatibility not adequately addressed
  - Proper hazards risk assessment not undertaken
  - High pressure gas main under site
- *Air Dispersion Modelling*
  - Cork airport data unrepresentative
  - Use of 'typical' incinerator emission values derived from Belgian plant of unknown design and unknown feed, is unrepresentative
  - Air inversions common in harbour
- *Other*
  - Applicants enterprise in not highly regulated

3.11 Cork Harbour Alliance for a Safe Environment – Passage West-Glenbrook-Monkstown Branch (CHASE PWGMB)

This objection comprises a letter received 22 November from Ms M D'Alton for CHASE PWGMB (Appendix C); and testimony given by Ms Dalton and Ms Bowen at the Oral Hearing. The testimony at the hearing was supported by two documents - Oral Hearing Records #2 & #27 (Appendix G). Refer also to Audio records *DR/17-02-05/U+14, V, W, X, Y, Z, AA, BB, CC, DD & EE; DR/18-02-05/B+4 & C ; DR/01-03-05/J+1;* and *DR/01-03-05/J+7, K, L* (Appendix F). This latter record (closing statement by Ms M D'Alton) was made on behalf of both CHASE PWGMB and Passage West Town Council (c.f. Objection #12).

Issues Identified:

- *Site Suitability*
  - Flooding
  - Erosion
  - Close to harbour, hydrogeological contaminant transfer risk
  - Harbour is an enclosed air-basin
  - Too close to populations
  - Wrong location for optimum emissions dispersion, and minimal greenhouse gas production
  - Location contrary to EU and WHO guidelines[21, 22]
  - Local geography unsuitable for such a proposal
- *Health Impact of Emissions*
  - Agency must have regard to human health impacts (EU and WHO health obligations)
  - Character & nature of emissions unknown
  - Baseline air quality monitoring indicated exceedance of heavy metals and particulates AQS's
  - Incinerator emissions will add significantly to the burden of pollutants in the area
  - Local populations are at risk from emissions
  - National Health Research Board[23] noted reports of a possible link between cancer incidence and location of incinerators
  - No monitoring of health in communities near waste facilities

[21] *Incineration*. Sectoral Guides (operational draft), EU Commission Environmental Integration web pages at: http://europa.eu.int/comm/development/body/theme/environment/env_integ/env_integration/frameset.html

[22] Site Selection for new Hazardous Waste Management Facilities. WHO Regional Publication European Series #46, 1993.

[23] Health and Environmental Effects of Landfill & Incineration – A Literature Review. Health Research Board, 2003.

- No assessment of health effects of proposed incinerator on local populations
- Incinerator emissions are dangerous
- Heavy metals in incinerator emissions are dangerous

- *Air Dispersion Modelling*
  - Harbour prone to thermal inversions
  - Baseline Meteorological Data used [from airport] not representative
  - Baseline air quality monitoring for modelling too short
  - Stack height is below level of surrounding hills and so terrain is complex
  - No validation of metals anomalies following closure of Ispat Steel plant
  - Ambient air impact assessment - 50% rule as per NZ Government guidance not utilised or considered
  - Some predicted ambient impacts are very close to the relevant AQS
  - Effective stack height calculations compromised by too many climate conditions
  - Models used were inappropriate for the site circumstances
  - Models used have limitations
  - Models as used did not allow for meteorological 'calms' and inversions
  - Harbour meteorological conditions very complex (sea breezes, fumigation, fluky winds, terrain, ...) resulting in poor confidence levels in modelling results
  - Input parameters for the modelling not consistent, representative or correct
  - No modelling of emissions in the event of an accident
  - Model results not realistic or reliable

  - Dispersion occurs in different directions for the two models selected
  - Areas of peak ground level concentration are different for the two models selected
  - Why do peak concentrations occur near boundary if the plume is dispersing about 90 m above the ground
  - No identification of the reliability of the model estimates or determination of magnitude and sources of error
- Both incinerator flues modelled as one, should have been split for purposes of assessment
- Modelling source code deficiencies
- Local structures not accounted for in modelling input code
- Roches Point meteorological data is incomplete
- Use of 1995 meteorological year data set questioned for currency
- Model assumptions not compatible with site specifics
- Certain key meteorological parameters were undefined
- No model 'sensitivity' analysis undertaken
- Wrong PSD classification for Ringaskiddy area used in model assessments
- Use of emissions data from Belgian incinerators in modelling is unrepresentative as the facilities are not similar in design nor feed-stock, to the Ringaskiddy proposal
- Stack height not determined according to USEPA guidance

- For a plume to reach effective stack height, it must first overcome conditions at stack height
- Incidence of class G stability in harbour
- Local sea breezes warrant special attention due to possibility of recirculation of pollutants due to on-shore and off-shore breezes
- No evaluation of shoreline fumigation
- Modelling of heavy metals
    - Incorrect distribution weighting used for Cadmium
    - Additional individual model runs should have been carried out due to detected metal exceedance in background study

- *Need*
    - Incineration will negatively impact on recycling initiatives, and on-site recovery activities [at point of production of waste]
    - Size of operation exceeds demonstrated need
    - Applicants will end up with a monopoly
    - Plenty of incineration capacity abroad, it [hazardous waste] is a valuable commodity in EU
    - Not enough waste generated in the Cork area to justify selection of this location
- *Safety concerns*
    - Accident 'domino' effect with other industries in area
    - Fire/explosion risk due to adjacent Hammond Lane site (swarf fires)
    - Local communities fear the proposal
    - Wrong atmospheric parameters used for study on major accident prevention

  - Site located in a cul-de-sac, making access of emergency services difficult

- *Suitability of Technology*
  - No outlet in Ireland for toxic ash from the facility
  - Underground tanks a risk to groundwater
  - Risk to surface waters from contaminated storm-water run-off/monitoring failure
  - Proposed operation abatement equipment is good, but is not going to work all the time
  - Fluidised bed incinerators require homogenised feed of known wastes, this is not the case for this proposal
  - Proposals not BAT for this site
  - Incineration is not sustainable
  - Water storage tank capacity borderline
  - Will the Ringaskiddy operation use the same equipment and protocols used by the Antwerp operation where there was a major accident
  - USA GEP/BAT for stack height in complex terrains is 1.5 to 2 times height of local landscape
- *Competency of applicants*
  - Applicants technical competence queried given historical accidents record
- *Legal Basis for licence*
  - Adequate information not submitted in application documentation for application to be considered legal
  - Incinerators not included in Cork Waste Management Plan[24]

[24] Cork Co Co Waste Management Plan 2004. Seen at http://www.corkcoco.ie/co/web/docviews/environment?did=651878816&pageUrl=/Cork+County+Council/departments/environment+%26+waste/publications

- Adequacy of EIS (Site is contrary to EU and WHO site selection guidance(op cit); 12 months of on-site meteorological data needed for impact assessment/modelling; climate assessment inadequate; life cycle energy/resources need for activity not presented; ecological baseline studies and impact assessment inadequate; no human health assessment; no noise assessment for operational facility; site selection process flawed; air dispersion modelling not carried out in accordance with specified standards)

- *Proposed Licence*
  - No monitoring of harbour water proposed
  - Stack height should be 90m

3.12 Passage West Town Council (PWTC)

This objection comprises a letter received 22 November from Mr N O'Keeffe for PWTC (Appendix C); and testimony given by Mayor J Kelleher (Mrs), Mr D Donnelly, Mr M McGrath and Ms M D'Alton at the Oral Hearing. The testimony at the hearing was supported by three documents - Oral Hearing Records #21, #22 & #26 (Appendix G). Refer also to Audio records *DR/16-02-05/S+0 & T; DR/16-02-05/V+1, W, X & Y ; DR/17-02-05/A+11, B, C, D & E;* and *DR/01-03-05/J+7, K &* (Appendix F). This latter record (closing statement by Ms M D'Alton) was made on behalf of both CHASE PWGMB and PWTC (c.f. Objection #11).

Issues Identified:

- *Site Suitability*
  - Flooding
  - Erosion risk
  - Site fails WHO site selection criteria
  - Thermal inversions in harbour

- *Need*
  - Decision premature with regard to waste minimisation, reuse and recycling initiatives
  - Incineration is at the bottom end of the waste hierarchy
  - Indaver will have a monopoly
  - Future changes to the definition of waste will reduce the waste statistics and thus the need for incineration
  - Availability of incineration will be a disincentive to recovery/recycling
  - Waste is a resource and should not be burnt
  - Size of facility is much greater than national need
  - Mass burn is lowest efficiency with regard to encouraging cleaner production
  - Industry in harbour already dealing with its own waste
  - Cork does not produce the volumes of waste to supply this facility or to justify its location
  - Hazardous waste currently sent abroad for recovery, why replace this with disposal in an incinerator
- *Safety Concerns*
  - Seveso classification and risk to local communities & Maritime college
  - Cumulative risk of proposed project and other Seveso plants in the area
- *Health Impact of Emissions*
  - Incinerators produce emissions that are dangerous to health
  - No such thing as a safe level of dioxins
  - Who will look after health protection, not the EPA according to a communication issued by them

- Precautionary Principle[25] should be applied and project halted until more research undertaken, not good enough to say there is no information available to prove a health risk, one has to go out and actually generate the information to prove there *is* no risk

- *Suitability of Technology*
  - Produces a toxic ash, and there is no suitable disposal site identified for the ash
  - There are alternative technologies for the treatment of hazardous waste
- *Competency of applicants*
  - Poor international record on incidents
- *Legal Basis for licence*
  - Large public opposition to proposal
  - Right to pollute does not exceed right to clean air
  - EIS deficient (no proper ecological survey/assessment carried out; noise impact during construction not assessed; no meaningful assessment of technological alternatives to incineration)
  - EPA inspector did not consider Town Council submission in making his report
  - Proposed incinerator does not comply with National Hazardous Waste Management Plan[26]
  - No mention in *County Cork Waste Management Plan*[27] or in *Sludge Management Plan for County Cork*[28] of need for an incinerator
- *Air Dispersion Modelling*
  - EIS deficient in that modelling does not represent the emissions impact on the harbour

[25] *Communication from the Commission on the Precautionary Principle*, EU Commission COM(2000)1, Brussels 02-02-2000
[26] Irish EPA, 2001
[27] Cork County Council 2004
[28] Cork County Council 1999

- Meteorological data used was inappropriate

- *Other*
  - No confidence in EPA
  - EPA do not refuse to give licences
  - Right to object to a licence not given prior to issue of Proposed Decision
  - A paucity of independent assessment of the impact of incineration

3.13 Cork Harbour Area for a Safe Environment (CHASE)

This objection comprises a letter received 22 November from Ms M O'Leary for CHASE (Appendix C); and testimony given by Ms M O'Leary, Mr N Collins, Dr G ten Tusscher, Dr A Staines, Mr F Duff and Mr J Noonan at the Oral Hearing. The testimony at the hearing was supported by five documents - Oral Hearing Records #18, #25, #28, #30 & #31 (Appendix G). Refer also to Audio records *DR/16-02-05/Y+4, Z, AA, BB & CC; DR/17-02-05/F+1 ; DR/18-02-05/M+6, N, O, P, Q, R, S, T, U, V, W & X; DR/22-02-05/E+12, F, G, H, J & K; DR/22-02-05/K+11, L. M, N, O, P & Q* and *DR/01-03-05/C, D, E, F, G & H* (Appendix F). The written objection received 22 November 2004 includes as an appendix a 12-page critique of the Proposed Decision by Mr P North. This element of the objection has been included for assessment purposes with the main body of Mr North's testimony given on behalf of East Cork for a Safe Environment (refer Section 4 of this Chapter, above). The 22 November objection also appended a number of technical documents in support of the CHASE objection. The content of these attached documents has been noted and, where relevant, considered in the summary of issues given below. It should also be noted that the closing statement by Mr Noonan (presented 1-

3-05) for CHASE was also indicated to represent the concerns of many of the third party objectors to the proposed development.

Issues Identified:

- *Site Suitability*
  - Site does not conform to WHO site selection criteria
  - Flooding risk
  - Erosion risk (c.f. also EPA research report by Dr Sweeney on climate change and sites suitable for development)
  - Thermal inversions
  - Seveso II site suitability criteria not considered
  - Contradiction between positive aspects of Ringaskiddy site and positive aspects of applicants other incinerator site in Co Meath
  - Site too close to maritime college & residential areas
  - Gas main on site
- *Safety Concerns*
  - Explosion risk to local communities & Maritime college
  - Measures for explosion prevention during transfer, offloading and blending not adequately considered
  - Incinerators have a poor international track record for safety
  - Fire risk in bunker
  - Incineration is not a 'fail-safe' industry
  - Selected technology is prone to fires
  - Operation incorrectly classified as Lower Tier SEVESO II site [29]
- *Competency of applicants*
  - Poor international record on incidents
  - No trust in their ability to run the site properly

[29] Council Directive 96/82/EC of 9 December 1996, as amended

- Applicant has no experience in running such a facility

- *Health Impact of Emissions*
  - Applicants note in Section 14.6.4 (pg 170) of waste application that incinerator emissions cause harm
  - Cumulative toxic impact of all industry in the harbour not considered
  - What is total daily load of dioxin and mercury released
  - Incinerators produce emissions that are dangerous to health (including dioxins, heavy metals, biological agents (MBM))
  - Fine particulates (PM_{10} & $PM_{2.5}$) commonly associated with incinerator emissions are particularly hazardous to health
  - Worst case emissions impact not assessed (accidents)
  - Industry does not have the right to remove public right to clean air
  - Ireland has low levels of Dioxins, why allow an increase
  - Children are already being exposed to concentrations that are too high
  - Approved emission standards are for adults, not children
  - Standards based approach is flawed
  - Young are at increased risk
  - No such thing as a safe level of dioxins, any exposure is too much
  - Modern waste streams generate a more toxic emission
  - Dioxins do not belong in your body

- Chronic impacts as well as acute (from accidental discharges) need to be considered
- Synergistic (multiple agent) effects of emissions not assessed
- Who is looking/will look, after health protection?
- Who will monitor the health of the communities?
- Decision cannot be made having regard to the findings of the Health Research Board report[30]
- None of the Health Research Board recommendations have been adopted/implemented
- It is adduced that EPA stated it is difficult to show 'cause and effect' in relation to health impact from incinerators
- We are seeing effects in humans at emission levels that are currently deemed acceptable
- We may well see the health effects of modern incineration in years to come
- Incineration detrimental to Irelands health
- Irish health information systems cannot support routine monitoring of the health of people living near waste sites
- If there is no baseline health survey now, it will be impossible to determine if there has been a change in community health status should the incinerator go ahead
- Background levels of Nickel are already high, why add to this
- Any addition of pollutants/environmental burden to the local environment will cause harm
- Communities have a right to a safe environment

[30] *Health & Environmental Effects of Landfilling and Incineration of Waste – A literature Review*. Health Research Board, Dublin, 2003.

- *Suitability of Technology*
  - Matter cannot be destroyed, incineration is just 'a method of dispersion'
  - Was a life-cycle analysis carried out on the resources need for the post-combustion emissions management/abatement
  - No BPEO (Best Practicable Environmental Option) assessment carried out in relation to the management of the various waste streams
  - No pre-characterisation of some of waste feed into incinerator, thus no possibility to characterise emissions
  - CO_2 emissions from the incineration of hazardous waste cannot be offset against renewable energy targets
  - Technology selected should be one that prevents the release of dioxins
  - Ash wastes present a pollution threat and may contaminate the harbour
  - Bag filters will not trap PM_{10}'s and $PM_{2.5}$'s
  - Residence time for injected waste (to after-burner) may not provide adequate destruction
  - Contribution to climate change via greenhouse gas emissions
  - Once dioxins have been released you cannot undo the problem
  - Use of lime/limestone in flue gas cleaning is not BAT; catalytic dioxin destruction filters are
  - What will be done with the waste gypsum from flue gas cleaning, this will be contaminated
  - No back-up to single scrubber option

- On-line monitoring from Belgium not acceptable
- Processes for chemical drum cleaning not defined, what happens to wash-water
- How will the waste 'bunker' be contained, how is containment to be monitored
- Crane mixing of waste feed to fluidized bed to achieve correct blend is too arbitrary a method
- How will Chlorine content of waste feed be monitored
- Over what time-scale will it be possible to adjust the operating conditions of the fluidised bed to adjust for new feed-stock
- How is blending to be handled for the liquid waste burning
- What is the minimum retention time for the fluidised bed incinerator, how is this to be controlled
- Fire-water storage provisions on-site are inadequate
- Procedures for spill management and fugitive emission control are poorly defined
- Ash will only be sampled bi-annually, so where will it be safely stored in the interim pending a decision on suitable disposal
- What will be done with the ash, in other EU countries there are problems dealing with the hazardous ash

- *Legal Basis for licence*
  - EIS validity (baseline health impact assessment not done; human health impact section of EIS inadequate; site selection flawed; too many unanswered questions e.g., condition 3.10.4 of PD; no proposal for ash disposal; dioxin survey of lands not included; consultants compiling EIS are operating on a limited brief (construction only); no sentinel species

identification/monitoring; applicants have not satisfactorily demonstrated that the proposal will not cause harm; odour assessment inadequate; light pollution not assessed; no worst-case impact assessment done; no medical expert for the applicants; volumetric flow of stack emissions underestimated; heat impact assessment not done; groundwater contamination risk not adequately assessed; baseline dust survey inadequate; fugitive emissions assessment inadequate)

- Non-Technical summary should have been amended to reflect information provided under Articles 13 & 14 of the licensing regulations
- EIA failure: Local Authorities/An Bord Pleanála and EPA do not consult with each other in relation to assessment of the EIS
- EIA not carried out as per EU requirements
- Not all of the additional information requested by EPA (in Articles 13 & 14) was supplied
- Standards based approach to setting of limit values and assessing risk is flawed, standards only 'mitigate' (c.f. recitals to Incineration Directive[31]) and do not eliminate or prevent, harm (irrational optimism)
- Limits have their limits!
- WHO guidance on waste incineration not followed[32]
- Applicants have not shown they can be considered Fit & Proper Persons (§40(4) & §40(7) of WMA's)
- Incineration contrary to City & County Development Plans and strategies

[31] Directive 2000/76/EC of 4 December 2000, on the incineration of waste.

[32] *Waste Incineration (Environmental Health & Planning).* WHO Regional Publication – Europe; Pamphlet #6, 1996.

- Proposal poses a huge environmental threat and poses a safety risk, therefore, and in law, the licence cannot be issued
- Proposal inconsistent with national waste plans (NHWMP)
- Incinerator proposal is premature given that Priority Actions (e.g. waste prevention program) in the NHWMP not introduced
- No planning permission in place for second incinerator
- Public & Political opposition
- Proposal in contravention of Stockholm Convention on POPS
- Proposal in contravention of Convention on Biological Diversity
- Article 8 of Convention on Human Rights not being upheld by EPA in the incinerator decision process
- Application breaches EU Precautionary Principle, Proximity Principle and Polluter Pays Principle
- Application is inconsistent with the provisions of the EU Treaty
- Medical evidence is sufficient to prevent EPA granting a licence (§40(4)(b) of WMA's)

▪ *Air Dispersion Modelling*

- Model input parameters flawed
- Use of recent EIS air quality data for other proposals in the Harbour flawed
- Where do the ambient TOC estimates come from
- The identification of the proposed site as Class III in relation to US EPA PSD[33] assessment has

[33] Prevention of Significant Deterioration (US EPA Clean Air Act regional air quality classification system)

consequences for standards, how was this classification made

- Baseline assessment flawed as the detection limits for some of the metals were flawed
- In relation to SOx, annual limit values for the protection of ecosystems are presented, but estimated process contributions and total emissions of SOx from the facility are then only compared against shorter term quality limits, not against the annual limit
- Emissions of other substances (e.g., PCB's, PAH's, ..) produced by incinerators are not considered in the EIS
- Cork Airport meteorological data used in the modelling is not representative of the lower harbour
- The SO_2 ground-level concentration was predicted based on original waste characterisation, this was never revised to account for the change in waste types in a response to an Article 12 request for information
- The assumption that Irish Ispat was the cause of high background levels of metals & dust is not substantiated, further monitoring could have supported this thesis
- The classification of the area as *Industrial* for the purpose of the EU Directive on Air quality[34] is incorrect and did not get regulatory approval

▪ *Need*

- There are numerous incinerators in EU capable of handling Irelands waste

[34] European Council Directive 99/30/EC on limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air

- The national 'executive' who support incineration are ill informed
- Incineration is not worth the risk
- Incinerators will harm recycling and 'alternatives' initiatives
- Not enough waste to 'feed' the incinerators
- Proposals are in excess of needs
- There are alternatives to incineration
- The NHWMP does not specify that incineration is the preferred 'thermal treatment' option
- Applicants will have a monopoly
- No support for incineration from industry
- Incineration is not sustainable
- It is suggested that the EU does not support incineration
- The national spatial strategy does not mention the requirement for incineration

▪ *Proposed Licence*

- Precautionary principle would dictate that ELV's should be low as technologically possible
- By the time the plant is built, EU emission limits will have dropped further
- Standards are invariably reduced
- EU limits should be considered a maximum
- Conditions require second incinerator to be built without the requirement for planning permission
- Treatment of submission from the Minister of Health in the Inspectors Report is in conflict with the letter from the Director General of the EPA to the Department of Health & Children (Appendix H)
- No medical expert in EPA assessing application

- No good and comprehensive reasons for grant of proposed licence given
- Agency & Inspectors Report failed to give adequate or proper consideration to: the application & supporting documents, and to the third party submissions
- Inspectors report is erroneous in places
- No reference to the Maritime College in the Inspectors description of the site area
- Inspectors report does not present an adequate description of the transfer station
- It is not clear from Part 1 – Activities Licensed of the PD what some of the authorised classes of activity actually permit
- Conditions in PD are inadequate and inappropriate to regulate the control & operation of the incinerator and transfer station
- Conditions of the licence require the applicant to include unreasonable modifications to the design of the facility
- Condition 1.3: The objection wishes this condition to specifically state that obligations under planning control are not set aside
- Condition 1.4: The objection wishes that the waste tonnage limit in this condition reflected the limits set for each incinerator
- Condition 1.7: The objection suggests a revised text for this condition which would have the effect of ensuring that all plans, programmes, and proposals get written approval prior to their operation

- Condition 1.9: The objection notes that the applicant, during the application process, modified the range of wastes to be accepted and that this change satisfies the criteria specified in the condition: thereby making the original application null and void
- Condition 1.9(a): What exactly constitutes a 'material change or increase', how much is permitted before it is deemed significant
- Condition 2: The objection wants this condition modified to the extent that will ensure the incinerator is not operated unless there is written approval of licensee personnel and that there is better clarity on the qualifications and experience necessary
- Condition 2: The applicant has not detailed corrective actions in their application
- Condition 2.3.2: The obligations for waste minimisation is nugatory taking into account what the facility is to do
- Condition 2.3.7: The objection requires that information on types and quantities of wastes received, stored and dispatched and their fate, should be available for inspection
- Condition 3: The objection suggests that the operation of the incinerator should be prevented until written approval of all infrastructure has been given by the EPA
- Condition 3.1: The requirement to have all infrastructure – including the second incinerator – in place before/without the need for, planning permission subverts the democratic process

- Condition 3.2.4: No conditions for groundwater protection specified
- Condition 3.5: Capacity limitations and bunding arrangements for waste inspection and quarantine areas should be specified
- Condition 3.6.2: No negative pressure for fugitive emission control at the transfer building; where will the vapours go
- Condition 3.7: The bunding capacities indicated in the condition are inadequate, what will flooding risk add to the requirements?
- Condition 3.9.2: What does 'as far as practicable' mean, where will water go when it cannot be used?
- Condition 3.9.3: There is no detail in the licence on how run-off to surface water and sewers should be monitored and controlled, the associated Schedule C is empty, why are no limits set for protection of marine environment
- Condition 3.9.4: The parameters selected for surface water monitoring (pH and TOC) are crude and unlikely to detect anything but the most severe spills
- Condition 3.10.2: The conditions should also specify a minimum amount of spill absorbent material to be maintained on-site
- Condition 3.10.4: There is no information identifying where the sludges spoken of in this condition will be disposed, the EPA had asked for this, as additional information in the application determination, but no information was supplied

- Condition 3.10.6: It is reported by the applicants at the planning inquiry that there is 2 hours of fire-water storage, it is suggested that this is not adequate
- Condition 3.14: The objection notes that as some of the waste input will be uncharacterised then the calorific value will be unknown and this condition cannot be complied with
- Condition 3.14.4: The objection comments that as dioxins have to be monitored only quarterly and that there are no limits defined for the ash, how can there be confidence in the quality of the input controls required by this condition
- Condition 3.14.8: The permitted values for TOC and loss on ignition are higher than can be achieved technologically, and may *hide* other contaminants
- Condition 5: On-site meteorological monitoring should be included in emissions monitoring
- Condition 5.1: The objection expresses amazement that no discussion or detail of fugitive emissions management is included/specified
- Condition 5.2: The objection suggests that this condition would be impossible to comply with during flood conditions
- Condition 5.3: There is no provision in the licence to require an environmental monitoring programme outside the confines of the site and in particular in the centres of population nearby; items to be monitored should include – noise, vibration, dust, smell, fumes, and key air quality parameters

- Condition 5.3: Baseline environmental monitoring in local communities should be put in place before the commencement of the activity
- Condition 6.5: The competencies requires by this condition are not specified, the Agency should decide on these
- Condition 6.9: The objection requires the Agency (competent authority) to calibrate monitoring equipment
- Condition 6.15: The objection suggests that the sampling and characterisation of the residue ash should be done by the competent authority
- Condition 8.2.3(a): The objection states that the applicants have already stated they will take customers' word regarding the nature of waste arriving at the facility; this is not good enough
- Condition 8.3: The objection states that incoming waste that contravenes the conditions of the licence should not be accepted
- Condition 8.4: The objection states that there is no information on the waste leaving the site and this should be known in advance; how will this waste be controlled?
- Condition 8.13: The objection states that flooding of the site will wash pollutants from the waste ash and gypsum storage into the harbour
- Condition 9: The objection asks that this condition be modified to prevent operation of the facility until the Agency has approved all policies, procedures and other details of accident prevention & emergency planning

- Condition 9: The objection asks that the condition be modified to require the local communities are consulted on the accident and emergency prevention plans prior to them being approved
- Condition 9.4: The objection asks where are the *appropriate facilities* referred to in the condition, operation should not commence until there has been agreement on these
- Condition 10: The objection states that the closure bond of €12.5M is inadequate to close the site, the objection suggests €100M
- Condition 10: The objection asks what financial security will be put in place to underwrite an incident
- Condition 11.1(a) & (c): The objection requires that there should be a 24 hour number available to the licensee in the event of a major incident
- Condition 12:
- Schedule B [sic] : This objection in fact refers to Schedule C, and requires that control & monitoring schedules for emissions to all waters should be specified
- Schedule C: No monitoring proposed for fugitive emissions of dust or solvent
- Schedule C.6.1: Biannual monitoring requirement for groundwater is totally inadequate, contamination can spread a long way in six months and the chemicals in question are high risk

▪ *Other*

- Ireland does not have its own dioxin monitoring capability
- No national environmental health action plan

- EPA accepting applicants word is unjustified
- EPA has no experience in the area of incineration
- No faith in ability of EPA to monitor & enforce
- EPA by supporting incineration is not being a powerful agent for change either in attitude to the environment or in actions on environmental protection
- Enforcement fines are so meagre they do not deter

3.14 Objections Heard from Members of the Public

Only one member of the public opted to avail of the invitation to be heard at the Oral Hearing. Ms D Krien made a brief statement to the hearing on the 22nd February 2005. The issue raised in her submission are highlighted below. Refer also to Audio record *DR/22-02-05/MM+7, NN* (Appendix F).

Issues Identified:

- *Health Impact of Emissions*
  - Incinerators produce emissions that are dangerous to health
  - Air in Ringaskiddy already 'full of poisons'
- *Other*
  - Negative impact on tourism and agriculture

Chapter 4 Consideration of Issues raised in Third Party Objections

This Chapter gives consideration to issues and other matters identified in Chapter 3 and has regard to the supporting information contained in the written and oral objection of the Third Parties; the information offered by the applicants in their testimony presented to the hearing; as well as that yielded in cross examination of the Oral testimony. Regard is also given to national & EU statute, policy and guidance, as may be relevant; and to other relevant published information as cited.

As noted in the introduction to Chapter 3 many of the objections and issues raised could be deemed to fall under the heading of 'Adequacy of Environmental Impact Statement'. It is not reasonable, however, that for the making of this report the whole EIS be examined again in detail from the beginning: this task has already being carried out by the EPA Inspector and confirmed in his report to the board (Appendix B-1). The 'objection' phase of the licence determination/EIS assessment process, administratively and from the point of view of reasonable process, cannot be a complete *de novo* examination in detail of all documents on the application file, *ab initio*. Rather, the purpose of the examination of objections to the draft licence decision in-so-far-as they relate to the adequacy of the EIS and the EPA's role in assessment of an EIS, should be confined to points where the objectors specifically identify;

- inaccuracies in the EIS documentation not previously considered,
- new, important and relevant information not previously considered,
- where an Inspector may have erred in his/her findings, or overlooked something, or clearly inadequately dealt with matters of some significance, the result of which could be pivotal

in a decision on an application (i.e. sufficient to undermine the EIA process and thus any favourable decision on such an application).

Operating within these reasonable boundaries it is possible to identify key issues of importance brought forward by the objectors that could have a bearing on the validity of the EIS assessment (i.e. the EIA process), and consequentially, the Proposed Decision. The following 'Issue clusters' represent my view of the fundamental points of third party objections – brought forward from Chapter 3 - which are critical to the validity of the assessment of the EIS for this application and the issuing of the Proposed Decision. The EIS, the licence application and all supporting file information dealing with these issues were, where relevant, examined/re-examined.

One of the issue clusters, which is not directly tied to EIS validity, captures those objections to specific licence conditions in the draft decision (c.f. Part 4.9 of this report).

The discussion of these objections and any conclusions flowing from that discussion may in some cases lead to recommended amendments to the proposed licence. These proposed amendments are highlighted in the text of a recommended final decision introduced in Chapter 6 and attached as Appendix I.

4.1 Health Impact of Emissions

The issue cluster dealing with health impact will be further subdivided for ease of discussion. From examination of the objections detailed in Chapter 3, some key sub-sets of this cluster can be established:

- Incinerators produce dangerous emissions
- EPA not protecting health
- Standards based regulation flawed

- No health impact assessment carried out by the applicants or EPA
- No health monitoring proposed
- Cumulative and synergistic impact not assessed
- Maximum at-risk individual incorrectly identified in assessments

There were also a number of references to ambient air quality raised in relation to health. These are discussed in Part 4.2 of this report.

4.1.1 EPA, Health Protection & Standards

It was argued by many of the third party objectors that the EPA is not – or is not claiming responsibility for - protecting the health of the local community in relation to its decisions. This is not the case. The legislation that the EPA is working to specifically provides for the protection of human health. I refer in particular to §40(4)(a) &(b) of the Waste Management Acts 1996 – 2003, in which it states that the EPA is prohibited from issuing a licence for an activity unless it is satisfied that, in the carrying on of that activity, emissions will not breach any relevant standard, and that a legally operated activity will not cause environmental pollution. *Environmental Pollution* is defined in §5 of the same Act;

> *Environmental pollution means, in relation to waste, the holding, transport, recovery or disposal of waste in a manner which would, to a significant extent, endanger human health or harm the environment, ...*

So the EPA has to ensure that human health is protected. This legal obligation is confirmed in the *Decision and Reasons for the Decision* section on page 1 of the Proposed Decision issued (Appendix B-4). Moreover, I would also note that in relation to the Board of the EPA whose primary functions are informed by §52 of the Environmental Protection Agency Acts 1992 & 2003, the provision of subsections (2)(c) and (2)(d) make it legally

binding that the Agency shall ensure a high standard of environmental protection as well as the prevention of significant environmental pollution. Again, the concept of environmental pollution embraces the potential for harm to human health. The EPA has to ensure human health is protected in the execution of its licensing functions.

This position is confirmed in a letter issued by the Director General of the EPA (Dr M Kelly) to the Secretary General of the Department of Health & Children dated 25 March 2003 (Appendix H). This letter is also introduced by CHASE and others in support of their case that no-one is protecting health. It is my view that the this is not an accurate interpretation of the EPA letter: what the EPA say is that they are not responsible for the monitoring of human health in the community or the collation of such statistics – this being a matter for the Department of Health & Children and the Health Boards. I would support this position. Further discussion on the matter of community health monitoring is included in part 4.1.2 of this report.

The EPA March 2003 letter states that the protection of human health in relation to the operation of waste facilities is assured through the use of standards: the third party objectors reject this standards approach – implying that it is not sufficient. It is my experience that a limit based (also known as performance based) standards approach to regulation is, internationally, a common approach to environmental protection employed by legislators and regulators. Society only functions in a safe and structured way because standards are established governing a whole range of environmental factors that impact on our lives (e.g. drinking water quality, bathing water quality, air quality,

waste acceptance, food hygiene, etc.,). The World Health Organisation (WHO), for example, relies heavily on limit standards in many of their publications.

Performance based standards offer greater enforcement control and certainty for particular aspects of industrial operation than would either a *technology standard* approach, or *practice standard* approach, be able to achieve on its own.

In my view performance standards offer greater certainty for operational and regulatory objectives, as well as for the protection of the environment. Oral testimony for CHASE from Dr Staines notes that though emission standards do invariably get revised downwards they 'are a good place to start'. Oral testimony at the hearing (P North for ECSE (DR/15-2-05/R); Dr Staines and Dr ten Tusscher for CHASE (tracks DR/22-2-05/H & DR/18-2-05/W respectively)) confirmed that the emissions standards set in the EU Incineration Directive[35] are informed by international experts in, *inter alia*, the area of toxicology. In my view it would be particularly difficult to get a toxicologist, or similar, to certify that a particular piece of waste technology (*Technology Standard*) will ensure protection of human health; or for that matter, to certify if a specification on the maintenance or operation of a facility (*Practice Standards*) will ensure protection of health. Such specialists more usually specify a performance standard (or limit) where unequivocally and to the best of their knowledge, no harm will be done. To regulate on the basis of achievement of *ambient standards* is another approach that can, in principle, work. However, the enforcement difficulty with this approach is that ambient environmental conditions -

[35] EU 2000/76/EC

particularly in the vicinity of urban and industrial development – are, and can be, influenced by a whole range of factors not all necessarily associated with the facility one is regulating. This makes enforcement a huge challenge; and is why site specific performance standards, or Emission Limit Values (ELV's), are the preferred principle approach for emissions regulation.

The Irish EPA in their 2002 publication on information to be contained in an EIS comment on page 12 that the use of international standards for safety in dose, exposure or risk in environmental impact assessment is usual. Furthermore, the EIS guidelines note that these standards are based upon medical and scientific investigation of the direct effects on health from a substance, effect or risk; and that this practice of reliance upon limits, doses or thresholds for environmental pathways (such as air or soil) provides robust and reliable health protectors for analysis relating to the environment.

The EU Incineration Directive states in the seventh recital that in order to achieve a high level of *human health protection* it is necessary to set and maintain, stringent operational conditions (*practice standards*) and technical requirements (*technology standards*), as well as emission limit values (*performance standards*) for incinerator plants. Indeed, the Proposed Decision (draft licence) issued by the EPA employs all three approaches: though in relation to emissions standards the Proposed Decision relies on the setting of strict ELV's derived from the Incineration Directive. On the matter of emission limit values, the seventh recital of the Incineration Directive also notes that such limits … 'should prevent or limit as far as is practicable negative effects on the environment and the resulting risks to human health'. The

first Article of the Incineration Directive formally confirms the objective of the Directive and the standards specified there-in. Viz;

> *Article 1*
>
> **Objectives**
>
> The aim of this Directive is to prevent or to limit as far as practicable negative effects on the environment, in particular pollution by emissions into air, soil, surface water and groundwater, and the resulting risks to human health, from the incineration and co-incineration of waste.
>
> This aim shall be met by means of stringent operational conditions and technical requirements, through setting emission limit values for waste incineration and co-incineration plants within the Community and also through meeting the requirements of Directive 75/442/EEC.

Having regard to the scientific committee basis for the Incineration Directive emission limits – as accepted by the third party objectors – I am satisfied that in principle they are intended to ensure the ongoing protection of human health. What remains is that matter articulated in recital 13 of the Incineration Directive, which observes that the assessment of a proposed activity that falls within the scope of the Integrated Pollution Prevention Control Directive (IPPC)[36] could result in emission limits stricter than those set out in the Incineration Directive. Such a tightening of limits would generally be informed by site-specific circumstances. The detailed air impact modelling discussed in Part 4.2 of this report confirms that the emissions at the Incineration Directive limits will not result in breach of any ambient standard or result in significant environmental pollution.

[36] EU 96/61/EC

There is no evidence produced to suggest that the Incineration Directive emission limits, as incorporated into the draft licence, will result in harm to human health.

The Third Party objectors also suggest that the reliance on a performance standards approach is not in-itself sufficient, and that some form of community based monitoring is necessary in order to validate the Directive limits. This matter is discussed in Part 4.1.2 of this report (below).

4.1.2 Health Impact Assessment & Community Health Monitoring

As noted in Chapter 3 many of the third party objectors believe that a community health impact assessment should have been carried out as part of the EIS and additionally there is no provision in the Proposed Decision or elsewhere for monitoring of health in the community.

In part 4.1.1 of this report reference was made to the letter from Dr Mary Kelly of the EPA to the Department of Health & Children (Appendix H). In this letter the position of the EPA is clearly put: it does not have the legal mandate or the expertise to evaluate or monitor public health statistics. Such a task resides with the Department of Health & Children and the Regional Health Authorities.

The Health Authorities are statutory consultees of the EPA, it is in their gift to bring forward information or concerns regarding a project that might influence the EPA in relation to the acceptance of a proposal for an area or the setting of ELV's. It may be that a particularly sensitive population is proximate to a proposal or that health statistics indicate existing environmental

burdens to the extent that additions to such loads could not be supported. Such measures would be additional - and precautionary – to say, ambient air quality limits specified in EU or WHO standards, and Directive specified ELV's. No such submissions were made in relation to the Indaver proposal for Ringaskiddy. Moreover ambient air quality assessment suggests that the proposed incinerator emissions will not contribute to the breaching of any air quality standard (c.f. Part 4.2.4 of this report).

As noted by Dr Staines for CHASE, and others, the Health Research Board report[37] concluded that Irish health information systems could not support routine monitoring of the health of people living near waste sites. As noted by Mr Ahern for Indaver in his testimony at the Oral Hearing (DR/23-02-05/F+9) these systems are now in the process of being put in place. These systems will be a useful information mechanism for good urban and industrial planning. They are rightly the responsibility of public health professionals that have the legal, medical and ethical mandate, as well as the authority and qualifications to compile and operate such systems. The health authorities are statutory consultees of the EPA in relation to proposed industrial and waste activities, and when consulted they can bring to the attention of the EPA any local health issues. The only submission from the health officials was a letter from the Minister for Health. The matters raised in this submission are of a general nature (no epidemiological evidence or data): this letter was considered by the EPA Inspector in his report (Appendix B-1).

[37] Health and Environmental Effects of Landfilling & Incineration of Waste: A Literature Review. HRB, Dublin, 2003

The health status of any individual or community is a hugely complex issue. There is a large number of factors that impact on health status (genetics, eating habits, water quality, previous living environment, condition of home, education, access to medical care, circumstance, internal and external environmental conditions, social habits, work environment, etc.,). It is quite impossible, logistically, and indeed legally, for any proposer of an industrial or other development, to undertake any meaningful health impact assessment for a project that would involve gathering health statistics for a community for incorporation into an EIS – i.e. a baseline epidemiological study. For such a survey to be meaningful, data would have to be collected over many years – i.e. once-off baseline monitoring is of little value. To argue for this approach to development authorisation would prevent the development of roads, airports, power-stations, etc., for years pending collection and evaluation of data. Even then, and primarily because of the multi-factorial influence on health status, identification of definitive links between specific point causes and effects in an already urban and industrialised area would be clinically challenging. In my view it is more appropriate to employ a *standards based approach* where emissions limits and/or ambient limits, are established which are for the purpose of human health protection. A discussion on the use of standards is included in Part 4.1.1 of this report. This latter approach combined with site-specific assessment (e.g. dispersion modelling, ambient loading) are well understood processes, which are achievable, testable, and scientifically robust: and from a regulatory point of view permit a high level of certainty and the formulation of a development decision. This certainty and workability would not be possible if each developer had to assess the health status of

local populations - via epidemiological studies. A further difficulty with the individual epidemiological survey approach to new facility authorisation is that these studies tend to be backward looking with respect to effect and cause, such an approach is not hugely useful for a new activity proposed for the study area.

Another aspect of this health impact assessment issue that needs to be considered is that which I will term the *source driven assessment* as opposed to a *receptor driven assessment*. I have articulated above my reservations regarding an applicant for an industrial process undertaking population health monitoring (receptor monitoring); however, a useful variation on health impact assessment is to look at the specific technology proposed and assess the likely health impact of it (source driven assessment). Such an approach is quite helpful where there is certainty of technology, and relative constancy of process. In relation to incinerators there are three recent reports which in my view constitute source driven health impact assessments. Viz;

- Waste Incineration & Public Health, US National Research Council 2000
- Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes, UK Department for Environment, Food and Rural Affairs, 2004
- Health and Environmental Effects of Landfilling and Incineration of Waste: A literature review, Irish Health Research Board, 2003

All three of these reports conclude that modern incinerator technology, operated correctly, should ensure that the process does not impact on health. This view is also held by the WHO

and is articulated on page 10 of their 1996 Waste Incineration Pamphlet number 6. Although dated 1996, the applicants for the Ringaskiddy incinerator gave evidence of receipt of confirmation from the WHO that this document still represented WHO current thinking (evidence of Mr Ahern DR/23-02-05/E+10).

It is my view that the application of EU emission standards to protect health; the assessment of ambient air quality and burdens, as contributed to by an activity; and the reliance on findings of independent health assessment of particular technologies are sufficient in this case, to satisfy the Health Impact Assessment requirement for the purposes of an EIS.

The WHO website includes a section on *Methods for Quantifying Environmental Health Impacts*[38]. This section of the WHO site introduces a paper (amongst others) by R Fehr on *Environmental Health Impact Assessment: Evaluation of a Ten Step Model*[39], commenting that this paper summarises the basic methodology for quantifying environmental health impacts at national and local level. Fehr articulates ten key elements of an environmental health impact assessment. Viz:

(1) Project Analysis
   - o Project specification
   - o Expected emissions, hazards

(2) Regional Analysis
   - o Anthropogenic features
   - o Geography
   - o Land use

(3) Population Analysis
   - o Size, composition

[38] http://www.who.int/quantifying_ehimpacts/methods/en/
[39] Fehr, R., Jour of Epidemiology, Vol 10, #5, pp618.

- Health status
- Behaviour

(4) Background Situation
- Environmental monitoring
- Existing pollution
- Additional data needs

(5) Prognosis of Future Pollution
- Emissions predictions
- Cross media pollutant transfer

(6) Prognosis of Health Impact
- Comparison with media specific limit values
- Comparison with ambient concentrations
- Comparison of other hazards with limit values
- Risk assessment (pathways to receptors, body burdens)

(7) Summary assessment of Impacts

(8) Recommendations

(9) Communication

(10) Evaluation

Fehr also gives examples of the type of data that would be included under the various headings. In the case of the first two steps, the EIS prepared by the applicants includes all the information necessary and suggested by Fehr for these elements. In the case of the population analysis, Fehr suggests gathering information on size, distribution, composition, of local populations and on local food production, etc. Again this information is in the applicants EIS. Fehr also suggests health status should be included but did not articulate clearly what this means other than inclusion of examples like the identification of vulnerable populations and road death statistics (from an example Health

Impact Assessment on a road project). The applicants in the case of this incinerator application elected to use the Maximum At Risk Individual (MARI) concept for health impact assessment. The applicants submit that the MARI – who is a theoretical individual; a subsistence farmer, living for 30 years (usually) in, and obtaining all their food from, a 100m diameter plot upon which the maximum pollutant flux is deposited – represents the most sensitive of cases in a receiving population. In my view this approach satisfies the requirements of Step 3 of the Fehr model. In relation to Steps 4 and 5 of the Fehr approach, the EIS, the Waste Application and the evidence of Dr Porter for Indaver at the Oral Hearing, all of which detailed the baseline air impact assessment and the emissions modelling work; in my mind satisfy the data requirements suggested by Fehr. For Step 6 of the WHO cited 10 Step Plan, Fehr talks of comparison of emissions with media-specific limits and employment of a risk assessment looking at pathways for harm to receiving populations. The Waste Application and the EIS and the evidence of Dr's Porter & Callaghan (OH records 23 and 37 respectively, Appendix G) provide this detail. Interestingly, and in relation to the matters discussed in part 4.1.1 above, it is worth noting that Fehr comments in his paper - in relation to the assessment of health impact from emissions – that '*Because of compliance of predicted environmental burdens with relevant limit values, specific negative health effects from threshold agents were not expected to take place*'. This suggests that Fehr supports the approach of reliance on compliance with emission limits to protect health. Steps 7, 8 and 9 of the Fehr 10 Step Plan are well presented in the licence application documentation and EIS. Step 10 refers to a follow-up requirement to monitor approved projects.

It is my view that the approach adopted by the applicants corresponds very closely with the WHO referenced Fehr 10 Step Plan for environmental health impact assessment.

The calls for the applicants to establish ongoing health monitoring are similarly vulnerable, and of questionable value from the individual proposal point of view and the EIA process. Such monitoring is more appropriately the responsibility of the national and regional health authorities, and should be used to support/ inform strategic plans for development. The US National Research Council[40] recommend (pg 7) that the power of epidemiological studies would be increased if a regional or area multi-facility approach is taken, rather than examining health issues site-by-site.

Following on from this last point and on the subject of when a particular community has had enough industrial development or has reached its emissions adsorptive capacity I would like to note at this point the obligations of the EU Directive on Strategic Environmental Assessment[41]. In this Directive, waste management plans or county development plans must in themselves be subject to an environmental assessment and be accompanied by an environmental report. Health impact is one of the aspects of such an assessment that must be considered in the environmental report. Whereas it is very difficult for one industrial developer to assess the health of a region with respect to their particular proposal, it is much easier for competent authorities responsible for regional planning to incorporate a regional view of health impact in-so-far-as-it

[40] *Waste Incineration & Public Health*. US National Research Council, National Academy Press, 2000.
[41] EU 2001/42/EC, of 27 June 2001

relates to the plan in question. For example any future revision of the County or City Development Plans for Cork would have to consider health impact of the industrial development plan. This might include identifying industrial pressure points that are not desired from a health impact perspective (e.g. encroachment of housing on industrial development, unregulated industry, etc.,), or it might include information on emissions ceilings for prospective industry in various locations (local air quality standards/objectives). Such an assessment would benefit from the support of regional health authorities and access to health statistics. Such assessments will further add to the protection of communities, and would logically follow a strategic or multi-facility approach rather than individual facility approach. The regional authorities are also better placed to operate regional air quality monitoring stations as a tool for ongoing evaluation of the environmental footprint of regional development plans. The requirement for such monitoring to be carried out and reported on by individual plants in an area containing many sources is questionable. Having all industry in a region fund a local authority regional air quality monitoring program is a superior solution and would provide for better use of the results with-respect-to regional planning for protection of community health.

In addition to the proposed use of BAT and compliance with EU emission limits, the applicants, through the application of acceptable risk assessment methods, have shown that from an ambient air quality point of view their proposal will not result in a breach of any health standard.

4.1.3 Incinerators Produce Dangerous Emissions

The evidence adduced by Dr ten Tusscher and Dr Howard for CHASE in relation to the harmful effects of the chemicals generally associated with incinerator waste gasses is unequivocal and beyond dispute: these gas streams are dangerous to health if left untreated. Numerous reports, publications and studies support this position. e.g., 42, 43, 44, 45, 48 Extensive references are also provided by Dr Howard and Dr ten Tusscher in their documents submitted in support of the CHASE written objection. Incinerator waste gas streams typically contain; particulates, metals, acid gases, products of incomplete combustion, dioxins & furans. It is also adduced that the changing nature of modern waste streams results in more dangerous emissions. This latter objection was not technically supported and I am not convinced that it can be in this current waste management and industrial regulatory framework of cleaner production and hazardous chemical substitution. There may be less dilution in the incinerator feed stock by materials now recovered for recycling, however, given the noted cleaner production initiatives, this should not significantly impact on mass-load of pollutants.

The applicants have stated in their EIS as well as in the waste licence application documentation that the abatement technology proposed will result in emissions all within the EU Incineration Directive emission limits and in the case of dioxins, levels are expected to be just 10% of the Directive limits. The draft licence includes numerous controls and provisions requiring

[42] *Waste Incineration*, WHO Pamphlet #6, 1996
[43] *Incineration of Household Waste*, Post Note 149, UK Parlimentary Office of Science & Technology, 2000.
[44] *Waste Incineration & Public Health*. US National Research Council, National Academy Press, 2000.
[45] *Health Impacts of Waste Management Policies*. Nicolopoulou-Stamati et al, eds. Environmental Science & Technology Library, 2000.

the capture and treatment of these gas streams to a standard that can comply with the emission limits.

The third party objections have not produced any evidence that shows the Incineration Directive emission limit values to be fallible, and likely to lead to environmental pollution. Dr ten Tusscher did state in his oral testimony that there is currently no safe level of dioxin and any exposure is too much (DR/18-02-05/R+11). I find this testimony difficult to accept. As a society, we are every day deliberately releasing dioxins (vehicular traffic, oil & coal fired power stations, home heating systems, etc.,), indeed the transport systems that brought Dr ten Tusscher to the Oral Hearing likely contributed to the ambient European and National dioxin burden. Within the field of risk assessment there has to be acceptance of tolerable levels of dioxin – and indeed other pollutants - where no significant health effect can be determined. If society were to accept Dr ten Tusscher's thesis on this point then – and just for starters - all fossil fuel power generation; international travel; and national public, as well as private, mechanised transport systems would have to cease. Pretty much any chemical substance or compound will result in harm to human health if exposed to excess quantities (e.g. salt, vitamin A, paracetamol, etc.,). It is accepted of course that unlike the examples just cited, dioxins serve no useful purpose to man, and are in a category of chemicals known for their high toxicity (Persistent Organic Pollutants, POP's). Never-the-less the risk based thesis still holds: we have relied, and continue to rely, on specialist scientists to advise on what levels are safe or where no observed effects can be recorded. Every person in Cork or elsewhere who drives to work or takes the train or bus, is making a conscious decision to support an activity that releases

potentially harmful emissions. Dioxins are also produced naturally by our planet (e.g. forest fires & volcanoes). Dr ten Tusscher's (for CHASE) view is not supported by the WHO, who in 1998 published the findings of their re-evaluation of the Tolerable Daily Intake (TDI) for dioxin[46] (see also the evidence of Dr Callaghan for Indaver, OH Record #37). The WHO concluded that a tolerable daily intake of 1-4pg/kg body weight, for lifetime exposure would have no health consequences. It is also worth noting that the intake range specified (1-4pg/kg bw) conservatively includes an uncertainty factor of 10.

The recently published EPA Dioxin and Furan inventory[47] concluded that emissions to air for dioxins and furans by 2010 would be less than 2% of national emissions of these pollutants. Although a number of the objectors believed this study to be invalid, it should be noted that it was undertaken in accordance with an international protocol[48] and no good evidence was adduced to undermine the validity of this protocol. The largest source of these pollutants estimated for 2000 and predicted for 2010 is uncontrolled combustion processes (fires, back yard burning, etc.,). The contribution from transport sources is twice that estimated for incineration.

The 2001 Strategy communication from the EU Commission on Dioxins, Furans and PCB's hosts, *inter alia*, a useful summary of the

[46] Assessment of the health risk of dioxins: re-evaluation of the Tolerable Daily Intake (TDI) – Executive Summary. WHO, May 1998.

[47] *Inventory of Dioxin and Furan Emissions to Air, Land and Water in Ireland for 2000 and 2010*. EPA ERTDI report 2000-DS-2-M1; Dublin, 2002.

[48] *United Nations Environment Programme – Standardized Toolkit for Identification and Quantification of Dioxin and Furan Release*. UNEP Chemicals 2001.

pressing health concerns with regards to Dioxins & Furans.[49] The objectives of this strategy are identified as:

- Assessment of current state of environment (w.r.t. POP's);
- Reduction of human exposure to Dioxins & PCB's in short term and to maintain human exposure at safe levels in the medium to long term;
- Reduction of environmental effects from dioxin & PCB's

This strategy document notes that EU studies and predictions indicate that there will be a 90% drop (from 1985 levels) in emissions of dioxin to air from industrial sources in the EU by end 2005 (via, principally, the IPPC and Incineration Directive[50] controls). Moreover, the Commission document notes (pg.10) that the relationship between industrial and non-industrial sources (e.g. domestic sources) is shifting towards a growing importance of non-industrial sources. These observations support the position in Ireland where industrial sources are not considered the main contributor to dioxin release.

The Commission Strategy on dioxins (op. cit.) notes that central to the success of the strategy and achievement of the health objectives, is the implementation in the short-term of BAT at potential source installations. This is BAT as defined under the IPPC Directive and the Incineration Directive. Compliance with these directives thus supports the Community Strategy and thus protection of health with respect to the cited harmful emissions.

We heard in the testimony of the Third Party objectors that expert scientists, of international repute, from across the European Union

[49] Community Strategy for Dioxins, Furans, and Polychlorinated Biphenyls. Communication from the Commission to the Council, the European Parliament and the Economic & Social Committee, COM(2001) 593 final, Brussels 24.10.2001.

[50] Council Directive 96/61/EC & Directive 2000/76/EC, respectively.

have determined the emission levels established in the Incineration Directive. Furthermore, we have learnt from earlier discussion that the Directive advises us, that at these levels, any risks to human health are prevented or limited to the maximum practicable extent. Mr North, for ECSE, in examination of his testimony for ECSE acknowledged that the health impact of emissions at the levels specified in the licence would be 'tolerable' (DR/15-02-05/R). Moreover, the applicants have stated in their application documentation that the technology to be employed at the incinerator is expected to result in emissions of key pollutants which are a fraction of the specified ELV's.

The report of the Health Research Board[51] on a literature review of, *inter alia*, health impacts from waste incinerators concluded that the evidence for a link between cancer and proximity to an incinerator is not conclusive. In relation to respiratory impacts and general populations living near incinerators the report notes that the research is also inconclusive. The inconclusive results of the health impacts from incinerators recorded by the Health Research Board reflect the findings of the US National Research Council[52] in their study published in 2000 (pg. 6), and the UK Department for Environment, Food & Rural Affairs (the latter for municipal solid waste incineration only)[53] in their 2004 publication (pg. 255).

Significantly the Health Research Board report does note (pg. 186) that many of the studies behind the literature reviewed by them were based on older incinerator facilities, which, it is reported, '*... would not have had the same emission control*

[51] *Health & Environmental Effects of Landfilling and Incineration of Waste – A Literature Review*. HRB, Dublin, 2003.
[52] *Waste Incineration & Public Health*. US National Research Council, National Academy Press, 2000.
[53] *Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste & Similar Wastes*. Enviros et al., for DEFRA, HMSO London. 2004.

standards as those applied today'. The US National Research Council publication (op. cit.) also concludes that emissions from newer, well-run facilities are expected to contribute little to environmental considerations and health risks (pg. 6). This conclusion is also supported by the UK Department for Environment, Food and Rural Affairs report (op. cit., pg. 70 & 254) where it comments that emissions to air from municipal solid waste incinerator plants have reduced significantly in recent years to comply with modern limits and technology. The Ontario (Canada) Ministry of the Environment also concluded (pg. 1) that properly designed and operated incinerators should not result in a significant impact on health[54]. The somewhat dated but regularly cited WHO Pamphlet #6 on Waste Incineration[55] comments that '*... properly equipped and operated waste incineration need not pose any threat to human health*'. The previously mentioned WHO publication on tolerable daily intake[46] also noted that in the 1990's there is clear evidence of a decrease in dioxin levels in human milk in almost every region, and this is most probably attributable to enhanced identification and control of environmental input sources.

Dr ten Tusscher, Dr Howard[56] and others for the third party objectors make the point that children and the unborn are particularly vulnerable to air pollutants. This view is supported by, amongst others, the WHO[57] and the European Environment Agency[58]: pollutants from combustion sources being amongst

[54] *Environmental risks of municipal non-hazardous waste landfilling and incineration: technical report summary*. Ontario MoE, 1999.
[55] 1996
[56] CHASE objection; and also in - *Particulate Matter: properties and effects upon health*. Maynard & Howard, Bios Scientific, UK, 1999.
[57] *Health Aspects of Air Pollution*. WHO report #E 83080, 2004
[58] *Children's Health and the Environment: a review of evidence*. EEA – WHO joint publication, EEA Environmental Issue Report #29, 2002

the most problematic. Knox[59] concluded that childhood cancers/leukaemia births are closely associated with high atmospheric emissions from combustion processes, mainly oil based, and from organic evaporation. The reference period for health statistics used in the Knox study was 1966 to 1980, i.e., historical processes not operating to EU emission standards. The third party objectors have not adduced any evidence that would lead me to doubt the health protection assurances in the Incineration Directive - and by relation the emission limit values in the draft licence - and in the WHO air quality standards[60]. Moreover, no convincing evidence has been adduced to convince me that, following abatement and compliance with the limits specified, the authorised emissions from the applicants facility will continue to remain a danger to health (adult and child).

It is likely that in the future, following further evaluation by EU experts, additional ELV's for other parameters (e.g. $PM_{2.5}$) may be imposed on the licence following EU review of the Incineration Directive arising from WHO and or EU re-evaluations (e.g. EU Café programme). See also the report by the EU Scientific Committee on Health and Environmental Risks (SCHER)[61]. The health risk potential of fine particulate matter ($PM_{2.5}$) is becoming better understood and will likely shortly lead to the establishment of an ambient EU air quality standard for this parameter[61]; this may in turn lead to an amendment of the Incineration Directive limits. However, it should be noted that waste combustion sources are not considered a very significant contributor to ambient fine particulate levels (PM_{10} or less, Maynard & Howard

[59] Knox, E.G., 2005. Childhood cancers & atmospheric carcinogens. J Epidemiol Community Health, Vol 59, pp101-105.
[60] *Air Quality Guidelines for Europe - Second Edition.* WHO Regional Publication #91, 2000.
[61] *New evidence of air pollution effects on human health and the environment.* EU Scientific Committee on Health & Environmental Risks. European Commissions Directorate C, 18 March 2005.

1999[56] pg.135), which is a similar case to that for the estimated sources of Dioxins & Furans discussed earlier. This has to be balanced against the reported toxicity of incinerator particulate emissions. Further discussion of the ambient impact of dust from the incinerator is included in Part 4.2 of this report.

In the absence of any EU emission limit and given the growing international concern regarding fine particulate, it would be important, at least, to monitor the content of $PM_{2.5}$ and PM_{10} in the incinerator emissions, the results of which will better inform the application of any future standard. The paper by Dr Howard appended to the CHASE objection, and the oral testimony by Mr Clancy for CHASE City (Dr/17-02-05/J+4) identify that the filter technology proposed for the Ringaskiddy incinerator has a poor efficiency in relation to the very fine particulate fraction ($PM_{2.5}$). In the absence of a EU air quality standard for $PM_{2.5}$ and given the health concern surrounding this pollutant[61, 62] I believe, as a precautionary measure, that the final design specification for the incinerator flue-gas train should include a high performance specification for the particulate filters sufficient to remove as much $PM_{2.5}$ & PM_{10} from the gas stream as is reasonably practicable (c.f. recommendations in Chapter 6 of this report).

Another issue raised by the third party objectors was in relation to the synergistic impact of multiple chemical release. Such assessments are extraordinarily complex and in most cases can only be carried out as a statistical risk assessment exercise (e.g. Monte Carlo assessment) employing the individual toxicity of substances and combining these in statistical computations. The difficulty with synergistic impact assessment is because

[62] Dr Howard report appended to CHASE objection.

internationally there is little information available on the health or clinical effects of combinations of chemicals. This synergistic impact also has to have regard to the mode of exposure to the different pollutants (e.g. ingestion, contact, breathing, etc.,). The Ontario Ministry of the Environment in 1999 published a report that, *inter alia*, attempted to *statistically* consider the combined risk to health from different pollutants associated with non-hazardous municipal waste incinerator emissions (selected 15 priority substances for incinerator emissions). They concluded that '*... estimates of population health risk indicated no cases of cancer would be expected due to exposure to incinerator emissions*'.[63] International best practice at the moment is to look at the risks of individual substances. Even in the field of medicine there is little evaluation of the clinical synergistic impact associated with multiple medications: it is an almost impossible task given the multiplicity of influencing agents, particularly outside the laboratory environment (other medicines, current medical condition, environmental factors, diet, delivery vectors, mobility, geography, climate, genetics, etc.,). The third party objectors have not identified any international protocol or procedure for such assessment that was not carried out by the applicants. It could be argued that in the absence of available scientific knowledge the *precautionary principle* should be applied and the project halted until science provides the answers. [The role of the EU *precautionary principle* in relation to the determination of this waste licence application is discussed in part 4.4.2 of this report.] But this is an impossible and unachievable goal for science, it simply could not be done; there are too many confounding and influencing factors to make such a multi-substance assessment of clinical impact within

[63] *Environmental Risks of Municipal non-Hazardous waste landfilling & Incineration – Technical Reporet Summary*. MoE, Ontario, Canada 1999.

a population realistically achievable. In any case, incineration is not the main producer of dioxins in the Irish environment, uncontrolled combustion sources are. It is even difficult to consider how one might begin to assess the synergistic clinical effects of emissions from those non-industrial sources. The main approach adopted internationally is to consider toxicity on a substance-by-substance basis (e.g. WHO air quality standards): and where relevant to use the most toxic in risk assessments. The EU Commission recognise in their communication[64] on the *precautionary principle* that ... 'it is not possible in all cases to complete a comprehensive assessment of risk, but all effort should be made to evaluate the available scientific information'. The approach adopted by Indaver for the proposed Ringaskiddy incinerator followed international scientific and risk assessment protocols in this regard.

The various sources of dioxin in our environment were discussed above. Soils and sediments are important reservoirs of dioxin in the environment. One of the principal pathways for human exposure to dioxin – from all sources - is food consumption; contributing more than 90% of total exposure.[65, 66, 67] However, in relation to the risk to food from incinerator emissions the Irish Food Safety Authority in a 2003 report[68] conclude;

> *... the FSAI considers that ... incineration facilities, if properly managed, will not contribute to dioxin levels in the food supply to any significant extent.*

[64] EU Commission Communication on the Precautionary Principle. COM(2000)1, 02.02.2000
[65] EU Commission COM(2001) 593 final, dated 24.10.2001 on a Community Strategy for Dioxins, Furans & PCB's.
[66] Evaluation of the occurrence of PCDD/PCDF and POP's in waste and their potential to enter the foodchain. Fiedler et al., 2000, for DG Environment, EU Commission.
[67] EU Commission Recommendation of 4 March 2002 on the reduction of the presence of dioxins, furans and PCB's in feedingstuffs and foodstuffs. 2002/201/EC.
[68] *Report on waste incineration and possible contamination of the food supply with dioxins.* FSAI, Dublin, 2003.

I am not convinced that the Third Party concerns regarding impact on food/agriculture from the Indaver proposal are scientifically supported or sustainable.

The Third Party objectors also express concern that the assessment of the incinerator emissions did not consider emissions associated with non-standard or *upset* operating conditions (e.g., start-up, shut-down, accidents). The objections introduced evidence about a sister company of the applicants operating in Belgium where failure of a monitor led to serious excess dioxin emissions over a 40 day period. The UK Department for Environment, Food & Rural Affairs in their review of health effects from incinerators[69] observe (pg. 71) that in 2003 there were 56 incidences in UK incinerators of emissions – of various parameters – in excess of permitted limits, but that there was no evidence of health effects, and that such short-term exceedances were [fortunately] not significant. The UK report comments that such exceedances are more likely to occur at facilities undergoing commissioning or alterations and that particular attention should be paid to regulation of such facilities at these times. The US National Research Council on Incineration & Public Health[70](pg. 180) concluded that there is insufficient data to assess health impact of off-normal operating conditions. Based on a review of the available literature, I am satisfied that the risk to human health from emissions associated with off-normal operations represent the greatest potential threat to the local community. The Proposed Decision in Conditions 3.14 and 9 detail the controls necessary to regulate abnormal operation. These will have to be agreed with the EPA prior to commencement of the operation. The key to prevention of releases is maintenance of

[69] *Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste & Similar Wastes.* Enviros et al., for DEFRA, HMSO London, 2004.

good combustion conditions, and it is suggested that good monitoring protocols in the flue-gas train should assist in mitigation of such events (Waste Incineration & Public Health[70], pg 62). Schedule C of the Proposed Decision sets out comprehensive Control & Monitoring provisions for the proposed operation. The objectors have not shown that these controls when implemented will fail to monitor for, and mitigate, upset conditions. Additionally the application documentation details the emissions management protocols for abnormal operation conditions (c.f. Sections 9.5 and 15.2.7 of Volume 1 of the Waste Licence Application). One of the critical parts of the flue gas abatement train is the cooling of the gas before the addition of the activated lime and carbon and the baghouse filters. The applicant has noted in Section 15.2.7 of the Waste Application that in emergency shutdown an auxiliary supply of water to the spraytowers *may* be considered at detailed design stage. I consider such key process control should not be an optional consideration; and that all engineering measures should be employed to ensure that in the event of shutdown or upset conditions that the gas stream from the boiler continues to pass through the necessary elements of the gas cleaning train. The recommended licence attached as Appendix I includes this requirement (c.f. Chapter 6 of this report). It is also important to note that Condition 3.14.14 of the Proposed Decision *instructs* that there shall be no by-pass of the air abatement system. This would include upset conditions. This condition survives into the Recommended Licence attached as Appendix I. Additionally, Condition 3.14.13 requires the shutting down of the incinerator in the event of abnormal conditions developing. The detail of what constitutes abnormal conditions is to be agreed under

[70] *Waste incineration & Public Health*. US National Research Council. National Academy Press, Washington DC, 2000.

Conditions 3.14.7 and 9.2 of the Proposed Decision. Some examples of such events are articulated by the applicant in Section 15.2.7 of their Waste Application.

In relation to the potential impact of major accidents please refer to Part 4.7 of this report.

Finally, it is necessary to examine the point made by Ms Hogan for RDRA (DR/-01-03-05/V+0) that according to the WHO, health cannot simply be considered as an absence of disease or infirmity, but rather, it is a state of complete physical, mental and social wellbeing. There are many factors in relation to the attainment of this health status that are beyond the control or influence of either the applicant or the EPA (multi-factorial). There is no doubt that the communities in Cork do not trust incinerator technology - indeed in some cases the oral evidence clearly demonstrated that they even fear it: nor is there trust in the abilities of the applicants, and this impacts on their sense of wellbeing. Trust in the technology will only follow experience with demonstrated successful operation of a state of the art facility working to best international standards: and trust in the operators will only flow from the use of properly trained and experienced staff to design and run the facility, as well as maintaining a good compliance history and ensuring effective enforcement. The US National Research Council (USNRC) publication on Incineration & Public Health (op. cit.) includes a good discussion on the social issues and community interactions in relation to incinerator proposals (pg. 217). Similar to the issues articulated above and in many of the objections, the USNRC study identifies three key elements that influence the psychological wellbeing of communities considering a proposed incinerator: viz; can one

trust those responsible for the development, operation or regulation of the facility; is the facility needed; has the siting and determination process been fair.

The decision process for this application has interacted with the public in a most thorough and transparent manner. The Proposed Decision places the highest recognised EU standard of operation on the facility. The expert advice is that emissions from this facility at the levels controlled in the licence will not impact on health. The operators – who in Ireland have a good compliance history – will be required to employ the most experienced of staff to design and run the facility. A reinforcement of Condition 2.1 of the draft licence is recommended so-as to ensure the retention of the technical experience necessary and to reassure the communities (c.f. recommendations in Chapter 6 of this report). It is recognised that such provisions may not totally allay the fears of the community (trust issues), and thus there may be a residual impact on their sense of wellbeing. Such assurances will only flow from experience of the activity. Additional recommendations in relation to the regulation (enforcement) of the licensed activity detailed in Chapter 6 of this report should also be of some assurance to the local communities. The issue of site selection is considered in part 4.3 of this report.

The US National Research Council on Incineration & Public Health (op. cit.) conclude (pg. 179) that *'... on the basis of available data, a well-designed and properly operated incinerator facility emits relatively small amounts of [particulate matter, lead, mercury, dioxins and furans], contributes little to ambient*

concentrations, and so is not expected to pose a substantial health risk'.

On the issue of long-term or chronic impact, the evidence available from the cited sources - in this part above - leads me to conclude that there is no case for believing that there will be long term public health impacts associated with emissions from the proposed incinerator.

No evidence or testimony has been presented to lead me to conclude other than, I am satisfied that, in relation to emissions from the proposed incinerator, operation of this facility to the standards specified in the recommended final licence (Appendix I) are sufficient to protect and preserve the health of the communities (including recreational) in the harbour area; and furthermore, the controls in place for air emissions during upset conditions are sufficient to assure me that public health will be protected at all times. And contrary to assertions made by the Third Party objectors, I am satisfied that a decision to grant a final licence for the incinerator will not conflict with the obligations of Article 8 of the Convention on Human Rights.[71] My conclusion supports the finding of the Inspectors report for the Proposed Decision (Appendix B). The European Court of Human Rights in a judgement dated 09.06.2005 dealing with industrial pollution related harm to a resident in a Russian town[72] and violation of her rights under Article 8 of the Convention[71], found against the State because the emissions from an industrial plant exceeded the nationally set safe limits, and that in regulating the industry there was no evidence of due regard having been taken in respect of

[71] Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms, and its Protocols. Done Rome 04.11.1950 and as subsequently amended and registered with the Court of Human Rights 2003.

[72] Case 55723/00, Case of Fadeyeva v. Russia

the community close to the offending plant: the operational permit for the plant did not specify how the interests of the population residing around the plant were taken into account when the conditions attached to the permit were established. No direct evidence has been adduced by the third party objectors on where the breach of Article 8 is to be proven. It is my view that the Inspectors Report and the Proposed Decision (Appendix B) do acknowledge the risk to the local populations in the assessment of the project and the drafting of the conditions. Moreover, and as articulated earlier, the application of the Incineration Directive and BAT requirements in the making of the permit, also serve to protect public health. I find no case to uphold an objection on the grounds of a failure to protect the local communities as provided for under Article 8 of the Convention on Human Rights[71].

Regarding concerns raised about noise and general dust emissions from an operational facility I am satisfied that through the application of BAT and maintaining compliance with the conditions of the licence will ensure these emissions do not result in nuisance or harm to the local populations or receiving environment.

4.1.4 Health Impact and use of MARI

The third party objectors raise concerns regarding the basis for emissions limits and ambient standards, particularly the use of the Maximum At Risk Individual (MARI) concept in impact assessments. They argue that the MARI – who is a theoretical individual; a subsistence farmer, living for 30 years (usually) in, and obtaining all their food from, a 100m diameter plot upon

which the maximum pollutant flux is deposited – is not the maximum at risk individual: they argue that children are.

As noted earlier the evidence of Dr ten Tusscher and Dr Howard do speak of the high risk to children from pollutants associated with incinerators and other combustion sources.

The use of the MARI or maximum exposed individual methodology is internationally accepted - particularly in the US - as a reliable risk assessment approach, and one which has many conservative factors of safety built into the calculation methodology. Having regard to this and to the evidence of Dr Callaghan for Indaver (document #37 submitted to Oral Hearing - Appendix G) that predicted dioxin/furan intake for the MARI is approximately only one-third the WHO/EU recommended daily intake for these substances; as well as the absence of any solid scientific argument or thesis that would undermine the recognised approach, I find I cannot up-hold the Third Party objectors concerns on this point. From his calculations Dr Callaghan for Indaver (OH record #37, Appendix G) concluded that with the incinerator operating at maximum emission levels, the predicted body intake for the MARI is less than 1/3'rd of the low end of the WHO and EU guideline values for dioxin intake (1 TEQ2,3,7,8 TCDD pg/kg body weight per day). You will recall that earlier it was noted that the WHO in determining the tolerable daily intake (TDI) included a conservative factor of 10 for uncertainty when identifying the safe lifetime TDI range 1-4pg/kg bw[46]. Dr Callaghan, for Indaver, also concluded that the background dioxin levels for the Cork harbour area were low compared to other countries, to the extent that a standard glass of milk from West Cork would provide a dioxin dose seven times

greater that a full days inhalation of the ambient air in the harbour. With the exception of the suggested inappropriate use of the MARI and not a child as a sensitive receptor (see above), Dr Callaghan's assessments were not technically contested by the third party objectors.

4.2 Air Dispersion Modelling & Ambient Air Quality

These aspects of the application and the EIS were extensively examined by the Third Parties in their objections and at the Oral Hearing; producing a large number of issues, some of which are very technical in nature. This cluster of complex objections will be considered under a number of general sub-headings;

- PSD Classification and Cumulative Assessment
- Background Ambient Air Quality
- Air Dispersion Modelling
- Assessment of Impact on Ambient Air Quality

Throughout this section there is frequent reference to a Dr Porter of AWN Consulting acting for Indaver. For convenience I will not repeat his affiliation at each mention.

4.2.1 PSD Classification and Cumulative Assessment

The area around Ringaskiddy is industrialised and has several other potentially significant sources of air emissions. The applicants set out to assess the possible combined impact of these sources with the proposed new source, on background ambient air quality. This assessment is termed a 'cumulative impact assessment'. Essentially, the impact of nearby sources is assessed where interactions between the plume of the proposed point source and the plumes of nearby sources can occur.

The methodology adopted for this assessment is described in Section 9.24 and Appendix 9.4 of the EIS for the application. It was confirmed by Dr Porter, at the Oral Hearing, that cumulative assessment looked at all existing facilities, as well as those facilities that had received planning permission (DR/22-2-05/AA +7).

It is the evidence of the applicant that the approach taken during this assessment was as recommended by the USEPA in its 'Prevention of Significant Deterioration PSD'[73] increment approach (Appendix 9.4 EIS).

The PSD system has three classes of area based on land use; and varies from Class I (national parks, special areas of conservation etc.,) to Class III (industrial areas). The PSD increment is the maximum increase in concentration that is allowed to occur above a baseline concentration for each pollutant. The PSD increment is therefore lowest for Class I areas, reflecting their protected status or high natural value.

As the PSD increment system was developed in the US, relative PSD increments applicable to EU Air Quality Standards (AQS's) were derived by the applicant (Table 9.5 EIS). It was proposed that the PSD increment be applied only to areas where significant overlap between plumes would occur (pg 12, Section 9 of EIS).

In all the applicant had a number of means to assess impact on ambient air quality:

- Relevant EU AQS's in force[75] (where avaliable)

[73] US EPA (1989) Prevention of Significant Deterioration (US EPA Clean Air Act regional air quality classification system)

- Derived relative PSD increments
- A quality standard derived from the Occupational Exposure Limit
- An AQS that was proposed by the EU at the time

Details of these standards can be seen in Section 9.3.3 of the EIS.

The applicant has proposed that the Ringaskiddy area be classified as Class III, an industrial area. This results in the application of the highest permitted PSD increment with regard to the cumulative assessment of the impact on ambient air quality. This choice of class was queried by a number of Third Party objectors during the Oral Hearing (e.g. DR/18-2-05/Z +1). It was proposed by a Third Party objector that the PSD classification should be Class II (i.e. less industrial, more rural) instead of ClassIII. Consequently, the basis for the applicant's choice of PSD Class was questioned (DR/22-2-05/U +4). The view of the applicant is that the Ringaskiddy area is one of the major industrial areas in the country and that the applicable PSD classification in this case is Class III (DR/22-2-05/X +7). Given the industrial zoning of, and the level of industrial development in, the Ringaskiddy area, I am satisfied that the correct PSD classification for the area is Class III.

For the cumulative assessment, the emissions to air from other significant nearby sites were included. These sites are listed in Appendix 9.6 of the EIS. The significant emissions to air from these sites are detailed in Tables A9.19 to A9.24 of the EIS. It can be seen from these tables that emissions from these sites were set at a maximum (i.e., at their respective licence limits). However, this approach was questioned by East Cork for a Safe Environment

(ECSE), as they felt that these levels might not reflect actual emissions[74] (pg63).

In addition, in Section 5.3.5 of their oral evidence (OH Record #27, Appendix G), CHASE (PWGMB) outlined what they term 'inconsistencies' in the source data for the emission points used in the cumulative assessment. They outline some differences between data as used in the ISCST3 model and as reported in the EIS. ECSE also raise this issue on page 3 of their submission on the Licence Application[74].

I recognise that there are indeed some inconsistencies as described above. However, having examined these inconsistencies, I am of the opinion that they are largely counter-balancing in terms of how they will impact on ambient air quality and so I do not believe that these inconsistencies are fatal to the modelling process. In any case, with regard to the emissions from nearby sources, the applicant has assumed emissions to be at their maximum, which represents a very conservative approach to the assessment. Table 9.4 of the EIS outlines the US EPA-recommended range of operating conditions that were applied in the cumulative assessment for the proposed new source as well as the nearby significant sources. It can be seen that these represent maximum operating conditions. Overall, I am satisfied that a conservative and valid approach was taken by the applicant for the cumulative assessment.

[74] Submission No. 8 to Licence Application 186-1on behalf of East Cork for a Safe Environment (Document from PH North dated September 2004)

4.2.2 Background Ambient Air Quality

Many of the third party objectors expressed concern that ambient air quality for some parameters is challenged and will deteriorate as a result of the incinerator project going ahead.

The measurement of background atmospheric pollution concentrations in the vicinity of point source emissions remains the most reliable method of determining air quality. The applicant undertook to carry out an assessment of existing background ambient air quality. The monitoring was carried out in the area from April to June 2001 using a combination of sampling techniques. Monitoring was carried out for NO_2, SO_2, dust (as PM_{10}), benzene, metals, dioxins/furans and HCl. A detailed description of the monitoring programme is described in the EIS (beginning at Section 9.3).

During cross examination of his testimony at the Oral Hearing, Dr Porter was questioned extensively by ECSE with regard to the basis of the baseline monitoring (monitoring locations, sampling frequency, adequacy of monitoring period, data handling, potential impact of winter heating months, etc.,) (DR/18-02-05/X +6). It was also questioned by ECSE as to whether it was feasible to extrapolate from three monthly average values to annual average values as was carried out by the applicant for the EIS (DR/18-02-05/X +2).

Dr porter has stated that Ringaskiddy, at present, has very good quality air, and that the ambient air monitoring programme was designed with this in mind (DR/18-2-05/X +2). Dr Porter commented that a three monthly monitoring period was a 'good balance' for the site (DR/18-2-05/X +3).

When questioned on the monitoring period by Cork Harbour for a Safe Environment, Monkstown branch (CHASE - PWGMB) (DR/22-2-05/T +7) with regard to appropriateness and guidance sought, Dr Porter replied that the approach taken was that which is currently enshrined across the EU, in that effort put into baseline monitoring should be consistent with the risk of breach of AQS's in that location. Dr Porter added that, 'in the context of an area with good ambient air quality there is no need to monitor for a full year'. He added that the EU outlines indicative monitoring in Council Directive 1999/30/EC[75] which was reviewed with regard to the monitoring strategy (DR/22-2-05/T +8).

CHASE (PWGMB) agreed that this seemed 'like a sensible approach', but challenged the basis of this approach for the Ringaskiddy area given that relatively high levels of metals and particulates were measured in the area. The question was asked 'how could this be good air quality?' (DR/22-2-05/T +9).

Table 9.13 of the EIS shows that the average ambient concentrations of cobalt, chromium, copper, mercury, manganese, lead, antimony and thallium were all below their respective annual limit values. But, ambient levels of nickel exceeded the then proposed EU AQS in every week of the monitoring campaign. At the time of the monitoring in 2001, the proposed EU AQS for nickel was 0.01 µg/m^3 as per an EC Position Paper in 2000[76].

[75] Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air – Official Journal L 163 of 29.06.1999

[76] European Commission – Ambient Air Pollution by As, Cd, and Ni Compounds – Position Paper Final Version (2000)

It was felt by CHASE (PWGMB) that this merited further ambient monitoring (OH Record #27, Appendix G). The facility at *Irish Ispat*, formerly Irish Steel, was in operation at the time (now closed) and it was agreed by CHASE (PWGMB) that this facility was the most likely source of metals in the ambient air at the time (DR/22-2-05/T +10). Specifically, *Irish Ispat* was licensed to emit nickel in its IPC licence issued by the EPA. Dr Porter felt that the general air quality is good when 'you take *Irish Ispat* out of the equation' (DR/22-2-05/T +12).

However, there is another metals processing facility in the area: Hammond Lane Ltd., is a metals recycling facility situated next to the proposed facility. It was asked whether or not it was known if Hammond Lane is impacting on the ambient levels of heavy metals in the area (DR/22-2-05/U +13).

Dr Porter responded that all metals were low except for nickel. He added, that the proposed AQS for nickel is not yet in force. Further, the nature of EU AQS's, permits short term peaks in ambient levels, as it is long term levels averaged over the year that are important. This was agreed by CHASE (PWGMB) but they continued to suggest that the monitoring period was too short to properly evaluate this (DR/22-2-05/U +14).

Table 9.13 of the EIS shows that levels of cadmium and arsenic were generally below the limit of detection of the analytical technique used (0.013 µg/m^3). However, this limit of detection (LOD) was higher than the new proposed EU AQS's[77] for arsenic, cadmium and nickel, which range from 0.005 to 0.02 µg/m^3 (OH Record #23, Appendix G). It should be noted that these

[77] European Commission – Final proposed Directive for As, Cd, Ni, Hg and PAH's in Ambient Air (2003). These AQS's represent an update of the position in 2000

recommended AQS's were not in force at the time of baseline monitoring.

This was a matter for concern for some Third Party objectors, including CHASE (PWGMB) and it was felt that the baseline air quality assessment was flawed as a result (DR/18-02-05/AA +2). It was accepted by Dr Porter that a suitable LOD was not achieved at that time, taking the new proposed standards into account. However, it was argued that the analysis was UKAS accredited and was based on AQS's current at the time and on normal metals levels experienced historically (DR/18-02-05/AA +2).

Evidence was provided by Dr Porter at the Oral Hearing of an ambient air quality monitoring campaign carried out by AWN Consulting at a facility nearby in the area (Pfizer Loughbeg) in March 2003 (Section 4.3, OH Record #23, Appendix G). According to oral evidence provided by Dr Porter, a lower LOD (0.001 µg/m^3) for metals was achieved in the analysis. Background levels for arsenic, cadmium and nickel were determined to be 0.002, 0.001 and 0.003 µg/m^3 respectively, all within the new proposed EU AQS's (DR/18-02-05/AA +3). This, according to Dr Porter, confirms that the air quality in the harbour is good (DR/22-2-05/T +12).

For air dispersion modelling of a number of metals, the sum of the metals in the emissions were modelled rather than the individual metals themselves. CHASE (PWGMB) felt that, due to the exceedences of the then proposed AQS for nickel, additional air dispersion model runs on individual metals should have been carried out (Section 5.3.4 OH Record #27, Appendix G).

However, in my opinion, it is only the ambient levels of nickel that are of concern as the levels of all other metals were low. It can be seen in Section 9.10 of the EIS that individual air dispersion modelling was carried out on nickel (as well as cadmium and arsenic) using emissions data obtained from other Indaver incinerator facilities in Belgium. Given this, and the evidence for improved air quality in Cork Harbour since the closure of *Irish Ispat*, I do not believe that any further modelling of individual metals would have provided any extra value to the EIS.

As regards particulates, a mean value of 21µg/m^3 was determined for particulate matter (as PM_{10}) over the monitoring period which is less than the annual EU AQS^{75} of 40µg/m^3. The levels were determined to be within the 24-hour AQS of 70 µg/m^3, which was applicable at the time, but exceeded the new 24-hour AQS of 50µg/m^3 (applicable in 2005) on three occasions in April and May 2001 (Section 9.3.4 EIS).

An explanation for the higher levels of PM_{10} was offerred by the applicant in the EIS. It was postulated that higher than normal levels of fugitive dust were responsible. An attempt was made to correlate meteorological conditions, such as higher than average daily temperatures, with these peak levels of PM_{10} (Section 9.3.4 EIS). Even though meteorological conditions can of course affect dispersion of dust, I find this possible explanation weak and it has not been substantiated in any way.

Dr Porter subsequently argues in his oral evidence that the higher levels of PM_{10} were possibly due to the presence of the *Irish Ispat* facility. To support this contention, an EPA report is referred to, in which details of ambient dust monitoring carried out around the

Irish Ispat facility in 2001 are recorded. Ambient levels of dust (as PM_{10}) as high as 350 µg/m^3 were measured at the boundary of the now closed facility (Section 4.2 OH Record #23, Appendix G). Dr Porter stated that he was 'happy that levels are within AQS's at the site, particularly given the monitoring carried out in 2003 and that Irish Ispat is closed' (DR/22-2-05/U+ 9).

According to the oral evidence provided by Dr Porter, the ambient air monitoring campaign carried out by AWN Consulting near Pfizer Loughbeg in 2003 also determined baseline levels of NO_2, SO_2, PM_{10}, benzene and HCl. The monitoring period was only a month in duration but all levels measured were below their respective EU AQS's (Section 4.3 OH Record #23, Appendix G). This supports Dr Porters assertion that the ambient air in the Rinaskiddy area is generally of good quality.

It was argued by CHASE (PWGMB), that the improvement in ambient air quality in the area, subsequent to the closure of the *Irish Ispat* facility, should have been substantiated by further ambient monitoring (DR/22-2-05/T +14). Although I do not believe it to be fatal to the EIS, I feel that it would have been a useful confirmatory exercise to carry out some limited repeat monitoring directed at confirming the general good level of air quality in the area in the absence of *Irish Ispat*.

It is the purpose of the air quality assessment that determines the required duration of the monitoring programme. Such programmes may vary from a few hours to many years. It is suggested in the EU Air Quality Framework Directive[78] that

[78] Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management - OJ L 296 of 21.11.1996

continuous monitoring campaigns of at least eight weeks duration are necessary for indicative assessment of air quality in an individual area. This relates to areas with multiple sources and it is reasonable to designate Ringaskiddy as such an area. Clearly, to determine background air quality an adequate number of measurements must be taken. Factors such as the number of sampling instruments available, the location of deployment as well as meteorological conditions must be considered before a duration is set[79]. In fact, it is the number of monitoring instruments employed that strongly determines the monitoring period. Longer monitoring periods would be required where the number of samplers is limited[79].

Overall, ambient pollution levels in heavily polluted areas have significant variation and characteristic patterns during the day as well as through out the year. Accordingly, for these areas, ambient monitoring is normally carried out over an extended period to cover such variations. However, as one moves to less polluted rural areas, the length of time over which one monitors is reduced as the ambient levels are lower and do not demonstrate significant temporal variation. I am satisfied that the monitoring periods chosen for the ambient monitoring programme were generally adequate. This is due to the following reasons:

- Historically low and generally invariable level of pollutants in the area
- Number of samplers utilised
- Sufficient spatial spread of samplers to account for multiple sources and changes in weather conditions.

[79] Optimal Monitoring of Air Quality in the Vicinity of Point Sources – Final Report prepared for the Irish EPA under the 1994-1999 Research & Development Programme. Report #11, February 2001.

I agree that it is a reasonable statistical exercise to extrapolate from short-term averages to annual averages where existing background levels are generally low and invariable, as in this case. In addition, I am satisfied that, given the density of housing in the Ringaskiddy area, the impact of winter heating months on ambient pollutant levels would not be significant.

The applicant was challenged by CHASE (PWGMB) to justify the choice of locations of the ambient monitoring stations. A description of guidance available through the US EPA's PSD system for siting ambient monitors was provided by CHASE (PWGMB) (DR/22-2-05/U +1). The thrust of this guidance is that some initial air dispersion modelling should be carried out to determine the locations of maximum GLC's, taking into account existing and proposed facilities, and that the ambient monitoring stations should be situated at these locations. The applicants were asked whether or not they had followed this PSD guidance(DR/22-2-05/U +4).

Dr Porter replied that the PSD approach was only used in the air dispersion modelling and for cumulative assessment and not for the baseline monitoring. According to Dr Porter, an assessment of the appropriate approach was taken following consultation with the relevant information in the various reference documents as listed in the EIS, particularly one report from the UK[80] (DR/22-2-05/U +7), and that in any case, the location of the maximum predicted GLC's is at the site boundary in the current assessment, close to where the fixed continuous monitoring station was located (DR/22-2-05/U +3).

[80] UK DETR – Review and Assessment: Pollutant-Specific Guidance. The Stationary Office (1998)

While I consider that the locations of the ambient monitors are adequate – though somewhat fortuitously so - and that a version of available guidance was followed, I also believe that it would have been useful if some attempt to predict the locations of worst case impact had been carried out by the applicant, prior to locating ambient monitors. That said, and given the fortunate out-turn of the predicted maximum GLC's with respect to monitoring stations, I do not believe that this is a fatal flaw in the EIS process.

It is contended by ECSE that no explanation has been provided for the variation in background levels of HCl, metals and dioxin measured in ambient air and that this variation is suggestive of errors in sampling or analysis[74 (pg 62)].

Dr Porter responded that for ambient dioxin levels, apparent variation can occur due to the data handling methods used to express 'non-detects' results (i.e. samples with levels less than the LOD) . Consequently, results are normally expressed within a range and the approach is used to provide an idea of the variability of results due to the effects of such 'non detects'. This also applies for metals. Other factors can cause variations in pollutants. These include the weather, emission source output changes and laboratory analysis effects (DR/18-2-05/X +14). It is my opinion that there will always be some variation in results of any monitoring campaign of this type – i.e. ambient. Some are easily explained, others not, but they do not always infer sampling or analytical errors.

There is no doubt that, in relation to the assessment of background air quality, the presence of *Irish Ispat* was a

confounding factor. Nonetheless, given its closure and the confirmatory results of another air quality study carried out in the vicinity of the proposed development in 2003, as provided in evidence by the applicant at the Oral Hearing (OH Record #23, Appendix G), I am satisfied that the quality of air in the Ringaskiddy area is generally of a good standard and that the study was carried out by the applicant to a satisfactory standard.

4.2.3 Air Dispersion Modelling

This sub-section is further considered under a number of headings.

*4.2.3.1 **B**ackground to **A**ir **D**ispersion **M**odelling*

Dispersion models are used for many reasons, but one of the most important is as an indicator, or predictor, of ambient pollution levels for regulation and pollution control purposes. Regulation is usually by one, or a combination, of two approaches. These are by controlling pollutant emissions directly at source (emissions abatement) or by setting limits on the acceptable levels of ambient pollutants, known commonly as Air Quality Standards (AQS).[81]

In reality, the accuracy of dispersion models and their ability to predict dispersion behaviour will always be limited for a number of reasons. The models themselves are significant approximations to true dispersion behaviour, and even given a perfect model, prediction of the state of the atmosphere (on which dispersion behaviour critically depends) is also only approximate. This is partly due to the limited availability of meteorological data and to the natural variability of

[81] UK Environment Agency - Research and Development Technical Report P353 – A Review of Dispersion Model Inter-Comparison Studies using ISC, R91, AERMOD and ADMS (2000)

atmospheric conditions. It has been generally accepted that, though these difficulties are quantifiable to some extent, they are unavoidable in practical models. Though much work has been done in trying to define the degree of accuracy of the models, the regulator is left with an inevitable level of uncertainty in this aspect of pollution control practice.[81]

*4.2.3.2 **A**ssessment of **T**errain **T**ype*

During cross examination of Dr Porter, the question was posed by CHASE (PWGMB) whether not the terrain surrounding the proposed facility was simple or complex in terms of air dispersion modelling (DR/22-2-05/BB +1). Some discussion on this subject followed. Definitions of simple, intermediate and complex terrain with respect to the ISCST3 air model were provided by the applicant in the EIS (Section 9, pg 11) and were outlined again by Dr Porter during cross examination (DR/22-2-05/BB+4).

Based on this and on evidence provided by Dr Porter regarding significant terrain features in the area (Table 7.2, OH Record #23, Appendix G), I am satisfied that the terrain in the vicinity of the stack is 'intermediate' in nature. This esentially means that within 5.5 km of the stack, there are two terrain features whose heights are above the height of the stack but below what is termed 'effective stack height'. Effective stack height is the height to which the plume finally rises. The height of final plume rise depends on a number of factors. These include speed of prevailing wind, atmospheric stability as well as the momentum (due to exit velocity) and the buoyancy (due to heat) of the plume. The plume will rise to its final height when the heat and associated buoyancy of the plume has reached equilibration with the surrounding air. Effective stack height is therefore, the

stack height plus the additional height of rise of the plume. The terrain features that lead to the designation of the surrounding terrain as intermediate, are the hill at Curraghbinny Woods at 74m (c.2.2 km south of stack), and Hill of Cobh at 91m (c.5 km North of stack). See 'Effects of Local Terrain and Stack Height' below for more discussion on effective stack height.

*4.2.3.3 **A**ppropriateness of **M**odels **U**sed in **T**erms of **L**ocal **T**errain*

In order to assess the possible impact of the proposed development on the ambient air of the surrounding area, the applicant carried out air dispersion modelling. Modelling was carried out on those substances controlled by the EU Incineration Directive[82] and included deposition modelling of dioxins and metals. Emissions from the site were modelled and assessed based on three different emissions scenarios covering a range of operating conditions. These were typical, maximum and 50%-of-maximum operating conditions. The methodology used to determine emissions under these operating conditions are outlined in Section 9 of the EIS. To allow the models to predict the movement and dispersion of a plume, hourly-sequenced meteorological data, as is available from *Met Eireann*, is also required. See Part 4.2.3.6 of this report, *Representativeness of Meteorology Data Utilised,* below for more discussion on the meteorological data used.

The Industrial Source Complex – Short Term 3 (ISCST3) air dispersion model was used to assess the impact on air quality. This model is a US EPA approved model for use with industrial sources. The surrounding terrain including topography, out to a radius of 10 km, was mapped into the models with the site at the

[82] Council Directive 2000/76/EC on the incineration of waste

centre (pg 80, Section 9 of EIS). In addition, a receptor grid measuring 20 km by 20 km, with the site at the centre, was also mapped out. Terrain height data for each receptor location was input to the model. According to the EIS; boundary, residential and sensitive receptors (e.g. schools) near the proposed facility were discretely (fixed points) mapped into the modelling domain (modelling area). This gave a total of 5448 receptor points at which Ground Level Concentrations (GLC's) were determined for each pollutant (Section 3.6 OH Record #23, Appendix G). The applicant states on page 84 of the EIS that the ISCST3 model was used in line with US EPA guidance available at the time.[83]

AERMOD represents a significantly more advanced air dispersion model than ISCST3, although, the US EPA has not yet granted regulatory approval (Section 9.2.3 EIS). According to Dr Porter, AERMOD was utilised to provide assurance that the ISCST3-based assessment was protective of air quality and did not under-estimate predicted GLC's (Section 9.2.3 EIS). In addition, according to the EIS (pg 84), use of AERMOD was also in line with the available guidance at the time.[84]

Industrial Source Complex – Short Term 3 (ISCST3): There was much debate as to the appropriateness of the ISCST3 model for use in the Cork Harbour area. Dr Porter was asked by CHASE (PWGMB) why he used ISCST3 (DR/22-2-05/BB +8). Dr Porter's response was to point out that the approach used for selection of model is the 'regulatory' approach as is rquired by the EPA in Ireland. It was stated, in evidence provided by Dr Porter at the Oral Hearing (Section 7.2.1 OH Record #23, Appendix G), that ISCST3 is the current US EPA-approved

[83] US EPA Guidelines on Air Quality Models, Appendix W to Part 51, 40 CFR chapter 1 (1999).
[84] US EPA Federal Register, 40 CFR Part 51 - Requirements for Preparation, Adoption and Submittal of State Implementation Plans (Guidelines on Air Quality Models) Propose Rule (2000)

regulatory model for assessing the impact from industrial sources in both 'flat and complex terrain'. The US EPA's Seventh Conference on Air Quality Monitoring of June 2000 is referred to in this regard.[85] Indeed, evidence was provided that ISCST3 and its earlier versions, have been used world-wide over the last 20 years in a range of meteorological conditions and terrains (Section 7.2.2, OH Record #23, Appendix G).

In oral evidence provided by CHASE (PWGMB) it was pointed out that ISCST3 is not the only USEPA approved regulatory model. Examples of other models were provided and it was asked whether or not alternative, more appropriate models, could have been used in this case. Some of these other models are listed in Section 3.4.1 of the CHASE (PWGMB) submission to the Oral Hearing (OH Record #27). During cross examination, an explanation was provided by Dr Porter of the uses of some of these other models (DR/22-2-05/BB +9).

ISCST3 does have limitations. It is unable to capture low wind speed values (less than 1m/s) and its steady-state basis means that it cannot adequately model atmospheric inhomogenieties (both vertical and horizontal) associated with varying surface characteristics (Section 7.2.3, OH Record #23, Appendix G). Dr Porter was asked by CHASE (PWGMB) whether or not it have ever occurred to him that the model might not be right for the harbour area given these limitatons (DR/22-2-05/BB +14). Dr Porter explained that, in terms of terrain complexity, US EPA guidance is to start with a screening assessment and to proceed to more refined

[85] US EPA Seventh Conference on Air quality monitoring of June 2000 – Volume I and II

models if required. It was pointed out that the refined model at the time was CTDM PLUS, which is a model designed to be used, if necessary, in a complex terrain scenario (DR/22-2-05/BB +12).

According to Dr Porter, the following is the approach that was used. The complex terrain screening algorithm for ISCST3 is COMPLEX1, and when used in conjunction with ISCST3, the model can deal with complex terrain. He accepted that ISCST3 has its limitations, but added that evaluation studies of ISCST3 in complex terrain show that it will predict very conservative GLC's. He added that it may not be the most ideal model, but it will over estimate, sometimes by up to 600%. Dr Porter felt that, in conjunction with the more advanced AERMOD model (see below), it was appopriate to use ISCST3. AERMOD has a more advanced algorithm to deal with complex terrain and its results supported ISCST3's conservative outcome in this approach (DR/22-2-05/BB +14).

Dr Porter had pointed out earlier in the cross examination that in this case, terrain height is not the limiting factor for impact on air quality. This was demonstrated by results obtained when using ISCST3 with, and without, the COMPLEX1 screening algorithm (DR/22-2-05/BB +4).

In the evidence provided by Dr Porter, it is stated that the worst-case ambient air quality impact is predicted to occur at the site boundary, with ambient concentrations decreasing with distance as you move away from the site. This prediction is used to validate the use of the steady-state

assumptions associated with the ISCST3 model (Section 7.2.3, OH Record #23; DR/18-2-05/J +10).

AERMOD : The suitability of AERMOD for use in complex terrain was questioned in evidence provided by CHASE (PWGMB) (Section 8.1.2, OH Record #27, Appendix G). Evidence was provided by Dr Porter that AERMOD has undergone extensive performance evaluation tests in a variety of settings, including complex and mountainous terrain. Results of the evaluation tests indicate that AERMOD provides good agreement between measured and predicted results in both simple and complex terrain and therefore is suitable for modelling in complex terrain (Sections 7.2.4 and 7.2.5, OH Record #23, Appendix G). Two references are cited in Section 7.2.4 of Dr Porters evidence (OH Record #23, Appendix G) outling these evaluation tests [86, 87].

Evidence was provided by Dr Porter that AERMOD, through the use of AERMET PRO (AERMOD's meteorological pre-processor), has the ability to take into account varying surface characteristics when determining plume dispersion across a modelling domain (Section 7.2.9 OH Record #23, Appendix G). Two references are given in Section 7.2.9 of Dr Porters evidence (OH Record #23, Appendix G) to support this[88, 89]. AERMET allows AERMOD to account for changes in plume behaviour with height (pg 81, Section 9 of the EIS). While AERMOD is essentially a steady-state Gaussian model, its advanced formulation allows it to treat vertical distribution

[86] US EPA Comparison of Regulatory Design Concentrations: AERMOD vs ISCST3 vs CTDM PLUS (1999)
[87] US EPA AERMOD: Latest Features and Evaluations (2003)
[88] US EPA Users Guide to the AERMOD Meteorological Preprocessor (AERMET) (1998)
[89] US EPA AERMOD Description of Model Formulation (1998)

of a plume more accurately, when meteorological conditions require (pg 80 Section 9 of the EIS).

AERMOD also has been designed to model the variation of turbulence with height as well as the change in mixing height throughout the day (pg 81 Section 9 of the EIS).

The possible use of smoke tests was raised by ECSE. Dr Porter was asked if he had ever used them to verify wind movement within the harbour (DR/18-2-05/BB +7). Dr Porter replied that smoke tests are carried out as part of the evaluation process for a model, and that while models can be used to predict dispersion from a source that does not yet exist, smoke tests cannot (DR/18-2-05/BB +8).

There are of course differences between the models. Overall results indicate that use of ISCST3 led to more conservative predictions than the more advanced AERMOD, particularly over shorter averaging periods (pg 9, Section 9 of the EIS). It is accepted that AERMOD is more likely to predict GLC's more accurately than ISCST3, and so I am satisfied that the modelling results predicted by ISCST3 do represent a conservative/worst case scenario. In fact, it was agreed by one Third Party objector that ISCST3 and AERMOD are probably the best models available (ECSE[74] (pg 62)). I am satisfied that the models used were appropriate to the location in general.

*4.2.3.4 **A**ppropriateness of **R**ural **D**ispersion **C**o-**E**fficient for **U**se with **I**SCST3*

When modelling with ISCST3, different dispersion co-efficients are available to use. The type of co-efficient utilised reflects the type of land use within the modelling domain and is used to describe the effect that the land will have on plume dispersion. There is a co-efficient to describe a rural area and one for use in populated urban areas. In this case, the applicant chose to use a rural dispersion co-efficient.

CHASE (PWGMB) pointed out that as per the US EPA Guidelines on Air Quality Models (2003)[90], the impact of possible development in the modelled area should be assessed. They asked whether or not the most recent Development Plan for Cork County had been taken into account when carrying out the dispersion modelling using a rural dispersion co-efficient. The question was asked as to whether or not, the increased urbanisation planned for the area in the near future would affect the validity of the dispersion co-efficient chosen (DR/22-2-05/AA +14).

Dr Porter explained that even though a rural dispersion co-efficient was used for modelling in the area , both urban and rural dispersion co-efficients were assessed. It was found that use of urban dispersion co-efficients resulted in maximum GLC's that were 45% lower than rural. This is mainly due to the extra turbulence found in urban areas resulting from heating at night time. He added that F and G stability categories do not really occur in urban areas because of this extra 'urban' turbulence, so extra urbanisation can in fact lead to lower ambient pollutant

[90] US EPA Guidelines on Air Quality Models, Appendix W to Part 51, 40 CFR chapter 1 (2003).

concentrations. Dr Porter concluded that if they had used an urban co-efficient, they would have achieved lower maximum GLC's, but it would have been inappropriate to do so(DR/22-2-05/BB +1).

I am satisfied that the use of a rural dispersion co-efficient rather than an urban co-efficient with ISCST3 was appropriate and represented a precautionary – and worst case - approach to the modelling.

*4.2.3.5 **A**ppropriateness of **S**urface **C**haracteristics for **U**se with **A**ERMOD*

As outlined above, AERMOD incorporates a meteorological pre-pre-processor known as AERMET. AERMET requires the input of values for parameters used to describe surface characteristics. Values for surface characteristics depend on the type of land use in the surrounding area, such as urban, rural, forest, water, etc. The surface characteristics required include; Surface Roughness, Albedo and Bowen Ratio. Explanations of these terms are set out in Appendix 9.1 of the EIS.

Site-specific surface characteristics were determined for the Ringaskiddy area out to a 3km radius from the emission source, with a weighted average for every 30° arc of the circular area considered. Derivation of values for the parameters is discussed in Appendix 9.1 of the EIS: values are displayed in Tables A9.1 to A9.3 of the EIS. Variation by season was also assessed and included in the modelling (pg 82, Section 9 of the EIS).

Having examined Tables A9.1 to A9.3 as well as maps for the area available in the EIS, I am satisfied that the applicant has

made a reasonable effort to determine values for the surface characteristics of the area.

*4.2.3.6 **R**epresentativeness of **M**eteorology **D**ata **U**tilised*

Meteorological data from the years 1993 to 1997 were used in the modelling with the results for the worst-case year being reported. The worst-case year was determined to be 1995 as it resulted in annual average GLC's that were 30% higher than the five-year average (pg 2, Section 9 of the EIS). See also Table A9.4 of the EIS.

However, meteorological data were not collected at the site of the proposed facility. According to the evidence provided by the applicant (pg 8, Section 9 of the EIS), meteorological data to be used in the modelling were selected following a review of existing data available in the area and that the data selection was according to the 1999 US EPA recommendations[83]. The meteorology stations closest to the Ringaskiddy area were identified as being at Roches Point and Cork Airport. However, it should be noted that the Roches Point meteorology station ceased gathering meteorological data suitable for modelling purposes in 1991 (pg 8, Section 9 of the EIS). Cork airport data were then appraised for suitability. The type of meteorological data required generally for air dispersion modelling purposes is routinely collected at Cork Airport.

Evidence is provided in the EIS that, on examination of available meteorological data from the two stations, a similar wind direction pattern was revealed, with Roches Point showing higher-than-average wind speeds (EIS Section 9, pg 8). The applicant also examined and compared the frequency of each

stability category at both meteorology stations. It was demonstrated that the relative frequency of each stability category is very similar, despite the different locations of the meteorology stations (Roches Point being coastal and Cork Airport being approximately16 km from the coast) (pg 27 OH Record #23; See also Figure 7.1 pg 29 OH Record #23, Appendix G). The applicant concluded that, the Cork Airport meteorological data, when extrapolated to stack height and effective stack height, will be similar to conditions pertaining at the same heights within the modelling domain of the proposed facility at Ringaskiddy (pg 27 OH Record #23, Appendix G).

A further examination was carried out which was detailed in evidence provided by the applicant at the Oral Hearing. The applicant set out to confirm that any differences in meteorological data between the two stations would not significantly affect GLC's as predicted by the air dispersion models. Meteorological data from Roches point (1986 -1990) was modelled using both ISCST3 and AERMOD and compared to GLC's generated using Cork Airport meteorological data with both models. Moreover, additional meteorological data were collected from Cork Airport giving ten years (1993 – 2002) of data to be used in the modelling comparison. Results generated demonstrate that use of Cork Airport data leads to more conservative GLC predictions than those using Roches Point data (Figures 7.2 to 7.5 OH Record #23, Appendix G). Use of both data sets also indicates a similar dispersion pattern in ambient concentration with a steep decrease in concentration as you move away from the site boundary (Figures 7.6 and 7.7 OH Record #23, Appendix G).

The subject of the validity of the meteorological data used as input in the models was raised by ECSE during cross examination of Dr Porter. It was stated by ECSE that the accuracy of using meteorological data in one location that has been measured in another location has never really been looked at (DR/21-2-05/M +9). The question was asked, 'has Cork Airport meteorological data been validated for use around Cork Harbour ? (DR/21-2-05/M +11). In reply, Dr Porter pointed out that a comparison of meteorological data from Roches Point and Cork Airport was detailed in his evidence (OH Record #23, Appendix G). He added that the data shows the similarity between them in terms of stability category, wind speed and directions. Both sets of meteorological data were used, both models were used, and the results showed no significant differences, either in short term or long term averages, of predicted GLC's (DR/21-2-05/M +13).

The sufficiency of using only two locations to provide relevant meteorological data for modelling in the Cork Harbour area was then questioned by ECSE (DR/21-2-05/M +13). It was pointed out by Dr Porter that Ringaskiddy is in an intermediate location between the two stations at Roches Point and Cork Airport and, given that there is no dramatic change in terrain between the two stations, it is very unlikely that there will be a dramatic change in meteorological conditions between them either (DR/21-2-05/M +13).

Further questioning with regard to the meteorological data was carried out by CHASE (PWGMB). It was asked, with regard to the comparison between the meteorological data collected at Roches Point and Cork Airport, whether or not a comparison with

all meteorological factors, rather than just wind speed and direction, could have been carried out (DR/22-2-05/CC +5).

In reply, Dr Porter pointed out that some meteorological data are representative over a much wider area than others. For example, mixing height is measured by *Met Eireann* at only one point in the country. It is determined by upper air soundings every day at Valentia Island. [Mixing Height defines the body of air in which a plume normally disperses and is dependent on atmospheric stability, the extent of solar radiation reaching the ground, wind speed and surface roughness.] Wind speed and direction depend more on the locality at which they are measured, while factors such as mixing height, temperature and stability vary less spatially (DR/22-2-05/CC +6).

When questioned further about the validity of using mixing height data from Valentia Island in Cork Harbour, Dr Porter confirmed that morning and evening mixing height calculations are carried out by *Met Eireann* and Trinity Consultants and that the resulting mixing height values are purchased finally from Trinity Consultants for use in the modelling. [Trinity Consultants is a private company which purchases meteorological data from National services all over the world and processes it mathematically into a usable form, e.g. for air dispersion modelling.] Dr Porter further confirmed that the mixing height values as determined for the measurement point on Valentia Island are used directly in the Cork Harbour modelling. He is not aware of any correction for temperature gradient between Valentia Island and Cork Harbour (DR/22-2-05/CC +9). He pointed out that, because there are much less upper air meteorology stations in the world than ground stations, information from upper air stations, such as

mixing height values, is spread spatially over a much greater area (DR/22-2-05/CC +11). CHASE (PWGMB) stated that *Met Eireann* advised them (telecon with Ms D'Alton) that Valentia Island data is not usable in Cork Harbour (DR/22-2-05/CC +11).

Determining mixing height is usually an expensive and complex task requiring considerable expertise and should therefore not be undertaken lightly. It should be noted that mixing height is not measured in any other national station in Ireland. While I must accept that the validity of correcting Valentia Island mixing height data for use in Cork Harbour was not carried out, I cannot accept that such a short distance (from a meteorological point of view) from Valentia Island to Cork Harbour could have an impact on this meteorological parameter (mixing height) of such significance as to alter dramatically the final model results . For this reason, I think it is rational to use mixing height data, as measured in Valentia Island, in the modelling at Cork Harbour.

According to the New Zealand Government's *Good Practice Guide for Atmospheric Dispersion Modelling*[91], if a plume penetrates up through, or is released above, the mixing height, the pollutants will be trapped aloft and their effect will not be observed at ground level. If a plume is trapped within a shallow mixed layer the vertical dispersion will be limited and high ground-level concentrations are likely to occur. Dr Porter demonstrated in his brief of evidence at the Hearing, how, under stable conditions, a plume of sufficient buoyancy will carry a plume above the mixing height. In this way, even with a low mixing height, the plume will rise up through to form an effective mixing height that increases in height with downwind distance

[91] New Zealand Ministry for the Environment, 2004. http://www.mfe.govt.nz/publications/air/atmospheric-dispersion-modelling-jun04/

(Section 7.2.16 OH Record #23, Appendix G). It should be noted that, according to meteorological data available for Roches Point (1988), that the mixing height in Cork Harbour will average 75 to 150m (i.e low) for only about 5% of the time between midnight and six am in the morning (Section 7.2.14 OH Record #23, Appendix G).

Dr Porter was questioned whether or not he had determined values for parameters such as surface roughness, albedo and bowen ratio at Roches Point and Cork Airport for comparison also. Dr Porter replied that values for these parameters were only determined for the area around the development site (DR/22-2-5/DD +5). As discussed above, values for these factors depend on land use. Based on guidance available from the UK EA, I feel that it would have been useful, for comparison purposes, to include information relating to the surface characteristics at the Cork Airport meteorology station[92]. However, I do not feel that this is not a fatal flaw in the modelling assessment as it is dispersion in the harbour area that is of primary concern in this case.

The fact that meteorological data was not measured locally at the development site was a concern for many Third Parties. The value of measuring local data was discussed during cross examination of Dr Porter. Dr Porter referred to a US EPA guidance document on AERMOD[87], which reports on a comparison carried out between ISCST3 and AERMOD with regard to the use and representativeness of meteorological data from different stations (DR/22-2-05/DD +8). The comparison study

[92] UK Environment Agency Air Quality Modelling and Assessment unit – Air Dispersion Modelling Report Requirements. Document available from UK environment Agency website @ http://www.environment-agency.gov.uk/commondata/acrobat/report_edited_252797.pdf

looked at some different ways of collecting data. These included the use of an on-site multi-level meteorological tower, a one level on-site meteorological station and off-site national weather stations. There was very good correlation of results, he said(DR/22-2-05/DD +10). In addition, a meteorological guidance document was referred to by Dr Porter - Meteorological Monitoring Guidance for Regulatory Modelling Applications (February 2000): he states that it is made clear, that in terms of siting of meteorological stations, it is the conditions at effective stack height that are important in steady modelling applications (DR/22-2-05/DD +11).

CHASE (PWGMB) continued and asked why an on-site meteorological station was not put in place given the cost and importance of the proposed development (DR/22-2-05/DD +11). Dr Porter answered that data from Roches Point and Cork Airport can be used even if the terrain is different as it does not impact significantly on the model (DR/22-2-05/DD +12).

'Who says that Roches Point and Ringaskiddy are the same?' asked CHASE (PWGMB) (DR/22-2-05/DD +12). Dr Porter agreed that the terrains are different, but added that it is the weather conditions at effective stack height that are of interest, and that the two have similar conditions at effective stack height (DR/22-2-05/DD +13).

CHASE (PWGMB) explained that they trust the models used but do not trust what has gone into into them (e.g input data). They are therefore concerned, because of what has been derived from the models, such as stack height and compliance with AQS's, in the absence of local meteorological data. They feel

that this could have been easily measured between the Planning Oral Hearing and the Oral EPA Hearing (DR/22-2-05/DD +13). They feel that it is the meteorological data that is the real issue (DR/22-2-05/DD +14).

CHASE (PWGMB) referred to a US EPA Conference on air dispersion modelling[85]. It recommended case by case objective assessment of the meteorological data used for air dispersion modelling by experienced meteorologists (DR/22-2-05/DD +14). This was put to Dr Porter but he was unable to provide evidence of having done so.

Dr Porter was asked by CHASE (City Group) whether or not any local knowledge had been sought with regard to local meteorology. Dr Porter replied that standard regulatory models rely on scientific data input and not on local knowledge. However, he added that if difficulties are experienced with a model and if there is a need to conceptualise plume behaviour in the absence of a model then additional factors such as local knowledge can play a part (DR/21-2-05/BB + 1).

I believe that the arguments and data provided by the applicant with regard to the appropriateness of the use of Cork Airport data in the modelling are compelling. These include the following:

- Proximity of Roches Point meteorology station to the Ringaskiddy site
- Similar patterns and frequencies at Roches Point and Cork Airport with regard to the significant meteorological parameters of relevance to air dispersion modelling

- No significant difference in predicted GLC's using both models with meteorological data from both stations
- A similar dispersion pattern for the predicted GLC's using both models with meteorological data from both stations
- Intermediate location of Ringaskiddy between the two meteorology stations
- Similarity of meteorological conditions at effective stack height across the harbour area.

I am therefore satisfied that use of Cork Airport meteorological data is appropriate in this case. In addition, I consider, for the following reasons, that it has been reasonably established that use of Cork Airport data represents a conservative and safe approach to the air dispersion modelling:

- The prediction of more conservative GLC's whenusing Cork Airport data rather than Roches Point data
- Use of 1995 as the year with worst-case meteorological data for the air dispersion modelling.

The issue of regulator approval for the meteorological data prior to modelling was raised by CHASE (PWGMB) in their oral evidence (Section 6.3.6 OH Record #27, Appendix G). Despite US EPA guidance, it is not normal Irish EPA policy to evaluate the suitability of meterological data prior to use in modelling. In his consideration of the Licence application, the EPA licensing inspector assessed the applicant's air quality study (refer Appendix B-1), as well as modelling results. The inspector had an opportunity to seek further information if required. The inspector did not seek any further information with regard to the meterological data. Thus the inspector demonstrated satisfaction with the meteorological data as used by the applicant. Essentially, it is during the Licence Application

assessment stage that the regulator (in this case the EPA) demonstrates its approval or not of the meteorological data used in the modelling. I am satisfied that this is what was done in this case.

*4.2.3.7 **S**tatistical **A**nalysis*

Dr Porter was cross examined by ECSE with regard to the accuracy of the models used and the uncertainty of the results obtained from them. Dr Porter was asked whether or not he had modelled the emissions from other existing sources in the area to verify the ambient air quality data that had already been collected (DR/18-2-05/BB +9). In his reply, Dr Porter explained that the assessment of model accuracy was much more complicated than that. The models are statistical models and so results are not compared on an hour-by hour basis. The time/space element is stripped away. Correlation of modelled results with air quality monitoring results is carried out by comparison on a quantile plot. Model accuracy is studied very closely during evaluation studies. ISCST3 and AERMOD have been extensively evaluated for this (DR/18-2-05/BB +10).

Dr Porter was asked by ECSE whether or not he had carried out any estimations of the uncertainty associated with the models used (DR/21-2-05/L +1). Dr Porter referred to Section 10.2 of the US EPA's 2003 Guidelines on Air Quality Models[90] (Recommendations – Point A) and quoted 'No specific guidance on the quantification of model uncertainty for use in decision making is being given at this time. As procedures for considering uncertainty develop and become implementable, this guidance will be changed and expanded. For the present,

continued use of the best estimate is acceptable' (DR/21-2-05/L +2).

When asked by ECSE whether or not he had sought guidance in relation to uncertainty from other sources (DR/21-2-05/L +3), Dr Porter replied that even though guidance can be sought anywhere in the world, the use of US EPA guidance is considered appropriate by the Irish EPA (DR/21-2-05/L +4).

When questioned by the Chair about model uncertainty, Dr Porter replied that at present it is not possible to say that a model has an certain value of uncertainty as it was more complex than that. He added that the US EPA have not yet resolved the uncertainty issue and that in essence their guidance for the present is to use the model result. The US EPA is currently working on determining the best way to deal with the uncertainty of modelling results (DR/22-2-05/MM +2).

Dr Porter was questioned a number of times with regard to the statistical basis of the air dispersion models by Carrigaline Area for a Safe Environment (CASE). CASE asked Dr Porter whether or not he had established standard deviations for the values of the meteorological factors used in the modelling (DR/21-2-05/W +1). Dr Porter replied that all of the meteorological data was bought from *Met Eireann* via Trinity Consultants. It was pointed out by Dr Porter that, as purchasers of this data, they do not have any input into how the data is collected. Trinity Consultants carry out all pre-processing, quality control and assurances. The data was used directly following purchase (DR/21-2-05/W +1).

When asked a little later as to how many observations he had made for the meteorological data, Dr Porter replied that the models used a year of data, with an hourly value for each variable being input to the model (DR/21-2-05/W +11). All of the input data are available for review on the compact discs submitted to the EPA as part of the Waste Licence Application.

One of the basic tenets of air dispersion modelling using Gaussian-based plume models is that dispersion is inversely proportional to wind speed. However, this leads to problems at very low wind speeds. Essentially there are limits for the models at low wind speeds and their ability to predict air concentrations breaks down. This occurs at 1.0 m/s for ISCST3 and 0.5 m/s for AERMOD. At low wind speeds, the models predict unrealistically high concentrations which do not match measured (or observed) concentrations determined during model evaluation.

CASE felt that use of Gaussian plume models meant that 'we are now into econometrics'. Econometrics is the use of mathematical models to make economic projections or predictions and, according to CASE, has become reasonably accurate (DR/21-2-05/W +3). With regard to this, the question was asked by CASE 'can you reconcile the difference between observations and predictions at very low wind speeds?' (DR/21-2-05/W +3). CASE continued 'if you cannot arrive at a standard deviation, you do not have a model!' (DR/21-2-05/W +6).

At this point, Dr Porter again referred CASE to the recommendations of the US EPA's 2003 Guidelines on Air Quality Models[90], which recommends the use of best estimate, for the

present, in the absence of specific guidance on uncertainty (DR/21-2-05/W +6).

CASE argued that the US EPA had not said anything about Gaussian models. Again, Dr Porter referred CASE to the same recommendations in the US EPA's 2003 Guidelines[90] (Point A5 for ISC models) where it states that the ISC model is a steady state Gaussian plume model. Dr Porter added that he has followed US EPA guidance (DR/21-2-05/W +6).

CASE claim that the the whole basis for Dr Porters evidence is invalid as the observations they have got do not fit the model. CASE believe the model to be correct, and so therefore the observations made by Dr Porter must be incorrect (DR/21-2-05/W +7). I am not sure what is meant by CASE when they refer to the 'observations' made by Dr Porter. There may be some confusion here with regard to the term 'observations'. I am satisfied that the terms 'observations' with regard to the models relate to those measurements carried out during the evaluation of model performance by the developers of the models. It is during these evaluation trials that the operational limits of the models (e.g.with regard to wind speed) are determined (see below).

On being asked by the Chairman to clarify their concern about the use of Gaussian plume models, CASE stated that when one collects data for a model, the data is supposed to fit the model (DR/21-2-05/X +1). It is essential to note that the meteorological data were not measured or collected by the applicant but were purchased and then used in the models. Dr Porter used the meteorological data in the models to provide predictions of

GLC's. These GLC's are outputs of the models and as such 'fit' the models taking the meteorology into account.

The meterological data used represents attempts by an instrument to measure a changing value (e.g. atmospheric temperature, wind speed etc.,) through out the day. Like economic data, these data are non-experimental and cannot be controlled[93]. This is not the same as repeated attempts to measure an unchanging amount or value, e.g. the temperature of boiling water or the weight of a brick. These would represent controlled experiments.

In any measurement or experiment, there will be errors associated with the measuring instrument. One can use statistical parameters such as precision (reproducibility), uncertainty and accuracy etc., to analyse the data so that these errors of measurement can be accounted for. Through repeated measurements of a 'known' reference amount or value, one can quantify the magnitude of these parameters for a measuring instrument. This can be carried out during calibration and maintenance of an instrument. In my opinion, with regard to the meteorological data, it is the reliability of the data that is the crucial point. The realiability of the data depends on the reliability of the measuring intruments. I believe that the sources of the meteorological data, *Met Eireann* and Trinity Consultants, are above reproach. Met Eireann, having a Quality Assurance and Control system (QA/QC) system in place, determine the reliability of their instruments through maintenance and calibration. Therefore, in relation to the meteorological data purchased by the applicant, the statistical parameters for

[93] Basic Econometrics (3rd Edition) – Damodar N. Gujarati (McGraw-Hill, 1995)

accuracy and uncertainty are associated with the performance and reliability of the measurement instruments themselves and not with the data as used in the models.

When questioned by the Chair about the measurement of meteorological values, Dr Porter stated that historically, values were averages measured over a ten minute period per hour, although they may be measuring continuously now. Met eireann have their own QA/QC system, and it was his opinion that measurement instrument precision and accuracy would be very good, with accuracy at roughly +/- 1% (DR/22-2-05/MM +1).

Literally, econometrics means 'economic measurement'. Econometrics is a combination of economic theory, mathematical economics, economic statistics and mathematical statistics[93]. Essesentially, it is the application of such tools to economic problems and theories. I do not feel that econometric principles can necessarily be applied in this instance. While mathematical models are used in econometrics, they have been especially developed for that purpose. The same can be said for air dispersion models. But while there may be some basic similarities (such as use of Gaussian distribution) they are not necessarily the same thing. It must also be acknowledged that, though complex and sophisticated, models represent only mathematical approximations of actual behaviour. It has been shown above that air dispersion models are in fact very good at describing plume dispersion.

However, all models have their functional limits. As a case in point, the behaviour of the air dispersion models at low wind speeds has been described above. But models are also in a

constant state of review and development. It has been shown that the more recent AERMOD model represents an improvement over ISCST3 in many ways. AERMOD has an improved algorithm to allow it to deal with lower wind speeds than ISCST3. It can only be assumed that there will be more improvement in the future to allow Gaussian plume models to describe plume behaviour at lower wind speeds more accurately.

I do not believe that any pre-modelling statistical analysis of the meteorological data as purchased, e.g., for standard deviation etc., would have added any value to the modelling as it does not provide any information on the 'accuracy' or 'uncertainty' of the model itself. The degree of uncertainty associated with these models has not yet been quantified by the US EPA. So, we must accept US EPA guidance, issued in 2003 on this matter[90]. That is, best estimate as provided by the model, must be used as the final result. I am satisfied that the best estimate is the predicted GLC as provided by a regulator approved model used by an experienced modeller, as in this case.

*4.2.3.9 **A**ffects of **L**ocal **T**errain and **S**tack **H**eight*

The possibility of surrounding terrain affecting plume dispersion was discussed extensively during the hearing as was the ability for the models to take this into account. The thrust of Dr Porters evidence was that, due to the heat of the gases exiting the stack (plume buoyancy), the plume would rise until it reaches effective stack height (estimated as varying 120m OD to 190m OD). Consequently, due to this height, the plume would not be influenced by any terrain features or subject to complex flows (DR/18-2-05/AA +9). The horizontal distance travelled by the

plume after it exits the stack and gets to effective stack height is outlined in evidence provided by Dr Porter. It has been determined using both Roches Point and Cork Airport meteorological data and both models. It has been predicted to reach effective stack height within a horizontal radius from the stack of between 88m and 185m (Table 7.2 OH Record #23).

Further oral evidence was given by Dr Porter during cross examination on the subject by ECSE (DR/21-2-05/M +14) and *An Taisce* (DR/21-2-05/Q +4). The thrust of the questioning related to the difference in conditions between a height of 2m (say in a sailing boat)and effective stack height within the harbour area and whether or not the local terrain would impact on plume dispersion at effective stack height.

Dr Porter explained that, in general, terrain features will only influence points below the height of the feature. The models can look at plume dispersion, under stable meteorological conditions, at heights of between 120 and 190m. Therefore, when the plume is at effective stack height the influence of surrounding terrain will not be significant on the dispersion pattern as the plume will be above all local terrain within 5.5 km of the stack. Outside of this, the gradient (or slope) of any terrain at effective stack height is so low and so far away that there will be no impact on dispersion. When in a boat in the harbour at 2m, one is subject to variable winds, because the surrounding terrain at that height will be a complicating factor. The effects will be significant as there will be wind channelling. However, at roughly 120m, there is no complex terrain and no channelling. 'That's the difference' said Dr Porter (DR/21-2-05/M +14; Q +4).

However, it was pointed out by ECSE that as plume rise is a factor of plume temperature, then there could be a problem with dispersion at minimum exit temperature as could be the case if the plume reheat system failed. According to Dr Porter, that was something that would have to be discussed with the engineer for the project as modelling was only carried out using a plume exit temperature of 100°C (DR/21-2-05/N +1).

Air dispersion modelling during accidents and emergencies was not carried out by the applicant (see section 'No Modelling of Emissions During an Incident' below). In Section 15.2.7 of the Waste Licence Application, the applicant outlines the on-site emergency shut-down procedure which will be used to bring the incinerator units to a safe-status in the event of an emergency. In the event of a power failure, an emergency standy generator will be used to power any equipment required during an emergency shut-down. In the event of an emergency shut-down, the air emissions abatement system will continue to operate until shut-down is complete. Exit gases will continue to be passed through the reheater though they will not be heated to the particular set-point as during normal operation. According to the applicant a plume may be visible as it discharges to atmosphere at this stage. To mitigate this impact, the flue-gas reheaters should remain operational until the relevant furnace has been fully shut-down (c.f. recommendations in Chapter 6 of this report).

Dr Porter was asked whether or not the plume would miss the town of Cobh, which lies roughly 3km north of the proposed facility (DR/21-2-05/S +11). Dr Porter replied that even under worse-case conditions, which are stable weather conditions with

intermediate wind speeds, the plume will rise to effective stack height at between 120 and 190m and will be well above Cobh at that point. The Hill of Cobh peaks at 91m. At very low wind speeds, at effective stack height under stable conditions, there will be lateral meander and horizontal dispersion, but as the plume is so high up, it will not impact on any terrain. If there is some wind up at effective stack height, there will be some vertical dispersion but the plume is unlikely to disperse vertically to ground at Cobh under stable conditions, according to Dr Porter (DR/21-2-05/S +13).

During cross examination of Dr Porter by CHASE (PWGMB) there was much discussion on the design of stack height and whether or not it was high enough to guarantee effective and safe dispersion. Much of this discussion centred around the concept of Good Engineering Practice (GEP). GEP is an historical engineering calculation used to design stacks of sufficient height so as to avoid two problems associated with plume dispersion:

- Impact on the plume itself due to nearby buildings (called building downwash) which causes the plume to bend to the ground
- Impact of plume on downwind terrain.

GEP holds that stack height should be at least 2.5 times the building height.

According to Dr Porter, the models used take building downwash and terrain into account (DR/22-2-05/Z +6) and added that the stack height at 55m was arrived at by modelling and not by using GEP. The stack height was designed to achieve air quality in accordance with the AQS's at the site boundary(DR/22-2-05/Z +7).

CHASE (PWGMB) have concerns over stack height as it was arrived at by modelling, which they feel has flawed input, and are suggesting that the stack design is too low and does not take US EPA guidance on GEP into account. In addition, they feel that wind tunnel tests should have been used to duplicate real life effects to design a more adequate stack height (DR/22-2-05/Z +14; AA +1). When asked about the use of tunnel tests by ECSE, Dr Porter stated that it was not standard procedure (DR/18-2-05/BB +3).

During this cross examination, Dr Porter referred a number of times to use of AERMOD and its ability to deal effectively with building downwash and complex terrain (DR/22-2-05/Z +12). He added that both models (ISCST3 and AERMOD) had been used to determine stack height using a conservative approach i.e. worst-case results (DR/22-2-05/AA +3) and that building downwash was accounted for in the derivation (DR/22-2-05/AA +5).

Building downwash will occur during stable conditions and intermediate wind speeds (worse-case meteorological conditions). The plume will ground and impact the site boundary and as there is only 50 - 100m between the stack and the site boundary, the plume will not undergo any significant dilution or dispersion. It is because of building downwash that, despite a 55m stack, the worst-case GLC's are predicted to occur at the site boundary.

In addition, an advanced building downwash algorithm known as PRIME has become available for use with AERMOD. Dr Porter

confirmed during cross examination by *An Taisce* that all modelling results reflect the use of this new development for AERMOD (DR/21-2-05/S +2). Initially, it was predicted that the worst-case GLC's would occur at the southern boundary of the site, but utilisation of PRIME with AERMOD resulted in the prediction of worst-case GLC's at the Northern boundary of the site. This difference basically reflects the significant difference in the formulations of the building downwash algorithms between ISCST3 and AERMOD. These worst-case GLCs' are significantly below the EU AQS's and reduce quickly and substantially as the plume moves away from the boundary.

Dr Porter was asked by CHASE (PWGMB) whether or not there is any meteorological situation in which the plume would go sideways instead of up (DR/22-2-5/EE +8) or where there is no effective stack height (DR/22-2-5/EE +9). Dr Porter explained that the key piece of information to bear in mind is that it is at the site boundary (roughly 100m from the stack) that worst-case GLC's are predicted to occur. This is due to building downwash. The worst-case GLC's are within EU AQS's and that there will be significant dilution of the plume from that point out even with a change in wind direction (DR/22-2-5/EE +9). When asked what would be seen during these circumstances, Dr Porter replied that 'you will see a bent over plume'. When asked what would happen if the proposed stack height was raised to 100m, Dr Porter replied that the wind will bend a plume at 10m or 100m but added that the concentrations on the ground would not be so high (DR/22-2-5/EE +10).

When asked by ECSE about the possibility of 'eddy diffusion' happening to the plume, it was agreed that this is the same as a

phenemenon known as 'stack tip downwash'. This occurs when the exit velocity of the stack gases is too low relative to the ambient wind speed and also results in a bent-over plume. Dr Porter pointed out that the minimum exit velocity for the stack gases has been set to 15 m/s to overcome this. He added that the models used have also taken this into account (DR/18-2-05/BB +1).

The applicant has investigated the potential for the surrounding terrain to significantly affect plume dispersion. Terrain features up to 13 km away from the site were assessed. Taking distance to, and gradient of, terrain features into account, it was concluded that the terrain would not impact significantly on wind speed and direction at the effective stack height.

I am satisfied that the surrounding terrain will not significantly affect the plume as it rises to effective stack height, nor the behaviour of the plume at effective stack height.

During cross examination of Dr Porter, CHASE (PWGMB) asked why there was not any explanation offered in the EIS for the concept of effective stack height (DR/22-2-05/BB +6). Dr Porter stated that it was not normal practice to include this in an air quality model report (DR/22-2-05/BB +7). However, given the relevance of this concept with regard to the protection of ambient air quality in the harbour, I consider that - though not critical - it would have been reassuring to include some explanation of this air dispersion modelling aspect in the EIS.

*4.2.3.10 **A**ffects of **L**ocal **M**eteorology and **C**oastal **L**ocation*

There was much concern among the Third Party objections with regard to the behaviour of the plume during certain kinds of meteorological events. These included thermal inversions, calms, fumigation and land/sea breezes. Concern was also raised about whether or not the models used could cope with these events.

Thermal inversions and calms: During the day, the temperature of the atmosphere normally decreases with height. However, during a thermal (or temperature) inversion, the Earths surface is cooler than the air above it. This is typically caused by cooling of the Earths surface at night and leads to the formation of what is termed a 'stable nocturnal boundary layer' in the atmosphere in which vertical movement and dispersion of a plume is affected. Thermal inversions would normally be associated with very stable night-time conditions, during calm or low wind, such as would be expected under atmospheric stability categories F and G (Section 7.2.13 OH Record #23; DR/21-2-05/X +5). Though thermal inversions normally occur at night they can also occur during the day under certain circumstances. They are not limited to coastal locations and can occur anywhere (DR/21-2-05/AA +13).

When questioned by CHASE (PWGMB) about the frequency of occurrence of thermal inversions in Cork Harbour, Dr Porter said that by adding together the frequency of occurrence of stability categories F and G in the Harbour, a good indicating figure could be arrived at. He agreed that a figure of around 5% would be a good indication (see below), but added that

the AERMOD model takes this meteorological condition into account (DR/22-2-05/CC +14).

Essentially, calms (or stagnation) are periods of no, or almost no measurable, wind, probably up to a maximum of about 0.5 m/s (DR/22-2-05/CC +12).

In general, steady-state Gaussion plume models cannot model situations with very low wind speeds (typically < 0.5 – 1.0 m/s) as they predict unrealistically high GLC's (See Part 4.2.3.7 'Statistical Analysis' above). It is because of this that ISCST3 ignores wind speeds less than 1.0 m/s, while the more advanced AERMOD is limited to wind speeds above 0.5 m/s (Section 7.2.17, OH Record #23, Appendix G). Consequently, both models will not calculate ambient GLC's for periods of calm or for any hour with average wind speeds less than their respective operational wind speed limits. This was confirmed during cross-examination of Dr Porter by *An Taisce* (DR/21-2-05/T +1).

As very stable or calm conditions can pose difficulties for the models, the applicant has examined meteorological data from *Met Eireann*, for the Roches Point station to determine frequency of occurrence of such conditions. Very stable conditions are associated with atmospheric stability categories F and G. A period of 30 years (1961 – 1990) was examined. It has been established that the frequency of stability categories F and G are only 4.9 and 0.2% respectively (Section 7.2.13, OH Record #23), indicating a low frequency of occurrence in the lower Cork Harbour area.

With regard to calms, it has been demonstrated that the frequency in Cork Harbour is also very low. The frequency of calms averaged less than 3% at Roches Point between 1961 and 1990. While, between 1993 and 1997, Roches Point had an average of 0.3% calms (Table 9.1 EIS).

However, to put these figures into perspective, Dr Porter agreed, during cross examination by CEA, that there could be as many as 200 'missing' hours from the models due to calms, as measured by *Met Eireann* (DR/18-2-05/Y +8).

When questioned by *An Taisce* about what is done in terms of modelling under these conditions, Dr Porter explained that the US EPA recommended convention is to use a screening model such as SCREEN3. SCREEN3 is used to examine the scenario by looking at all meteorological conditions. Use of SCREEN3 has indicated that the worst case scenario actually occurs during intermediate wind speeds of roughly 1.5 to 3.0 m/s under stability category F and not during periods of very low wind speeds or calms. Dr Porter added that at 1.0 m/s, the predicted maximum GLC's are lower by a factor of six than those predicted at wind speeds of 3.0 m/s. Therefore, he concluded that calm conditions of are not the limiting factor for the area in terms of air quality (DR/21-2-05/T +7). See also the section of this report on 'Fumigation' below for more on use of SCREEN3.

Dr Porter expanded on this when further questioned by *An Taisce*. Essentially, the worst case wind speeds are intermediate because of some competing factors. As decribed above, very low wind speeds will increase plume

rise and decrease building downwash. The stack is not more than 2.5 times building height, so building downwash becomes a factor to consider, although it was considered in the modelling. However, at higher wind speeds, plume rise is reduced and there is more building downwash. But, you also get more dilution. So there is a trade off between the conditions in terms of a favourable effect on plume dispersion. The worst case was found for the intermediate wind speeds. In those circumstance, the plume impacts at the site boundary because of building downwash and as the plume only has 50 to 100m before it hits the site boundary there is not much dispersion or dilution (DR/21-2-05/S +13). It must be concluded therefore that very low wind speeds (0.5 - 1.0 m/s) do not result in the highest GLC's.

An Taisce questioned Dr Porter about the effect of thermal inversion or calms on the plume as it exits the stack (i.e. before it gets to effective stack height). Dr Porter explained that, when dealing with a buoyant plume, as in this case, the plume will continue to rise through the lower mixing height and achieve a stable layer above the lower mixing height. Essentially, the heat of the exiting gases will allow the plume to achieve its own higher mixing height. As Dr Porter said, 'buoyancy will force its way through' (DR/21-2-05/S +10; Section 7.2.16 OH Record #23, Appendix G).

Even though the incidence of stability categories F and G and of calms is very low, the applicant has described plume behaviour during such conditions. In fact, circumstances favourable for high plume rise (to effective stack height) are low wind speeds and higher temperature differences

between the plume and the ambient air around it. Both of these circumstances are normally associated with stable night-time conditions (Section 7.1.3, OH Record #23, Appendix G).

According to Dr Porter, AERMOD has been specifically formulated to deal with stable boundary layers (thermal inversions) in a consistent manner. He stated that 'all the latest science is built into AERMOD and it handles inversions very well'. He added that AERMOD is 'very much state of the art'. It was explained that AERMOD can calculate mixing height under stable conditions (DR/22-2-05/DD +1).

AERMOD also has the ability to consider plume behaviour during very low wind and calm conditions. It is formulated to deal with plume meander, dispersion in the horizontal, distance to higher terrain, distance to effective stack height and plume speed. The exception, as explained above, is where there are conditions of wind speeds less than 0.5 m/s (Section 7.2.15, OH Record #23, Appendix G; see also US EPA guidance[87]).

Dr Porter determined, using AERMOD, that under calms, when wind speeds are less than 0.5 m/s, the plume from the stack will rise to around 190 m OD. This height is significantly above all surrounding terrain within 10 km of the site (Section 7.2.15, OH Record #23, Appendix G)

In its 2003 guidelines on air quality models[90], the US EPA provides some guidance on the issue of calms. It acknowledges that Gaussion plume models cannot

adequately model plume behaviour during such conditions. It is recommended that the hours during which calms occur should be disregarded and that a convention for handling such missing hours be used (Section 7.2.19). The applicant has shown that such conditions have been considered and it has been demonstrated that the frequency of occurrence of calms in the harbour is low. It has also been demonstrated that under calm conditions, the height of the plume rise will in the order of 190 m OD, well above any terrain within 10 km of the site. The applicant then followed US EPA guidance in using a screening algorithm (in this case SCREEN 3). This showed that the meteorological conditions associated with worst-case GLC's do not occur during calms. Dr Porter explained that, in fact, the occurrence of calms is not the limiting factor in terms of the impact of the proposed facility on air quality in the harbour area (DR/21-2-05/T +7).

Using both models, the effective stack height was calculated using worst-case meteorological conditions (wind speeds of 1.5 to 3.0 m/s under stability category F). For ISCST3, effective stack height ranged from 123 to 127 m OD, while for AERMOD effective stack height ranged from 193 to 196 m OD. To further demonstrate the significant plume rise under stable conditions, effective stack height was determined using ISCST3 at a wind speeds of 1 m/s. It ranged from 151 to 154 m OD (Section 7.1.4, Tables 7.1 and 7.2 OH Record #23, Appendix G). These plume heights are significantly higher than any terrain features within 5.5 km of the stack. See 'Effects of Local terrain and Stack Height' above for further discussion on the effects of terrain on plume behaviour.

Unstable conditions occur during days with clear skies and sunshine. Heating of the atmosphere and the Earths surface occurs leading to the creation of thermals (up drafting winds). This can be seen as the plume loops up and down as it disperses (DR/21-2-05/X +5). During these conditions, an unstable (or convective) boundary layer is produced within which the plume is dispersed and diluted. According to Dr Porter, AERMOD has also been specifically formulated to deal with the unstable (or convective) boundary layer in a consistent manner (Section 7.2.15, OH Record #23, Appendix G).

During cross examination by CHASE (PWGMB), Dr Porter was asked what the effective stack height would be under unstable conditions (DR/22-2-05/DD +2). Dr Porter answered that, under unstable conditions, there would be plume rise but added that, as the limiting worse case conditions are stability category F and low wind speeds, effective stack height had been determinded for those conditions. He pointed out that, in fact, unstable conditions A and B are very rare with the most common condition being neutral category D (see below) (DR/22-2-05/DD +3). It can be seen from Figure 7.1 of Dr Porter's evidence (OH Record #23, Appendix G), that the incidence of stability categories A and B is indeed very low in the Harbour area.

Neutral conditions generally occur on days with some cloud cover and some wind and are typically very good for dispersion (DR/21-2-05/X +5). According to the meteorological data from *Met Eireann*, it is the neutral stability category D that is experienced most frequently in the

lower Cork Harbour, with about 40-45% of this category occurring at night (Section 7.2.13, OH Record #23, Appendix G).

Figure 7.8 of Dr Porter's evidence (pg 45, OH Record #23, Appendix G), shows the hourly variation of mixing heights (as annual averages) at Roches Point. This, according to Dr Porter, demonstrates the prevalence of stability category D, not only at Roches Point, but all over Ireland (DR/18-2-05/L +2). In fact, Ireland experiences neutral conditions for about 80% of the time (DR/21-2-05/T +7). Dr Porter stated that, under neutral conditions, there is intermediate plume rise but effective stack height had not been calculated for stability category D (DR/22-2-05/DD +3).

While it was felt by many Third Parties that the harbour area is 'prone' to thermal inversions, the frequency of occurrence of thermal inversions and calms in the harbour area is actually quite low. Use of the models with the screening model (SCREEN3) has demonstrated that the worst-case meteorological conditions that result in the maximum predicted GLC's are not during calms or thermal inversions, but are associated with intermediate wind speeds (1.5 to 3.0 m/s) under stability category F. Under these conditions, building downwash occurs and the plume can impact the boundary. PRIME, an advanced algorithm associated with AERMOD, has been used to describe building downwash.

Overall, I am satisfied that the applicant has given full consideration to these particular conditions and I am of the opinion that they do not represent the worst-case

meteorological conditions with regard to impact on ambient air quality in the area.

Fumigation: Fumigation can occur when a plume is emitted into a stable layer of air (such as in a thermal inversion). It results in a plume being mixed to ground level. Shoreline fumigation is caused by the movement of air from a stable marine environment to an unstable inland environment. The plume can mix to ground level at the point of contact between the two bodies of air. Given the coastal location of the proposed facility, the source plume may be subject to shoreline fumigation. Shoreline fumigation can occur in rural areas within 3 km of a large body of water (Appendix 9.5 EIS).

It is accepted in the EIS that ISCST3 will not adequately model these events (pg 111, Section 9 of the EIS). Again, the USEPA recommends the use of a screening model such as SCREEN3 to assess the impact of such conditions on ground level concentrations[90, 94]. The applicants have carried out such a screening exercise. Results are shown in Table A9.17 of the EIS (pg 112 Section 9). It is the evidence of the applicant that worst case assumptions have been made in this screening assessment and that no exceedance of the short-term air quality standards is predicted to occur (Sections 7.2.9 to 7.2.12 OH Record #23, Appendix G; Table A9.17 Section 9 of the EIS).

It is claimed in Dr Porter's evidence that these meteorological conditions are infrequent (Section 7.2.12, OH Record #23, Appendix G), however, no data were provided to support

[94] US EPA SCREEN3 Model Users Guide (1995)

this claim. In fact, when asked if he knew the frequency of occurrence of fumigation in Cork Harbour. Dr Porter stated that he did not know (DR/22-2-05/EE +2).

It is indeed unfortunate that there are no data for the frequency of occurrence of fumigation events. Nevertheless, the applicant has shown that they have followed the US EPA recommended approach by using a suitable screening model, in this case SCREEN3. It has been shown, as discussed above, that the worst case conditions are not associated with fumigation events but are under stability category F and intermediate wind speeds of 1.5 to 3.0 m/s. With this mind, there is no reason to suggest that fumigation events represent a significant threat to air quality.

Land and Sea Breeze Recirculation: Land and sea breezes represent typical daily events which can occur near a shoreline. Because of the relative difference in heating and cooling rates between the land and sea, a sea breeze occurs in the morning and blows from sea to land, while a land breeze occurs in the evening and blows from land to sea. This, in effect, leads to a recirculation of air between the land and the sea. Some Third Party objectors were concerned about the possible effects of these breezes on plume dispersion and whether or not there would be recirculation of the plume pollutants within the harbour.

When questioned about this by CHASE (PWGMB), Dr Porter explained that the land/sea breeze recirculation is a meso-scale meteorological condition. The sea breeze can extend inland by up to 20 to 30km and by the time the plume gets

20km inland on a sea breeze, the dilution of the plume is so great that recirculation on a land breeze would have no impact on air quality (DR/22-2-05/DD +7).

Given the scale over which a land/sea breeze operates and the degree of dilution available to the plume as it moves on these breezes, I do not believe that the occurrence of such breezes represents a threat to the air quality on Cork Harbour.

4.2.3.11 Other Concerns

Sensitivity Analysis: The question of whether or not sensitivity analysis of the modelling was carried out by the applicant was raised during the Oral Hearing. Sensitivity analysis is essentially a process whereby the predictions of the model are tested for reliability and accuracy taking into account factors such as meteorological data, emissions parameters and land use characteristics[92]. It allows a modeller to get a 'feel' for the results of the model.

CHASE (PWGMB) referred to the issue of sensitivity analysis in their evidence at the Oral Hearing (OH Record #27) and particularly to guidance from the Ministry for the Environment in New Zealand[91]. According to CHASE (PWGMB), the general thrust of this guidance is that, if the predicted results are within 50% of an AQS, it is possible that the AQS will be exceeded in actual fact because of the uncertainty associated with the model results. It is the evidence of CHASE (PWGMB) that the predicted impact on ambient air quality as outlined by the applicant in the EIS contains many instances where this '50% factor' is being exceeded (see Tables on pg 41 – 44 of OH Record #27).

During cross examination on this issue by Mr. Slattery (for Indaver), CHASE (PWGMB) stated that, in light of model uncertainty, it would be good modelling practice to carry out some sort of sensitivity analysis to test the accuracy of model results, particularly if predicted model results are within 50% of an AQS (DR/18-2-05/C +1).

While referring to the 2003 USEPA guidelines on air quality models[90], it was outlined by Mr. Slattery for Indaver that, with respect to model accuracy, the use of best estimate as provided by the modeller is recommended. He added that it is not US EPA guidance that results obtained are just doubled in consideration of this '50% factor'. This was agreed by CHASE (PWGMB), but they added that sensitivity analysis should be carried out to check the accuracy of the results obtained (DR/18-2-05/C +1).

The applicants argued that, use of the second more advanced model AERMOD to check the performance of ISCST3 constitutes what is effectively a sensitivity analysis (DR/18-2-05/C +2). CHASE (PWGMB) responded that, until the appropriateness of use of the ISCST3 model has been demonstrated, they could not agree that use of the second model represented a form of sensitivity analysis (DR/18-2-05/C +3); and argued that sensitivity analysis should involve varying inputs to check if outputs are realistic. CHASE (PWGMB) did agree that use of a second model is good practice to compare results of both models, but only if the models are relevant to the application (DR/18-2-05/C +3).

It has been argued by CHASE (PWGMB) that use of the models ISCST3 and AERMOD was inappropriate. Notwithstanding this, I have already confirmed that I am satisfied that the models used are appropriate in the current context.

I am of the opinion that forms of sensitivity analyses have been carried out by the applicant. These forms can be grouped as follows:

(i) *Use of second air dispersion model*

I am satisfied that use of AERMOD does constitute a form of sensitivity analysis for the modelling carried out using ISCST3. As outlined above, AERMOD was utilised by the applicant to provide assurance that the ISCST3-based assessment was protective of air quality and did not under-estimate predicted GLC's (pg 9 Section 9 of the EIS). The applicant postulated that, if use of AERMOD also demonstrated compliance with AQS's, then there was a very strong indication that air quality would not be detrimentally affected by emissions from the facility (pg 84 Section 9 of the EIS).

The comparison of the models was carried out using the five years of meteorological data available from Cork Airport (1993 to 1997). The results of this comparison are displayed in Table A9.4 of the EIS. When comparing the results between the models (rather than between the years), it can be seen that ISCST3 produces higher GLC's than AERMOD. According to the applicant, these differences reflect the contrasts in complexity between

the models. As described above, AERMOD is the more advanced and more accurate of the two. So, while the comparison does not provide an actual test of the accuracy of ISCST3, it does provide a level of comfort that use of the less accurate, but higher, GLC's predicted by ISCST3 represents a safer and more conservative approach to the assessment of impact on air quality.

As stated above, the comparison between the models utilised five years of meteorological data. This also allowed the evaluation of inter-annual variation (pg 84 Section 9 of the EIS). I feel that there is a certain amount of 'reproducibility' in the results from year to year within each model set. Though only carried out over a five-year period, it provides a reasonable indication that the meteorological data are consistently representative from year to year and that there is no significant inter-annual variation in the data.

From these data sets, the worst-case year was determined to be 1995. This was used to model all other pollutants to assess impact on ambient air quality and again represents a conservative approach to the assessment of impact on air quality.

(ii) *Use of data from a different meteorology station*

While meteorological data from Cork Airport has been used to model emissions from the proposed facility, meteorological data from another station (Roches Point) were also evaluated. Roches Point is only 5km from the site. This was carried out to confirm that any differences

in meteorological data between the two stations would not significantly affect the predicted results. Meteorological data for the following periods were used in both models: Cork Airport (1993 – 2002), Roches Point (1986 – 1990).

The results of these comparisons are displayed in Figures 7.2 to Figures 7.5 of Dr Porter's evidence (OH Record #23, Appendix G). It can be seen that for each model, the results generated, using either Cork Airport or Roches Point data, reveal similar 'ball park' ranges of values. Essentially, if either data is used with either model then quite similar ranges of results are obtained. I feel that this represents a reasonably robust test of the appropriateness of the use of Cork Airport data to model emissions from the facility. In addition, both short-term and long-term results obtained using Cork Airport data are slightly higher than for Roches Point. Therefore, use of meteorological data from Cork Airport rather than Roches Point represents a more conservative approach to the assessment of impact on air quality.

(iii) Examination of Dispersion Coefficients

Surface characteristics is another area where model inputs can be altered to test the results obtained. For the ISCST3 model, different dispersion co-efficients are available to describe the surface characteristics of the modelling domain. As discussed above, the applicant chose to use a rural dispersion co-efficient for the ISCST3 model but also applied an urban co-efficient so that a comparison of results could be carried out. Use of an

urban co-efficient resulted in maximum GLC's that were 45% lower than rural. This was due to the extra turbulence found in urban areas. Dr Porter concluded that it would have been inappropriate to report in the EIS the lower GLC's associated with the urban dispersion co-efficient (DR/22-2-05/BB +1).

While these analyses, as carried out, may not have matched the expectations of Third Parties for sensitivity analysis, I do feel that they represent significant comparative tests for the modelling results.

Model Input and Information: A number of concerns were raised with regard to the completeness of input to the models and to information relating to set-up and use of the models. These were raised chiefly by CHASE (PWGMB) in their evidence to the Hearing (OH Record #27). Most of these concerns are dealt with in other sections of this Chapter. However, there is a number of others than can be dealt with here. All section numbers refer to the CHASE (PWGMB) evidence, OH Record #27; these are:

- Use of default options on ISCST3 model (details in Section 3.3.2)
- No wind direction alignment for ISCST3 model (Section 6.3.4)
- Some pre-processor modelling code files in ascii, others in binary (Section 6.3.2)
- No terrain pathway evident within the modelling code (Section 5.2.4)

- Modelling source code deficiencies, e.g. local structures, such as proposed maritime college, not accounted for in modelling input code (Section 5.3.7)
- Set-up and use of AERMOD (Section 8.1.3)
- Values of certain specific meteorological parameters not included in the EIS (Section 6.3.7)

It was not made clear as to what exactly the impact of these actions would be on the model results. No evidence has been provided that these will result in less accurate or less conservative modelling results. I have stated my satisfaction that the modelling, using both models, has been carried out in a precautionary and conservative manner. It has been demonstrated that the ISCST3 model will generate higher GLC's than the more advanced and accurate AERMOD model (See Table A9.4 Section 9 of the EIS), but it is the ISCST3 model results that have been reported in the EIS for air quality impact assessment. In addition, as explained above, I am happy that forms of sensitivity analysis have been carried out on the modelling. Overall, I have to say that despite the criticisms above, I believe that there is no evidence to suggest that any one of them represents a fatal flaw in the modelling.

Modelling Emissions from Two flues in One Stack: The proposed development will have two individual incinerator units. Each incinerator unit will be developed separately and planning has been granted for construction of only one incinerator unit to date (Phase I). The second unit will be the subject of a separate planning application (Phase II).

During the hearing, CHASE (PWGMB) raised the fact that planning has been granted for only one unit so far, but that modelling was carried out using the projected combined emissions from the two proposed units (DR/22-2-05/Y +1). Dr Porter replied that, for all modelling carried out for the application, it was assumed that both incinerators would be operating at the same time even though there will be a period in which only one incinerator will be operating on its own. This modelling approach reflected a worst-case approach in terms of impact on ambient air quality (DR/22-2-05/Y +1).

Modelling of emissions from the facility was carried out on the one stack that the proposed facility will have. This one stack will contain two inner flues with a flue coming from each incinerator unit. CHASE (PWGMB) asked if this was contrary to USEPA guidance on human health risk assessment[95], whereby it is recommended that on facilities where multiple sources or stacks exist (or are proposed), each source should be modelled separately (Section 3.3.3 OH Record #27). This was also discussed also during cross-examination of Dr Porter by CHASE (PWGMB). CHASE (PWGMB) argued that, unless the stacks are from the same type of source and are close together, permitting authorities should know what is being emitted from them separately (DR/22-2-05/Y +2). It was argued by CHASE (PWGMB) that the permitting authorities need to know what each flue is emitting in case a problem should occur with one of the source units (DR/22-2-05/Y +3).

[95] US EPA Human Health Risk Assessment Protocol, Chapter 3 – Air Dispersion and Deposition Modelling (1998)

In response to this, Dr Porter argued that the specific US EPA guidance[95] was actually referring to a human health risk assessment whereby each flue would be modelled separately to determine risk to human health. He pointed out that, in fact, both flues were modelled separately but only the combined results were reported, as this would represent the worst-case emissions scenario.

Dr Porter continued that if modelling was carried out using emissions from the Phase I unit only and the results used to design stack height, then that stack height may not be sufficient taking into account the additional emissions from the Phase II unit when it becomes operational (DR/22-2-05/Y +5). The stacks were modelled separately, but results were not reported separately. They were reported as a combination to represent the worst-case impact. Notwithstanding this, the separately modelled results are approximately 50% of the combined results, according to Dr Porter (DR/22-2-05/Y +6). CHASE (PWGMB) however, did not feel that this was sufficient and that the separation of the two types of assessment (human health and ambient air quality) was not appropriate.

CHASE (PWGMB) were cross-examined on this issue by Mr. Slattery on behalf of the applicant. Mr Slattery, made the point that the two flues combine in the one stack and that it would make no difference to carry out the modelling out the two flues separately. He added that the applicant was happy that they had followed US EPA guidance on the matter (DR/18-2-05/B +10).

It has been established that the two flues were modelled separately and the results reported as a combination. I can see no flaw in this to estimate the worst case impact. In addition, I accept that the separately modelled results would each be approximately 50% of the combined results.

Alteration of Pollutants During Transport Through the Atmosphere:

In evidence provided by ECSE, it was stated that ISCST3 and AERMOD do not account for alteration of pollutants in the atmosphere after release. It was pointed out that alteration of air-borne pollutants could occur through such atmospheric processes as photochemistry, agglomeration, condensation and absorption in rain[74 (pg63)].

It must be accepted that, due their nature as 'mathematical predictors', air dispersion models cannot cater fully for every event in the atmosphere. The models are, as they have been described above in 'Background to Air Dispersion Modelling', significant approximations with regard to actual pollutant dispersion and alteration.

Nonetheless, some attempts have been made by the applicant to address the behaviour of some pollutants after their release from the proposed stack. These can be grouped as follows:

(i) Nitrogen Dioxide

In the emissions from a combustion source, oxides of nitrogen (NO_x) in the form of nitric oxide (NO) and nitrogen dioxide (NO_2) are released. Typically NO makes up 95% of the total NO_x emissions. But it is NO_2, which is of

more concern from a health and environmental impact point of view as, after release, most of the NO is rapidly oxidised to NO_2 in the atmosphere. To account for this alteration, the applicant has followed the approach as recommended by the US EPA for modelling the dispersion of NO_2 taking into account emissions of NO_x[90] . This procedure is outlined in Section 9.5 of the EIS.

(ii) Dioxins and Furans (PCDD's and PCDF's)

The dispersion of dioxin-like compounds from the proposed stack was also modelled as part of the EIS preperation. The modelling accounted for the partitioning of PCDD/PCDF congener releases into both the particle and vapour phase. The models calculated ambient air vapour and particle phase concentrations. Wet vapour and wet and dry particulate deposition fluxes were also modelled. See Section 9.8 of the EIS.

(iii) Mercury

Emissions of mercury were modelled taking into account both the particle-bound and vapour phases in the release. The models calculated ambient air vapour and particle phase concentrations. Wet vapour and wet and dry particulate deposition fluxes were also modelled. See Section 9.9 of the EIS.

(iv) Other Heavy Metals

For modelling emissions of the other heavy metals (as listed in 'Background Ambient Air Quality' above), the metals were assumed to be in the particulate phase only, which is, according to the applicant, in line with US EPA

recommendations (Section 9.10.1 EIS). The models calculated the ambient air particle phase concentration. Wet and dry particulate deposition fluxes were also modelled. See Section 9.10 of the EIS.

No Modelling of Emissions During an Incident: In order to assess the possible impact on ambient air quality from the proposed facility, a number of different scenarios were modelled. These included emissions occurring during typical, maximum and 50%-of-maximum operating conditions. These conditions are described in more detail in Section 9 of the EIS.

It was a matter of concern for many Third Parties, that some attempt to model emissions to air during a malfunction of the incinerator units was not carried out by the applicant. It was argued that what were being classed, as 'maximum' emissions for modelling purposes were not a maximum at all, as it would be expected that maximum emissions could occur as a result of an incident or malfunction.

In their submission to the EPA on the Licence Application for the facility, ECSE maintained that maximum emissions should have been determined from 'considerations of operational parameters under credible worst-case, normal and abnormal conditions'[74 (pg 44)]. It was put to Dr Porter during cross-examination by ECSE that one would have to assume failure of emissions controls systems to get a realistic idea of maximum emissions. Dr Porter responded that this would not be standard practice, to which it was replied by ECSE that it would be 'common sense and good practice' (DR/21-2-05/M +3).

In fact with regard to emissions during systems failures, ECSE were concerned that the stack height as designed may be too low to cater for safer dispersal of emissions during an incident and that they would prefer a stack of 150m. In response to this, Dr Porter suggested that with a stack height of 55m there would not a problem either (DR/21-2-05/N +12).

Dr Porter was also cross-examined on the issue by CHASE (PWGMB). Essentially they feel that the conclusions of the air quality impact assessment are misleading when it is reported in the EIS that the ambient levels of all substances being emitted will be well below the relevant AQS's. This is so because they feel that as accidents can and do happen (as with Indaver's incinerator plants in Belgium), emissions of substances like dioxins could be much higher than those anticipated by the applicant during the modelling. Dr Porter accepted that accidents could occur on industrial sites but that it is effectively up to the operators of the site to manage their operations to prevent accidents and to keep emissions at typical levels. He added that he could not be hypothetical (DR/22-2-05/X +11).

When asked by CHASE (PWGMB) whether or not anyone had considered emissions during an incident or failure, Dr Porter replied that, with regard to impact on air quality, he had not looked at any scenario where there were failures of systems on site. He added that it would not be normal practice to assess such scenarios in air quality assessments (DR/22-2-05/X +13).

The applicant has addressed accidents and emergencies in Section 15 of its Waste Licence Application. It has outlined the systems that will be put in place to prevent, and respond to, incidents and emergencies. These systems will include use of management systems, training, standard procedures and equipment designed to prevent, and respond to, operational failures. The site is required by the proposed Waste Licence to develop and maintain an Accident Prevention Policy and an Emergency Response Plan. In addition, the Waste to Energy (WTE) plant will be manned on a 24-hour/ 7 day basis. The air emissions abatement lines are designed to continue in operation during an emergency shut-down (even in the event of a power failure) until shut-down is complete. See also Part 4.7 of this report for more discussion of safety matters.

In addition, I am satisfied that the applicant has followed US EPA guidance on PSD[73] compliance with regard to the determination of maximum emissions for use in modelling (see Part 4.2.1 of this report *PSD Compliance and Cumulative Assessment* above). I agree that it is not normal practice to attempt to carry out air dispersion modelling of emissions during an emergency. This would constitute an entirely hypothetical scenario and would not therefore provide any real or reliable results for assessment.

Modelling particulate metal emissions: As site-specific particle-size distribution data are not available, the applicant used standard data, available from the US EPA, to carry out deposition modelling of dioxins, furans and heavy metals (see Table 9.42 EIS). Use of these data for modelling of non-volatile metals was questioned by CHASE (PWGMB) in their

oral evidence (Section 5.3.1 OH Record #27). They feel that these data should have been determined using actual emissions from Indavers facilities in Belgium. In the EIS, the applicant explains that the standard US EPA distribution data would be typical of some combustion facilities fitted with electrostatic precitators or fabric filters. As both of these types of abatement are to be used in the proposed facility, I am satisfied that the data are suitable for use in the modelling. I do not believe that determining such data from emissions from other Indaver sites would have added any more value to the already available 'typical' data from the USEPA.

The use of metals emissions data from other Indaver sites in Belgium was questioned by CHASE (PWGMB) (Section 5.3.2 OH Record #27). These data can be seen in Table 9.59 of the EIS and were used to desribe emissions of metals for use in deposition modelling of particulates. I do consider that it is valid to use emissions data from the Indaver sites in Belgium where those data are available.

When carrying out dry deposition modelling of particulate like non-volatile heavy metals, it is the emission in terms of mass of release that is evaluated in the modelling. Therefore it is the mass weighting distribution that is utilised rather than the surface area weighting. It was pointed out by CHASE (PWGMB) that, for modelling of cadmium, the surface area weighting distribution had been used in error. I believe it is necessary to accept this as just an error; though, I do not consider that it constitutes a fatal error in the modellling. A summary of the modelling results for cadmium are included in

Table 9.65 Section 9 of the EIS; and are discussed in Section 9.10.5 of the EIS. As outlined in other sections above, the results indicate that the maximum impact will be at the site boundary. However, no exceedence of the proposed EU AQS is predicted to occur under both typical and maximum operating conditions. Given that the modelling and air quality impact assessment have been carried out in such a conservative manner, I am of the opinion that the error in dry deposition modelling of cadmium is an insignificant one with regard to impact on ambient air quality.

Use of SCREEN3 model: The use of the SCREEN3 screening model was questioned by CHASE (PWGMB). They list what are termed 'limitations' in Section 8.2.2 of their evidence to the Hearing (OH Record #27). In addition, they list in Section 8.1.3 of their evidence a number of areas where information, with regard to model set-up and use, is not provided. A number of these concerns have been dealt with in other Sections of this chapter. It was not made clear by CHASE (PWGMB) as to what exactly the impact of the other 'limitations' or information shortfalls would be on the modelling results. No evidence has been provided that these will result in less accurate or less conservative modelling results. Dr Porter did point out specifically during cross-examination by CHASE (PWGMB), that, contrary to the limitations listed in their evidence, SCREEN3 can account for terrain and building downwash when being used to model for fumigation events DR/22-2-05/EE +2).

SCREEN3 was used by the applicant to assess the impact of such meteorological conditions as calms and fumigation. I

have already stated my satisfaction that the applicant has followed US EPA guidance in this regard. It was pointed out by Dr Porter that use of SCREEN3 is an emperical screening study and is found to be very conservative in the results that it predicts (DR/22-2-05/EE +2). I am satisfied that use of the SCREEN3 model was appropriate and in line with US EPA guidance.

Use of the CALPUFF Model: A brief description of CALPUFF is included in evidence provided by Dr Porter. According to his evidence, CALPUFF is currently the USEPA regulatory model for long-range transport (distances greater than 50 km); it is a non-steady state model 'Puff' model rather than a steady state 'Plume' model such as ISCST3 or AERMOD. Dr Porter adds, that as a non-steady state model, CALPUFF can deal more capably and realistically with meteorological events know as 'calms', when wind speeds stagnate. It has been used to model pollutant dispersion in areas that are prone to such events, where calms occur typically for 20 to 25% of the time (Section 7.2.19 of Dr Porters evidence, OH Record #23, Appendix G).

At the Hearing, Dr Porter also provided evidence of a comparative study, which had been carried out in the US between CALPUFF and ISCST3[96], using areas of varying frequencies of calms (see Section 7.2.19, OH Record #23, Appendix G). Based on the results of this study, it was postulated by the applicant that use of either the CALPUFF or ISCST3 model in the Ringaskiddy area would provide similar

[96] US EPA A Comparison of CALPUFF and ISCST3 (1996)

results within 5 km of the site. Another study[97] was referred to in the evidence; which found that CALPUFF tended to over-predict levels when compared with AERMOD (Section 7.2.22 OH Record #23, Appendix G). It should be noted that according to the meteorological data for Roches Point, the frequency of calms in the lower harbour area is very low (see *Thermal Inversions and Calms* in Part 4.2.3.10 of this report, above).

During cross-examination by CHASE (PWGMB), Dr Porter was questioned about the use of CALPUFF to model during calms. According to CHASE (PWGMB), CALPUFF is not just used for treatment of calms, but it can be used in situations where there are other variable meteorological factors such as can occur in Cork Harbour. It was put to Dr Porter that CALPUFF could have been used to model dispersion generally in Cork Harbour even though the frequency of calms is low. They said that it did not cover the full story (DR/22-2-05/EE +6).

In his response, Dr Porter explained that CALPUFF can indeed be used on a case by case basis for complex meteorological flow conditions 'where steady state straight line assumptions are not appropriate' (DR/22-2-05/EE +6). He continued that CALPUFF is used to model long range transport of plumes from strong sources. CALPUFF could be used to model impact on a point 30km from a strong source. However, in the current case, the worse case impact is only 100m from a stack which has been treated as constantly emitting source (DR/22-2-05/EE +7). As outlined above, steady-state, straight line dispersion has been assumed for ISCST3, particulary over

[97] SENES Consultants Ltd Guidelines for Air Quality Dispersion Models – Critical Review & Recommendations (2003)

such a short distance between stack and boundary. He added that the purpose of CALPUFF is to try and examine areas where things are not constant. He concluded that it has been suggested by the US EPA that, despite its complexity and advanced nature, CALPUFF has not yet been evaluated for regulatory use in near field applications (DR/22-2-05/EE +11).

It has been demonstrated by the applicant that the CALPUFF model is primarily used to model long range transport of pollutants from strong sources and that the model has not yet been evaluated for use in near-field situations. No evidence has been provide to suggest that CALPUFF would have provided more accurate GLC's than ISCST3 or AERMOD in this case. I am satisfied that the use of ISCST3 and AERMOD was appropriate and the models were used in a conservative manner.

4.2.4 Assessment of Impact on Ambient Air Quality

During cross examination of Dr Porter, several Third Parties queried whether or not the applicant had assessed the possible impact of air emissions on a Special Area of Conservation (SAC), which lies to the North of nearby Great Island (DR/22-2-5/X +10). Dr Porter explained that, although specific SAC's were not looked at, the 20 x 20 km grid of the modelling domain would have taken the area of the SAC into account when predicting GLC's. EU AQS's for the protection of ecosystems and vegetation were utilised to assess impact and none was indicated, according to Dr Porter (DR/22-2-5/X +11).

The applicant was asked by ECSE why EU AQS's for the protection of ecosystems were used to assess impact on the SAC and not the PSD increment permitted for a PSD Class I area. They asked whether or not US EPA guidance had been sought in this matter (DR/22-2-5/X +10). Dr Porter argued that there is such a lot of guidance available that it is not possible to follow every direction in every document. I am satisfied that it is acceptable to use the relevant EU AQS's to assess impact on vegetation and ecosystems.

Predicted annual average concentrations of NO_2 and an assessment of their impact are detailed in the EIS (Figure 9.6; Tables 9.24 and 9.25). It is accepted that the impact of the predicted levels of NO_2 on the SAC would be insignifcant.

A concern was raised with regard to modelling of SO_2 by CHASE in their objection to the draft licence (Appendix C). This was in relation to the response from the applicant to a request for additional information from the EPA (as part of the application assessment process). The applicant included a breakdown of wastes to be accepted at the facility in Tables 3.6 to 3.13 of the Waste Licence Application. However, due to a request from the EPA (as part of the application assessment - letter dated 30 July 2003), some revision to the tables had to be carried out and revised Waste Acceptance tables were submitted as part of the applicants response (received 15-09-2003, EPA Public File). The revised table can be found in Section 2.0 (Waste acceptance and Handling) of the reponse. CHASE feel that, as the ambient SO_2 GLC's were predicted based on the original waste descriptions in the Application, then any changes to the waste description *post* the modelling negates the modelling results

originally obtained. I have examined the all of the relevant tables and am satisfied that the changes are very minor. Some wastes had been incorrectly classified in the Application and the applicant had to carry out some minor corrections. I do not consider that this would impact at all on the nature or volume of emissions of SO_2 to air from the plant.

Another concern was raised by CHASE with regard to the AQS's for SO_2 contained within Council Directive 1999/30/EC[98]. They have claimed in their objection to the draft licence (Appendix B-4 of this report) that the applicant has ignored the requirement to meet the SO_2 AQS specified for the protection of ecosystems. It was alleged that the applicant had not included in the EIS an assessment of the impact of annual average SO_2 levels (in the presence of the facility) on vegetation and ecosystems. The applicant had only considered the impact of daily and 1-hourly levels of ambient SO_2 (Table 9.29 Section 9 of the EIS). In the request for information, in relation to the waste application, sent by the EPA in July 2003 (op. cit.), it was requested that an assessment of the impact of annual average SO_2 levels on ecosystems be carried out. In their response, the applicant argued that this annual limit value for SO_2 was not deemed applicable to the location, but an assessment was carried out in any case and the results included in the response. The details of the assessment are included in Section 2.5 of the response (received 15 September 2003). The results of the assessment are found in Table 2.5.3 and Figure 2.5.1 (Appendix 2 of response) and indicate that there will be no adverse impact on ecosystems or vegetation in the area.

[98] Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide and oxides of nitrogen, particulate matter and lead in ambient air.

ECSE have asserted that the predicted impact on existing ambient air quality is considerable and that comparison with AQS's is not appropriate for the area. This is, according to ECSE, because AQS's are not levels regarded as having no health effects; rather they are levels above which remedial action must be taken by regulatory authorities (DR/18-2-05/Y +13). It is contended by CHASE in their objection (see document by Mr P North as part of the CHASE objection, Appendix C in Volume 2 of this report) and by ECSE in their submission on the application[99] , that the air quality in Ringaskiddy will be significantly damaged and that the development, when operational, will have sufficient impact to reduce the quality of air from a very clean rural-type quality to of a moderately clean urban environment. ECSE[99] (pg 62) also contend that comparison of predicted air quality impact with levels in major urban areas of UK and Continental Europe rather than existing baseline for the area is not appropriate.

Dr Porter argued that, even with very low background levels, it is the EU AQS's that have to looked at to put the existing background levels into context. He added that the impact of the proposed facility is very minor at the nearest residential receptor (DR/18-2-05/X +1). In response to this, ECSE pointed out that the impact is indeed very minor, but only if you compare the impact to the AQS's and not to existing air quality (DR/18-2-05/X +1).

I accept that it is the EU AQS's that must be referred to when assessing quality of ambient air and the impact of any proposed development. It is necessary to have an agreed system of assessing air quality based on scientific knowledege and expert

[99] Submission No. 8 to Licence Application 186-1 on behalf of East Cork for a Safe Environment (Document from PH North dated September 2004)

experience. What would we do otherwise? To use exisiting background air quality as an operational or compliance standard which must not be exceeded may not be appropriate as it could prevent any kind of development in an area. A population must be willing to accept some change within set standards and some calculable low risk, if they are to enjoy the many benefits of social, industrial and economic development. In any case, exisiting background levels are themselves not immutable and are subject to variation overtime.

The applicant has demonstrated that the air dispersion models used were suitable to the area of the proposed development and that US EPA guidance was followed where appropriate. Further, as the modeling was carried out in a conservative manner with a number of worst-case assumptions being made (Section 9.2.1 of EIS), I am satisfied that worst-case predicted GLC's were reported in the EIS. Overall, I am satisfied that the applicant has demonstrated sufficiently that emissions from the proposed development will not impact significantly on the quality of ambient air in the Cork Harbour area. In addition I do not consider it likely that the proposed development will prevent any future development in the area, either industrial, commercial or domestic.

4.3 Site Suitability

Within this issue cluster, the third party objectors raise the following main points:

- Erosion & Flooding risk
- Proximity to receptors (harbour, populations, food production)
- Location contrary to EU and WHO guidelines

- Risk site (geology unsuitable, hydrogeological vulnerability, gas main, site contamination)
- Proximity to sea and salt content in air intake will be problematic
- Ringaskiddy area already over-developed with industry

A number of objections also relate to the location of the proposed incinerator in a geographic bowl, where air dispersion is poor. This issue is considered in Part 4.2 of this report, above.

Third party objections on the issue of site suitability that relate to planning aspects, or to criteria not relevant to this site, are not considered.

4.3.1 Erosion & Flood Risk

Many of the third party objections consider the site as unsuitable for the development proposed because of the flood and erosion risk. Dealing first with the flooding issue, there was witness evidence of a major storm in October 2004 which flooded the site. The objectors believe that this represents an unacceptable risk. I have visited the site and am aware that drainage from it is poor. Additionally drainage from the local road enters the site. This condition allied with the exceptionally high tides witnessed by the community in the storm resulted in the flooding of the site. The major infrastructure proposed by Indaver for the site includes drainage control on, and at the perimeter of the development. Ms O'Leary for CHASE acknowledged during examination of her oral statement that the proposed levels for the incinerator put it well above the highest flood level recorded (DR/16-2-05/CC+4) and that their main concern was in relation to the Transfer Station component of the development. Ms Lydon for Indaver in her statement to the Oral Hearing (OH Record #35, Appendix G)

estimated by reference to a range of tide levels around the harbour (and Nautical Almanac conversions) that on the day of the October 2004 storm a flood water level of 2.76mOD was possible. This concurs closely with the estimates provided by CHASE (2.85mOD – which is only 9cm different from the derived level produced by Indaver). Ms Lydon's evidence notes that the proposed 'kerb' to be constructed around the Transfer Station at a level of 2.9mOD would have protected the site from flooding on that day (safety factor of 14cm by Indaver calculations, or 5cm by CHASE calculations). Additionally Ms Lydon noted that waste in the Transfer Station would be on racks, i.e. held above the floor level of the facility. I am not satisfied that the kerb is of a sufficient height. The high winds associated with storms will generate waves which would likely have a crest height greater that 10cm above rest height. This would overtop the kerb if one uses CHASE estimated levels and would be very close to overtopping on the Indaver estimates. I am of the view that for the purposes of pollution prevention and prudent risk management, the kerb should be raised to a 3mOD, or alternatively no waste should be stored on the site at a level below 3mOD. There is a ready and simple engineering 'fix' to the flood risk, which in my view dismisses any fatal flaw suggestion by the third party objections (e.g. storage of waste above flood levels).

On the erosion risk I am again of the view that this risk can be 'engineered out' of the development by standard construction processes common to marine construction. Catastrophic erosion of rock buttressed coastlines like that in and around the harbour would not be commonplace. Moreover, a cursory comparison of the current costal survey and the Ringaskiddy area coastline

mapped in 1896-7[100] by the Ordinance Survey - and particularly the seaward coastline to the east of the proposed incinerator site - shows insignificant land-loss over the 100 years or so since that survey; suggesting that this is a stable coastline.

A number of the third party objections referenced a report by Sweeney et al.,[101] which concludes that a prohibition on new development in areas vulnerable to flooding from sea-level rise offers the best economic solution for future development in a global warming context. However this report also notes that 'hard' engineering solutions to problems of sea-level rise in Ireland are appropriate for areas with high-value urban property or expensive infrastructure. In my view the Cork Harbour area would fall into this category. Moreover, the time frame for the predictions of Sweeney et al., is 100 years which is way beyond the life expectancy of the proposed development. Any future change to development policy for the Cork Harbour area is a matter for the competent local authorities. I am not persuaded by the Third Party objector's arguments in relation to this point.

4.3.2 Proximity to receptors (harbour, populations, food production)

There are no direct discharges of process effluents from the proposed facility to the harbour. The waste application documentation includes details on the engineering measures to protect the harbour from pollutant escape (surfacing, drainage, bunding, ..). I am satisfied the proposed measures are BAT in relation to the protection of the water quality in the harbour.

[100] First Edition 25" survey, Published 1898, Sheet LXXXVII. National Library of Ireland.
[101] Climate Change: Scenarios and Impacts for Ireland. EPA ERTDI research project 2000-LS-5.2.1-M1, 2003.

In relation to the risk to populations and food production I would refer to Part 4.1.3 of this report which includes detailed discussion on the emissions impact on health and food from the proposed facility. I am satisfied that the location of the site with respect to populations and food production is safe from an emissions risk perspective. Additional discussion on the safety aspects in relation to accidents at the site are discussed in part 4.7 of this report.

4.3.3 Location contrary to EU and WHO guidelines

The third party objections state that the proposed site of the facility is contrary to WHO and EU guidance. Specifically the objectors refer to a 1993 WHO document on site selection[102], and to EU guidance[103]. In the case of the former, *Exclusionary Criteria* for the location of hazardous waste sites are identified on pages 33 and 34. These criteria include, inter alia, two key points identified by the objectors;

- costal or riverine areas with a history of flooding,
- areas prone to atmospheric inversions where the safe dispersal of accidental emissions is prevented.

The third party objects comment that in the case of the Ringaskiddy site both these criteria are fulfilled.

The cited EU draft guidance notes that the location of incinerators up-wind of residential areas or in air-basins should be avoided, and the availability of ash disposal or re-use is also relevant to the siting.

[102] Site selection for new hazardous waste management facilities. WHO European Region Publication #46.
[103] *Incineration*. Sectoral Guides (operational draft), EU Commission Environmental Integration web pages at http://europa.eu.int/comm/development/body/theme/environment/env_integ/env_integration/frameset.html

The applicants, in section 2.6 of the EIS for the application detail the site selection process. They refer to the cited WHO document and a UN document[104]. The latter does not articulate exclusionary criteria, but identifies elements to be considered in the site selection process.

The EPA consideration of the site selection has only to concentrate on the factors that contribute to the safe environmental performance of the facility at the locations considered. The planning aspects (e.g. access to transport infrastructure) of site selection are a matter for the planning authorities. The EPA has to be satisfied that pollution control operations and emissions from a site can be safely managed having regard to the characteristics of a particular location. In undertaking its assessment the EPA has to have regard to published guidance where available (BAT concept).

In relation to the WHO guidance it is firstly important to note that the guidance is aimed at all types of hazardous waste facilities (landfills, transfer stations, incinerators, treatment, recovery, etc.,). Clearly some of the exclusionary criteria are going to be more critical for certain types of activity than others. For example it is my view that the flood risk to a hazardous waste landfill operation represents a greater environmental risk than say would a flood at a deep well injection facility. The Ringaskiddy facility is not located within a flood plain within the classic sense as it is not subject to regular inundation, and is subject only to tidal flux. The significance of the flooding during the October 2004 storm was discussed earlier (part 4.3.1) and therein noted that the incinerator at Ringaskiddy is located above flood levels;

[104] Basel Convention Technical Guidelines on Incineration on Land D(10). UNEP #4, 1997.

and so is not an issue with respect to flooding. The Transfer station is to be engineered to improve its flood defence. These measures are not considered extraordinary. The degree of risk for this latter operation is reduced given the storage proposals at the transfer station (racking). I am not satisfied that the third party objectors demand that the exclusionary criteria in the WHO guidance in relation to flood risk for this facility should prevail, or can be upheld. Moreover, the WHO guidance observes that the absence of a facility can pose a greater risk than the modification of [exclusionary] criteria; and that the criteria can be set aside having regard to the function of the facility as well as the engineering possibilities. The WHO document also states that too stringent criteria can needlessly exclude large areas. As noted previously the engineering measures necessary to make the transfer station safe from flood risk are modest in concept and construction.

As regards the observation on the EU web documents that incinerators should not be located up-wind of residential areas it is demonstrated in the evidence of Dr Porter for Indaver (OH record #23, Appendix G) that the predicted maximum ground level concentration for emissions from the facility will not impact on any of the residential areas in the Cork harbour area (c.f. Part 4.2 of this report). Moreover, I have some reservations regarding this advice given that many hospital incinerators and municipal incinerators on the continent are located in the communities they serve. My reservations are buttressed by the WHO views expressed in their Pamphlet #6 on Waste Incineration (pg.12)[105] where it is acknowledged that incineration plants can be located close to where the waste is generated.

[105] Waste Incineration. WHO Europe Office, pamphlet #6, 1996.

In relation to the exclusionary factor dealing with dispersion of accidental emissions (inversions / air-basin) the evidence of Dr Porter for Indaver (OH record #23, Appendix G) and Section 9 of the EIS identifies that the incidence of thermal inversions is low (see also Part 4.2.3.10 of this report). In my view the proposed incinerator poses no greater environmental risk from accidental emissions – and indeed in some cases considerably less risk - than many of the other industries in the harbour area where large quantities of solvents, oils, fuels, and other substances are stored. Consider the very large fuel storage depot near Tivoli in the upper Cork Harbour area, the Whitegate Oil Refinery, or the large sea going vessels carrying oil and fuels in and out of the harbour. Such risks cannot be eliminated for Cork Harbour as it is currently developed, and thus have to be managed. The provision for, and management of, such risks is primarily the responsibility of the Health & Safety Authority and regional emergency services. Further discussion of health and safety aspects of the objections is included in part 4.7 of this report, below.

4.3.4 Risk site (geology unsuitable, hydrogeological vulnerability, gas main, site contamination)

The third party objectors have not adduced sufficient evidence to support the claim that the geology is unsuitable. Having reviewed the geological characteristics of the site as reported in the EIS documentation (Section 11), I find no fatal flaw in this aspect of the site characteristics.

Mr North for ECSE and others raised concerns regarding the loss of contaminants from the site to the underlying groundwater and thence to the harbour. The Transfer Station is to be constructed

as a full containment facility; as is the incinerator: with all process areas covered by hard surface. Additionally the applicant proposed groundwater monitoring to act as a leak detection method: though this monitoring is intermittent. Mr North believed that the waste bunker in the incinerator should be double lined as it represents a particular risk (robust environment due to mechanical grab operation and hazardous wastes – some of which may be potentially aggressive to bunker construction materials). I support Mr North's view and believe that in addition to the monitoring of the groundwater below the site, the final design detail for the bunker should include a form of secondary containment and the frequency of groundwater monitoring parameters should be increased (c.f. recommendations in Chapter 6 of this report).

There is a gas main running around the southern perimeter of the site. The Third Party objectors believe the proximity of the development to this main is an unacceptable risk. The incinerator will require a gas supply as part of its process and so even if no supply were present, one would have to be imported. I am not convinced that the proximity of the gas main to the site is an obstacle to authorisation.

Testimony by Mr Chambers for CEA identified that there was historical contamination of dioxin on (or near) the site of the proposed development and that this issue was not addressed by the developers. However, this was contested by Mr Gardiner for Indaver at the Oral Hearing and he referred to comprehensive soil dioxin studies carried out on the proposed site (and elsewhere in the region) as part of their proposal (Appendix 6 of the Waste Licence Application documentation) which showed

that current dioxin levels in soils at the site were low in relation to European standards. In my view Mr Chambers objection has been satisfactorily addressed, and I have no residual concerns on this point.

4.3.5 Proximity to sea and salt content in incinerator air intake

This objection concerns the chloride content in the air intake due to proximity to the sea and the problems this will cause in the incinerator (e.g., efficiency, performance, corrosion). No convincing technical argument is presented in support of this claim, and in any case this is a matter for operational control of the facility, the emission limits are not to be compromised. I am not satisfied this is a major vulnerability for the operation.

4.3.6 Ringaskiddy area already over-developed with industry

The development policy for the harbour area is a matter for the local planning authorities. From an emissions point of view and ambient air quality, the applicants evidence in Section 9 of the EIS and the testimony of Dr's Porter and Callaghan for Indaver to the OH (OH records #23 and #37, Appendix G) demonstrates that there is more than enough capacity in the area to assimilate the incinerator development without approaching ambient air or dose limits for pollutants.

4.4 Legal Basis for Licence

A large number of the objections raised under this heading relate to adequacy - and thusly - the legal validity of the EIS for the application. Many of the main perceived or argued shortcomings of the EIS are dealt with in detail elsewhere in this chapter under their own headings (Health Impact, Air Emissions, Accidents, Site selection, Alternative Technologies, Baseline Assessment, etc.,). These points will not be

reconsidered here. A number of the objections also questioned the statutory process where EIS certification was split between the EPA and planning authorities for certain projects. It is not appropriate to address this sort of legal question in this report (see also Part 2.5.15 above).

A number of broad sub-headings can be identified in relation to this cluster of Third Party objections. Viz;

- Adequacy of EIS/EIA
- Compliance with EU principles, conventions, or agreements
- Compliance with National Hazardous Waste Management Plan
- No disposal facility for the incinerator ash
- Relationship with IPPC licensing
- Compliance with Directives
- Compliance with Regional Waste Plans
- Applicants not Fit & Proper Persons
- Assessment of Third Party submissions in EPA Inspectors Report with Recommended Decision.

4.4.1 Adequacy of EIS/EIA

The inspector for the application, in his report to the Board with the Recommended Decision (Appendix B) confirmed that the EIS was complied with the requirements of the EIA and Waste Licensing Regulations.

I have considered in detail the points raised by the Third Party objectors in relation to the inadequacy of the EIS and find that a convincing case for the fatal – to the EIS - omission of studies, data or assessment has not been made. The EPA EIS guidelines[107 (pg 8)] note that an EIA process should remain focused on issues that: are environmentally based; are likely to occur; and have significant and adverse effects. The Third Party

objectors have not brought forward to the Oral Hearing or in written objection any evidence of significance or of a substantial nature - cumulative or individual issue - to persuade me that the EIS documentation considered, and certified, by the EPA Inspector for the application, was incorrect, inadequate or incomplete.

An EIS is not intended to be an exhaustive assessment of every possible sub-issue or aspect under the headings or topics identified in the EIA regulations[106] and reproduced on page 3 of the EPA guidance[107] (air, water, landscape, human beings, climate, ...): rather, a developer should identify, with justification, the key aspects/impacts (significant likely adverse impacts) of a particular development, and address these in the EIS. The EPA EIS guidance (op. cit. pp3) supports this view when it notes that the level of detail - of assessment - of the topics may differ depending on the likelihood of impacts.

A number of the Third Party objections state that there is no documented evidence of Environmental Impact Assessment having been carried out on the project. EIA is not a document *per se*, nor a single recorded act, rather, it is a process: the primary purpose of which is to ensure that projects which are likely to have significant effects on the environment are subject to an assessment of their likely impacts. The EIS document is a subset of that process. The EPA EIS guidelines (op. cit.) observe that EIA is a process that feeds into, scrutinises and improves a project. EIA, from a regulators perspective, commences at scoping meetings and continues through assessment of applications and submissions, draft decision making,

[106] SI 93 of 1999. Second Schedule.
[107] Guidelines on the information to be contained in Environmental Impact Statements. IR EPA, 2002.

determination of objections, to final decision. Certification of the EIS is a sub – though very important – element of this process. So although not presented in one document, the EIA process is in fact registered in numerous documents reflecting the stages of the project (records of scoping meetings, EPA correspondence, Third Party correspondence, application documentation, draft decisions, EPA reports on assessment of application or objections, records of EPA Board decisions, etc.,). This report too will form part of the record of the EIA process for the Indaver Ringaskiddy incinerator application.

4.4.2 Compliance with EU principles, conventions, or agreements

The Third Party objections raise concerns regarding the validity of the development with respect to;

- The Kyoto Protocol[108]
- The Stockholm Convention[109]
- The Basel Convention[110]
- The Convention on Biological Diversity[111]
- The Proximity Principle[112]
- The Precautionary Principle[113]

These are considered below.

4.4.2.1 The Kyoto Protocol

This protocol arose out of the UN Convention on Climate Change and is aimed at, *inter alia*, the control of greenhouse gas emissions (e.g. CO_2, CH_4, N_2O, etc.,). The EU in response to the Kyoto agreement, and other EU position papers, brought into law

[108] Done 11 December 1997, Kyoto, Japan.
[109] Done 22 May 2001, Stockholm, Sweden.
[110] Done 22 March 1989, Basel, Switzerland.
[111] Done 5 June 1992, Rio De Janeiro, Brazil.
[112] As established under Article 5 of the Waste Framework Directive 75/442/EEC, and articulated in the 1989 Community Waste Strategy (amended 1996).
[113] EU Commission Communication COM(2000) 1 02-02-2000 on the Precautionary Principle

Directive 2003/87/EC on greenhouse gas emissions trading. Annex I of that directive exempts incinerators from the directive requirements. However in relation to the general obligations under the Kyoto Protocol the application of BAT, energy recovery, emissions scrubbing for NOx at the proposed incinerator site do comply with the general principles of the Protocol. Moreover, section 15 of the EIS and some additional commentary in Dr Porter's evidence for Indaver at the Oral Hearing (OH record #23, Appendix G) deals with the issue of greenhouse gas emissions from the facility and how it can be shown that the current arrangements (shipping abroad of waste, and landfilling) represent a greater challenge to the Kyoto principles than would the proposed incinerator. With respect to greenhouse gas emissions incineration is considered preferable to landfill. The EU Institute for Prospective Technological Studies paper on incineration in Europe[114] determined that the methane produced at a landfill is a more potent greenhouse gas than CO_2 and landfill gas collection systems typically do not recover all gas production. Landfill gas will also be produced by residual waste (organics and recyclables removed) in landfill, as it is technologically impossible to remove all biodegradables (except by incineration). So from the perspective of the Kyoto Protocol incineration is preferable to landfill.

I find no basis for the challenge that the Indaver facility contravenes the obligations of the Kyoto Protocol.

4.4.2.2 The Stockholm Convention

A number of the Third Party objectors believe the proposed incinerator is contrary to the objectives of the Stockholm

[114] The Incineration of Waste in Europe: Issues and Perspectives. EU Commission IPTS office, Sevilla, 1999.

Convention (op. cit.): this being articulated in detail by Dr Howard in the CHASE written objection (Appendix C) and Mr Duff for CHASE at the Oral Hearing (OH record #30, Appendix G). Dr Porter for Indaver addresses the issue of the Stockholm Convention in his submission to the oral hearing (OH record #23, Appendix G).

The Stockholm Convention deals with the protection of human health and the environment from persistent organic pollutants (POP's). In particular the convention identifies in Annex A and Annex B substances that should be eliminated from production and use. Annex C of the Convention deals with unintentional production of POP's from anthropogenic sources, and identifies dioxins and furans produced in combustion installations (including waste incinerators) as coming within the scope of that Annex. Annex C is implemented by Article 5 of the Convention: which requires parties to the Convention to take specified measures to reduce the release of these anthropogenic sources of POP's. Among the measures suggested are the development of an action plan to address the release of Annex C POP's, the promotion of BAT, promotion of source reduction/elimination, promotion of alternative materials, products or processes with a view to reducing POP production. In relation to BAT, the Convention specifically refers to the application of BAT for new sources such as incinerators. The proposed incinerator for Ringaskiddy is BAT and thus complies with the obligations of the Convention. Moreover, it could be argued that the continued export of wastes for incineration abroad (current practice) will, via the transport systems used, generate Annex C POP's. The elimination of this transport related POP's burden would in fact be in keeping with the objectives of Article 5 of the Convention.

Dr Porter for Indaver in his submission to the Oral Hearing (OH record #23, Appendix G) emphasises that the application of BAT, the bettering of EU Incineration Directive emission standards and the use of advance flue gas cleaning systems, are all factors that contribute to the proposed incinerators compliance with the requirements of the Stockholm Convention.

BAT in this case is informed by two codes. The first is the EU BAT Reference Document for incineration (EU BRef)[115], the second is the best available techniques/best environmental practices defined by the Stockholm Convention expert group (Stockholm Convention BAT/BEP)[116]. The EU commission office in Spain charged with the preparation of EU BRef documents have recently published the final draft of the Incineration BRef (May 2005); the previous draft was dated March 2004. Although the Indaver waste licence application was made before the 2004 draft of BRef there were also earlier drafts which likely informed the applications on best technology. The burner technology, and especially the flue gas cleaning system, proposed by Indaver, is compliant with the latest EU BRef (2005 final draft), i.e. the proposed technology is EU BAT.

In relation to the Convention BAT/BEP document[116] the proposal would be considered a 'new source' for the purposes of this document. The Convention BAT/BEP talks of a range of actions and provisions that must be progressed in order to support the objectives of the Convention in relation to Dioxins &Furans. Many of these are policy based or involve the application of clean technology and source reduction initiatives. The latter two are

[115] IPPC Best Available Techniques Reference Document on the Incineration of Waste – Draft Final May 2005. EU Commission. (Finalised draft from March 2004 version).

[116] Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Convention on Persistent Organic Pollutants. Dec 2004.

progressed principally through the IPPC licensing regime for the sources identified in Part II of Annex C to the Convention. Most of the objectives and actions are beyond the control of the applicant for the Ringaskiddy incinerator proposal: but in relation to the burn technology and flue gas treatment proposed for the Ringaskiddy incinerator, these do comply with the Convention BAT document in relation to Dioxin-Furan formation, destruction and abatement. The Stockholm Convention BAT document identifies three key elements of incinerator combustion operation that contribute to the reduction of dioxin formation; these are Time of Residence, Temperature and Turbulence. Additionally rapid quench are also necessary to prevent dioxin-furan formation. The proposed Ringaskiddy incinerator burn-design and flue gas treatment train incorporates these principles. And in relation to abatement/destruction of dioxins-furans in the flue gas the Ringaskiddy proposal includes two stages of dioxin-furan removal; involving activated carbon and lime injection with baghouse filtration. This abatement process is noted as one of the approved technologies in the Stockholm Convention BAT document.

In 2004 the European Parliament and Council of the European Union made a Regulation on foot of, *inter alia*, the Stockholm Convention, dealing with persistent organic pollutants.[117] The seventh recital to the Regulations states that the provisions of the regulations are underpinned by the *precautionary principle* (see below). Annex V of the Regulations identifies [properly designed, operated and authorised] incineration as a permitted disposal operation for the destruction of POP's.

[117] Regulation (EC) No. 850/2004 of the European Parliament and of the Council, dated 29 April 2004, on Persistent Organic Pollutants and amending Directive 79/117/EEC. OJ L229, 29.6.2004, p.5.

Finally, and on the subject of elimination/destruction of anthropogenic dioxins-furans it is interesting to note that a WHO fact-sheet on dioxins[118] observes that high temperature incineration is the best available answer for dioxin destruction.

I am satisfied that the proposed incinerator does not conflict with the obligations of the Stockholm Convention.

4.4.2.3 The Basel Convention

This Convention deals with the transboundary movement of hazardous waste. The Convention deals with many aspects of hazardous waste movement, however Article 4 of the Convention sets out some key obligations that have a bearing on the incinerator proposal. Specifically I refer to the obligations set out in sub-articles 2(b) & 2(c) which require the State to ensure that, to the extent possible, hazardous waste disposal facilities should be available within the State, and that the operation of such facilities should not pollute or otherwise impact on human health or the environment. The 9th recital to the Convention also emphasises the proximity principle for hazardous waste disposal when it articulates that the Parties to the Convention '... *are convinced that hazardous waste and other waste should, as far as is compatible with environmentally sound and efficient management, be disposed of in the State where they were generated'*.

In-so-far as the obligations of this Convention relate to the proposed incineration I can see no conflict between them; nor have any of the Third Party objections brought forward convincing argument to dissuade me from reaching this

[118] Dioxins and their effects on human health. WHO fact-sheet #225, June 1999.

conclusion. If anything, the proposed incinerator will allow Ireland to become self-sufficient in respect of disposal of many hazardous waste streams; and by not exporting our environmental burden, and disposing of it within the State to a standard that protects human health and the environment, we can be seen to be upholding the principles espoused in the Basel Convention.

4.4.2.4 The Convention on Biological Diversity

In brief summary this convention deals, principally, with the conservation of biological diversity, the sustainable use of biological components, and the sharing and benefiting of genetic resources. The Third Party objectors have not adduced any information or evidence to demonstrate how the incinerator proposal - as it is intended to be constructed, operated and emissions controlled - directly conflicts with this Convention.

4.4.2.5 The Proximity Principle

Article 5 of the Waste Framework Directive[119] establishes the obligation on Member States to establish a network of disposal operations, for the purposes of becoming self-sufficient. This obligation was articulated as the proximity principle in the 1989 EU Commission *Community Waste Strategy* and in the revision of that strategy in 1996.[120] In its simplest form, the principle requires that waste for disposal should be dealt with in one of the nearest appropriate installations. This principle is also reflected in the Basel Convention. Ireland currently has no significant merchant hazardous waste disposal facility, yet the State produces hazardous waste in our hospitals, universities, schools, homes,

[119] 75/442/EEC.
[120] Community Strategy for Waste Management. EU Commission communication COM(96)399final. August 1996.

farms, industries and businesses. A lot of this waste cannot be recovered and must be safely disposed. Our current practice of sending it abroad for disposal is not strictly in keeping with the proximity principle. We are exporting our environmental burden to our neighbours. This is not sustainable. It is accepted – and this is provided for in the Waste Framework Directive and by the proximity principle - that for some difficult waste, export will remain a necessary option, as the economics of scale will act against the environmentally and economically efficient operation of a dedicated disposal facility close to production. The proposed incinerator is in keeping with the *proximity principle* for Ireland having regard to its obligations within Europe.

A number of the Third Party objectors argue whether Cork is the right location if one applies the proximity principle within our borders. Many factors go to inform the location of such a facility, or facilities, within a waste producing state; viz, transport, waste supply, critical infrastructure, emissions outlets, ... etc. I do not herein propose to re-examine the planning aspects of the strategic location of the facility: the EPA should restrict itself to matters of site selection that impact on the safe environmental operation of a facility and the safe management of its emissions. In that regard a facility located in Cork will have access to the port to export the hazardous fly-ash gathered at the incinerator as there is currently no suitable disposal facility (landfill) in the State that can accept this waste. However, there are landfill facilities in the region that have, in principle, the technical ability to accept the non-hazardous incinerator ash. There is no technical aspect of the Ringaskiddy waste facility location that has been shown to present an unacceptable environmental challenge to the proposed operation. Additionally the other

emissions from the facility have been shown to be safe to public health and the environment at the selected Cork site.

For such a small country and being modest hazardous waste producers I do not believe the proximity principle is best served by examination on a county by county, or regional, level for such a facility. A national perspective is appropriate; and as a nation the proximity principle suggests we should, in-so-far-as-is possible, be dealing with our own hazardous waste and not exporting it. The UK Royal Commission on Incineration[121] on the subject of the precautionary principle concluded that the principle should be regarded as a broad aim for the siting, design and size of incinerators. I believe this is particularly the case when considering a facility intended to serve a national need.

The planning need for the municipal waste incinerator component of the application is yet to be decided. This is not a matter for the EPA.

4.4.2.6 The Precautionary Principle

The EU Commission, in 2000, produced a useful communication on the application of the precautionary principle[122]. This publication was later complimented by a report from the European Environment Agency (EEA) on the subject Principle.[123]

The principle is more a governance philosophy rather than a clearly and unambiguously articulated principle. There is no one definition of it in EU legal texts, and similar governance principles

[121] Royal Commission on Environmental Pollution: Seventeenth report – Incineration of Waste. HMSO, 1993.
[122] Communication from the Commission on the precautionary principle. EU Commission COM(2000)1, 2-Feb-2000.
[123] Late lessons from early warnings: the precautionary principle 1986-2000. EEA Environmental Issue Report #22, 2001.

are found in a number of international treaties and protocols (Stockholm Convention, Montreal Protocol, etc.,). Article 174 (Environment) of the EC Treaty contains the main EU formal reference to – but no definition of - the principle. The EEA document (op. cit.) concludes that '*the precautionary principle is an overarching framework of thinking that governs the use of foresight in situations characterised by uncertainty and ignorance and where there are potentially large costs to both regulatory action and inaction*': and observes that '*society's growing commitment to the precautionary principle is essentially a response to a growing tension between two aspects of science: its growing innovative powers were increasingly outrunning its capacity to anticipate the consequences'.* The precautionary principle is mainly seen as a way to deal with a lack of scientific certainty. Uncertainty is often expressed as a form of risk: this is why Risk Management is core to the application of the precautionary principle.

In the 1970's German scientists articulated what was to become the founding element of the European understanding of the precautionary principle[123]: what they developed was a general rule of public policy action to be used in situations of potentially serious or irreversible threats to human health or the environment, where there is a need to act to reduce potential hazards before there is strong proof of harm, taking into account the likely costs and benefits of action and inaction. This *rule* suggests that there must be a 'trigger' for the identified threat, and so further development of the principle in Germany articulated the following core elements which have to do with 'foresight' or 'precaution':

- Research and monitoring for the early detection of hazards;
- A general reduction of environmental burdens;
- The promotion of clean production, and innovation;
- The proportionality principle, where the costs of actions to prevent hazards should not be disproportionate to the likely benefits;
- Stakeholder co-operation in solving problems via integrated policy measures that aim to improve the environment, competitiveness and employment;
- Action to reduce risks before full 'proof' of harm is available if impacts could be serious or irreversible.

The EU communication on the Precautionary Principle (op. cit.) identified two distinct aspects of the principle: (i) the political decision to act or not to act (including the triggers for same), and; (ii) how to act (i.e. the measures).

So in relation to incinerators, one needs to ask what threats/triggers; elements of foresight; and measures, can be relied upon to determine whether or not there is a sufficient case to consider that there is strong proof of unpredictable, or unquantifiable or unmanageable harm. The EU and its Member States, and indeed world bodies like the UN and WHO, have recognised the health risks from pollutants such as heavy metals, POP's, and fine particulates: in particular combustion sources of these pollutants (including incinerators). The preceding sections of this report have identified numerous medical and scientific investigations of, or reports on, incineration and its potential health/environmental impact. The growing body of science is

reducing the degree of uncertainty regarding the health/environmental effects of these pollutants.

There has been a variety of responses, including International Conventions and Protocols, International Standards, Directives, Regulations, Policy, Action Programmes[124] and Strategies: many of which have been outlined herein. The precautionary principle is reflected in National legislation too; in particular I refer to §52(2)(c) of the EPA Acts 1992 & 2003: this section deals with the guiding principles for the functioning of the Agency, in particular the Board. It is fair to say that the EU in particular has acted in relation to the health/environmental risks from combustion source emissions. Work is continuing too, e.g. EU Café program on air pollution. So in Europe we can say that there have been decisions to act and measures put in place: these being triggered by scientific information coming forward on the health impacts of, for example, particular air pollutants: i.e. moving to a position of greater scientific certainty. Many of these measures were founded on the principle of precaution (e.g. EU Dioxin, Furan & PCB's Strategy and latterly the Regulations (op. cit.), the Incineration Directive, the IPPC Directive, the development of BAT, etc.,). In relation to the six core elements of 'foresight' or 'precaution' articulated in Germany (see above) the EU Community document on a *Strategy for Dioxins, Furans and PCB's*[125] identifies existing International & Community measures, and where relevant sets out a program, that will build on existing measures and implement new ones. The measures identified in the cited Community Communication address the core elements identified by Germany as fundamental to the

[124] E.g. EU Sixth Environmental Action Programme: An action programme for the environment in Europe at the beginning of the 21st Century. EU Commission.
[125] Communication from the Commission COM(2001) 593 final, 24.10.2001

precautionary principle. It is my view that, in relation to incineration, the *precautionary principle* has already informed the measures adopted by the EU (e.g. Directives, Emission Limits, BAT documents, etc.,), and by complying with these measures one can be said to complying with the *principle*, and thereby the EU Treaty. The EU Strategy on Dioxins, Furans and PCB's (op. cit) states on page 13 that ... 'precaution underlies the concern of the Commission and is embedded within this Strategy'. The proposed Indaver incinerator is compliant with the articulated EU governance measures and responses to the risk posed by such facilities.

Burden of proof is a key aspect when dealing with scientific uncertainty and the assessment of risk in relation to an industrial process. Indaver have taken on the task of providing the burden of proof that their proposal is safe. This is confirmed by the EPA, because in issuing the draft licence they are stating their satisfaction that emissions from the activity will, *inter alia*, not cause significant environmental pollution. From the evidence before me in the application documentation, including that brought forward in the Oral Hearing, and as well as information that I have researched and cited in this report, I can conclude that EU and international experience and evidence supports the applicants statement.

The EU and the EEA note in their documents[122, 123] on this subject that the application of the precautionary principle should not be used as a means of blanket opposition to innovation, nor should it be used to justify arbitrary decisions. In my view, and having regard to the information, evidence and arguments outlined in Chapter 4 of this report (including the cited references), the

invocation of the *precautionary principle* for the purposes of blocking the Indaver Ringaskiddy proposal, would constitute such an arbitrary decision, having no basis in science, regulation or policy.

4.4.3 Compliance with the National Hazardous Waste Management Plan (NHWMP), & waste ash management

The NHWMP[126] was prepared by the EPA under its statutory obligations, and published in 2001. It is currently under review. The Plan, though it has a statutory basis, is not a legal instrument.

The assessment of the *strategic* and *need* aspects of any project against national, regional or local plans is essentially a matter for the planning authorities. It is not administratively appropriate, nor reasonable for the EPA to undertake a complete duplication of this assessment process. That said, §40(4)(cc) of the Waste Management Acts 1996 – 2003 requires that the Agency shall not grant a waste licence to an activity unless:

> *the activity concerned is consistent with the objectives of the relevant waste plan or the hazardous waste management plan, as the case may be, and will not prejudice measures taken or to be taken by the relevant local authority or authorities for the purpose of the implementation of any such plan.*

Such a satisfaction need not necessarily be derived from an EPA assessment that entirely duplicates the effort of another authority: and the EPA could be entitled to rely on the findings of another statutory authority in relation to the compatibility of a project with documented plan such as the NHWMP. In my view,

[126] Irish EPA, 2001.

and in relation to the assessment of a project against a plan, the Agency should follow a similar statutory process to that in relation to the general authorisation of an activity requiring both planning and EPA authorisation: which is, that the issue of management of emissions (including BAT), and related emissions impact of an activity is for the EPA and not the planning authorities.

§34(2)(c) of the Planning & Development Act 2000 states that:

> *... where an application [for planning permission] relates to development which comprises or is for the purposes of an activity for which ... a waste licence is required, a planning authority shall take into consideration that the control of emissions arising from the activity is a function of the Environmental Protection Agency*

§54(3) of the Waste Management Acts (1996-2003) as amended by §257 of the Planning & Development Act 2000, notes that for a development to be authorised by the EPA a planning authority shall not place conditions in their authorisation that deal with:

> *(i) controlling emissions from the operation of the activity, including the prevention, limitation, elimination, abatement or reduction of those emissions, or*
> *(ii) controlling emissions related to or following the cessation of the operation of the activity*.

So confining assessment of this waste facility application to those aspects of waste plans as are relevant to the EPA remit; the EPA might consider, for example, if the proposed technology for the management of a hazardous stream identified in the NHWMP is BAT with respect to the emissions management. I am satisfied

that the incinerator technology proposed for the Ringaskiddy site is BAT in respect of the hazardous waste streams identified in the NHWMP and proposed to be accepted at the facility.

In relation to the choice of technology and the management of emissions the Indaver proposal complies with the objectives of the NHWMP as articulated on page 2 of the Plan. Furthermore, I am satisfied that the Indaver proposal will not prejudice measures to be implemented or taken in relation to the Plan, as it constitutes one of the desired measures identified in the Plan (refer priority 7, section 9.7 of the plan).

The incinerator will produce non-hazardous and hazardous ash. The former would be suitable for landfilling in a non-hazardous waste landfill under current acceptance criteria. The latter will have to be exported for disposal in a hazardous waste landfill, as there is no such commercially available facility in Ireland. The applicants stated at the Oral Hearing that the hazardous waste ash could be sent to their authorised landfill facility in Antwerp (OH Record #33, Appendix G). The incinerator will thus generate a hazardous waste for export; though this will be a fraction of the material currently exported, and so complies in-so-far-as-is technically and economically feasible with the thrust of the Basel Convention and the Proximity Principle. The export of this ash for landfilling thus does not represent a conflict with the NHWMP.

There was some comment from the Third Party objectors that the size of the facility was too great and would compromise other hazardous waste recovery/minimisation measures contemplated by the NHWMP. This point strays into the Planning Authority area,

which is a matter that has already been decided upon. However I will bring forward some recent key information that has a bearing on the technological capacity issue. Of the 63,706t hazardous waste exported for Recovery in 2002 (excluding soils)[127], it is known that a proportion of this was high-energy waste sent to over-seas incinerators with energy recovery and classed for shipment purposes as Recovery. Such a practice was identified in section 6.1.3 of the NHWMP. The national statistics are built on these shipment records. However in 2003 the EU Court of Justice ruled[128] that the use of waste in an incinerator to recover energy could not be classed as Recovery for the purposes of the Waste Framework Directive[129]. This ruling changed the classification of some of the wastes previously exported to incinerators under the banner of Recovery; and will consequently likely raise the quantity exported for Disposal by incineration in future statistical surveys. The most recent EPA survey of waste exports[130] identified 74,420t of waste exported for incineration, and 80,852t exported for Recovery (excluding soils). Within the latter, some 33,919t was classed as Use as Fuel. As the 2003 EU Court decision begins to take effect some of this fuel use will likely move from Recovery to Disposal classification.

Another c.35,000t of hazardous waste Recovery goes to solvent reclamation/regeneration and metals recycling. These latter options, along with high calorific value waste used for energy recovery in the likes of cement plants (Recovery), being in the order of 2/3^{rds} of hazardous waste recovered abroad (my estimate), will, in my view, be unaffected by a national

[127] National Waste Database 2002 – Interim Report. EPA, 2004.
[128] Commission V Luxembourg, Case C-448/00, decision 13-02-2003.
[129] 75/442/EEC as amended.
[130] National Waste Database 2003 – Interim Report. EPA, 2004.

incinerator as these processes are likely always to be commercially more attractive than disposal by incineration.

This recent data indicates that a facility of 100,000t capacity is not disproportionate to need, and is unlikely to detrimentally impact to any significant extent on recovery/recycling initiatives or other measures identified in the NHWMP. The latest statistics were not available to the An Bord Pleanála determination.

It is also necessary to identify the obligations of Condition 2.3.2.2 of the Proposed Decision (Appendix B) which requires, *inter alia*, the operation of an environmental objective to evaluate all practicable options for cleaner technology, resource efficiency, and the prevention, reduction and minimisation of waste. In order to operate this objective properly the licence holder will have to, amongst other matters, demonstrate on a yearly basis efforts taken to source environmentally sustainable recovery options for waste streams generated on, or coming into, the facility.

Indeed a true embracement of the Proximity Principle would suggest that a national hazardous waste disposal facility such as that proposed is necessary. This is reflected in the NHWMP (pg.66) where it concludes that the development of a thermal treatment facility for the disposal of hazardous waste is required if Ireland is to achieve self-sufficiency and reduce our reliance on export. In particular the NHWMP endorses the development of waste to energy plants such as that proposed for Ringaskiddy.

4.4.4 Compliance with Regional Waste Plans

The Third Party objectors say that the incinerator proposal is not provided for in the Cork City and County Waste Plans. There is a similar argument here to that made in relation to NHWMP, in that the determination of strategic and infrastructural need for a project against such plans is primarily a matter for the planning authorities. It is not administratively appropriate that the EPA duplicate the role of the planning authorities in this regard. As noted previously, the EPA has to be satisfied that proposals are consistent with such plans and do not prejudice measures adopted in said plans: and in particular the EPA must have regard to emissions, BAT and emissions impact in relation to its assessment of a proposal against such plans. As in the case of the NHWMP I am satisfied that the technology proposed by Indaver is BAT for the management of most hazardous wastes identified in the County & City Plans, and that the emissions will not conflict with the plans.

It is noted that both Cork Plans opt for landfill as a final disposal option for residual non-hazardous wastes, where-as the EU would see that incineration with energy recovery (as proposed by Indaver) is a preferred technology over landfill in the waste hierarchy. That said, both plans recognise incineration as an emerging solution that needs examination. Incineration with energy recovery, of residual non-hazardous municipal waste generated in the region would significantly reduce the volume of waste needed to be landfilled and the likelihood of production of landfill gases, etc. This reduction in volume also contributes to a reduction in the size of the landfills – and thus the environmental footprint – needed to serve the region. This suggests to me that the BAT technology proposed by Indaver

would, if adopted, enhance the value of the Plans, and further achievement of the stated objectives of the Plans.

4.4.5 Relationship to IPPC Licensing

A number of Third Party objections queried why the incinerator was not authorised as an IPPC Directive[131] facility under national provisions (EPA Acts 1992-2003).

The authorisation of activities specified in Annex I of the IPPC Directive is, in Ireland, split between two legislative codes: viz, the Waste Management Acts and the EPA Acts. Waste operations specified in Category 5 of Annex I of the IPPC Directive are generally authorised under Part V of the Waste Management Acts, except where they are associated with an industrial activity licensed under Part IV of the EPA Acts. So stand-alone or 'merchant' IPPC waste operations are authorised under the Waste Management Acts. §39A of the Waste Management Acts 1996 – 2003 specifically deals with the situation where there may be a need to clearly determine which licensing code is appropriate for an activity. By letter dated 26.11.2003 a formal declaration was issued to Indaver advising them that the Ringaskiddy operation would be dealt with under Part V of the Waste Management Acts. This letter is on public file.

Regardless of the code under which the operation is authorised I can confirm that the statutory provisions for both codes comply, in-so-far-as-is relevant to specified categories of activity, to the provisions of the IPPC Directive.

[131] 96/61/EC

4.4.6 Compliance with VOC[132], Incineration[133] and IPPC[131] Directives

It is suggested in Third Party objections that the proposed incinerator is by virtue of the waste it produces (ash, gypsum), is unsustainable and contrary to Articles 3(b) and (c) of the IPPC Directive.

Incineration is an acceptable element of the waste management infrastructure and is recognised as such in national policy, by the WHO[134], and the EU (through, *inter alia*, the making of Directives and BAT guidance for the safe operation of Incinerators; and importantly as noted in the third of the EU's three basic principles for waste management: the third principle acknowledges the role of incineration, and moreover, states that it is preferable to landfill[135]). Though incineration with energy recovery is low down the preferred options for waste management, it is never-the-less a recognised element of the EU waste hierarchy, I am satisfied that the technical design of the Ringaskiddy incinerator and operation to the terms of the licence ensures compliance with the IPPC Directive. Indeed, in relation to the argument advanced for Article 3(c) of the Directive, it is my view that it would be nonsense to consider that a Directive which sets out to regulate a class of activity (Incineration – Category 5 of Annex I to the IPPC Directive) in-fact acts fatally against the existence of that activity (where at BAT) by virtue of an obligation within it. Furthermore I have previously mentioned (Part 4.4.3 above) that Condition 2.3.2.2 of the Proposed Decision for the incinerator details the obligations on the operator of the facility in respect of waste minimisation.

[132] 1999/13/EC
[133] 2000/76/EC
[134] Waste incineration. Pamphlett #6, WHO, 1996
[135] http://europa.eu.int/comm/environment/waste/index.htm

In relation to a comment that there is no evidence of an 'integrated approach' taken in relation to the authorisation of an IPPC activity (Article 7, IPPC Directive) I would say that there is only one authority in Ireland responsible for the IPPC authorisation of an operation, and that is the EPA. There is a dual competency for EIS assessment between the EPA and the planning authorities. This has been fully provided for in statute. In relation to other matters such as safety and spatial planning, other authorities are involved. There is no vulnerability in relation to the requirements of Article 7 of the IPPC Directive.

The statutory provisions behind the licensing of IPPC Directive operations under Part IV of the EPA Acts or Part V of the Waste Management Acts involves the mandatory notification of statutory consultees in relation to applications and proposed licence decisions (e.g. Heritage Section, Department of Environment, Heritage & Local government; Dept of Communications, Marine & Natural Resources; Health Authorities, etc.,). Although these authorities/bodies have no formal responsibility in the actual making of conditions in any permit, their involvement as statutory consultees, in my view, further supports the thrust of Article 7, as they can *influence* the making of licence decisions or conditions.

There was an objection raised that the firewater retention provisions of the Incineration Directive were not dealt with in the application. This objection refers to Article 8(7) of the Directive. It is noted that this article deals with controls that need to be in place for operation of an incinerator facility. These fire-water facilities were identified in Section 3.5 of the Waste Licence

Application documentation and incorporated in the proposed licence in Condition 3.10.

A Third Party objection stated that the facility would be subject to control of Volatile Organic Compounds (VOC's) under the Solvent's Directive[132]. The waste facility at Ringaskiddy is not a specified installation for the purpose of Article 1 of the Solvents Directive. That said it is important to note that Condition 6.13 of the Proposed Decision does require the incorporation into the Environmental Management Programme for the facility of a programme for fugitive emissions reduction. Fugitive VOC emissions within the facility would come under this obligation.

4.4.7 Fit & Proper Persons

Many of the Third Party objectors believe that the applicants have not demonstrated themselves as Fit & Proper persons for the purposes of §40(4)(d) of the Waste Management Acts. This section states that the EPA shall not grant a licence unless it is satisfied that an applicant is a Fit & Proper Person. §40(7) of the Act goes on to define a Fit & Proper Person as one who [in summary]: (i) is free of relevant convictions; (ii) has, or has access to in a direct control capacity, the requisite technical knowledge to carry on the activity, and who; (iii) can meet the financial liabilities associated with the carrying on of the activity.

There is no evidence or testimony before me to suggest the applicants have any difficulties with items (i) & (ii). In relation to item (iii) Condition 12.2 of the draft licence is important as it requires all necessary indemnities to be in place prior to acceptance of waste. This is to guarantee the assurances of the

applicant in the application documentation (Attachment A19.7 Waste Licence Application) in relation to liabilities.

Most of the concerns raised by the Third Party objectors was in relation to the technical ability of the applicant given that no member of the applicants staff have experience in the design or operation of an incinerator, and that technical errors by a sister company of the applicant led to breaches of dioxin emission standards for 40 days (Antwerp),(see a brief summary of this incident on page 15 of OH Record #33, Appendix G).

For the same reason that it is not necessary to have the final detail of all technical design for a project at permit application stage, it is not necessary to have employed all the technical staff who will run a facility at application stage. This would be unreasonable given that refusal is possible. What is necessary is that, in the application documentation an applicant can demonstrate a technical appreciation and competence for the environmental & operational issues, as well as technology and abatement systems, and that they can competently deal with all the EPA requests for information. In their waste application documentation (including EIS) the applicants have submitted sufficient technical detail for the EPA to reach a proposed decision in relation to the application. These documents also explain the relationship of the applicants to their international parent company, who do have extensive experience in the area of incineration. Furthermore, Mr Ahern for Indaver comments in his submission to the Oral Hearing (page 24, OH Record #33, Appendix G) that the detailed design and construction of the facility will be given to internationally recognised experts. This contract will include training and supervision of Indaver staff.

Condition 2.2 of the Proposed Decision requires the operator to obtain prior approval of all management/technical staff to be employed on site. This Condition will act to ensure the applicant puts in place the management team that was committed to in the application. It is not specified in the condition what the minimum experience or qualifications of the technical manager for the incinerator should be; though any agreement of this individual (or individuals, as the operation is 24hr) will likely require careful attention. As an added reassurance to the Third Party objectors I am recommending that Condition 2.1 be reinforced with some minimum technical criteria for the technical manager, as well as providing for the agreement of the facility design. I am also recommending that for the purposes of construction quality assurance (CQA), that a qualified person(s) independent of the applicants and design/construction team review the final design prior to construction, and furthermore review the completed build prior to commencement of operations. Similar independent CQA approaches are adopted for other large waste infrastructural projects authorised by the EPA (e.g. landfill, mining waste lagoons). This person(s) should be retained and instructed by, and report to, the EPA, with cost recovery by charge to Indaver.

Having regard to the application documentation I am satisfied that the applicants have demonstrated that they can comply with the burden of proof on technical competence. The draft licence conditions as amended in my recommendations (c.f. Chapter 6), prevent the progress of the design, construction and operation of the facility until the appropriate skilled personnel are in place.

4.4.8 Inspectors Report with Recommended Decision did not address the issues raised in submissions on the licence application

I have reviewed the Inspectors Report and the Third Party assertions in their objections that this report did not address issues raised in submissions. The degree to which any report or assessment (including this one) addresses an issue is a matter for the author having regard to jurisdiction, as well as the relevance and significance of the issue raised. It is therefore a matter of individual technical and procedural judgement. Additionally it is not always necessary to explicitly identify how an issue raised by a Third Party has been incorporated into the recommended licence. For example, concerns raised by a Third Party that specific elements of technology proposed for a development are not safe, might be simply addressed in stating the technology is of recognised international BAT standard; rather than a detailed examination of the specific points of objection on specific technologies. Inevitably, an applicant or third parties may not agree with an inspectors report assessment or recommendation, and the statutory process permits objection and appeal of such decisions involving such reports. This does not invalidate the Inspectors Report.

Article 6(8) of the Aarhus Convention[136] requires that in [public] decision making, due account is taken of the outcome of public participation. I am satisfied that for the purposes of Sections 40(2) and (4) of the Waste Management Acts and in relation to that stage of the statutory process, the Inspectors Report for the Indaver Ringaskiddy application (Appendix B) is a valid record of

[136] Convention on Access to Information, Public Participation in Decision Making and access to Justice on Environmental Matters. Done at Aarhus, Denmark, 25.06.1998.

the matters regarded, assessed and determined in the recommendation presented in that report, and so did not negatively impact on the legal validity of the Proposed Decision: due account of submissions on the application was taken.

Additional specific matters on the Inspectors Report are also addressed in Part 4.9 of this report below.

4.5 Competency of the Applicants

Under this issue cluster the Third Party objectors raised a number of points of objection which can be summarised as follows;

- No trust in applicants
- Experience &Technical competency of applicants

In relation to the experience and technical competency of the applicants I would refer back to Part 4.4.7 of this report where the issue of technical competency of the applicants was considered under the heading of Fit & Proper Persons.

On the subject of public trust, this is not a matter that can be determined by me in this report; suffice it to say in my recommendation to grant a final licence to the applicants I am declaring my trust in the applications technology (which is EU BAT), the location, their future operation, and the ability of the licence to regulate the activity and protect the health and the environment of the local community. It is a task for the applicants to earn the trust of the community. Condition 2.3.7 of the recommended licence (c.f. Chapter 6) requires the operator to operate a public communications programme and to make available locally information on the environmental performance of the facility.

4.6 Need

A number of the issues raised in this cluster of Third Party objections relates to the capacity of the incinerator and perceived need, locally and nationally. I have previously dealt with the role of the EPA in relation to the assessment of this proposal against local and national waste plans (refer Parts 4.4.3 and 4.4.4 above). That discussion concluded that incineration was compatible with the stated Plans in-so-far-as my role in assessment could determine (not duplicating role of Planning Authority), and that 'need' with-respect-to waste arisings, best technology for management, and emissions abatement, could be demonstrated for the facility.

Other sub-sets of this issue cluster are;

- We are already exporting hazardous waste for incineration, so why do we need one in Ireland
- Proposal is premature and will stifle waste recovery / reduction / recycling initiatives
- Public and political opposition to proposal
- Proposed Civic Amenity site duplicates a facility already present in the area
- There are alternative technologies to incineration
- Changes to EU waste list will reduce the list of wastes and thus the need for incineration
- There is already enough industry in Ringaskiddy

4.6.1 We are already exporting waste for incineration so why build a facility in Ireland

This issue is primarily to do with the Proximity Principle. Extensive discussion of this principle and why a national hazardous waste

disposal facility is needed and continued export is not environmentally sustainable is included in part 4.4.2 of this report. A facility that deals with our own waste within the jurisdiction of Ireland also supports the principles of the Stockholm and Basel Conventions (op. cit.).

It was suggested by a Third Party objector that the environment around these EU incinerators is already polluted so why not continue to send our waste there and keep our own country clean. This point of view runs against the proximity principle, and in my view is an environmental injustice. Where environmentally, technically and economically possible, Ireland has to take responsibility for its own waste: this is a social and ethical imperative, and is an essential component of the sustainable development paradigm for Ireland. No submission, evidence or statement has been adduced to convince me otherwise.

4.6.2 Proposal is premature and will stifle waste recovery / reduction / recycling initiative

It was suggested in the NHWMP than an oversized hazardous waste incinerator may inhibit waste prevention techniques. A number of Third Party objectors also believed the availability of incinerator capacity will prejudice the development of waste recycling and recovery techniques.

A good deal of the hazardous waste generated is produced on industrial sites regulated by the EPA under the IPPC licensing system (Part IV of the EPA Acts 1992 – 2003). Written into the licensing system is the concept of BAT, which is defined in §5 of the EPA Acts. Here, the Act requires the EPA to have regard [when considering BAT for an industry] to, *inter alia*, emissions prevention (e.g. waste) and measures such as;

- Low waste technology, and
- The furthering of recovery and recycling

Moreover, all currently issued EPA IPPC licences require the operator - via Condition 2 of their licence – to prepare a programme that;

> *... shall as a minimum provide for a review of all operations and processes, including an evaluation of practicable options, for energy and resource efficiency, the use of cleaner technology, cleaner production, and the prevention, reduction and minimisation of waste, and shall include waste reduction targets*

So, the availability of a national 'merchant' incinerator is not the main driver for management options for waste. The waste prevention and recovery, or cleaner production, obligations of the industrial regulatory system, are; and this obligation falls to the waste producers. The recent EPA waste production statistics[137] show a growth in hazardous waste production in Ireland, likely reflecting, amongst other factors, the expanding economy. This is over-and-above the hazardous waste dealt with by industries on their own sites. The capacity of the proposed hazardous waste incinerator with respect to waste arisings was discussed in part 4.4.3 of this report, and therein determined to be appropriately sized for the management of waste currently exported for disposal. There is no reason for recoverable hazardous waste to be required in the proposed Ringaskiddy incinerator in order to keep it economic. Some of the high calorific value waste exported for 'recovery' is being burnt in cement kilns as an auxiliary fuel for energy production. The proposed incinerator at Ringaskiddy also has energy recovery, and could accept these currently exported

[137] EPA Interim Waste Database Reports 2002 and 2003.

'Recovered' waste derived fuels. The environmental benefit would be the reduction of the transport emissions associated with shipping.

I am satisfied, that through current cleaner technology initiatives, there should be no loss of focus if a new hazardous waste disposal facility commences operation, and that there should be minimal impact on environmentally sustainable genuine recovery initiatives. No substantive evidence has been adduced to dissuade me of this view.

4.6.3 Public and political opposition to proposal

From the record of the submissions on the application for the Ringaskiddy incinerator and the contributions to objections and the Oral Hearing it is clear that there is political and public opposition to this proposal.

§40(4) of the Waste Management Acts 1996-2003 sets out the grounds by which a waste licence can be refused to an applicant. Public opposition is not one of the specified grounds. Additionally §52(2) of the EPA Acts 1992 & 2003 set out the guiding principles for the Agency in executing its functions. Public opposition is not one of the principles identified: except in-so-far-as the public interest is served in achieving the proper balance between the need to protect the environment and the need for infrastructural, economic and social progress and development (i.e. sustainability). Based on my examination of the application documentation as well as the information brought to my attention at the Oral Hearing, and from my subsequent research (documented herein), I am satisfied that

the Ringaskiddy incinerator proposal, though unpopular, is environmentally sustainable.

4.6.4 Proposed Civic Amenity site duplicates a facility already present in the area

The Third Party objections note that the small Civic Amenity facility attached to the incinerator and waste transfer station operations duplicates what is available locally. The civic amenity operation proposed by Indaver is very modest with a projected annual throughput of c.260t. At this scale it is my view that the Indaver facility will not be a strategic threat to the Local Authority facility at Rafeen (approx. 5km to the west). The more supervised and managed civic waste sites there are nationally, the better it will facilitate waste management within the community. The additional travel distance for Ringaskiddy residents commuting to Rafeen is not sustainable when a more local facility is available. The deficit of national infrastructure for community recycling facilities is noted in the EPA's *Irelands Environment* report 2004.

I find I cannot uphold this objection.

4.6.5 There are alternative technologies to Incineration

There were numerous objections from Third Party objectors including a detailed submission from CASE (Ms Masson DR/16-02-05/G+5, & OH Record #16, Appendix G) that there are alternatives waste treatment technologies to incineration.

A number of the alternative technologies cited by CASE are still under development. In time these may become commercially available. At the moment in Ireland there are very limited hazardous waste disposal/treatment facilities operating on a

commercial level (e.g. Atlas Oils, Shannon Environmental Services); and nothing of the scale or appropriateness that will cater for the hazardous wastes currently exported. Section 2 of the EIS for the Ringaskiddy proposal includes a discussion on the need for incineration.

In Western Australia the Core Consultative Committee (3C)[138] on waste was formed in 2002 to advise the government on technical issues to do with hazardous waste management. This is a multi-stakeholder committee. Their *Briefing Paper 5 - Hazardous Waste Treatment Technologies*, like the CASE submission, is a good overview of many of the hazardous waste treatment technologies, and includes advantages and limitations for each. They note that ... 'there are many different types of hazardous wastes, each generated in differing amounts with differing levels of health and environmental risk, no single technology can suitably treat all types of hazardous waste'. On incineration the *3C* report notes that incineration can handle a very wide range of hazardous and industrial wastes and is not very sensitive to feed composition. The Irish EPA briefing note on incineration in Irelands waste management strategy[139] identified the technical role of incineration (with energy recovery) in an integrated waste management solution.

In 1999 an EU scientific research bureau (IPTS) produced a document examining the issues around incineration, for the European Parliament.[140] This report noted that incineration is only one of the options available for the management of waste, and as a consequence its merits must be weighed against those of

[138] www.3c.org.au

[139] Municipal Solid Waste Incineration as part of Ireland's Integrated Waste Management Strategy. EPA, 2004.

[140] The Incineration of Waste in Europe: issues & perspectives. Inst. of Prospective Technological Studies (EU Commission), Seville, 1999, EUR18717/EN.

the other options; the challenge being to find the right mix of options. The IPTS report also notes that incineration with energy recovery is the only practical option for recovery of certain waste streams (e.g. Residual Wastes). In 2002 the European Environment Agency published the outcome of a topic report on biodegradable municipal waste management in Europe.[141] On incineration, this report acknowledges its role in municipal waste management, and identifies certain advantages, viz; internationally well-known and stable running technology (grate incinerators); reduction of volume of the waste to 5% - 10% of original volume; energy recovery; clinker/ash residues are sterile; and CO_2 neutral energy production. The only disadvantage of environmental significance noted in the report is the production of NOx as well as other gases and particulates which require extensive flue-gas cleaning.

There was a lot of discussion on the concept of Zero Waste at the Oral Hearing, and the need for incineration if a zero waste strategy was applied (see ECSE OH Records #3 & #20, Appendix G). Irelands waste production is growing[142] and there are challenges to the Zero Waste concept. For example our hospitals, universities, clinics and animal welfare units all produce hazardous waste: short of closing these operations, these waste streams cannot be prevented or recycled. Incineration is an internationally accepted and EU preferred (over landfill) method of waste disposal. The NHWMP and subsequent waste database reports (EPA, op. cit.) show that the waste production in Ireland is there, and is currently being exported for disposal.

[141] Biodegradable municipal waste management in Europe: Part 3 Technology & Market Issues. EEA Topic Report 15/2001, Copenhagen.
[142] Irelands Environment 2004, EPA.

As noted earlier in this report, incineration is a recognised technology for the treatment of hazardous waste and non-recoverable residual waste (WHO[143], EU[144] & International Conventions[145]). Indeed there may be alternatives to the treatment of some of the waste streams for the proposed Ringaskiddy incinerator, but this does not invalidate the incinerator proposal. It is a BAT technology recognised by the EU in its BRef documentation[146] and in the Stockholm Convention BAT document[147]. All alternatives have their own environmental burdens. What not was demonstrated to me in the submissions or objections is that incineration with energy recovery was the least practicable environmental option having regard to the cumulative environmental burden of the various technologies cited for the individual waste streams. The main point from EU policy is that incineration plays a part in an integrated waste management strategy, and is a preferred step prior to landfill.

The objections have not convinced me that there is no place for incineration (i.e. no need) in an integrated waste management strategy for Ireland.

4.6.6 Changes to EU waste list will reduce the list of wastes and thus the need for incineration

The EU waste catalogue and hazardous waste lists were first published in 1994, and have been amended a number of times since. The EPA publication *European Waste Catalogue & Hazardous Waste List*[148] sets out the legislative history of the

[143] Pamphlet #6 – Waste Incineration, WHO Europe Region, 1996.
[144] http://www.europa.eu.int/comm/environment/waste/index.htm
[145] e.g. Stockholm Convention. Done 22 May 2001, Stockholm, Sweden
[146] IPPC Draft Reference Document on the Best Available Techniques for Waste Incineration. EU IPPC Bureau, Seville, Final Draft May 2005 (previous draft March 2004).
[147] Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants. UN, December 2004.
[148] EPA 2002.

development of the lists and the subsequent legal amendments. What is clear from my examination of the various iterations of the list since first publication is that it is extending, in particular the hazardous waste list. I am aware that the Commission is considering revisiting the definition of waste in the EU Framework Directive on Waste[149], in particular to address recent EU Court decisions on contaminated land and waste, however, I am not aware of any planned EU initiative to reduce the current waste list, not have any Third Party adduced evidence to support this objection.

4.6.7 There is already enough industry in Ringaskiddy

The strategic location of industry in any area is primarily a matter for planning authorities. However from an environmental burden point-of-view the ambient air quality impact assessment undertaken by the applicants (Section 9 of EIS and in waste application documentation) indicated that existing air quality is within standards and the proposed incinerator will not compromise these standards. So, from an emissions perspective the area can accommodate the incinerator. Further detailed discussion of the ambient air impact assessment is presented in Part 4.2 of this report.

4.7 Safety Concerns

It is clear from the Third Party objections that they fear the proposed facility, particularly with-respect-to explosion/fire risk. There were concerns raised on emergency service access, water supply, evacuation, etc. These matters are the responsibility of the Health & Safety Authority (HSA) and local emergency

[149] 75/442/EEC

services. There were also questions raised on the SEVESO[150] classification of the site. The incinerator is not a SEVESO activity; the Transfer Station is. The classification of the activity and regulation of SEVESO provisions is a matter for the Health & Safety Authority. As is the case for any other large industry covered by SEVESO, and prior to the commencement of operations at the site, the operator will be required to have in place all the necessary accident prevention plans and provisions to address the HSA regulatory requirements. In Section 15 of the Waste Licence Application for the Indaver site, the applicant has documented some of the accident and emergency provisions that are planned for the operation. Industrial activities subject to Local Authority, HSA and EPA regulatory control would be considered highly regulated industry.

There are two additional key concerns in this issue cluster that involve the EPA, viz;

- Accident Risk
- Risk from Hammond Lane Site

4.7.1 Accident Risk

The EPA is obliged via §40(4)(h) of the Waste Management Acts 1996-2003 not to grant a licence unless the necessary measures will be taken to prevent accidents in the carrying on of the activity concerned and where an accident occurs, to limit its consequences (after Article 3(e) of the IPPC Directive[151]). It is not logical for the EPA to duplicate the effort of the HSA where an operation is regulated under SEVESO - though there are areas of common interest - and so the EPA assessment should concentrate on, for example, the choice of BAT, the use of by-

[150] Council Directive 92/82/EC on the control of major-accident hazards involving dangerous substances.
[151] 96/61/EC

pass systems, upset emissions management, process control, burn temperature control, bunker fire management, incident notification, firewater management, etc., i.e., the safety aspects of technology choice, operation and control; as well as emissions control and abatement. In the case of a SEVESO site the accident prevention and emergency planning provisions required by a waste licence are a sub-set of the overall site safety plan prepared in accordance with the SEVESO requirements. Further discussion of this point is included in the response to objections on Condition 9, Part 4.9.7 of this report below.

By issuing the draft decision, the EPA has declared that this facility can be operated safely and the application documentation has demonstrated their intentions regarding upset conditions management. Some of these are detailed in Section 15 of the licence application documentation: the final detail for such measures need only be in place prior to the commencement of an activity. In the draft licence the EPA has placed a number of conditions regarding the provision for accidents. Viz, Condition 3.7 Tank & Drum Storage; Condition 3.10.6 Firewater; Condition 3.14.14 By-pass control; Condition 3.14.16 explosive gas and fire risk in the incinerator bunker; Condition 6 Control & Monitoring; Condition 9 Accident Prevention and Emergency Response; Condition 11.1 Incident notification; as well as a range of process control conditions that deal with the safe operation of the plant. Condition 3.18 deals with the specific risks associated with the co-storage of dangerous wastes in the Transfer Station.

The objections express concern that incinerators have a poor safety record. Firstly, the incinerator proposed for the Ringaskiddy site is not in-itself a SEVESO activity, but the Transfer Station component is. So the incinerator would not be classed amongst the higher public safety accident risk operations. From an environmental regulation perspective emissions outside permitted limits constitute a form of accident or incident. The UK Department for Environment Food & Rural Affairs review of municipal waste management[152] noted that there were 56 'incidents' at UK incinerators of emissions outside permitted levels, with the highest number of incidents associated with commissioning of new plant. Notably however, the environmental impact of the emissions was reported as not considered significant. Conditions 3.12 & 3.13 of the draft licence specifically regulate the start-up processes at the incinerator and test-burns, with a view of, *inter alia*, preventing commissioning related exceedances. Modern plant with continuous process control greatly enhances the ability to maintain emissions safety at a facility.[153] The fail-safe solution proposed for the Indaver incinerator is the prohibition in the licence of any by-pass of the flue gas abatement train.

As noted in Part 4.4.7 of this report I am recommending that the EPA retain the services of an expert in incineration technology to review the final detailed design, and inspect the construction of the facility. The brief for this review should include safety aspects of the process design (e.g. flash-back potential for solvent injection to after-burner). This expert should also assist EPA staff in the review of the commissioning tests for the unit.

[152] Review of Environmental & Health Effects of Waste Management: Municipal Solid Waste & Similar Wastes. Enviros for UK DEFRA, HMSO 2004.

[153] Waste Incineration & Public Health. US National Research Council. National Academy Press, Washington DC, 2000.

The assessment and compatibility of waste feed – and safety aspects around this topic - will be a matter for waste acceptance procedures to be developed prior to commencement of operations: Conditions 8.2 and 8.3 of the draft licence refer.

The Third Party objectors have not indicated in their objections sufficient argument to convince me that the provisions in the draft licence will not address emissions control during upset conditions.

4.7.2 Risk from Hammond Lane Site

There were a number of Third Party objectors who witnessed swarf fires on the Hammond Lane Metal Recovery facility which is located between – and adjacent to - the Indaver Transfer Station and the Incinerator. Any potential risk from this site for the SEVESO regulated Transfer Station will be a matter for the HSA, as would any assessment of cumulative SEVESO risk for the area (embracing other SEVESO sites). It would also be expected that in drafting the Accident Prevention & Emergency Response Plan stipulated in Condition 9 of the draft licence that the operator would take into consideration any on-site response required in the event of an incident on adjacent lands that may have implications for the management of emissions on the applicants site. Condition 9.1 of the draft licence could be augmented with a specific requirement to this effect (c.f. recommendations in Chapter 6 of this report).

4.8 Suitability of Technology

Within this issue cluster there are a number of themes that capture the concerns raised by the Third Party objectors. Viz;

- Choice of Technology
- Stack Height
- Operations/Management competence
- Waste acceptance & handling procedures
- Process controls
- Ash & Gypsum Waste Management
- Bunker blending of waste
- Bag filters will not cater for $PM_{2.5}$'s
- Monitoring

A number of objections raised under this heading are related to others considered in previous parts of this report. The issue of the competence of the applicants was addressed in Part 4.4.7 of this report; the role of incineration as an appropriate technology was addressed in Part 4.6.5 of this report; incinerator technology and emissions were presented in Part 4.1.3 of this report; waste ash management was dealt with in Part 4.4.3 of this report; stack height issues are considered in Part 4.2.3.9 of this report; and, the management of very fine particulate matter is considered in Part 4.1.3 of this report.

4.8.1 Choice of Technology

Most of the objections in this sub-cluster deal with the choices for operational plant, abatement technology (e.g. SCR V's SNCR), monitoring techniques, etc. A very long analysis of these issues is possible, however, I have studied the proposals of the applicant and conclude that they are BAT as set out in the EU BRef document[115] on waste incineration, and the proposals also comply with the Stockholm Convention BAT document[116]. No

site specific circumstances have been brought forward to convince me that BAT as specified is inadequate, and will not protect health and the local environment in and around this facility. What the applicant proposes is considered best technology.

Other objections considered that bulk tanks storing hazardous liquid wastes should be stainless steel, and that there should be no underground tanks. BAT for storage of potentially polluting materials is clearly articulated in the recently published EPA guidance, *Storage & Transfer of Materials for Scheduled Activities*[154]. This guidance would apply to the Indaver site, and will inform the selection of the most appropriate containment technology for the types of materials to be accepted. A reference to this guidance would be appropriate in Condition 3.7 of the draft licence (c.f. Chapter 6 of this report).

4.8.2 Process control & waste acceptance

The issue of waste acceptance and handling was addressed in Part 4.8.1 of this report. Further detail on the proposed waste acceptance procedures is included in Section 3.4.3 and 3.14 of the waste licence application. Testing requirements (explosive wastes, radioactive wastes, etc.,) are a subset of waste acceptance requirements. The scheme developed by the applicants has a waste quarantine area identified in the Transfer Station for rejected/suspect loads, it was not entirely clear where waste arriving directly to the incinerator plant would be quarantined in the event of rejection. The evidence of Mr Jones for Indaver to the Oral Hearing failed to clear this matter up to my complete satisfaction. However, this is not a fatal issue and is

[154] EPA, 2004.

a matter that can be agreed at final design stage under the provisions of Conditions 8.3 and 8.6 of the draft licence.

Procedures for the operation of the facility (process control) are to be developed prior to the commissioning of the operations, Condition 3.14.7 of the draft licence refers. These procedures will also have to address the management of the waste bunker and related waste compatibility issues. Condition 8.2.3(d) of the draft licence specifically requires the operator to present written proposals for the mixing/blending of waste in the bunker.

I am satisfied that these concerns can be addressed by properly devised and implemented operational procedures.

4.8.3 Ash Waste & Gypsum Waste Management

There are concerns raised regarding dust and contaminated run-off from the ash waste. The waste application documentation details (Sections 3.11 and 12) that the bottom ash which is wetted as part of the quench cycle, is to be stored in enclosed silos (with abatement), and when exported to landfill will go in covered trucks. A similar arrangement is proposed for the hazardous flue-gas cleaning ash. It will be stabilised and exported for disposal. Further discussion on the ash management is included in Part 4.4.3 of this report. Condition 8.14 of the draft licence requires the enclosed storage of these residues.

Depending on the final abatement technology option a gypsum waste (c.2555t) will be generated on site every year. This is collected and where suitable will be recovered in the construction industry. Otherwise it will have to go to landfill. EU

Council Decision 2003/33/EC bans the co-disposal of gypsum waste with biodegradable waste. The operator will have to secure a dedicated cell in a client landfill for the gypsum. Condition 7.3.2 of the draft licence requires the operator of the facility to explore recycling/recovery opportunities for waste produced on the site. This would include non-hazardous ash and gypsum. The construction industry represents the greatest potential for recovery of these wastes. Any such initiatives have to be agreed with the EPA under Condition 8 of the draft licence.

One of the objections raised the possibility of asbestos fibre being in the ash and there are no proposals to test for same. This is indeed a possibility and should be tested, particularly for characterisation of ash to landfill. A minor amendment of Schedule C.4 of the draft licence would address this issue (c.f. Chapter 6).

I am satisfied that the ash and gypsum management proposals are BAT.

4.8.4 Monitoring

There were concerns raised regarding the validity of the on-line remote monitoring from Belgium of the Ringaskiddy operation; the adequacy of annual monitoring; and the technique used to monitor chlorine in the waste feed.

One objection considered that the proposals for annual monitoring of certain air emission parameters is inadequate given the nature of waste expected. This objection is related to initial proposals from the applicant, the draft licence in Schedule

C1.2 specifies a range of monitoring intervals for different parameters, with varying intervals of Continuous to Quarterly, but no annual interval. In addition, there is a fortnightly requirement to monitor for dioxins/furans in the flue gas. This latter requirement reflects a proposal by the applicants to use the new AMESA monitoring technique (dioxins/furans in flue gas collected in a cartridge, based on proportionate sampling).

Condition 3.14.4(i) of the draft licence specified an hourly limit for Chlorine in the incinerator feed. The Third Party objectors ask how this is to be achieved. Condition 6.4 of the draft licence requires the operator to make provision for, *inter alia*, the monitoring of any control parameters in the licence. It will be up to the operator and installation designed to demonstrate to the agency that the facility can comply with all terms of the licence prior to commencement of operations. The appropriate chlorine monitoring technology is thus a matter for the operator to select, and to be demonstrated as BAT to the EPA.

On the matter of the remote monitoring, all critical monitoring and control requirements for this operation are specified in the draft licence and required to be made available on-site: Conditions 3 & 6 refer. Section 13 of the waste application documentation also details the applicants proposals for monitoring.

4.9 Inspectors Report & Proposed Licence

A number of the objections in relation to the Inspectors Report (Appendix B) comment that there was inadequate consideration given to Third Party submissions on the application. This matter was dealt with in Part 4.4.8 of this report (above). Remaining

issues in relation to the Inspectors Report and the Proposed Licence can be summarised as;

- Inspectors report is erroneous in places
- Inadequacy of Inspectors Report
- Reliance on self-monitoring by the applicant will not work.
- Specified ELV's not lowest possible
- Storm Sewer Discharges
- Deferral of technical matters to the licence
- No continual improvement provisions in the licence

In relation to the proposed licence and conditions I will deal with these objections by condition in numerical order. Some of the objections comment in general in relation to the draft licence stating that the Glossary is unclear and some of the conditions vague: I can only reasonably deal with specific objections to specific parts of the licence as set out below.

4.9.1 Inspectors report is erroneous and inadequate

No satisfactory evidence has been adduced by the Third Party objectors to demonstrate that there are errors in the Inspectors Report of such significance that they could be fatal to the decision made by the Board of the EPA.

On the subject of adequacy, this is a similar argument to that presented in Part 4.4.8 above in relation to the way Third Party submissions are considered in an inspectors report: there is a deal of technical and procedural interpretation in relation to the detail that should be presented in an inspectors report to the Board of the EPA in relation to an application for a licence. The Inspectors report is not intended to reproduce an EIS or the waste application. Its main purpose is four fold: viz,

- To record the independent assessment of the environmental impacts and mitigation measures, associated with a proposed activity
- To identify how key (relative to the type of activity) legislative requirements have been taken into account in the assessment of an application (so, for example if an activity is not discharging effluent to groundwater, then a detailed assessment of impact with-respect-to groundwater legislation may not be relevant).
- To document an assessment of submissions from third parties in relation to an application
- To make a recommendation regarding grant or refusal of a licence, and to identify and give reasons for key regulatory controls to be included in any recommended licence

The EPA model for an inspectors report has also evolved to include certain summary information that is helpful to the reader (EPA Board, public). This information is on the public file, in the EIS and in the application documentation, however it is useful to gather this information into the Inspectors Report as it helps to inform the reader of the technical, geographical and statutory background to the application. I speak of information like:

- Identification of the applicant and what is being applied for
- Summary description of the activity and its setting
- Identification of the main environmental aspects of the activity, and the management proposals for these aspects

So in relation to these three points, an inspectors report does not set out to duplicate the application documentation or the EIS, but to capture the essence of the project in an easy to digest

form. The Board of the EPA has the full application file available to them in making decisions on an inspectors report, should the need arise.

Except in the case of an Oral Hearing report which is a different case, there is no statutory requirement for an inspectors report on an application to be drafted, however such reports have become the procedural norm for regulatory authorities like EPA, both as a record of the assessment of an application, and as the basis for decisions. It also performs a very useful function in relation to public participation in that the reports document how the views of the public have been taken into account. This is an important element of the Aarhus Convention (op. cit.). §40(2)(b)(ii) of the Waste Management Acts, for example, requires the EPA to have regard to any submission made in relation to an EIS. An inspectors report documents such regard. However, where an inspectors report *is* made, Article 19(8) of the Waste Management (Licensing) Regulations 2004 (SI 395) requires that such a report be made available for public inspection.

An inspectors report has to be a fair and accurate representation of the file and the facts, and must be thorough when dealing with the main environmental aspects of an activity. I have reviewed Mr O'Brien's Inspectors Report for the Indaver application and find that it achieves this procedural burden. I am not satisfied that Third Party objections on the matter of report inadequacy can be upheld.

4.9.2 No trust in Self-Monitoring Paradigm

The Third Party objectors express concern regarding the reliance or trust placed in licensee self-monitoring in relation to the

operation of the proposed activity. Firstly it must be pointed out that the licence specifies a large number of process and operational control parameters, and it will not be possible for the applicant to comply with the licence or operate the plant safely if they do not monitor as specified. The EPA does not have staff on-site 24hours a day checking these control parameters, but does undertake its own independent monitoring which is usually unannounced. The conditions of the draft licence require a range of on-site arrangements to support control of the operation, viz, the establishment of an environmental management system, recording of procedural and technical breaches, corrective actions, incident responses, equipment calibration and functioning, staff training, use of accredited test methods, etc. EPA site inspections and audits set about evaluating and testing of operator compliance with these and all other licence obligations. Trust does not inform the construction of licence conditions. Such conditions are informed by what is technically, legally and administratively required or necessary for best practice. Trust is something for the operators to earn with respect to the local community.

4.9.3 Specified ELV's not lowest achievable

Some objections comment that EU emission limits may come down by the time the plant is built and that the limits specified in the licence can be bettered. Employing the *Precautionary Principle* would dictate use of these better limits.

The applicant has stated that with the abatement technology proposed they are likely to achieve emissions with Dioxin/Furan concentrations of only 10% of the specified EU limit. If EU emissions do drop before the facility comes into operation these limits, if done by direct effect, will have to be complied with by

the facility before it can commence operation. A lengthy discussion of the basis for the EU Incineration Directive limits is included in Part 4.1.1 of this report, and a discussion of the *Precautionary Principle* is included in Part 4.4.2 of this report. The limits specified in the draft licence represent the EU standard as specified in the Incineration Directive and the EU BAT document[115]. All the limits specified in the draft licence are appropriate for the activity and technology proposed, and where specified, are maximum admissible concentrations, and are considered safe.

Objections also raise concerns in relation to the specified noise limits and the potential for nuisance. The limits specified in the licence represent industrial best practice (c.f. EPA Noise Guidance publication[155]). In addition Condition 5.4 of the draft licence protects for potential tonal noise impact, and Condition 6.2 requires the annual monitoring of noise emissions from the facility at specified noise sensitive locations outside the facility. Noise impact during operational phase of the activity is not predicted to be of significance. However, in the event of ongoing complaints in relation to noise attributable to the facility, appropriate enforcement action can be taken. I am satisfied with the measures in the draft licence in relation to noise nuisance.

4.9.4 Storm Sewer Discharges

Some objections expressed concern that there is no proposed monitoring of the harbour water, and that discharges to the storm sewer may cause flooding/contamination at Ringaskiddy and in the bay.

[155] EPA Guidance Note for Noise in Relation to Scheduled Activities. 1995

There are no process effluent discharges to the bay or to sewer from the proposed facility. Only uncontaminated storm water may be discharged to sewer. The draft licence conditions include provisions for the continuous monitoring of this water stream and a prohibition on discharge to sewer unless uncontaminated (Conditions 3.9.3, 5.1 & 6.1 refer). I am satisfied with these provisions. On the issue of flooding of the sewer and hydraulic capacity of same, this is a matter for the operator to agree with the owners of the storm sewer. If the receiving storm sewer has capacity limitations, then the applicants will have to come forward with alternative storm-water management arrangements. No such capacity constraints have been identified in the application documentation or in any communication from the sewer undertaker on EPA files.

4.9.5 Deferral of technical matters to the licence

A number of the Third Party objectors are unhappy about the deferral of certain technical matters to the licence and believe that these should be assessed in advance of any approval. This is simply not reasonable in some cases, and not possible in others. The final detailed design of the facility will not be developed until all authorisations are in place, as some of these authorisations will influence the design. Matters like Emergency Plans or waste acceptance procedures need not be established until the facility is nearly ready to commence operations. The technical competence of the operational staff can be held over too as it is not reasonable to have an operator retain or commit staff to a project at application stage, that may not start for some years hence. Indeed it may not commence at all if all the relevant authorisations are not in place. Other matters like liabilities risk

cannot be contemplated until the final design is in place. In my view it is quite appropriate to defer to the licence certain matters that are key to the successful management and operation of the facility, and either the presence, or fine detail, of which is not necessary at the consent assessment stage.

4.9.6 No continual improvement provisions in the licence

This concern is catered for by, for example, Conditions 2.3.2, 2.3.3, 6.13 and Condition 7 of the draft licence.

4.9.7 Licence Conditions

This section deals with the many Third Party objections to specific conditions or terms of the draft licence issued to Indaver (Appendix B-4). The format for this consideration is firstly a statement of the objection followed by my assessment and recommendation.

Some of the objections are generic in nature and comment that the conditions (as a whole) are inadequate to regulate the operation. These are not specifically addressed here, but are addressed globally in my recommendations in Chapter 6 of this report.

Any reference in this section to *Parts*, *Conditions* or *Schedules* of the draft licence refer to those in the Draft Decision issued 26 October 2004 (Appendix B), and unless otherwise indicated these conditions survive intact into the recommended final licence (refer Chapter 6 of this report and Appendix I).

Part I – Activities Licensed

The objection believes that it is not clear from this part what activities are licensed.

This part of the licence formally states the Statutory classes of activity being authorised: the classes being set out in the Third and Fourth Schedules to the Waste Management Acts 1996 – 2003. For detail of the actual processes and wastes being authorised, it is necessary to refer to Conditions 1.1, 1.4, 1.5 and 1.6, as well as Schedule A of the licence. Importantly, Condition 1.1 refers to the waste processes described in the application documentation (including the EIS): and unless varied by a condition or refused, the processes thus applied for are legally bound into the licence.

Condition 1.3

This objection wishes the licence to specifically state that obligations under planning controls are not set aside.

I am of the view that the condition as worded achieves this objective.

Condition 1.4

The objection wishes that the waste tonnage limit in this condition reflects the limits set for each incinerator.

Schedule A of the draft licence sets the individual limits for the tonnage of waste to be processed at the various elements of the facility, there is no need to duplicate that control in Condition 1.4 which just looks at the overall capacity of the facility.

Condition 1.5

The objection asks that the position of solvent recovery on-site be clarified.

This objection is not altogether clear, however it is possible to state that, except for the operation of *waste transfer*, there are no authorised solvent Recovery[156] operations on-site. Solvent imported to the Transfer Station may be deemed suitable for recovery or reuse on another site and exported under licence for that purpose. Under current EU law all solvent waste sent to an incinerator is classed as Disposal, even if it plays a part in energy recovery.

Condition 1.7

The objection suggests a revised text for this condition, which would have the effect of ensuring that all plans, programmes, and proposals get written approval prior to their operation.

This condition sets out the role of agreed plans or programmes within the context of a licence, and provides for amendment of same. There are many plans and programmes to be devised in support of the operation of this facility, not all of which it is necessary to get Agency agreement in advance. The critical plans and programmes have been identified in individual conditions and generally do require agreement in advance (e.g. Conditions 2.2.1, 3.12, etc).

Condition 1.9

The objection notes that the applicant, during the application process, modified the range of wastes to be accepted and that

[156] Recovery and Disposal activities as defined in the Third and Fourth Schedules to the Waste Management Acts 1996-2003 and in Annex II of the Waste Framework Directive (75-442-EEC).

this change satisfies the criteria specified in the condition: thereby making the original application null and void

The condition is not retrospective. Any variation in waste feedstock raised in the application process is a matter for the application procedures and not the licence. What is relevant is that when the Recommended Decision was put to the Board of the EPA by Mr O'Brien, the full range of proposed wastes to be accepted was on the record.

***C**ondition 1.9(a)*

What exactly constitutes a 'material change or increase', how much is permitted before it is deemed significant.

This will be a matter for the EPA to articulate for a licensee, as it will vary from site to site depending on the processes; and is to some extent informed by §46(6) of the Waste Management Acts 1996-2003 which suggests that a material change is one that has environmental consequences. The issue of regulating change on an industrial site is also addressed in the IPPC Directive.[157] Article 12 of the Directive introduces the concept of *Substantial Change* in relation to the revision of operational permits. The Directive defines Substantial Change as one which, in the opinion of the competent authority, may have significant negative effect on human beings or the environment. The UK Environment Agency in 2004 published a very useful guidance note on defining *Substantial Change*.[158] What is clear is that though some generic principles governing notification of change can be established, the definition of what constitutes 'substantial change' or 'material change' is a site-specific

[157] 96/61/EC

[158] Change in Operation and Substantial Change under IPPC. UK Environment Agency Regulatory Guidance Series #1. June 2004.

matter having regard to the type of operation and the processes, and is a matter for the operator to agree with the Office of Environmental Enforcement. For the purposes of this objection material change can be articulated, at its most conservative, to be a change which at the very least has the potential to result in negative environmental consequences.

Conditions 2.1 & 2.2

The objection wants this condition modified to the extent that it will ensure the incinerator is not operated unless there is written approval of licensee personnel and that there is better clarity on the qualifications and experience necessary.

This point is accepted and Conditions 2.1 and 2.2.1 should be amended to reflect this. Condition 2.2.1 governs the notification of the management requirements specified in Condition 2.1 (c.f. recommendations in Chapter 6 of this report).

Condition 2

The applicant has not detailed corrective actions in their application.

The procedures for corrective actions will be devised as part of the Environmental Management System required by Condition 2.3.1. Although not explicitly stated in Condition 2.3.1, it is implied that the EMS has to be in place prior to the commencement of the waste handling operations on the site. Minor modification of Condition 2.3.1 would clarify matters (c.f. recommendations in Chapter 6 of this report).

Condition 2.3.2

The obligations for waste minimisation are nugatory taking into account what the facility is to do.

This condition speaks to the waste residues (including metals) of the disposal process (incinerator) and could also be extended to the waste handled in the Civic Amenity and Transfer Station components of the facility, where-in any waste that can be sustainably recovered or recycled should be diverted from the incineration units.

Condition 2.3.7

The objections require that information on types and quantities of wastes received, stored and dispatched (and their fate) should be available for inspection, as should the Environmental Management Programme (EMP) and the Annual Environmental Report (AER). An objection also notes that it is not clear when – relative to commencement of activities – the communications programme should be in place.

Conditions 11.3.2, 11.3.3 &11.3.6 of the draft licence require the maintenance of such records, and Condition 11.6 requires the annual report of this data to the EPA. It is my experience on regulated industrial sites, that public communication programmes such as that anticipated by Condition 2.3.7 have generally included a copy of the Annual Environmental Report. The results of each years EMP effort and plans for the following year are required elements of the AER (refer EPA guidance on AER's). In any case this document would be on public file with the EPA. In relation to the timing of the preparation of the Communications Programme it is recommended that the wording be slightly

amended to state when the programme is to be in place (c.f. recommendations in Chapter 6 of this report).

Condition 3.1

The objection suggests that the operation of the incinerator should be prevented until written approval of all infrastructure has been given by the EPA. Additionally, the objection notes that the requirement to have all infrastructure – including the second incinerator – in place before/without the need for, planning permission subverts the democratic process

It was discussed in an earlier section of this report (4.4.7) that EPA approval of the design, and construction quality assurance programs would enhance the licence. Some modification of Condition 3.1 is necessary to accommodate this and by consequence will address the concerns of the first part of this objection.

In relation to the second part of the objection, I would note that this point was a matter of some anxiety to the general public and indeed to the applicant (refer Part 5 of this report). I reiterated at the Oral Hearing that the requirement for planning approval for the second incinerator (for municipal solid waste) is not set aside by the EPA licence. That said, the condition as worded would suggest that the infrastructure for the second incineration should be in place co-incident with the first incinerator (for hazardous waste). Some re-crafting of the condition would rectify this anomaly and source of confusion (c.f. Recommendations in Chapter 6 of this report).

Condition 3.2.4

No conditions for groundwater protection specified.

There are no discharges to groundwater from this facility. Protection of groundwater is implicit in, for example, Condition 3.7 of the draft licence which deals with the safe containment of polluting substances, as well as Conditions 3.9 and 3.10 on surface water and drainage management. These conditions are for the express purpose of preventing loss of polluting material to groundwater. Moreover, Condition 3.2.4 sets out a requirement for the installation of groundwater monitoring boreholes and Schedule C.6.1 (via, Condition 6.1) sets out the monitoring requirements for groundwater. I cannot uphold this objection.

Condition 3.4.1

The objection believes there to be a contradiction between the requirement in this condition for a security fence and other structures required by the draft licence.

The objection has not expanded on this point to identify specific contradictions, so it is difficult to respond in any detail. Suffice it to say that the final configuration of the fence will have to ensure 'adequate' security, which in the context of this licence and the EPA remit, can be interpreted as securing those areas where wastes are processed and stored, or where processing, treatment, control, monitoring and abatement equipment or plant is kept/operated. The main purpose of this condition is to prevent unauthorised access and/or interference with any part of the operation that may lead to accidental or unscheduled emissions.

Condition 3.5

Capacity limitations and bunding arrangements for waste inspection and quarantine areas should be specified.

This concern is addressed via Conditions 3.7 and 8.6 of the draft licence.

***C**ondition 3.5.3*

The objection comments that if the radioactive scanner requested in this condition is not functioning then waste input should cease.

I am not convinced that the vulnerability with respect to potential radioactivity is the same for all waste streams. It would be negligible for MBM for example; therefore a total cessation of all waste input may not be appropriate. It will be necessary for the operator as part of the procedures for waste acceptance required by Condition 8.2 to define what limited waste streams will continue to be permitted in the event of failure of the radioactivity detector. Condition 6.10 requires the continued functioning of all key equipment, and notification of the EPA in the event of failure. I am satisfied that adequate controls are included in the draft licence.

***C**ondition 3.6.2*

No negative pressure for fugitive emission control at the transfer building; where will the vapours go.

Condition 6.13 of the draft licence addresses the management of fugitive emissions. Additionally, a specific condition has been devised to deal with fugitive emissions generated during drum washing or repackaging; refer Condition 3.18.3. The waste application documentation details the applicant's proposals for containment of vent gases from bulk storage gases, and other potential fugitive emissions (Section 9.6 & 9.7). I am satisfied this concern is adequately addressed.

***C**ondition 3.7*

The bunding capacities indicated in the condition are inadequate, what will flooding risk add to the requirements? Also the bund testing should be every 2 to 3 years and not 5 as specified in condition 3.7.5.

Condition 3.7 of the draft licence has to have regard to the management of flood or rainfall derived waters in the design of bund capacity. The flooding risk to the site was dealt with in part 4.3.1 of this report, and I am satisfied sufficient mitigation is provided. In relation to the frequency of testing of bunds it should be pointed out that this only refers to detailed technical testing, and does not preclude the more regular inspection of such facilities as part of routine site facility maintenance activities. Condition 6.14 provides for such inspections on a weekly basis. Such inspections may indicate more frequent full technical tests should defects be identified. I am satisfied that the concerns expressed are adequately addressed in the draft licence.

***C**ondition 3.9.2*

What does 'as far as practicable' mean, where will water go when it cannot be used?

The water in question is not a process effluent. The incinerator has a requirement for water use in the process. The recovery of storm water for this purpose saves on the use of mains water. To me this condition means that where the incinerator has the capacity to use the water, it will be used; and provided the chemistry of the water has not been compromised to the extent that its use in an abatement

system or boiler system, for example, is technically unacceptable. This condition aims to conserve resources, and is not a point of vulnerability for the operation.

***C**ondition 3.9.3*

There is no detail in the licence on how run-off to surface water and sewers should be monitored and controlled, the associated Schedule C is empty, why are no limits set for protection of marine environment.

Conditions 3.9 and 3.10 set out control requirements for surface water management. There are no process emissions to sewer from the activity, only sanitary waste is discharged to public foul sewer. Excess roof water (not re-used in process) is discharged directly to Local Authority storm sewer. Storm water from hard-standings, etc., is discharged via a monitoring point to Local Authority storm sewer. This latter discharge is monitored, and Condition 6.1 and Schedule C.2.3 of the draft licence refer. No limits are set for this storm water discharge because no polluted water is permitted to be discharged to storm sewer: the latter part of Condition 5.1 and Condition 5.2 refer. I am satisfied with these arrangements.

***C**ondition 3.9.4*

The parameters selected for surface water monitoring (pH and TOC) are crude and unlikely to detect anything but the most severe spills.

The objection is mistaken in understanding that only pH and TOC are to be monitored: Schedule C.2.3 details the full suite of monitoring parameters. This condition seeks to have early warning levels set for two key parameters. Having regard to

the nature of the activities, I am satisfied with the parameters selected.

***C**ondition 3.10.2*

The conditions should also specify a minimum amount of spill absorbent material to be maintained on-site.

The adequacy of the quantity of spill containment materials held on site will be a matter for enforcement following assessment of predicted daily risk and accessibility to new supply. Such an assessment will vary depending on the intensity of operations on site and is thus best left to be decided by the Office of Environmental Enforcement at the appropriate time.

***C**ondition 3.10.3*

The objection notes that some solvents are miscible with water and others denser and will not be catered for in the interceptor.

This point is true, though the denser solvents should be retained by the standard Class II interceptor. Conditions 3.9.3 and 3.9.4 of the draft licence require the installation of continuous TOC meter at this discharge to storm sewer which should trigger the presence of any fugitive miscible or other solvents in the storm water run-off. Moreover, Condition 3.7.3 requires the separate collection of any drainage from tank and drum storage areas. I am satisfied that the combined impact of these provisions addresses the risks identified by the objection.

***C**ondition 3.10.4*

There is no information identifying where the sludges spoken of in this condition will be disposed of, the EPA had asked for this, as

additional information in the application determination, but no information was supplied.

Such final site service contractual matters can be decided upon at a time nearer commencement of the operation. It may be that the sludge will be disposed of to the incinerator. This is a minor point of operational procedure that need not be finalised in advance of commencement of operations.

***C**ondition 3.10.6*

It is reported by the applicants at the planning inquiry that there is 2 hours of fire-water storage, it is suggested that this is not adequate.

I am satisfied that the fire-water management provisions specified in the licence application (Section 15.7) are acceptable.

***C**ondition 3.11.1*

The objection raises concerns regarding the queuing of trucks on the public road waiting to enter the site.

Such external traffic management issues are for the Local Authority.

***C**ondition 3.12*

The objection states that control of temperature in the post-combustion chamber is not adequately addressed by Condition 3.12.2(c). An objection also requests that the Test programme required by this condition be available for public inspection.

Condition 3.12.2(g) of the draft licence is intended to extract and put in place those very controls identified by the objection. Conditions 3.14.9, 3.14.10 and 3.14.11 also address

this concern. I am satisfied with these provisions. On the matter of public inspection, I should note that with very few exceptions (e.g. certain company financial information deemed confidential), all correspondence, reports, proposals, inspections, etc., associated with the operation of waste facilities are on EPA public files. The document in question would not qualify for confidentiality.

Condition 3.14

The objection notes that as some of the waste input will be uncharacterised then the calorific value will be unknown and this condition cannot be complied with.

Condition 8.2.3 of the draft licence details the procedures that will have to be established in relation to waste acceptance. I am satisfied that these are adequate to address the concern expressed.

Condition 3.14.4

The objection comments that, as dioxins have to be monitored only quarterly and that there are no limits defined for the ash, then how can there be confidence in the quality of the input controls required by this condition.

The final design of the plant will have to be able to prove ability to comply with Condition 3.14.4 before operations would be permitted to commence: an inability to operate the requirements of this condition would in my view constitute an incident and the plant thus could not operate. The definition of *Incident* in the *Glossary of Terms* in the draft licence should be amended to note that a failure to operate to the specified controls set out in the licence would constitute an incident (c.f. Chapter 6 of this report).

Condition 3.14.8

The permitted values for TOC and loss on ignition are higher than can be achieved technologically, and may *hide* other contaminants.

This condition reflects a legal requirement specified in Article 6 of the EU Incineration of Waste Directive[159] and so must prevail.

Condition 3.14.10

The objection comments that a higher temperature (similar to that for halogenated organic substances) is needed when burning Meat & Bone Meal (MBM) in-order to destroy the prions.

The EU Scientific Steering Committee[160] concluded in 1999 that the burning of animal tissue waste at 850^{0}C for 2 seconds is a recommended standard for disposal. Additionally the Irish Interdepartmental/Agency Committee on Disposal of Meat and Bone Meal[161] concluded that incineration - at minimum 850^{0}C for 2 seconds - is an acceptable and safe disposal mechanism for MBM provided all the existing regulatory conditions are observed. The proposed technology at Ringaskiddy will meet these standards.

Conditions 4.1.1.3 & 4.1.2.1

The objection believes that the ability to discard 10% of measurements is excessive, and also that uncertainty error (noted in Condition 4.1.2.1) should be added.

[159] 2000/76/EC
[160] EU Scientific Steering Committee, June 1999. http://europa.eu.int/comm/food/fs/sc/ssc/out53_en.pdf
[161] Report of the Inter-departmental/Agency Committee on Disposal Options for Meat & Bone Meal. 04-12-2003, Dept of Agriculture, Ireland.

This objection refers to the interpretation condition. The condition does not say that up to 10% of samples can be discarded, rather, it says that in the case of malfunction or maintenance no more than 5 samples in 48 (c.10%) can be discarded. That said, this sample processing clause, as well as the handling of the uncertainty error, are provisions of the Incineration Directive[162] and so must prevail.

Condition 5

On-site meteorological monitoring should be included in emissions monitoring.

Given the proximity of the proposed site to the meteorological station at Cork Airport and the limited station at Roches Point, I am not convinced of the need for the operator to install their own station. That said, the terms of Schedule C.5 of the draft licence - requiring meteorological monitoring - does allow for the operators to suggest a station of their own, should they wish it.

Condition 5.1

The objection expresses amazement that no discussion or detail of fugitive emissions management is included/specified. Additionally an objection queries as to what is meant by 'environmental significance', and how will this be measured/proven.

This matter of fugitive emissions is dealt with in the response to an objection on Condition 3.6.2 above.

On the subject of environmental significance as stated in the second part of Condition 5.1, and without prejudice to any

[162] Article 11 of 2000/76/EC

decision by the courts, such a determination would have regard to very many factors and will be for the OEE to decide depending on observed or measured impact of emissions on the receiving environment. Relevant criteria to take account of would, for example, be: character, magnitude, duration and extent of impact; or whether a substance emitted was a listed substance (e.g. breach of National Environmental Quality Standard). Aside from the straightforward deterrent or operational shackles imposed by this part of Condition 5.1 on the operator, this text is what, in enforcement, one might term 'a sleeper'. That is, a condition that one expects will never be relevant as all specified emissions will be within assigned limits and from authorised emission points, with no other notable emissions. But in the event of an incident the licence has an enforceable component that can be 'awoken': and the appropriate enforcement response will be informed by an assessment of the environmental significance of the unauthorised emission. The concept of 'significance' being applied to an incident is in my view reasonable and allows the principle of proportionality to be applied in the identification of an appropriate enforcement response. This concept is also reflected in the definition of environmental pollution in §5 of the Waste Management Acts 1996-2003.

Condition 5.2

The objection suggests that this condition would be impossible to comply with during flood conditions.

As noted in part 4.3.1 of this report the incinerator is some meters above the highest flood level, I am therefore satisfied that incinerator gas cleaning effluents do not represent a risk in the event of such a flood.

Condition 5.3

There is no provision in the licence to require an environmental monitoring programme outside the confines of the site and in particular in the centres of population nearby; items to be monitored should include – noise, vibration, dust, smell, fumes, and key air quality parameters. The matter of interpretation of environmental significance also came up in relation to this condition; refer the response to objection on Condition 5.1, above, in relation to this matter.

The draft licence is constructed around the principle that monitoring and control of emissions obviates the need for ambient monitoring. A long discussion of the value of standards based regulation and community monitoring is presented in Parts 4.1.1 and 4.1.2 of this report. There is often a profound difficulty in interpreting the source of ambient anomalies in data provided by one operation; such an interpretation is even more difficult in an already industrialised and urbanised area. The draft licence does require the collection of noise data - as may originate from the activity – within the community: Schedule C.6.2 of the draft licence and Table 8.7 of the EIS refer. For noise, it is generally easier to discriminate source, which thus reduces the general vulnerability of ambient monitoring and relationship to a specific operation. I am satisfied that the operation controls and emission limits specified in the draft licence are sufficient to protect the health of the local population and the environment, and so obviate the requirement for ambient monitoring to be specified in this licence. This conclusion does not diminish the value of a regional authority driven community ambient air monitoring for the purpose of

informing strategic planning (infrastructure, industry, etc.,), and monitoring of potential environmental burdens on community health. It is my view that such monitoring should, as a matter of best practice, be undertaken by all local/regional authorities whom that have strategic planning and community health responsibilities.

Condition 6.4

The objection queries whether the text in this condition requiring the monitoring of 'any emission' is achievable.

The objection makes a good point, I recommend amending the text of this condition to note that reference to 'any emission' shall be linked to emissions specified in the licence (c.f. Chapter 6).

Condition 6.5

The competencies required by this condition are not specified, the Agency should decide on these.

It would make a licence too unwieldy to have to detail within it all the possible international technical qualifications acceptable for the different functions. This will be a matter for the EPA Office of Environmental Enforcement (OEE) to audit. The operator, on finalising the operational staff compliment or list of external contractors, will have to demonstrate compliance with this condition to the satisfaction of the OEE.

Condition 6.6

The objection queries the meaning of 'representative' in this condition.

This generally means flow proportional or time proportional sampling as the case may be, depending on the specific emission.

Condition 6.8

The objection here comments that the EPA does not seem to know what standards exist.

This condition does not seek to identify a comprehensive list of all the relevant standards available and relevant to sampling protocols. The condition merely insists that all sampling is done to a recognised standard, and preferably a European norm if available. I cannot support the view of the objection in this case.

Condition 6.9

The objection requires the Agency (competent authority) to calibrate monitoring equipment, or have auto calibration abilities.

In relation to the correct operation of equipment it will be a matter for the operator to document the instrumentation, technical standards, technician or laboratory used to maintain and calibrate such equipment, and to demonstrate the integrity of such protocols to the satisfaction of the OEE. Condition 6.4 of the draft licence mandates the correct operation of such equipment; any failure to do so would constitute a breach of the licence. The EPA does not offer calibration services, but does undertake its own monitoring which is used to validate operator monitoring.

Condition 6.10

An objection believes that back-up monitoring equipment should be available on-site.

The condition as worded provides for replacement. In addition Schedule C.1.1 specifies the key equipment that has to be available to ensure functioning of the emissions control and abatement plant. Any failure of this equipment would be considered an *Incident* for the purposes of Condition 9. In addition Condition 3.14.12(d) of the draft licence requires the cessation of waste feed to the incinerators in the event of failure of critical measurement devices. I am satisfied that the objectors concern is addressed in the draft licence.

Condition 6.15

The objection suggests that the sampling and characterisation of the residue ash should be done by the competent authority.

Sampling and characterisation of the ash will have to be done by a laboratory certified for the requisite tests. The operator will have to prove this to the OEE. The EPA is also capable of taking its own samples and having these analysed. The operator is intending to have a laboratory on-site, however it may not be accredited for the full range of parameters to be analysed as specified in Schedule C.4, and thus may use an independent laboratory for ash testing. In any case I am of the view that this ash should be independently tested at least once per annum. A small amendment to Schedule C.4 would ensure this (c.f. recommendations in Chapter 6 of this report).

Condition 7.4

An objection considers that a study of the heat recovery efficiency should be done prior to build of plant as retrofitting is difficult.

> BAT for this facility will be maximum recovery of heat and should be accounted for in the design. In any case, I have previously indicated that an independent design review should be undertaken, and this point can be addressed as part of that review (refer also to recommended final licence in Chapter 6 of this report).

Condition 8.2.3(a)

The objection states that the applicants have already stated they will take customers' word regarding the nature of waste arriving at the facility and that this is not good enough.

> This issue has been addressed in the response to an objection on Condition 3.14 above, and it will be a matter for the operator to satisfy the OEE that the procedures are thorough and safe.

Condition 8.3

The objection states that incoming waste that contravenes the conditions of the licence should not be accepted. Also an objection states that it is unclear how wastes are to be deemed unsuitable and what will happen unsuitable loads.

> In relation to the first point I would say that this is what the condition demands. On the matter of waste suitability checking I would refer to Condition 8.2.3 of the draft licence which requires detailed procedures for same. I would also refer to Conditions 8.4 to 8.6, inclusive, of the draft licence

which – in addition to Condition 8.3 - detail arrangements for unsuitable wastes.

Condition 8.4

The objection states that there is no information on the waste leaving the site and this should be known in advance; how will this waste be controlled?

This concern is addressed in Conditions 8.4 and 8.5, and Schedule C.4 of the licence. The final character of the wastes leaving the site will only be definitively known following start-up of the facility and waste/residue testing.

Condition 8.8

The objection notes that the prohibition of mixing of waste cannot be complied with, as the waste will be mixed in the bunker prior to feeding to the incinerator.

The condition actually states that unless approved in writing, then mixing is prohibited. The draft licence is an approval in writing for the processes described in the application including bunker operations and waste feed preparation, and the bulking up of waste in the transfer station for introduction to the incinerator. This legal requirement is mainly rooted in Article 22(1)(b) of the Irish Waste Management (Hazardous Waste) Regulations 1998[163] which in turn is rooted in Article 2 of the EU Directive on Hazardous Waste[164], and the main purpose of these controls are, *inter alia*, to prevent the dilution of hazardous wastes by other wastes for registration/classification purposes. The legislation

[163] SI 163 of 1998
[164] Council Directive 91/689/EEC of 12-12-1991 on Hazardous Waste.

does provide for agreement of mixing such as indicated in the condition.

Condition 8.9

The objection queries how infectious waste is to be identified, and the prohibition on mixing will not work given the feed management system.

The classification of the waste is a matter under national stature for the waste producer. It will arrive at the facility pre-classified as 'infectious'. As to the point on mixing, I believe the objector is taking a too restrictive view of the term 'the incinerator' in this context. In my view the condition seeks to prevent the mixing of, in this case, the clinical waste with other wastes in, for example, the Transfer Station prior to delivery to the incinerator. The condition does not apply to actions in the hopper where all waste is automatically blended/shredded for introduction to the furnace.

Condition 8.13

The objection states that flooding of the site will wash pollutants from the waste ash and gypsum storage into the harbour.

These wastes are stored in contained areas protected from such events. Conditions 8.6, 8.13, & 8.14 of the draft licence refer.

Condition 9

The objection asks that this condition be modified to prevent operation of the facility until the Agency has approved all policies, procedures and other details of accident prevention & emergency planning. It is also demanded that the condition be

modified to require the local communities to be consulted on the accident and emergency prevention plans prior to them being approved.

The point regarding approval by the EPA of the accident prevention & emergency response procedures prior to start-up is accepted. Conditions 9.1 and 9.2 should be endorsed to this effect (c.f. Chapter 6). I am not convinced that the agreement of the plans specified in Condition 9 with local communities is the most appropriate way forward. The plans identified in this Condition would be a sub-set of an overall emergency response plan as required by the SEVESO Directive and national Regulations[165]. The EPA devised accident prevention plans and emergency response tend to be inward-looking from a site point of view and deal with the management of materials, plant, emissions and abatement equipment for the purposes of firstly preventing accidents and then the management of these elements - particularly emissions - in the event of an accident. The SEVESO emergency plans tend to take a wider and more comprehensive view involving external actors. It is perhaps more appropriate for the competent professional authorities who serve the communities with respect to accident response preparedness (HSA, Local Authorities, Fire Officers) to agree safety plans on behalf of the communities. This is provided for in the various authorisations a facility, such as that proposed by Indaver, has to secure (Planning, EPA Licensing, HSA approval, Fire Certificates, etc.,). These approval procedures protect the interests of the community in relation to accident related health and safety concerns.

[165] European Communities (Control of Major Accidents Involving Dangerous Substances) Regulations 2000, SI 476 of 2000.

Condition 9.4.1(a)

The objection asks where are the *appropriate facilities* referred to in the condition, operation should not commence until there has been agreement on these.

> The identification of these 'appropriate facilities' will be a matter for the operator to detail in the site emergency plan when drafted. It may be some years until the incinerator is commissioned and the local, regional or international range of appropriate alternative facilities may be quite different to that currently available. I see no need to agree these options as part of this permitting process. Condition 8.4 of the draft licence would still govern the transfer of waste as anticipated by Condition 9.4.1(a).

Condition 10

The objection states that the closure bond of €12.5M is inadequate to close the site, the objection suggests €100M. Objections also query what sort of indemnities will be put in place.

> The sum quoted in the objection is in fact the insurance indemnity currently held by the applicants, and not a closure bond. Nor is it the likely appropriate amount of public-employers liability indemnity for the activities proposed for the Ringaskiddy site: such a determination would have to be a matter of expert assessment following completion of project detailed design/construction. Condition 12.2 of the draft licence requires the operator – prior to commencement of waste acceptance – to have completed a liabilities risk assessment which is for the purpose of identifying the liabilities due to un-planned events (accidents) and planned events (closure). These are quite distinct areas of risk. Only when this

work is completed will it be possible to finally determine the right sum for public & employer's liability in the event of accidents, as well as the sum for the decommissioning of the site. Condition 12.2.1 makes this requirement clear. Minor clarification of the title to this condition (Condition 12.2) would assist in making this point (c.f. recommendations in Chapter 6 of this report). I would also recommend the amendment of Condition 12.2.1 to state that the liabilities assessment should be undertaken by an appropriately qualified professional firm. The Condition requires that the operator will not be able to commence operations until these matters have been satisfactorily addressed. It is not appropriate to have such indemnities in place at time of permit consideration. Condition 12.2.5 refers specifically to the Closure/Decommissioning fund; the computation proposed is not relevant to the calculation of renewal indemnity for accidental risks cover. Minor clarification of the condition would assist. I cannot predict now if the indemnity will be the €100M suggested by the objection, but I am satisfied that the draft licence provides for the risks to be properly evaluated, and to be provided for, prior to commencement of waste operations at the facility. It should also be noted that the proposed facility at Ringaskiddy would be a specified activity for the purpose of the EU environmental liability Directive[166]; this Directive has to be transposed into National law by 30 April 2007. Having regard to the provisions of the Directive and without prejudice to this and future national regulation in this area, I am satisfied that the Conditions of the draft licence satisfactorily address the ambition of the Directive. Some additional text is necessary

[166] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004, on environmental liability with regard to the prevention and remedying of environmental damage.

to cater for the requirement of operators to report on measures they are implementing to address the Directive; and to this end I am recommending a small piece of additional text to Condition 12.2 (c.f. recommendations in Chapter 6 of this report).

Condition 11.1

The objection requires that there should be a 24-hour number available to contact the licensee in the event of a major incident. Additionally an objection suggests that the operator should contact the EPA within 1hr of an incident.

This first concern is provided for in Condition 3.3.2(d) of the draft licence. Furthermore, the EPA has a 24hr incident notification service. The nature of the incident will define the urgency of the need to contact the EPA, such protocols are generally defined in the procedures and plans required by Conditions 9.2 and 9.3 of the draft licence. It would be highly unusual for an operator to wait until 10am on the day following a serious incident to contact the EPA, such an action would, in my view, be an overly liberal view of the term 'as soon as practicable'. However not all incidents are serious enough to merit emergency attendance of the EPA, this is why it is preferable, having regard to a particular operation and its setting, to then define in the Emergency Response Procedure noted in Condition 9.2 of the draft licence, which incidents are deemed serious and merit early notification of the EPA. I am satisfied that the provisions in the draft licence address the concerns of the objections.

Condition 11.3.2

The objection queries the use of the term 'if appropriate' in respect of the need to record waste permit details for waste arriving at the facility.

Article 22 of the Waste Management (Collection Permit) Regulations[167] disapply the requirement to hold a collection permit in certain circumstances. Also §34(1) of the Waste Management Acts 1996-2003 which requires the holding of waste collection permits, does not apply to local authority vehicles. Hence the use of the term 'if appropriate' in the condition of the draft licence.

Condition 11.7

The objection requests that the records of waste profiling and characterisation be kept for all customers and held for up to twenty years following termination of the contract [the condition specified 2 yrs].

I believe that the two-year time-frame is more than adequate to hold information for any cross-checking of operational performance. In any case for hazardous waste consigned - within the State - to this facility, Article 10 of the Waste Management (Movement of Hazardous Waste) Regulations[168] requires carriers and consignors of waste to hold records of hazardous waste sent to this facility for minimum of five years. Furthermore, Articles 7, 8 & 9 of these regulations require the consignee of hazardous waste (i.e., Indaver, the recipient of the waste) to hold copies of the documentation that accompanies waste movements (consignment note). These notes do contain information on

[167] SI 402 of 2001
[168] SI 147 of 1998

the nature and character of the waste. The regulations are silent on the time period for holding these records, and so it would seem Indaver would have to maintain such records at least for the same period as the waste producers and at the very worst for all the period they are in operation. I am satisfied with the provisions in the draft licence regarding off-site waste profiling and characterisation.

Schedule B

The objection states that the Emission Limit Values for dust are insufficient, that there are no limits for fine particulates (<PM_{10}, or $PM_{2.5}$), and no programme for continuous improvement in dust prevention/control.

In part 4.1.3 of this report on the subject of incinerator emissions and health, I noted that there are no limits in the EU Incinerator Directive[169] for such fine particulates, but I do agree - for the reason articulated in Part 4.1.3 - that these parameters should be monitored. Schedule C will be amended accordingly (c.f. recommendations in Chapter 6 of this report). If the EU come forward with limits in the coming years - and they most likely will - these limits will be transposed into all relevant licensed facilities operating in the State as provided for in statute. I have also suggested in Part 4.1.3 of this report that the filters in the flue gas should have a high performance standard for these fine particulates; the licence should be amended accordingly (c.f. recommendations in Chapter 6 of this report). Condition 6.13 of the draft licence deals with the requirement for an action plan to manage fugitive emissions.

[169] 2000/76/EC

Schedule C

This objection requires that control & monitoring Schedules for emissions to all waters should be specified.

This issue was dealt with in response to an objection on Condition 3.9.3 above.

Schedule C

No monitoring proposed for fugitive emissions of dust or solvent.

In addition to the process design controls, these concerns are addressed in Conditions 3.6 and 6.13 of the draft licence. There are also dust limits specified for the main emissions from the facility and for monitoring of these. Schedules B.1 and C.1 refer. I am not satisfied these environmental aspects will be a significant ongoing environmental issue for the operation of this site.

Schedule C

The objection questions what monitoring will be available for dioxins/furans during the 361 days when the quarterly sampling is not being done.

The applicant proposed a fortnightly sampling system for these parameters using the newly developed German approved AMESA system where a sample of gas volume stream is constantly and isokinetically extracted from the flue gas emissions. Dioxins & furans are adsorbed into resins in a cartridge, which is changed every two weeks. Test turnaround is 10 to 14 days. The dioxin/furan emissions for every day of the year will thus be known, albeit with a two-week sensitivity. The draft licence includes this sampling requirement in Schedule C.

Schedule C.6.1

Biannual monitoring requirement for groundwater is totally inadequate, contamination can spread a long way in six months and the chemicals in question are high risk.

Though there are no groundwater discharges and the site is to operate on a full containment philosophy for process areas, I accept this objection. Monthly determination for indicator parameters such as TOC, ammonia and conductivity would economically yield rapid indication of groundwater deterioration. Schedule C.6.1 should be amended accordingly (c.f. recommendations in Chapter 6 of this report).

4.10 Other Matters

There were a number of objections that did not easily fit other issue clusters and fall into this group of *Other Matters*. Some of the points are on policy and practice aspects of the operation of the EPA and Central Government and are beyond the scope of this report. It is also the case that in addressing issues raised in other clusters, that responses to some of the issues grouped under *Other Matters* have themselves been provided.

The following sub-clusters are identifiable within this grouping:

- Confidence in technical ability of EPA & Oral Hearing Chairman
- Irelands clean image tarnished by development
- No independent evaluation of application or evidence of consultation between statutory authorities
- Ireland does not have its own Dioxin monitoring capability

They are examined as follows.

4.10.1 Confidence in Technical Ability of EPA & Oral Hearing Chairman

The Third Party objectors expressed little faith in the EPA to regulate this industry, noting that it has not any experience in mass burn incineration. The EPA currently regulates 7 industrial sites with incinerators handling solid and liquid hazardous wastes. There is also EPA staff experience in the operation of incinerators. EPA officers have also participated in the making of the EU BRef document for waste incineration. That said, it is my view that all possibilities to gain additional experience should be considered. Any opportunity for enforcement officers to participate in technical exchange with EU regulators dealing with incineration should be explored through the IMPEL network of European enforcement authorities.

As to the objectors concerns regarding the ability of the Chairman, and assistant, to deal with the multiplicity of complex issues associated with the objections to the Indaver proposal, that is not for me to argue. That ability will be judged on the record of the Oral Hearing and this report.

4.10.2 Irelands clean image will be tarnished

It is difficult to know if this is a matter of planning concern or one of interest to the EPA in relation to emissions and pollution. I will address the latter aspects. The recent *Irelands Environment*[170] report which examines the state of Irelands environment identified five overall environmental priorities; viz,

- Meeting international commitments on air emissions

[170] EPA, 2004.

- Eutrophication prevention & control
- Waste management
- Better integration of environment & natural resource considerations into the policies, plans & actions of economic sectors
- Improving the enforcement of environmental legislation

Incineration is not a significant negative actor in relation to any of the five priorities identified. Indeed it could be argued to be a positive element in relation to the waste management priority. The Third Party objections did not elaborate how, if at all, the existing 11 incinerators in Ireland are impacting on image. As noted in earlier sections of this report (c.f. Part 4.1.3), the Irish Food Safety Authority conclude that incineration facilities, if properly managed, will not contribute to dioxin levels in the food supply to any significant extent. We also learned in Part 4.1.3 of this report that the projected dioxin & furan emissions from all the planned and existing Irish incinerators (including the Ringaskiddy proposal) in 2010 would be less that 2% of total national releases: the majority being derived from uncontrolled combustion sources. I am not convinced that the controlled emissions from the proposed incinerator will negatively impact on image.

4.10.3 No independent evaluation of application or evidence of consultation between statutory authorities

The inspector who drafted the Recommended Decision and the Inspectors Report for the Indaver application (Appendix B) did not believe there was a technical requirement to have independent assessment of the application over and above the independent assessment undertaken by the EPA and the statutory consultees. Any contribution by other agencies via the statutory consultation process is recorded in the Inspectors

Report. The case for an independent health assessment is argued in Part 4.1.1 of this report. The EPA is an independent body in relation to assessment of waste licence applications: its decisions being informed by §40(2) & §40(4) of the Waste Management Acts 1996-2003 and §52(2) of the Environmental Protection Agency Acts 1992 & 2003.

The objection on this point is not carried.

4.10.4 Ireland does not have its own Dioxin Monitoring capability

This is the case at the moment with samples are being sent abroad to specialist laboratories operating accredited procedures for Dioxins and Furans. EPA sampling is also undertake on their behalf by specialist contractors using specialist equipment. Up to now the work-load in this technical arena (dioxin sampling & testing) in Ireland has been modest, making the development of national facilities unjustified. There is no vulnerability noted by the Third Party objectors in relation to the current sampling and analytical systems. It is noted that the applicants did identify the future possibility of a new laboratory in University College Cork being able to undertake the analysis of the AMESA samples (fortnightly samples of dioxin/furan in flue-gas).

Chapter 5 Applicants Objection

This section of the report examines the objections lodged by the applicant, on 22 November 2004, to the Proposed Decision dated 26 October 2004 (c.f. Appendix B). This objection is included in Appendix C). The applicants elected not to elaborate on their written objection at the Oral Hearing, though the submissions presented by Messer's Porter, Callaghan, Ahern, Jones, Gardiner & Slattery, and Ms Lydon at the oral hearing were offered in support of the Indaver application.

The 'objection' lodged by Indaver principally seeks wording clarifications in respect of the conditions of the draft licence. Each objection will be examined and concluded upon, with or without a recommendation for an amendment of the conditions, in the recommended final licence (c.f. Chapter 6 of this report).

Glossary of Terms

The applicant wishes the definition of sludge in the Glossary to be clear in that it captures organic as well as inorganic sludges.

> This is acceptable. A minor amendment of the glossary entry will rectify the lack of clarity.

Condition 1.10

The applicants believe that Condition 1.10 as worded limits the licence for 5 years, and that the prolonged development and application process may complicate matters.

> The applicants are mistaken in their understanding of this condition. This condition is not intended to limit the duration of the operational licence, rather its purpose is to prevent the licence ceasing to have effect as a result of a long development period

due to §49(1) of the Waste Management Acts 1996-2003. The condition seeks to avail of the facility offered by §49(2) of the said Act to extend the commencement period of the licence to allow for the likely legal and construction delays. A rewording of the condition will bring clarity to this issue. Refer Chapter 6.

Condition 3.1 Infrastructure

The applicants note that this condition requires all specified infrastructure to be in place before the activity can commence: this would include the infrastructure for the Municipal Solid Waste Incinerator (Phase II) which does not yet have planning permission. The applicants also note that they may wish to proceed early with the Transfer Station and Recycling Park, but the condition requires the incinerators to be built too. They request a rewording of the condition.

This condition also presented difficulties for the Third Party objectors as they felt it suggested a by-pass of the planning system. The condition does not set aside the requirement to obtain planning permission for the Phase II development (refer Condition 1.3 of the draft licence).

The point of the applicants is well made. The condition should not necessarily prevent the staged development of the individual components of the facility, as these can be operated independently. A rewording of the condition would assist.

Condition 3.4 Facility Security

The applicants note that there are two fencing proposals for the site: the first an outer palisade fence for visual amenity and the second an inner security fence. The Condition as worded would make the palisade fence of security standard which is not desired as they have an inner 2m security fence.

The applicants point is accepted. The condition can be slightly amended to clarify this issue.

Condition 3.5 Waste Inspection & Quarantine Area

The applicants believe that conditions 3.5.1 and 3.5.2 on the issue of quarantine areas may result in the storage of incompatible reject wastes in the same area, and this would represent a safety hazard. They request a licence condition facility similar to that in their sister plant in Dublin Port, in relation to the clear labelling and appropriate storing of quarantined waste. They recommend some new text.

The issue of the handling and storage of reject wastes came up in examination of Mr Jones for Indaver at the Oral Hearing. There was a deal of uncertainty regarding where these reject wastes were to be stored. While I accept the safety point regarding the co-storage in limited areas of incompatible reject wastes, I do believe that designated area(s) removed from the waste input zone of the incinerator and waste reception area, need to be identified in the final detailed design. I accept that a sector of the Waste Transfer building can be designated for reject wastes identified at that location. Minor modification of the condition will allow the use of a number of designated areas, and require that quarantined waste be clearly identified.

Condition 3.8 Residuals Storage

The applicant believes that the residuals storage capacities specified in this condition be regarded as a minimum and the condition endorsed to that effect.

Accepted. This strengthens the condition.

Condition 3.10.3 Drainage System

The applicant objects to the requirement in Condition 3.10.3 for all surface waters to pass through an interceptor prior to discharge. Roof water will be uncontaminated and does not need to use the interceptor and the run-off from the yard areas is tested prior to discharge so the interceptor is an un-necessary step. They accept the need for an interceptor for the Recycling Park and Transfer Station car park.

> There is no need for the roof water to pass through the interceptor. However, having regard to the nature of the activities proposed and because the recipient Local Authority storm water sewer discharges directly to the harbour, I believe the continued use of an interceptor on the storm line prior to joining with the Local Authority storm sewer is best practice. The condition should prevail with a minor amendment to give relief for roof water.

Condition 3.11 Waste Acceptance & Hours of Operation

The applicant objects to the limitations in Condition 3.11.3 which would mean that no activities such as drum washing, cleaning, waste repackaging, etc., could be carried out at the Transfer Station or Recycling Park outside the specified waste acceptance hours. They suggest this is not what is preferred. They are happy with the limitations placed in Condition 3.11.1 in relation to the hours of acceptance or export of waste.

> I find the applicant's point of view acceptable. These components of the activity are part of a 24-hour operation at this facility and certain internal waste activities can be allowed, provided the ban on waste imports and export from the site, and noise limitations, etc., prevail. I support the removal of Conditions 3.11.3 and 3.11.4.

Condition 3.14.3 and Condition 3.14.6 *Incineration Plant – Additional Requirements*

The applicant requests that Conditions 3.14.3 and 3.14.6 be clarified such that the calorific value requirements relate to the mixed waste feed into the hoppers and not individual waste streams, and that the specified calorific values represent an acceptable range.

> This point is accepted. This control parameter is intended to apply to the waste stream as finally delivered to the furnace. Minor amendment of these conditions will add clarity.

Condition 3.14.4 Incineration Plant – Additional Requirements

The applicant argues that the pollutant limitations presented in this condition for waste feed are incorrectly applied. They suggest these limits are derived from a table in the licence application documentation which was intended to show *indicative* levels of the pre-treatment contaminant levels in the flue-gas. The table was not intended to represent the maximum level beyond which the gas cleaning systems would not work. That is, they are not indicative of the removal efficiencies of the flue gas cleaning system. They argue that the strict application of these limits would result in the needless export of some waste to over-seas incinerators operating similar gas-cleaning technologies. The applicant includes a table that shows the removal efficiencies for the treatment system they propose - based on the EU Incineration BAT Reference document[171] and other published technical documents - and the resultant maximum concentrations of these parameters in the input feed. Based on these they suggest alternative limitations for the condition.

> The applicant argues that the technology they propose can deal with a flue gas with more pollutant loading than that which would

[171] EU Commission IPPC Bureau, Seville. Final Draft May 2005 (previous draft March 2004).

result from the strict application of Condition 3.14.4. They support this claim by reference to the EU Bref document amongst others. The main concern of the EPA is compliance with the final emission limits, and if the operator can prove as part of the Test Programme indicated in Condition 3.12 (specifically Condition 3.12.2(e)) that the flue gas treatment stream can deal with a waste feed containing contaminants in this range, then this should be acceptable. The requirement for this condition is founded in Article 4(5)(b) of the EU Incineration Directive. I accept that the loadings presented in Condition 3.14.4 are influenced by the perceived efficiency of the flue-gas treatment system, the final technical *maximum* performance of which will not be fully accurately known until detailed design and testing is complete (the *minimum* performance criteria, i.e. EU Directive limits, is guaranteed). It does not make sense to have a condition that diverts waste abroad to other facilities with the same treatment technology. Either way the final Emission Limit Values will not be adjusted: these limits will stand as will all the impact assessment modelling based on these limits. The process control limits specified in Condition 3.14.4 are derived from estimated abatement efficiencies identified by the applicant in their application documentation. It is realised that these are estimated and that the Test Programme will be the final determiner of capabilities of the flue gas train and thus the appropriate process pollutant limit controls: however, the Incineration Directive requires the permit to set limits and so the licence must contain same. The Directive does not say that such specified limits cannot be reviewed. I am not, at this time, recommending acceptance of the revised limits suggested by the applicant in their objection for the control parameters specified, however I am recommending the amendment of Condition 3.14.4

to the extent that allows the pollutant loading limits in the waste feed to be revised following review of the cited Test Programme, and for any revision of those limits to be binding. Such a recommendation is without prejudice to Agency or operator access to Sections 42B or 46 of the Waste Management Acts 1996-2003. It is also necessary for the successful operation of the Test Program to allow agreed deviations from the limits specified in this condition so-as to test and demonstrate the performance capability of the abatement train.

Condition 3.19.3

The applicant requests some clarity on this condition, which is linked to their objection to Condition 3.11. They want the removal of containers to be linked to the periods when waste can be accepted/dispatched from the facility and then when practicable.

The applicants point is reasonable and will add clarity to the condition.

Condition 5.3 Protection of the Environment

The applicant raises concern regarding the understanding of the term 'amenity' in Condition 5.3, and comment that it is not identified in Article 40(4) of the Waste management Acts 1996-2003 as a matter for the Agency to be concerned with in granting a licence. They recommend an alternative text.

Firstly it must be noted that §40(4) of the Waste Management Acts 1996-2003, alone, does not define the nature of conditions that may be attached to a licence. In fact §41(2) of the same Act, details the wide range of matters that can be conditioned in a licence. Sections 40(2) and 40(4) do however act to inform the construction of conditions that underpin the basis of a decision making process.

The understanding of 'amenity' within the context of an EPA licence is perhaps best informed by §5(1) of the Waste Management Acts 1996-2003, where it says that the definition of environmental pollution means, the disposal, holding, recovery or transport of waste in a manner that to a significant extent would endanger human health or harm the environment, and in particular, ... *create of a nuisance through noise, odours or litter, or adversely affect the countryside or places of special interest*. This definition broadens the general understanding of environmental pollution from one of harm to health or the environment, and introduces the concept of nuisance to the meaning of pollution as well as a broader understanding of potential receptors – now including, for example, places of special interest. At its most basic, and informed by the definition of environmental pollution and staying within the scope of EPA licensing, the *protection of amenity* can, in my view, be understood to be the protection/preservation of one's safe and nuisance-free enjoyment of use (of the countryside, recreational area, domestic dwelling, place of worship, etc.,). And accordingly, *an amenity* cannot be understood in the restrictive sense as only including a public recreational area. Ones safe enjoyment of use is a matter that would come under the general heading of health protection, particularly, for example, in relation to impact from nuisance due to odours and noise. If the EPA could not be satisfied that the communities safe enjoyment or use of areas of private or public amenity is assured, then a licence could not be issued. In this case the EPA in the issuing of a draft licence considered that the facility operating to the terms of its licence would not result in environmental pollution. I support this view. The condition as worded is in my opinion satisfactory and a reinforcement of the basis on which the decision was made and a

formalization of an ongoing obligation for the licensee: it also succinctly captures the intent of the definition of environmental pollution in the WMA's. I do not accept the applicant's case on this point, and believe the applicants suggested text would act to dilute the scope of the condition.

Condition 7.1 Energy Audit

The applicant observes that the condition requires an energy audit to be completed within one year of date of grant of the licence. The development and commissioning of the activity following authorisation may be significantly delayed due to constructional or legal constraints; and so they ask that the condition be reworded to link the audit into the commencement of operations at the site.

The applicant's argument is acceptable and logical. An energy efficiency audit cannot be undertaken on a facility not yet built. That said, and as raised in a Third Party objection on this condition, the design for the facility should include energy efficiency as a design objective. A review of the energy efficiency of the design can and should be undertaken prior to construction/commissioning. Minor amendment of the condition will allow the applicants point and also not dilute the concern of the Third Party objection.

Condition 8.2.3(a) Waste Profiling

The applicants submit that waste profiling is not necessary for the community-recycling park, but only at the other components of the facility. The signage and labelling of the drop bins in the recycling park should suffice.

Agreed. Condition should be amended accordingly.

Condition 8.2.3(b) Waste Profiling

The applicants question the applicability of EU Decision 2003/33/EC to waste acceptance at the Ringaskiddy facility.

> This EU Decision sets out acceptance criteria for waste at landfill facilities, and as such has no relevance for waste accepted at the Indaver facility. However, as is clear from the title of Condition 8.2, it seeks to deal with waste acceptance and removal. The first line of Condition 8.2.3 '*Prior to the commencement of waste acceptance at the facility ...*' is not intended to limit what follows, to waste accepted at the facility, but rather, require the agreement of procedures for waste acceptance and removal before the operator begins to process waste on the site. Thus, the application of this Council Decision to any residues of the Ringaskiddy operation sent off-site for disposal to landfill is relevant. By Condition 8.5 of the draft licence the applicant is required to classify waste to be sent off-site; the methodology for this to be established in Condition 8.2.3(b) for that waste destined for landfill. The condition should therefore endure. Minor amendment of the text will clarify its intent.

Condition 8.2.3(c) Waste Profiling

The applicant suggests that the requirements in this condition for the weighing, documentation, etc., of waste at reception to the recycling park is not relevant.

> I agreed with the view of the applicants. It is not practical to weigh, document, etc., wastes arriving at the community recycling park: the documentation and weighing of these wastes is a matter for the operator as full receptacles are removed from the facility. However, the condition does not require the actions as understood by the applicant. Rather, it is up to the applicant to develop procedures appropriate for waste

weighing/acceptance /characterisation at the individual components of the facility. The condition as worded is acceptable and permits the development of a different approach for the community recycling park which would be appropriate for activities carried on therein.

Condition 8.2.3(f) Waste Profiling

The applicant argues that the requirement in this condition to determine the calorific value of every load of waste is impractical and want the condition reworded to that effect.

The maintenance of the calorific value of waste feed to the furnace is a key operational control parameter for the incinerators (c.f. Conditions 3.14.3 and 3.14.6 of the draft licence), and the EPA must be satisfied that the operator is in control of this issue. To do this the operator must have access to data on the calorific value of waste streams. That said it may not be necessary to test every waste stream on arrival for calorific value; the operator can establish known calorific ranges for specific classes or sources of waste streams and use these to classify waste at reception. Such protocols and metrics will have to be agreed with the EPA. Condition 8.2.3 as currently worded does not provide for EPA approval of these waste acceptance procedures, this can be easily accommodated in a minor change to the condition (this was also a point made by a Third Party objection). I am satisfied that the condition as worded is workable and gives the operator scope to agree a number of methods and approaches to the determination of calorific value. In any case the operator has to devise a process/quality control procedure to be able to demonstrate compliance with the final furnace-feed calorific requirements as specified in the above cited conditions, in order to ensure compliance with the licence requirements.

Condition 8.8 Mixing of Waste

The applicant objects to the prohibition of mixing of waste in this condition on the grounds that it will interfere with the optimal operation of the incinerators (homogenous feed required).

This is a similar objection to that raised by a Third Party. The condition actually states that unless approved in writing, then mixing is prohibited. The draft licence is an approval in writing for the processes described in the application including bunker operations and waste feed preparation, and the bulking up of waste in the transfer station for introduction to the incinerator. This legal requirement (no unapproved mixing of waste) is mainly rooted in Article 22(1)(b) of the Irish Waste Management (Hazardous Waste) Regulations 1998[172] which in turn is rooted in Article 2 of the EU Directive on Hazardous Waste[173], and the main purpose of these controls are, *inter alia*, to prevent the dilution of hazardous wastes by other wastes for classification purposes. The legislation does provide for agreement of mixing such as indicated in the condition. The licence consent approves the waste mixing as anticipated and described in the application, which is necessary to generate the correct feed for the incinerators. The condition mainly speaks to the classification, and the export of residues/waste from the site and that these cannot be mixed without prior consent. No change in the condition is required.

Condition 8.14 Residues Storage

The applicant comments that their proposal is for boiler ash and flue gas residues to be stored in partially contained silos in the yard area

[172] SI 163 of 1998
[173] Council Directive 91/689/EEC of 12-12-1991 on Hazardous Waste.

and not in a building. The silos will be open at ground level at three sides to allow truck access and have dust abatement. They want the condition amended to allow storage of such wastes on dedicated contained hardstanding.

The Third Party objectors raise a number of concerns in relation to the storage of boiler ash and flue gas cleaning residues from the incineration process. I do not accept the applicants objection on the grounds of BAT. The efficiency of the abatement system for the silos will not be guaranteed if the silos are open on three sides. I accept that these silos need not be in the main process building and that – as indicated in the waste application documentation – a number of areas are designated for storage of the residues. These areas should be fully enclosed with dust curtains or equivalent approved for entry/egress, and abatement as specified. Minor modification of the condition clarifies my position on this matter.

Condition 10 Decommissioning & Aftercare Plan

The applicant objects to the requirement to submit a decommissioning and aftercare plan within 12 months of date of grant of the licence. They consider that due to possible legal or construction delays the requirement for this plan should be linked in with the commencement of operations at the site.

Agreed. Minor amendment of Condition 10.1 will assist.

Conditions 11.3.2 & 11.3.3 Recording of Waste

The applicant considers that the recording of each load of waste as it arrives at the community recycling centre is not necessary.

This is a similar objection to that raised in relation to Condition 8.2.3(a) above, and I agree with the applicants. However

Condition 11.3.2 also requires the recording of waste departing from the facility. This would include the waste skips or containers removed by the applicant from the recycling park. This waste has to be documented for national statistical purposes. Minor amendment of the text of the condition will clarify the position in relation to the waste arriving at the recycling park and preserve the recording of waste leaving the park.

Condition 11.3.4 Profiling of Waste

The applicants do not believe it is appropriate to pre-profile waste destined for the community recycling park or Transfer Station.

This objection is similar to that raised in relation to Condition 8.2.3(a) above on waste accepted at the recycling park. The main concern in relation to this condition is the pre-characterisation of waste that will arrive directly at the incinerator from known customers for direct disposal. For waste arriving at the Transfer Station it will have to be characterised on receipt, and that arriving at the recycling park will have to be sorted by the producer into the various bins provided. I accept that this condition is mainly targeting the incineration process and has little relevance for the other processes. The condition can be amended accordingly.

Conditions 11.5.1 Data Management

The applicant notes that Condition 11.5.1 requires the development of a data management system with in six months of date of grant of the licence. They argue that construction and legal delays may complicate matters and suggest that the requirement be linked to the commencement of operations on the site.

Agreed. Minor amendment of the condition clarifies matters.

Conditions 12.1 Financial Charges

Similar to the previous objection the applicant believes the likely long lead-in time for the development of the activity means that payment of licensing fees from date of grant is not reasonable. The request that the payment of fees be linked to the commencement of licensed activities.

The collection of fees is to cover the anticipated costs of the EPA in relation to the supervision and monitoring of the licensed activity. Whilst I accept the applicants general point, it must be remembered that commencement of the EPA role in this supervision is not linked to the commencement of waste acceptance. Many of the conditions of the licence require pre-approval of designs, procedures, programmes, etc., in relation to the construction and operation of the facility, which take place before waste is accepted. So the commencement of recovery of fees should be linked to this effort. The collected fee being pro-rata for the year where such conditions are initiated. The applicant is free to make a case to the OEE at the commencement of each fee year, that fees associated with monitoring or auditing that were not incurred during pre-waste acceptance approval stages of a previous year, can be rebated against subsequent years fees. The condition should be amended accordingly.

Schedule A.1

The applicant requests that the term 'other waste to be agreed with the Agency' be added to this Schedule which sets out the waste types acceptable at the Community Recycling Park.

This request is entirely reasonable. The applicants note in their objection that there will have to be prior agreement with the Agency on matters such as quantity and handling. Such a facility

- for agreement - is quite common in licences for recycling centres and transfer stations, and allows the acceptance of new wastes that are deemed compatible with the specified operation, but subject to the over-all facility tonnage limitation. However, it is noted that Schedule A.1 of the draft licence, as worded (refer last entry in the table), already provides for the agreement with the Agency to take other non-hazardous waste. It is assumed therefore that the applicant does not deem this sufficient, as, presumably, there may be the need to accept recyclable hazardous waste of household origin such as batteries, fluorescent lamps and oils. I accept this point and believe that the placement of receptacles to facilitate recovery of such waste would be low-risk, and compatible with the overall purpose and community value of the recycling park. The operator may find that there is insufficient demand to warrant such facilities but seems would wish the facility to be in the licence to agree such minor operational matters. The schedule can be amended accordingly.

Schedule A.2 and A.3

The applicant notes that the format of some of the waste codes in these Schedules is not compatible with EU Commission Decisions 2000/532/EC. The applicants would like the tables in the schedules to be endorsed to say that when the code 'XX XX 00' is used, is it to be understood as meaning that all waste codes in the relevant four digit EU waste catalogue[174] chapter are to be included.

The EU catalogue does not have a waste code that ends in two zero's. This is the main issue for the applicants, as there are many entries in Schedules A.2 and A.3 of the draft licence that have '##

[174] See EPA publication *European Waste Catalogue & Hazardous Waste List: valid from 1 January 2002*. EPA 2002.

00' or '## 00 00' end in the entry. For drafting purposes in a table attached to a permit it is convenient and clearer to use a six digit format as this avoids confusion in the mind of the reader, even if the EU listing opts to omit the zero's in chapter and sub-chapter headings. The applicants are correct in their understanding that when the schedules in the draft licence use the two or four zero entries, it is intended to mean that all wastes within that chapter or sub-chapter, as may be relevant, are included. For example, there is no specific waste with a code of '13 00 00' as this is only a chapter heading for a range of individual waste streams. A similar case exists for sub-chapter headings (e.g. 13 02 00). The Schedules can be endorsed accordingly.

Schedule A.2

The applicant notes a typographical error in relation to the codes given for 'inorganic wastes from thermal process'.

The error appears to have resulted from a small space formatting problem. The recommended final licence can be amended to correct this error.

Schedule A.3 Limitations

The applicant requests that a clause be inserted in to the Schedule that permits the acceptance of other wastes as may be agreed by the Agency.

Article 4(4)(a) of the Incineration Directive[175] specifically requires that the waste categories to be treated, be 'explicitly' stated in the licence. Thus any addition to the lists of wastes to be handled in the incinerator would have to be formally recorded as an

[175] 2000/76/EC

amendment of the licence, and not just by simple agreement through exchange of letters. Depending on the significance of the proposed change to waste types the EPA could avail of either Sections 42B or 46 of the Waste Management Acts 1996-2003 to manage any requests for change and formally register same, as part of the licence. I cannot in law accede to the applicants request on this point.

***S**chedule A.3*

The applicant identified two typographical errors in the Schedule (code for oil filters & code for anaerobic treatment of waste).

These can be corrected in the recommended licence.

***S**chedule B **E**mission **L**imits*

The applicant requests that the specified emission limits for Carbon Monoxide (CO) in the licence be presented in a format similar to that set out in the Incineration Directive, as they may be a source of confusion as presented.

I have examined the limits specified in the draft licence for CO and those specified in the Directive. I am satisfied that there has been a faithful reproduction of the limits specified in Annex V of the Incineration Directive and the percentage compliance factor as articulated in Article 11(10) of the Directive.

***S**chedule C **M**onitoring & **C**ontrol*

The applicant requests the ability to amend the monitoring equipment or methodology specified in column 3 of Schedule C.1.1, as technological advancement may allow. The applicants note that such a provision is available for Schedule C.1.2.

This is a reasonable request.

Schedule C.2.3 Monitoring of Surface Water Emissions

The applicant requires some clarification in relation to the specified emission points and monitoring locations for surface water discharges at the Transfer Station & Recycling Park. The applicant makes some recommendations for the integration and re-labelling of locations.

Three main storm-water monitoring objectives are necessary for the Recycling Park and Transfer Station. Firstly the run-off from the Recycling Park needs to be monitored, secondly the run-off from the process yard areas of the Transfer Station needs to be monitored before release to the main storm drain, and thirdly the combined final discharge of storm water from all surfaces (including roof water) of the Transfer Station and Community Recycling park needs to be checked/monitored prior to discharge. All three of these storm water streams merge to finally exit at manhole #SW12 (drawing 106 waste licence application). However in order to monitor the relative contribution of each stream and to aid in the detection of problems, the individual streams, these should be separately checked. The Schedule as constructed does require this, however I accept the applicants point that some clarification of the locations specified in Schedule C.2.3 is required. I do not accept the applicants request to merge some of these points. Location SW2(a) specified in the licence is between location SW18 and SW18A on Drawing 106 of the Waste Application. Location SW2(b) in Schedule C.2.3 is location SW12 on Drawing 106, and location SW3 is best located - as the applicant suggests - at location SW07 on Drawing 106 (c.f. Chapter 6 of this report).

Chapter 6 Recommended Final Licence

This part of the report sets out my recommendations in relation to a final licence for the proposed Indaver facility at Ringaskiddy. Having considered in detail the objections of the Third Parties I find that a sufficient case for refusal of a final licence has not been made. Nor has a sufficient case been made to lead me to substantially alter the scope of the activities, processes or technologies authorised as indicated in the Proposed Decision (draft licence) issued 26 October 2004 (Appendix B-4). That said, the First and Third Party objections have caused me to recommend amendments of the draft licence that have the effect of reinforcing certain provisions or adding clarity as appropriate.

The assessment of objections in Parts 4 and 5 of this report has acted to inform certain recommendations in relation to general enforcement matters with respect to incinerators, and specifically, certain amendments of the text of the draft licence. The recommended text for the final licence (Recommended Final Licence) is included as Appendix I to this report, and is incorporated with Volume 1 of the report for ease of reference. Recommended amendments (additions and deletions) to the conditions and schedules of the original draft licence are noted in bold italics in the recommended final licence, and where the changes are subtle a flag box is included (schedules specifically). Each change is recorded hereunder and reasons given.

6.1 General Matters of EPA Enforcement

I recommend that the EPA retain the services of an internationally recognised process/chemical engineering incinerator specialist to assist EPA with design approval for the incinerator, and to assist in

review of the construction quality assurance report for the finished facility. I also recommend that this consultant be retained to assist in the review of the incinerator burn Test Programmes required by condition 3.12 of the final licence. This consultant is to be directly retained by, and report to, the EPA; and costs can be recovered by the EPA from the licensee.

I also recommend that the EPA OEE build on its existing incinerator enforcement expertise by, for example, engaging with the EU IMPEL group in educational and capacity building exchanges with regulatory authorities in other Member States who oversee merchant waste incinerators.

6.2 Amendments to the Draft Licence Conditions

You are referred to the text of the recommended final licence in Appendix I which shows in bold-italics the recommended changes to the licence from that presented in the Proposed Decision (Appendix B). An outline of the recommended changes and the basis for same are as set out below.

Glossary

The definition of 'incident' in the glossary is amended to clearly note that failure to operate specified controls would constitute an incident. Also clarification is added in respect of the glossary entry for sludges.

> Reason: *To improve regulatory control of incidents and to add clarity to the licence*

Condition 1.10

Replace this condition with a text that clearly reflects the statutory provisions in relation to delayed commencement of an activity (c.f. §49(1) of the Waste Management Acts 1996 – 2003).

Reason: *To clarify the duration of the licence.*

***C**ondition 2.1*

The text of this condition in the draft licence has been ammended to the effect that minimum qualifications/experience is necessary for the management of the site.

Reason: *To ensure that the facility is competently managed.*

***C**ondition 2.2.1*

This condition is ammended to require Agency approval of the management structure for the facility in advance.

Reason: *To ensure that the facility is competently managed and to assist enforcement powers.*

***C**ondition 2.3.1*

The condition is ammended to ensure that the required Environmental Management System (EMS) is in place before waste is accepted at the facility.

Reason: *To ensure that the necessary systems for management of the facility are in place at the right time.*

***C**ondition 2.3.7*

The condition is ammended to ensure that the required public communications programme is in place when development of the facility commences.

Reason: *To ensure that the necessary systems for management of the facility are in place at the right time.*

***C**ondition 3.1*

This condition clarifies the issue of staggered development of the various components of the facility – which is permitted.

Reason: *To clarify the licence conditions.*

***C**ondition 3.4*

The condition is amended to permit differentiation between amenity fencing and security fencing.

Reason: *To clarify the licence conditions.*

***C**ondition 3.5.1*

The condition is amended to acknowledge that there may be a number of waste quarantine and storage areas.

Reason: *To clarify the licence conditions.*

***C**ondition 3.5.2*

This condition is amended to note the possibility of more than one quarantine or inspection area. The amendments also require the appropriate storage (safety driven) and correct labelling of the waste in quarantine. Finally a clause is added to ensure no quarantine of waste in the reception or delivery areas of the site.

Reason: *To clarify the licence conditions and to improve the management of reject waste.*

***C**ondition 3.7.6*

A new condition is added that requires the applicants to have regard to EPA guidance on bunding and chemical storage.

Reason: *To ensure the correct standards are applied to the construction and operation of the facility.*

***C**ondition 3.8*

The condition is amended to note that the specifications contained therein are a minimum.

Reason: *To clarify the licence conditions.*

***C**ondition 3.10.3*

The condition is amended to exclude roof-water from un-necessarily having to pass through an oil interceptor.

Reason: *To clarify the licence conditions.*

***C**onditions 3.11.3 & 3.11.4*

These conditions are deleted as they duplicate the provisions of Conditions 3.11.1 and 3.11.2.

Reason: *To clarify the licence conditions.*

***C**ondition 3.14.3*

This condition is amended to add clarity to the requirements for calorific value and ranges for the mixed waste feed to the incinerators.

Reason: *To clarify the licence conditions.*

***C**ondition 3.14.4*

Two new sub-elements of Condition 3.14.4 on pollutant loading restrictions for the hazardous waste incinerator are added. The conditions permit the variation, by agreement and subject to the findings of the Test Programme (Condition 3.12), of operation control limitations of chemical substances in the waste feed.

Reason: *To allow for the optimal – and environmentally safe - operation of the facility.*

***C**ondition 3.14.17*

New condition added requiring the submission of a design and construction quality assurance plan, to the EPA for approval in advance. The condition also requires that the final design incorporate the use of high efficiency fine dust filtration, auxiliary water supply to the spray towers and double containment in the waste bunkers.

Reason: *To improve the regulatory control of the operation and to permit the incorporation of certain safety features in the design of the facility.*

***C**ondition 3.14.18*

A new condition is added that requires the flue-gas re-heater to remain working in the event of a shutdown, until the furnace has been stopped.

Reason: *To minimise impact of emissions and improve the regulatory control of incidents.*

***C**ondition 3.19.3*

The condition is amended to add clarity as to when waste is to be removed from the recycling park.

Reason: *To clarify the licence conditions.*

***C**ondition 6.4*

The condition is amended to add clarity as to what emissions need monitoring.

Reason: *To clarify the licence conditions.*

***C**ondition 7.1*

The condition is amended to ensure that energy efficiency is incorporated into the design of the facility. Additionally the requirement for an energy audit is linked to commencement of waste acceptance at the facility.

Reason: *To ensure that energy efficiency is built into the design (BAT), and to clarify the licence conditions.*

***C**ondition 8.2.3*

The condition is amended to ensure that the waste acceptance procedures obtain prior EPA approval.

Reason: *To improve the regulatory controls in the licence.*

***C**ondition 8.2.3a*

The condition is amended to exclude waste accepted at the recycling park from the pre-profiling of waste.

Reason: *To clarify the licence conditions.*

***C**ondition 8.2.3b*

The condition is amended to clarify that it speaks to a requirement for waste intended to be sent to landfill.

Reason: *To clarify the licence conditions.*

***C**ondition 8.14*

The condition is amended to acknowledge that waste storage areas are not necessarily all in the main building and that dust abatement must be used.

Reason: *To clarify and improve the regulatory controls in the licence.*

***C**ondition 8.16*

New condition. This caters for the potential risk posed by flooding of the site (c.f. Part 4.3.1 of this report).

Reason: *To provide for surface water protection.*

***C**ondition 9.2*

The condition is ammended to ensure that the licensee has regard to off-site risks to the safe operation of the authorised waste facility.

Reason: *To improve the regulatory controls in the licence and to ensure a holistic appreciation of risk for site operations.*

***C**ondition 10.1*

The condition is ammended to link the requirement for operational plans, to the commencement of waste activities on the site.

Reason: *To clarify the licence conditions.*

***C**onditions 11.3.2 & 11.3.3*

The conditions are amended to note the non-necessity to register specific details of all waste loads arriving at the recycling park. However waste leaving the recycling park to another area of the site has to be documented.

Reason: *To clarify the licence conditions.*

***C**ondition 11.3.4*

The condition is amended to clarify that the pre-profiling of waste is a requirement specifically for waste arriving directly at the incinerator for disposal.

Reason: *To clarify the licence conditions.*

***C**ondition 11.5*

The condition is amended to link the requirement for provision of a management system to commencement of waste acceptance at the facility.

Reason: *To clarify the licence conditions.*

***C**ondition 12.1.1*

The condition is amended to cater for a potential long lead-in time for the commencement of any part of the licence, and avoids charging fees for effort not incurred.

Reason: *To clarify the licence conditions.*

***C**ondition 12.2*

The title of the condition is ammended to add clarity to purpose.

Reason: *To clarify the licence conditions.*

***C**ondition 12.2.1*

The condition is ammended to ensure that the applicant employs an appropriately qualified consultant in the assessment of liabilities.

Reason: *To improve the regulatory value of the condition.*

***C**ondition 12.2.5*

The condition is ammended to put the correct title on the fund required (related to Condition 10).

Reason: *To clarify the licence conditions.*

***C**ondition 12.2.6*

A new condition is added to reflect the requirements of the EU liabilities Directive[176] and to get a regular up-date on the liabilities provisions at the facility.

Reason: *To improve the regulatory control of the activity.*

***S**chedule A.1*

A minor amendment is made to the schedule to permit, subject to agreement, acceptance of other compatible recyclable wastes.

Reason: *To allow for the optimal – and environmentally safe - operation of the recycling park.*

***S**chedule A.2*

A note is added to the schedule to clarify the use of the codes. Also typographical errors corrected.

Reason: *To clarify the requirements of the licence.*

***S**chedule A3.*

A note is added to the schedule to clarify the use of the codes. Also typographical errors corrected.

Reason: *To clarify the requirements of the licence.*

***S**chedule C.1.1*

A new foot-note is added to permit agreement of alternative monitoring methods or equipment to those specified.

Reason: *To permit the application of new or alternative monitoring and control BAT at the site.*

[176] Council Directive 2004/35/CE of the European Parliament and of the Council, of 21 April 2004, on environmental liability with regard to the prevention and remedying of environmental damage.

***S**chedule C.1.2*

The schedule is amended to require the monitoring of fine particulate components in emissions.

Reason: *To improve the monitoring programme for the facility.*

***S**chedule C.2.3*

The text of the schedule is amended to clarify the locations of the surface water monitoring stations.

Reason: *To clarify the requirements of the licence.*

***S**chedule C.4*

The schedule is amended to require additional monitoring of the ash and to ensure that the monitoring is undertaken at an accredited laboratory.

Reason: *To improve the monitoring programme for the facility.*

***S**chedule C.6.1*

The schedule is amended to add some monthly sentinel parameters into the monitoring suite.

Reason: *To improve the monitoring programme for the facility.*

***S**chedule D*

The schedule is amended to add to the content of the AER the requirements for reporting on environmental liabilities and Decommissioning & Closure Plan amendments.

Reason: *To improve and clarify the reporting requirements of the licence.*

END.

APPENDICES

Appendix A - Letters of Appointment

Appendix B - Draft Licence & Related Papers

- B-1 EPA Inspectors Report to Board with Recommended Decision
- B-2 Recommended Decision
- B-3 Board Minutes for Proposed Decision
- B-4 Proposed Decision

Appendix C - Objections & Requests for an Oral Hearing

Appendix D - EPA letter copying objections to all parties

Appendix E - EPA Correspondence on Oral Hearing

- E-1 Letter notifying parties of Oral Hearing
- E-2 Letter confirming time, date, and venue for Hearing
- E-3 EPA Guidelines for Oral Hearings

Appendix F - Digital Audio Record of Oral Hearing

Appendix G - Documents Submitted to the Oral Hearing

Appendix H - Letter dated 25 March 2003 from Dr M Kelly (Director General EPA) to Department of Health & Children

Appendix I - Recommended Final Licence (Annotated Proposed Decision showing recommended changes)

Appendix A - Letters of Appointment

Note: Included in Volume 2 of this Report

Appendix B - Draft Licence & Related Papers

B-1 EPA Inspectors Report to Board with Recommended Decision

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E-3 EPA Guidelines for Oral Hearings

Note: Included in Volume 2 of this Report

Appendix F - Digital Audio Record of Oral Hearing

Note: Schedule of testimony follows, but actual recordings Included in Volume 2 of this Report

Date	Order of Witness/Testimony	Time	Oral Hearing Record	Oral Hearing Digital Record Reference
14th Feb 2005	Mr. Boyle TD	13:38 p.m.	None	E+8, F, G, H, J
	Mr. D. Chambers (CEA)		# 1 and # 6	K+4, L, M, O, P, Q,
	Mr. A. Navratil (ECSE)	17:02	# 3 and # 20	S+1, T
15th	Mr. A. Navratil (ECSE) cont.	10:10	-	A+14, B, C, D
	Mr. P. North (ECSE)	10:45	# 15 and #12	D+9, E, F, G, H, J, K, L, M, N
	Mr. N. Hartly (ECSE)	14:05	# 4	O+3, P, Q
	Mr. North (ECSE) (resumes)	14:36	-	Q+5, R
	Mr. F. O'Neill (ECSE)	15:00	#8	R+13, S, T
	Ms. A Hogan (RDRA)	15:52	#7	U+8, V, W, X
	Mr. Crowley (CACA)	16:38	#9	X+8, Y, Z
	Ms. M. Hurley (CACA)	17:11	#11	Z+11, AA, BB, CC
16th	Mr. P. Walter (RDRA)	10:30	#5	C+3, D
	Ms. R. Cargin (KEW)	10:58	#14 and # 17	D+14, E, F, G
	Ms. J. Masson (CASE)	11:35	#16	G+5, H, J, K, L
	Mr. R. Allen (CASE)	13:46	#10	N+1, O, P, Q.
	Ms. Jo Kelleher (P.W.T.C)	15:00	#21	S+0, T
	Mr. D. Donnelly (P.W.T.C)	15:46	#22	Y+1, W, X, Y
	Ms. M O'Leary (CHASE)	16:35	#18	Y+4, Z, AA, BB, CC.
17th	Mr. M. McGrath (P.W.T.C)	10:28	#26	A+11, B, C, D, E
	Mr. Collins (CHASE – MOL)	11:16	#25	F+1
	Mr. G. Clancey (CHASE – CITY)	11:42	#24	G+11, H, J, K, L, M, N, O, P, Q, R, S, T
	Ms. M. Dalton (CHASE – PWGMB)	15:58	#2 & #27	U+14, V, W, X, Y, Z, AA, BB, CC, DD, EE
18th	Ms. Dalton (cont.)	10:19	#2 & #27	B+4, C
	Dr. Porter (Indaver)	11:00	#23	E+1, F, G, H, J, K, L
	Dr. Ten Tusscher (CHASE – MOL)	13:51	#28	M+6, N, O, P, Q, R, S, T, U, V, W, X
	Dr. Porter (Indaver) contd.	17:08	#23	Y+7, Z, AA, BB
21st	Ms. N. O'Reilly (MBSC)	10:10	#19	A+9, B, C
	Mr. P. Sweetman (An Taisce)	10:53	#29	D+7, E, F, G, H
	Dr. Porter (Indaver) Cont.	13:40	#23	K+9, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, BB

22nd Feb 2005	Mr. J. Kelleher (RDRA)	10:11	#32	A+11, B, C, D.
	Dr. A. Staines (CHASE – MOL)	11:12	#31	E+12, F, G, H, J, K
	Mr. F. Duff (CHASE – MOL)	12:26	#30	K+11, L, M, N, O, P, Q
	Dr. Porter (Indaver) cont.	14:48	#23	R+0, S, T, U, V, X, Y, Z, AA, BB, CC, DD, EE, FF
	Ms. B. Daly (CACA)	18:50	None	GG+10, HH
	Ms. D. Forde (RDRA)	18:59	None	HH+4, JJ
	Dr. Porter (Indaver) cont.	19:12	#23	JJ+1, KK, LL, MM
	Ms. D. Krien (Public)	20:02	None	MM+7, NN
23rd	Mr. J. Ahern (Indaver)	10:12	#33	A+12, rest
24th	Mr. J. Ahern (Indaver) contd.	10:05	#33	All
25th	Mr. J. Ahern (Indaver) cont.	10:05	#33	A, B, & C
	Mr. C. Jones (Indaver)	10:39	#34	C+9, rest
28th	Mr. C. Jones (Indaver) cont.	10:03	#34	A, B, C, D, E, F
	Dr. F. Callaghan (Indaver)	11:28	#37	F+13, G, H, J, K, L, M, N, O, P
	Ms. R. Lydon (Indaver)	14:56	#35	Q+11, R, S, T, U, V, W, X
Closing Statements				
1st March 2005	Mr. Slattery (Indaver)	10:08		A+7, B
	Mr. Noonan (CHASE – MOL)	10:30		C+0, D, E, F, G, H
	Ms. Bohen (CHASE –MPW)	12:01		J+1
	Ms. Dalton (CHASE – MPW & PWTC)	12:07		J+7, K, L
	Mr. Clancy (CHASE – CITY)	13:32		M+2
	Ms. Masson (CASE)	13:43		M+12, N
	Mr. Croinin (An Taisce)	13:52		N+6, O
	Ms. Wipfler (Dan Boyle)	14:10		O+10, P
	Ms. O'Reilly, MBSC)	14:20		P+4
	Ms. R. Fulton (KEW)	14:30		P+14, Q
	Mr. North (ECSE)	14:41		Q+11, R
	Mr. Navratil (ECSE)	14:51		R+5, S
	Ms. Hurley (CASE)	15:32		T+2
	Mr. Chambers (CEA)	15:41		T+11, U
	Ms. Hogan (RDRA)	15:54		U+9

Appendix G - Documents Submitted to the Oral Hearing

Note: Schedule of documents enclosed, and documents themselves included in Volume 2 of this Report

Note: All documents included in Volume 2 of this Report

Doc. No.	Date Submitted	Name of Submitter	Title/Description of Document
1	14 Feb 2005	Dan Boyle TD, Green Party	Submission on behalf of Cork Environmental Alliance to EPA OH 14/02/05
2	14 Feb 2005	Marcia D'Alton on behalf of Mary P. Bowen, CHASE (Passage West/Glenbrook/Monkstown	Waste Licence Application 186-1 by Indaver Ireland
3	14 Feb 2005	A.J. Navratil, East Cork for a Safe Environment in association with CHASE	The Politics of Health
4	15 Feb 2005	Natasha Harty, Jamesbrook, Middleton, Co. Cork	Submission from Natasha Harty, Jamesbrook, Middleton, Co. Cork to the EPA OH for the Draft Licences for Indaver Ireland, Ringaskiddy
5	15 Feb 2005	Peter Walter on behalf of Ringaskiddy Residents Association	No Title
6	15 Feb 2005	Mr. Derry Chambers, Cork Environmental Alliance	Section 9 Dioxin Investigation in Ringaskiddy
7	15 Feb 2005	Ringaskiddy & District Residents Association Ltd.	No title
8	15 Feb 2005	Frank O'Neill, East Cork Safety and Environment	Submission to the EPA on the Proposed Hazardous Waste Incinerator in Cork Harbour
9	15 Feb 2005	Cllr. Danny Crowley, Mayor of Cobh	Submission to Oral Hearing 15/02/05
10	15 Feb 2005	Joan Masson, CASE	Carrigaline Area for a Safe Environment (CASE)
11	15 Feb 2005	Mary Hurley, Cobh Action for Clean Air	No title
12	15 Feb 2005	A.J. Navratil	Health Impacts of Incineration, with particular reference to Toxicological Effects .... by Dr. C.V. Howard MB
13	15 Feb 2005	Indaver	Fire Water Retention
14	15 Feb 2005	Rosie Cargin, Kinsale Environment Watch	Submission by Kinsale Environment Watch
15	16 Feb 2005	Mr. Peter North, East Cork for Safe Environment	Indaver Oral Hearing
16	16 Feb 2005	Joan Masson, Carrigaline Area for a Safe Environment	Submission on behalf of Carrigaline Area for a Safe Environment

17	16 Feb 2005	Rosie Cargin, Kinsale Environment Watch	Indaver's exceeding of the Dioxins Standard
18	16 Feb 2005	Mary O'Leary, Cork Harbour for a Safe Alliance	Submission by CHASE
19	16 Feb 2005	Nuala O'Reilly, Monkstown Bay Sailing Club	Submission to the EPA against granting a licence to Indaver
20	16 Feb 2005	A.J. Navratil	Zero Waste, Australia
21	16 Feb 2005	Cllr. Jo Kelleher, Mayor of Passage West Town Council	Submission by Cllr. Jo Kelleher
22	16 Feb 2005	Cllr. Dominick Donnelly of Passage West Town Council	Submission to the EPA Oral Hearing on the Proposed Indaver Incinerator
23	16 Feb 2005	Dr. Edward Porter, AWN Consulting	Proof of Evidence – Air Quality & Climate
24	17 Feb 2005	Ger Clancy, Cork Harbour Alliance for a Safe Environment	Our 7 Questions for the EPA
25	17 Feb 2005	Noel Collins, Member of Cork Co. Council	Proposed Incinerator in Cork Harbour
26	17 Feb 2005	Michael McGrath, Passage West Town Council	Incinerator EPA Licence Application – Oral Hearing
27	17 Feb 2005	Marcia D'Alton, Chase Monkstown	Outline of Evidence to EPA OH – An Examination of the Air Quality Study
28	18 Feb 2005	Mary O'Leary, CHASE	Dioxin Exposure and Effects on Children's Health by Gavin W. ten Tusscher, MD
29	19 Feb 2005	Peter Sweetman, An Taisce	No Evidence of Dioxin Cancer Threshold
30	19 Feb 2005	Feargal Duff, CHASE	Statement on behalf of CHASE
31	19 Feb 2005	Anthony Staines for Chase (Mary O'Leary)	The human health impact of the proposed joint hazardous waste/municipal waste incinerator at Ringaskiddy: a critique of the health assessment in the EIS submitted with the waste licence application
32	22 Feb 2005	Joe Kelleher, Ringaskiddy Residents Association	Statement of Joe Kelleher to EPA OH 22 Feb 2005
33	22 Feb 2005	John Ahern, Indaver Ireland	Proof of Evidence + Waste Legislation Guide + Letter to the Editor – The Irish Examiner
34	22 Feb 2005	Conor Jones, Indaver Ireland	Proof of Evidence
35	22 Feb 2005	Ria Lydon, ARUP	Witness Statement

36	22 Feb 2005	Fr. Peadar Murphy, St. Mary's Convent National School, Cobh	No title
37	22 Feb 2005	Dr. Fergal Callaghan, AWN Consulting	Soil PCDD/F Concentrations and PCDD/F Intake
38	24 Feb 2005	Joan Hayes	Letter from Canberra Environment Centre to A.J. Navratil
39	24 Feb 2005	Joe Noonan	Newspaper Ad by Frank McDonald entitled "EU Report finds air pollution kills 310,000 Europeans annually"

Note: All documents included in Volume 2 of this Report

Appendix H - Letter dated 25 March 2003 from Dr M Kelly (Director General EPA) to Department of Health & Children

Note: Included in Volume 2 of this Report

Appendix I - Recommended Final Decision

The attached recommended final licence shows the Proposed Decision as was issued with the recommended changes as discussed in the text of this report highlighted in bold and colour as appropriate.

Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Headquarters
P.O. Box 3000
Johnstown Castle Estate
County Wexford
Ireland

WASTE LICENCE

FOR A WASTE MANAGEMENT FACILITY INCLUDING A HAZARDOUS AND NON-HAZARDOUS WASTE INCINERATOR

Recommended Licence

Licence Register Number:	186-1
Applicant:	Indaver Ireland
Location of Facility:	Ringaskiddy, County Cork

INTRODUCTION

This introduction is not part of the licence and does not purport to be a legal interpretation of the licence.

This licence is for the operation of a Community Recycling Park, Waste Transfer Station and two Incinerators to burn hazardous and non-hazardous waste and to recover energy in the form of steam and electricity (incineration plant) for export to the national grid at Ringaskiddy Co. Cork. The facility covers an area of approximately 12 hectares.

The Community Recycling Park consists of a "Bring Bank" where the public can bring material including cardboard, glass, aluminium cans, textiles batteries, waste oil and fluorescent tubes for recycling. Waste accepted at the park will be sent off site to suitable recycling facilities. The Community Recycling park is designed to accept in the region of 260 tonnes of waste per annum

The Waste Transfer Station has been designed to handle 15,000 tonnes of industrial hazardous and non-hazardous waste per annum. Industrial hazardous and non-hazardous waste will be sorted and repackaged where necessary. Material will either be exported for treatment off site or transferred to the incineration plant for on site incineration.

The Incineration Plant consists of two incinerators, a fluidised bed incinerator with post combustion chamber for the treatment of hazardous and non-hazardous solid and liquid waste and a moving grate incinerator for the treatment of residual non-hazardous solid industrial, commercial and household waste.

The licence allows up to 100,000 tonnes of waste per year to be incinerated in each of the incinerators.

Infrastructure for the incineration plant includes, waste reception area, furnace, boiler, energy recovery system, facilities for the treatment of exhaust gases (5 stage treatment system), on-site facilities for handling and storage of residues and waste water, stack, devices and systems for controlling, recording and monitoring the incineration process. The heat produced from the process will be used to generate approximately 18MW of electricity with 14MW being exported to the national grid.

The licensee must manage and operate the facility to ensure that the activities do not cause environmental pollution. The licensee is required to carry out regular environmental monitoring and submit all monitoring results, and a wide range of reports on the operation and management of the facility to the Agency.

The licence sets out in detail the conditions under which Indaver Ireland (Branch of Indaver NV, Belgium), 4 Haddington Terrace, Dun Laoghaire, County Dublin will operate and manage this facility.

Table of Contents

Page No.

DECISION & REASONS FOR THE DECISION

Reasons for the Decision

The Environmental Protection Agency is satisfied, on the basis of the information available, that the waste activities, licensed hereunder will comply with the requirements of Section 40 (4) of the Waste Management Acts 1996 to 2003.

In reaching this decision the Environmental Protection Agency has considered the application, supporting documentation and objection received from the applicant, all submissions and objections received from other parties, and the report on the Oral Hearing.

PART I ACTIVITIES LICENSED

In pursuance of the powers conferred on it by the Waste Management Acts 1996 to 2003, the Environmental Protection Agency (the Agency) proposes, under Section 40(1) of the said Act to grant this Waste Licence to Indaver Ireland to carry on the waste activities listed below at Ringaskiddy County Cork subject to conditions, with the reasons therefor and the associated schedules attached thereto set out in the licence.

Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Acts 1996 to 2003

Class 7.	**Physico-chemical treatment not referred to elsewhere in this Schedule (including evaporation, drying and calcination) which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1. to 10. of this Schedule (including evaporation, drying and calcination).**
Class 8.	**Incineration on land or at sea.**
Class 11.	**Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule.**
Class 12.	**Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.**
Class 13.	**Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced.**

Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Acts 1996 to 2003

Class 1.	**Solvent reclamation or regeneration:**
Class 2.	**Recycling or reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes):**
Class 3.	**Recycling or reclamation of metals and metal compounds:**
Class 4.	**Recycling or reclamation of other inorganic materials:**
Class 6.	**Recovery of components used for pollution abatement:**
Class 9.	**Use of any waste principally as a fuel or other means to generate energy:**
Class 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:**

PART II: SCHEDULE OF ACTIVITIES REFUSED

None of the proposed activities as set out in the waste licence application have been refused.

PART III: GLOSSARY OF TERMS

All terms in this licence should be interpreted in accordance with the definitions in the Waste Management Acts 1996 to 2003, (the Acts), unless otherwise defined in this section.

Abnormal Operations	Any technical stoppage, disturbance, or failure of any of the purification devices or the measurement devices, during which the concentrations in the discharges to the air may exceed the prescribed emission limit values.
Aerosol	A suspension of solid or liquid particles in a gaseous medium.
Adequate lighting	20 lux measured at ground level.
AER	Annual Environmental Report.
Agreement	Agreement in writing.
Annually	At approximately twelve monthly intervals.
Attachment	Any reference to Attachments in this licence refers to attachments submitted as part of this licence application.
Application	The application by the licensee for this licence.
Appropriate facility	A waste management facility, duly authorised under relevant law and technically suitable.
BAT	Best Available Technology
Bi-annually	All or part of a period of six consecutive months.
Biennially	Once every two years.
Biodegradable Waste	Any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food, garden waste, sewage sludge, paper and paperboard.
BOD	5 day Biochemical Oxygen Demand.
Breakdown	Any technical stoppage, disturbance, or failure of the purification devices or the measurement devices.
CCTV	Closed circuit television
CEN	Comité Européen De Normalisation – European Committee for Standardisation
COD	Chemical Oxygen Demand.
Condition	A condition of this licence.
Consignment	All movements of hazardous waste within Ireland must be

Note	accompanied by a "C1" consignment note issued by a local authority under the Waste Management (Movement of Hazardous Waste) Regulations (SI No. 147 of 1998). Transfrontier shipment notification and movement/tracking form numbers are required for all exports of waste from, into or through the state under the Waste Management (Transfrontier Shipment of Waste) Regulations (SI No. 149 of 1998).
Construction and Demolition Waste	All wastes which arise from construction, renovation and demolition activities.
Containment boom	A boom which can contain spillages and prevent them from entering drains or watercourses or from further contaminating watercourses.
Daily	During all days of plant operation, and in the case of emissions, when emissions are taking place; with at least one measurement on any one day.
Day	Any 24 hour period.
Daytime	0800 hrs to 2200 hrs.
dB(A)	Decibels (A weighted).
Dioxins and Furans	As defined in Council Directive 2000/76/EC on the incineration of waste.
DO	Dissolved Oxygen.
Documentation	Any report, record, result, data, drawing, proposal, interpretation or other document in written or electronic form which is required by this licence.
Drawing	Any reference to a drawing or drawing number means a drawing or drawing number contained in the application, unless otherwise specified in this licence.
Emergency	Those occurrences defined in Condition 9
Emission Limits	Those limits, including concentration limits and deposition levels established in *Schedule B* of this licence.
EMP	Environmental Management Programme.
EPA	Environmental Protection Agency.
European Waste Catalogue (EWC)	A harmonised, non-exhaustive list of wastes drawn up by the European Commission and published as Commission Decision 2000/532/EC and any subsequent amendment published in the Official Journal of the European Community.
Facility	Any site or premises used for the purposes of the recovery or disposal of waste.

Fortnightly	A minimum of 24 times per year, at approximately two week intervals.
GC/MS	Gas Chromatography/Mass Spectroscopy
HFO	Heavy Fuel Oil.
Hours of Waste Acceptance	The hours during which the facility is authorised to accept waste
Incident	The following shall constitute an incident for the purposes of this licence: a) An emergency; b) Abnormal operation; c) Breakdown; d) any emission which does not comply with the requirements of this licence; e) any trigger level specified in this licence which is attained or exceeded f) ***any failure to operate the specified controls set out in this licence***.
Industrial Waste	As defined in Section 5(1) of the Waste Management Acts, 1996 to 2003.
Inert Waste	Waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.
Incineration Plant	As defined in Council Directive 2000/76/EC on the incineration of waste.
ICP	Inductively Coupled Plasma Spectroscopy.
K	Kelvin.
KPa	Kilo Pascals.
Leq	Equivalent continuous sound level.
Licensee	Indaver Ireland (Branch of Indaver NV).
Liquid Waste	Any waste in liquid form and containing less than 2% dry matter. Any waste tankered to the facility.
List I/II Organics	Substances classified pursuant to EC Directives 76/464/EEC and 80/68/EEC.
Local Authority	Cork County Council

Maintain	Keep in a fit state, including such regular inspection, servicing, calibration and repair as may be necessary to adequately perform its function.
Mass Flow Limit	An Emission Limit Value which is expressed as the maximum mass of a substance which can be emitted per unit time.
Mass Flow Threshold	A mass flow rate, above which, a concentration limit applies.
Monthly	A minimum of 12 times per year, at approximately monthly intervals.
Night-time	2200 hrs to 0800 hrs.
Noise Sensitive Location (NSL)	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation/facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
Nominal Capacity	As defined in Council Directive 2000/76/EC on the incineration of waste.
Oil Separator	Device installed according to the draft European Standard prEN 858 (Installations for the separation of light liquids, e.g. oil and petrol).
PER	Pollution Emission Register.
Quarterly	All or part of a period of three consecutive months beginning on the first day of January, April, July or October.
Recyclable Materials	Those waste types, such as cardboard, batteries, gas cylinders, etc, which may be recycled.
Residue	As defined in Council Directive 2000/76/EC on the incineration of waste.
Regional Fisheries Board	South-Western Regional Fisheries Board.
Sample(s)	Unless the context of this licence indicates to the contrary, samples shall include measurements by electronic instruments.
Sludge	The accumulation of ***organic and inorganic*** solids resulting from chemical coagulation, flocculation and/or sedimentation after water or wastewater treatment with greater than 2% dry matter.
SOP	Standard Operating Procedure.
Standard Methods	As detailed in "Standard Methods for the Examination of Water and Wastewater", (prepared and published jointly by A.P.H.A., A.W.W.A & W.E.F) 20th Ed. 1998, American Public Health Association, 1015 Fifteenth Street, N.W., Washington DC 20005, USA; or, an alternative method as may be agreed in writing by the Agency.

TOC	Total Organic Carbon.
The Agency	Environmental Protection Agency.
Treatment	Treatment means the physical, thermal, chemical or biological processes, including sorting, that change the characteristics of the waste in order to reduce its volume or hazardous nature, facilitate its handling or enhance recovery.
Trigger Level	A parameter value, the achievement or exceedance of which requires certain actions to be taken by the licensee.
Weekly	During all weeks of plant operation, and in the case of emissions, when emissions are taking place; with at least one measurement in any one week.
WWTP	Waste Water Treatment Plant.

CONDITIONS

CONDITION 1. Scope

1.1 Waste activities at the facility shall be restricted to those listed and described in Part I Activities Licensed and as set out in the licence application and subject to the conditions of this licence.

1.2 For the purposes of this licence, the facility is the area of land outlined in the licence application. Any reference in this licence to "facility" shall mean the area thus outlined.

1.3 This licence is for the purposes of waste licensing under the Waste Management Acts, 1996 to 2003 only and nothing in this licence shall be construed as negating the licensee's statutory obligations or requirements under any other enactments or regulations.

1.4 The maximum tonnage to be accepted at the facility shall not exceed 215,260 tonnes per annum.

1.5 Waste disposal and recovery activities at this facility shall be limited to the waste categories and quantities as set out in *Schedule A: Limitations,* of this licence.

1.6 No composting or other biological transformation processes shall be carried out on site.

1.7 Every plan, programme or proposal submitted to the Agency for its agreement pursuant to any condition of this licence shall include a proposed timescale for its implementation. The Agency may modify or alter any such plan, programme or proposal in so far as it considers such modification or alteration to be necessary and shall notify the licensee in writing of any such modification or alteration. Every such plan, programme or proposal shall be carried out within the timescale fixed by the Agency but shall not be undertaken without the agreement of the Agency. Every such plan, programme or proposal agreed by the Agency shall be covered by the conditions of this licence.

1.8 The facility shall be controlled, operated, and maintained and emissions shall take place as set out in this licence. All programmes required to be carried out under the terms of this licence become part of this licence.

1.9 No alteration to, or reconstruction in respect of, the activity or any part thereof which would, or is likely to, result in

(a) a material change or increase in:

- The nature or quantity of any emission,
- The abatement/treatment or recovery systems,
- The range of processes to be carried out,
- The fuels, raw materials, intermediates, products or wastes generated, or

(b) any changes in:

- Site management infrastructure or control with adverse environmental significance,

shall be carried out or commenced without prior notice to, and without the prior agreement of, the Agency.

1.10 ***Having regard to the nature of the activity and arrangements necessary to be made or made in connection with the carrying on of the activity, the specified period for the purposes of Section 41(1) of the Waste Management Acts 1996 – 2003, is 5 years.***

REASON: *To clarify the scope of this licence.*

CONDITION 2. Management of the Facility

2.1 Facility Management

2.1.1 The licensee shall employ a suitably ***professionally*** qualified and experienced ***(15 years minimum in incinerator technology)*** installation manager who shall be designated as the person in charge. The installation manager or ~~a~~ nominated, suitably ***professionally*** qualified and experienced deputies~~y~~ ***(minimum 10 years incinerator experience, or 10 years hazardous waste management experience for the Transfer Station)*** shall be present on the installation/facility at all times during its operation or as otherwise required by the Agency.

2.1.2 The licensee shall ensure that personnel performing specifically assigned tasks shall be qualified on the basis of appropriate education, training and experience, as required and shall be aware of the requirements of this licence.

2.2 Management Structure

2.2.1 Prior to the commencement of waste activities, the licensee shall submit written details of the management structure of the facility to the Agency ***for approval***. Any proposed replacement in the management structure shall be notified in writing ***in advance*** to the Agency ***for similar approval***. Written details of the management structure shall include the following information:

a) the names of all persons who are to provide the management and supervision of the waste activities authorised by the licence, in particular the name of the facility manager and any nominated deputies;

b) details of the responsibilities for each individual named under a) above; and

c) details of the relevant education, training and experience held by each of the persons nominated under a) above.

2.3 Environmental Management System (EMS)

2.3.1 ***Prior to the acceptance of waste at the facility t***he licensee shall establish and maintain an Environmental Management System

(EMS). The EMS shall be updated on an annual basis and submitted to the Agency as part of the Annual Environmental Report (AER).

2.3.2 The EMS shall include as a minimum the following elements:

2.3.2.1 Management and Reporting Structure.

2.3.2.2 Schedule of Environmental Objectives and Targets.

The licensee shall prepare a schedule of Environmental Objectives and Targets. The Schedule shall as a minimum provide for a review of all operations and processes, including an evaluation of practicable options, for energy and resource efficiency, the use of cleaner technology, cleaner production, and the prevention, reduction and minimisation of waste, and shall include waste reduction targets. The schedule shall include time frames for the achievement of set targets and shall address a five year period as a minimum. The schedule shall be reviewed annually and amendments thereto notified to the Agency for agreement as part of the Annual Environmental Report (AER).

2.3.3 Environmental Management Programme (EMP)

(i) The licensee shall, not later than six months from the date of commencement of waste activities, submit to the Agency for agreement an EMP, including a time schedule, for achieving the Environmental Objectives and Targets prepared under Condition 2.3.2.2. Once agreed the EMP shall be established and maintained by the licensee. It shall include:

(a) designation of responsibility for targets;

(b) the means by which they may be achieved;

(c) the time within which they may be achieved.

(ii) The EMP shall be reviewed annually and amendments thereto notified to the Agency for agreement as part of the Annual Environmental Report (AER).

(iii) A report on the programme, including the success in meeting agreed targets, shall be prepared and submitted to the Agency as part of the AER. Such reports shall be retained on-site for a period of not less than seven years and shall be available for inspection by authorised persons of the Agency.

2.3.4 Documentation

(i) The licensee shall establish and maintain an environmental management documentation system which shall be to the satisfaction of the Agency.

(ii) The licensee shall issue a copy of this licence to all relevant personnel whose duties relate to any condition of this licence.

2.3.5 Corrective Action

The licensee shall establish procedures to ensure that corrective action is taken should the specified requirements of this licence not be fulfilled. The responsibility and authority for initiating further investigation and corrective action in the event of a reported non-conformity with this licence shall be defined.

2.3.6 Awareness and Training

The licensee shall establish and maintain procedures for identifying training needs, and for providing appropriate training, for all personnel whose work can have a significant effect upon the environment. Appropriate records of training shall be maintained.

2.3.7 Communications Programme

Co-incident with the commencement of development of the facility, the licensee shall establish and maintain a Communications Programme to ensure that members of the public can obtain information at the installation/facility, at all reasonable times, concerning the environmental performance of the facility.

REASON: *To make provision for the proper management of the activity on a planned basis having regard to the desirability of ongoing assessment, recording and reporting of matters affecting the environment.*

CONDITION 3. Infrastructure and Operation

3.1 The licensee shall***, for each component of the facility (Recycling Park, Transfer Station, Incinerator Phase I, and Incinerator Phase II) ,*** establish ***as when required for each component,*** all infrastructure referred to in the licence application and in this licence***,*** prior to the commencement of the licensed activities ***in that component***, or as required by the conditions of this licence.

3.2 Monitoring Infrastructure

3.2.1 The licensee shall install on all emission points such sampling points or equipment, including any data-logging or other electronic communication equipment, as may be required by the Agency. All such equipment shall be consistent with the safe operation of all sampling and monitoring systems.

3.2.2 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.

3.2.3 The licensee shall maintain all sampling and monitoring points, and clearly label and name all sampling and monitoring locations, so that they may be used for representative sampling and monitoring.

3.2.4 Groundwater
Prior to commencement of waste acceptance at the facility, the licensee shall install and maintain a minimum of two down-gradient and one up-gradient monitoring boreholes to allow for the sampling and analyses of groundwater in overburden and bedrock. All wellheads shall be adequately protected to prevent contamination.

3.2.5 Meteorological Station

3.2.5.1 The Licensee shall operate a weather monitoring station at a location agreed by the Agency which records the requirements specified in *Schedule C5: Meteorological Monitoring,* of this licence.

3.2.5.2 The licensee shall provide and maintain in a prominent location on the facility a windsock, or other wind direction indicator, which shall be visible from the public roadway outside the site.

3.3 Facility Notice Board

3.3.1 The licensee shall provide and maintain a Facility Notice Board on the facility so that it is legible to persons outside the main entrance to the facility. The minimum dimensions of the board shall be 1200 mm by 750 mm.

3.3.2 The board shall clearly show:-

a) the name and telephone number of the facility;
b) the normal hours of opening;
c) the name of the licence holder;
d) an emergency out of hours contact telephone number;
e) the licence reference number; and
f) where environmental information relating to the installation/facility can be obtained.

3.4 Facility Security

3.4.1 The licensee shall provide and maintain a ***palisade*** security fence to ensure adequate security at the facility. During hours of operation access to the Waste Transfer Station and the Community Recycling Park shall be controlled by security barrier. Outside hours of operation the gate shall be locked and monitored by CCTV.

3.4.2 The licensee shall provide and maintain a security building and security barrier for the control of access to the incineration plant. The entrance to the incineration plant shall be monitored by CCTV at all times.

3.5 Waste Inspection and Quarantine Areas

3.5.1 ~~***An I***~~***I***mpermeable Waste Inspection Area***s*** and ~~***a***~~ Waste Quarantine Area***s*** shall be provided and maintained at the waste transfer station and the incineration plant.

3.5.2 These areas shall be constructed and maintained in a manner suitable, and be of a size appropriate, for the inspection of waste and subsequent quarantine if required. The waste inspection ~~***area***~~ and ~~***the***~~ waste quarantine area***s*** shall be clearly identified and segregated from each other***, and quarantined waste shall be appropriately stored and clearly labelled***. ***No waste shall be quarantined in the waste reception/delivery area for the incinerators.***

3.5.3 The licensee shall provide and maintain a scanner for the detection of radioactive material in waste entering the incineration plant.

3.5.4 The licensee shall provide and maintain two weighbridges at the facility.

3.6 Prior to the date of commencement of the waste activities at the facility, the licensee shall install and provide adequate measures for the control of odours and dust emissions, including fugitive dust emissions, from the facility. Such measures shall at a minimum include the following:-

3.6.1 Dust curtains or equivalent, subject to the agreement of the Agency, on the entry/exit points from the buildings where waste is accepted. All other doors in this building shall be kept closed where possible.

3.6.2 Installation and maintenance of negative pressure at the waste reception area of the incineration plant to ensure no significant escape of odours or dust.

3.6.3 Installation of an odour management system.

3.7 Tank and Drum Storage Areas

3.7.1 All tank and drum storage areas shall be rendered impervious to the materials stored therein.

3.7.2 All tank and drum storage areas shall, as a minimum, be bunded, either locally or remotely, to a volume not less than the greater of the following:-

(a) 110% of the capacity of the largest tank or drum within the bunded area; or

(b) 25% of the total volume of substance which could be stored within the bunded area.

3.7.3 All drainage from bunded areas shall be diverted for collection and safe disposal.

3.7.4 All inlets, outlets, vent pipes, valves and gauges must be within the bunded area.

3.7.5 The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall be tested and demonstrated by the licensee to the satisfaction of the Agency and shall be reported to the Agency following installation and prior to their use as a storage area. The licensee shall repeat the test at five-year intervals and include the results of the test in the AER.

3.7.6 The licensee shall have regard to relevant EPA guidance in complying with this condition.

3.8 The licensee shall provide the following ***minimum*** residual storage capacity:

(a) bottom ash 2000 m^3;
(b) boiler ash 130 m^3 ;
(c) fly ash/flue gas cleaning ash 270 m^3; and
(d) gypsum 50 m^3.

3.9 Surface Water Management.

3.9.1 Effective surface water management infrastructure shall be provided and maintained at the facility during construction and operation of the facility.

3.9.2 Surface water runoff from impermeable surfaced areas and buildings in the Incineration Plant shall be collected and used as process water in the incineration plant as far as practicable.

3.9.3 Surface water from the incineration plant and hard standing shall not be discharged to the storm water sewer unless it has been monitored in accordance with *Schedule C* of this licence and is in compliance with any agreed trigger levels.

3.9.4 Prior to the acceptance of waste at the facility, the licensee shall submit to the Agency for its agreement, surface water monitoring trigger levels (pH and TOC).

3.10 Drainage system, pipeline identification

3.10.1 Prior to the commencement of waste activities, all wastewater gullies, drainage grids and manhole covers shall be painted with red squares whilst all surface water discharge gullies, drainage grids and manhole covers shall be painted with blue triangles. These colour codes shall be maintained so as to be visible at all times during facility operation, and any identification designated in this licence (e.g. SW1) shall be inscribed on these manholes.

3.10.2 The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage at the facility.

3.10.3 The licensee shall install and maintain oil separators at the facility to ensure that all surface water discharges ***(roof water excepted)*** pass through oil separator prior to discharge to the storm water sewer. The oil separator shall be a Class II full retention separator and the separator shall be in accordance with European Standard prEN 858 (installations for the separation of light liquids).

3.10.4 The drainage system, bunds, and oil separators shall be desludged as necessary and properly maintained at all times. All

sludge and drainage from these operations shall be collected for safe disposal.

3.10.5 All pump sumps or other treatment plant chambers from which spillage of environmentally significant materials might occur in such quantities as are likely to breach local or remote containment or separator, shall be fitted with high liquid level alarms (or oil detectors as appropriate) prior to the commencement of waste activities.

3.10.6 Fire water/storm water retention shall be provided on site as detailed in the licence application.

3.11 Waste Acceptance/Removal Hours and Hours of Operation

3.11.1 Waste shall be accepted at or exported from the Facility (Incineration Plant, Waste Transfer Station and Community Recycling Park) only between the hours of 0900 to 1900 Monday to Friday inclusive and 0900 to 1400 on Saturdays.

3.11.2 Waste shall not be accepted at or exported from the facility on Sundays or on Bank Holidays without the written approval of the Agency.

~~***3.11.3 The Waste Transfer Station and Community Recycling Park shall not be operated outside the hours 0900 to 1900 Monday to Friday inclusive and 0900 to 1400 on Saturdays.***~~

~~***3.11.4 The Waste Transfer Station and Community Recycling Park shall not be operated on Sundays or on Bank Holidays without the written approval of the Agency.***~~

3.12 Incineration plant - Test programme/Commissioning Plan

3.12.1 In the case of the fluidised bed incinerator and the moving grate incinerator, the licensee shall, at least three months prior to the commissioning date of each incinerator, submit to the Agency for its agreement a Test Programme/Commissioning Plan.

3.12.2 The Test Programme/Commissioning Plan shall as a minimum:

a) Verify the residence time as well as the minimum temperature and the oxygen content of the exhaust gas which will be achieved during normal operation and under the most unfavourable operating conditions anticipated.

b) Demonstrate that each combustion chamber will be able to achieve 850°C for a minimum of two seconds on a continuous basis.

c) Demonstrate that the post combustion chamber of the fluidised bed incinerator will be able to achieve 1100°C in the case of the incineration of waste with a content of more than 1% halogenated organic substances.

d) Establish all criteria for operation, control and management of the abatement equipment to ensure compliance with the emission limit values specified in this licence.

e) Establish criteria for the control of waste input including the minimum and maximum mass flows, the lowest and

maximum calorific values and their maximum content of pollutants to ensure compliance with the emission limits set in this licence.

f) Assess the performance of any monitors on the abatement system and establish a maintenance and calibration programme for each monitor.

g) Confirm that all measurement equipment or devices (including thermocouples) used for the purpose of establishing compliance with this licence has been subjected, in situ, to its normal operating temperature to prove its operation under such conditions.

3.12.3 The Test Programme/Commissioning Plan shall be implemented as agreed and a report on its implementation shall be submitted to the Agency on completion.

3.13 Incineration plant shall not be operated (outside of the agreed Test Programme/Commissioning Plan) until such time as it is authorised to do so by the Agency.

3.14 Incineration Plant Operation - additional requirements

3.14.1 The plant shall be operated in accordance with the criteria for operation and control as determined in the test programme in Condition 3.12.

3.14.2 The nominal capacity of the fluidised bed incinerator shall be 13.3 tonnes per hour.

3.14.3 The calorific values of the ***mixture of*** waste input into the fluidised bed incinerator shall be ***in the range 6MJ/kg minimum, and 40 MJ/kg maximum***.

3.14.4 The waste input into the fluidised bed incinerator shall not contain pollutants which exceed the following levels:

a) Chlorine 300kg/hour

b) Fluorine 6 kg/hour

c) Sulphur 200 kg/hour

d) Cadmium & Thallium 0.25 kg/hour

e) Mercury 0.1 kg/hour

f) The sum of antimony (as Sb), arsenic (as As), lead (as Pb), chromium (as Cr), cobalt (as Co), copper (as Cu), manganese (as Mn), nickel (as Ni), and vanadium (as V) 20kg/hour.

Subject to the prior written approval of the Agency, the specified limits may be varied for the purposes of execution of the Test Programme required by Condition 3.12.3 (or subsequent such tests).

Any revision to these load limits following review of the Test Program required by Condition 3.12.3 (or subsequent tests), shall, following written approval of the Agency (Condition 3.13 refers), become part of this licence as binding operational control requirements for the fluidised bed incinerator.

3.14.5 The nominal capacity of the moving grate incinerator shall be 13.3 tonnes per hour.

3.14.6 The calorific values of the waste input into the moving grate incinerator shall be a minimum of 8MJ/kg and a maximum of 14 MJ/kg.

3.14.7 Prior to the commencement of waste activities the licensee shall establish and maintain standard operating procedures for the operation of the incineration plant. These shall incorporate the process controls identified in *Schedule C: Control and Monitoring*, of this licence.

3.14.8 The incineration plant shall be operated in order to achieve a level of incineration such that the Total Organic Carbon (TOC) content of the slag and bottom ashes is less than 3% or their loss on ignition is less than 5% of the dry weight of the material.

3.14.9 Even under the most unfavourable of conditions, the incineration plant shall be operated in such a way that, after the last injection of combustion air, the gas resulting from the process is raised, in a controlled and homogeneous fashion, for a duration of two seconds to a temperature of 850^{0}C (and 1100^{0}C in the case of the incineration of waste with a content of more than 1% halogenated organic substances), as measured near the inner wall or at another representative point of the combustion chamber as authorised by the Agency. Waste shall be charged into the incinerator only when these operating conditions are being complied with and when the continuous monitoring shows that the emission limit values are not being exceeded.

3.14.10 Each incineration plant shall be equipped with at least one auxiliary burner. The burner must be switched on automatically when the temperature of the combustion gases after the last injection of combustion air falls below 850^{0}C and 1100°C in the case of the incineration of waste with a content of more than 1% halogenated organic substances. The auxiliary burner shall also be used during plant start-up and shut-down operations in order to ensure the temperature of 850ºC or 1100°C as appropriate is maintained at all times during the operations and as long as unburned waste is in the combustion chamber.

3.14.11 During start up or shut down or when the temperature of the combustion gas falls below 850ºC or 1100°C as appropriate, the auxiliary burner shall not be fed with fuels which may cause higher emissions than those resulting from the burning of gas oil, as defined in Council Directive 75/716/EEC, liquefied gas or natural gas.

3.14.12 The incineration plant shall have and operate an automatic system to prevent waste feed:

a) At start-up, until the temperature of 850ºC or 1100°C as appropriate has been reached;

b) Whenever the temperature of 850ºC or 1100°C as appropriate is not maintained;

c) Whenever the continuous measurements show that any emission limit value is exceeded due to disturbances or failures of the purification devices

d) Whenever stoppages, disturbances, or failure of the purification devises or the measurement devices may result in the exceedance of the emissions limit values.

3.14.13 In the case of abnormal operating conditions the licensee shall, as soon as practicable,

3.14.13.1 shut down incineration plant operations; and

3.14.13.2 shut down process lines.

The licensee shall not resume incineration operations without the agreement of the Agency.

3.14.14 There shall be no bypass of the air abatement system.

3.14.15 The boiler shall be equipped with an automatic cleaning system to minimise the reformation of dioxins and furans.

3.14.16 The waste bunker shall be equipped with a detector for the presence of explosive gases and with a smoke detection system with alarm and water cannon for fire control.

3.14.17 Prior to the commencement of construction of each of the incinerators, the licensee shall submit for Agency approval the final design specification for the incineration plant (including a Design & Construction Quality Assurance Plan). The design shall include, inter alia, specification for: high performance filters/abatement for fine particulates (PM_{10} & $PM_{2.5}$); provision for permanent auxiliary water supply to spraytowers; and, a double containment design for the incinerator waste bunkers.

3.14.18 In the event of an emergency shutdown of either incinerator, the flue-gas re-heaters should, where safely possible, remain fully functioning until the impacted incinerator has completed its shutdown and emissions to the stack have ceased.

3.15 Prior to the commencement of waste activities the licensee shall ensure that adequate standby and back up equipment is provided on site to provide for contingency arrangements in the event of a breakdown of critical waste handling, treatment or abatement equipment.

3.16 All treatment/abatement and emission control equipment shall be calibrated and maintained, in accordance with the instructions issued by the manufacturer/supplier or installer.

3.17 The licensee shall provide and use adequate lighting during the operation of the facility in hours of darkness.

3.18 Waste Transfer Station Operation - additional requirements

3.18.1 Toxic materials, corrosive materials and flammable materials shall be stored separately.

3.18.2 Water reactive materials and materials such as organic peroxides shall be stored in special dedicated storage.

3.18.3 Drum washing and repacking shall be carried out within a dedicated building provided with extraction and abatement as required.

3.19 Community Recycling Park Operation - additional requirements

3.19.1 All containers for the reception of waste to be clearly labelled.

3.19.2 The park shall be supervised during operating hours.

3.19.3 The placement and removal of containers shall be carried out during ***waste acceptance ~~operating~~*** hours and containers shall be remov***ed as soon as practicable*** when full ***~~al~~*** when full.

REASON*: To provide for adequate infrastructure and appropriate operation of the facility to ensure protection of the environment.*

CONDITION 4. Interpretation

4.1 Emission limits for emissions to atmosphere from the incineration plant, in this licence shall be interpreted in the following way:

4.1.1 Continuous Monitoring

4.1.1.1 The half-hourly average values and the 10-minute averages shall be determined within the effective operating time (excluding the start-up and shut-off periods if no waste is being incinerated) from the measured values after having subtracted the value of the confidence interval specified at 4.1.1.2 below. The daily average values shall be determined from those validated average values.

4.1.1.2 At the daily emission limit value level, the values of the 95% confidence intervals of a single measured result shall not exceed the following percentages of the emission limit values:

Carbon monoxide:	10 %
Sulphur dioxide:	20 %
Nitrogen dioxide:	20 %
Total dust:	30 %
Total organic carbon:	30 %
Hydrogen chloride:	40 %
Hydrogen fluoride:	40 %
Ammonia:	40 %

4.1.1.3 To obtain a valid daily average value no more than five half hourly average values in any day shall be discarded due to malfunction or maintenance of the continuous measurement system. No more than ten daily average values per year shall be discarded due to malfunction or maintenance of the continuous measurement system.

4.1.2 Non-Continuous Monitoring

4.1.2.1 For periodic measurements, compliance shall be determined from the measured value after having subtracted the uncertainty error for the selected method of sampling and analysis for each relevant pollutant.

4.1.2.2 For any parameter where, due to sampling/analytical limitations, a 30 minute sampling period is inappropriate,

a suitable period between 30 minutes and 8 hours should be employed and the value obtained therein shall not exceed the emission limit value.

4.1.2.3 For all other parameters, no 30 minute mean value shall exceed the emission limit value.

4.1.2.4 For flow, no hourly or daily mean value shall exceed the emission limit value.

4.2 The results of the measurements made to verify compliance with the emission limit values shall be standardised at the following conditions :

4.2.1 Temperature 273 K; pressure 101.3 kPa; 11 % oxygen; dry gas, in exhaust gas of incineration plants.

4.3 Noise

4.3.1 Noise from the activity shall not give rise to sound pressure levels (Leq,T) measured at noise sensitive locations which exceed the limit value(s).

Reason: To clarify the interpretation of emission limit values fixed under the licence.

CONDITION 5. Emissions

5.1 No specified emission from the installation/facility shall exceed the emission limit values set out in *Schedule B: Emission Limits* of this licence. There shall be no other emissions of environmental significance.

5.2 The licensee shall ensure that there are no discharges of effluent from the cleaning of exhaust gas to surface water, sewer or ground.

5.3 The licensee shall ensure that the activities shall be carried out in a manner such that emissions do not result in significant impairment of, or significant interference with amenities or the environment beyond the facility boundary.

5.4 There shall be no clearly audible tonal component or impulsive component in the noise emissions from the activity at noise sensitive locations.

5.5 The licensee shall ensure that vermin, birds, flies, mud, dust, litter and odours do not give rise to nuisance at the facility or in the immediate area of the facility. Any method used by the licensee to control any such nuisance shall not cause environmental pollution.

5.6 The licensee shall ensure that all vehicles delivering waste to and removing waste and materials from the facility are appropriately covered.

REASONS: *To control emissions from the facility and provide for the protection of the environment and to provide for the control of nuisances.*

CONDITION 6. Control and Monitoring

6.1 The licensee shall carry out such monitoring and at such locations and frequencies as set out in *Schedule C: Control and Monitoring* of this licence.

6.2 The licensee shall carry out a noise survey of the site operations within three months after the commencement of the licensed activity and annually thereafter. The survey programme shall be submitted to the Agency in writing at least one month before the survey is to be carried out. The survey programme shall be in accordance with *Schedule C: Control & Monitoring*, of this licence or as otherwise agreed by the Agency. A record of the survey results shall be available for inspection by any authorised persons of the Agency, at all reasonable times and a summary report of this record shall be included as part of the AER.

6.3 Subject to the requirements of Article 11 of the Council Directive 2000/76/EC on the incineration of waste, the licensee may amend the frequency, locations, methods and scope of monitoring as required by this licence only upon the written instruction of the Agency and shall provide such information concerning such amendments as may be requested in writing by the Agency. Such alterations shall be carried out within any timescale nominated by the Agency.

6.4 Monitoring and analysis equipment shall be operated and maintained so that all monitoring results accurately reflect any ***specified*** emission, discharge or environmental parameter.

6.5 All persons conducting the sampling, monitoring and interpretation as required by this licence shall be suitably competent.

6.6 Measurements for the determination of concentrations of air and water polluting substances shall be carried out representatively.

6.7 Monitoring equipment shall be vibration isolated in accordance with manufacturers' specifications.

6.8 Sampling and analysis of all pollutants including dioxins and furans as well as reference measurement methods to calibrate automated measurement systems shall be carried out in accordance with CEN-standards. If CEN standards are not available, ISO, national or international standards which will ensure the provision of data of an equivalent scientific quality shall apply.

6.9 The appropriate installation and functioning of the automated monitoring equipment for emissions into air and water shall be subject to an annual surveillance test. Calibration shall be carried out by means of parallel measurements with reference methods at least every three years.

6.10 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.

6.11 The licensee shall, at a minimum of daily intervals, inspect the facility and its immediate surrounds for nuisances caused by litter, vermin, birds, flies, mud, dust and odours.

6.12 The readouts from continuous emission monitors shall report monitoring compliance information that enables direct comparison with the emission limit values specified in *Schedule B: Emission Limits*, of this licence.

6.13 The licensee shall prepare a programme, to the satisfaction of the Agency, for the identification and reduction of fugitive emissions. This programme shall be included in the annual Environmental Management Programme.

6.14 The drainage system, bunds and oil separators shall be inspected weekly.

6.15 Residues from the incineration plant shall be subject to the monitoring and analysis specified in *Schedule C: Control & Monitoring,* of this licence, prior to determining the route for disposal or recycling. The monitoring and analysis shall establish the physical and chemical characteristics and polluting potential of the residues.

6.16 Monitoring off-site shall be subject to the agreement of the property owner(s) where appropriate.

REASON: *To ensure compliance with the conditions of this licence by provision of a satisfactory system of control and monitoring of emissions.*

CONDITION 7. Resource Use and Energy Efficiency

7.1 **The licensee shall ensure that energy efficiency is built into the design for the plant.** The licensee shall carry out an audit of the energy efficiency of the site within one year of the date of ***the commencement of waste acceptance*** ~~***grant of this licence***~~. The licensee shall consult with the Agency on the nature and extent of the audit and shall develop an audit programme to the satisfaction of the Agency. The audit programme shall be submitted to the Agency in writing at least one month before the audit is to be carried out. The energy efficiency audit report shall include:

7.1.1 A review of opportunities for increasing the overall energy efficiency of the facility over the coming year.

7.1.2 Identify progress with those opportunities identified in the previous annual report.

7.1.3 Identify the net usable energy produced per tonne of waste processed (i.e. energy consumption of the facility and unused energy discharged from cooling operations to be deducted).

The audit and report shall be repeated at intervals as required by the Agency.

7.2 The recommendations of the audit shall, where appropriate, be incorporated into the Schedule of Environmental Objectives and Targets under Condition 2 above.

7.3 The licensee shall identify opportunities for

7.3.1 The reduction in the quantity of water used on site including recycling and reuse initiatives, wherever possible.

7.3.2 The recovery/recycling of residues.

7.3.3 Optimisation of fuel and raw material usage on site.

These shall be incorporated into the Schedule of Environmental Objectives and Targets under Condition 2 above.

7.4 Within twelve months of completion of the audit specified in Condition 7.1 the licensee shall undertake a study to identify the opportunities to maximise the use or recovery of heat generated during the incineration process.

REASON: *To ensure that resources and energy efficiency are used to maximise the environmental performance of the facility.*

CONDITION 8. Materials Handling

8.1 Disposal or recovery of waste shall only take place in accordance with the conditions of this licence and in accordance with the appropriate National and European legislation and protocols.

8.2 Waste Acceptance/Removal and Characterisation Procedures

8.2.1 Wastes shall be accepted at/removed from the facility only from/by an authorised or exempted carrier under National or European legislation or Protocols. Copies of the waste collection permits must be maintained at the facility.

8.2.2 The quantity of waste to be accepted at the facility on a daily basis shall not exceed the appropriate storage capacity available for such waste.

8.2.3 Prior to commencement of waste acceptance at the facility, the licensee shall establish and maintain, ***and submit to the Agency for written approval,*** detailed written procedures for the acceptance and handling of wastes. These procedures shall include the following:

a) Waste inspection at the point of entry to the facility***,*** and waste characterisation and waste profiling from known customers or new customers accepted at the ***waste transfer station and incinerator plant~~ facility~~***.

b) Methods for the characterisation of waste ***send off-site to landfill***, in order to distinguish between inert, non-hazardous and hazardous wastes. Such methods shall have regard to the EU decision (2003/33/EC) on establishing the criteria and procedures for the acceptance of waste at landfills or any revisions pursuant to Article 16 and Annex II of Directive (1999/31/EC) on the landfill of waste.

c) Waste weighing, documentation and reception.

d) The manner in which waste will be handled for disposal or recovery. This shall include bunker management procedure at the incineration plant (mixing, periodic emptying and cleaning).

e) The licensee shall, where possible (prior to accepting the waste at the incineration plant) determine the mass of each category of waste in accordance with, and by reference to, the relevant EWC codes as presented by

Commission Decision 2000/532 of 3rd May 2000 as amended.

f) The licensee shall determine the calorific values and the content of pollutants as required to provide for the management of waste input to ensure compliance with the emission limit values set out in this licence.

8.3 Any waste deemed unsuitable for processing at the facility or in contravention of this licence shall be immediately separated and removed from the facility at the earliest possible time. Temporary storage of such wastes shall be in a designated Waste Quarantine Area. Waste shall be stored under appropriate conditions in the quarantine area to avoid putrefaction, odour generation, the attraction of vermin and any other nuisance or objectionable condition.

8.4 Waste sent off-site for recovery or disposal shall be conveyed only by holders of waste collection permits issued under National or European legislation or Protocols to an appropriate facility authorised to accept such waste. The waste shall be transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment and in accordance with the appropriate National and European legislation and protocols.

8.5 The licensee shall ensure that waste prior to transfer to another person shall be classified packaged and labelled in accordance with National, European and any other standards which are in force in relation to such labelling.

8.6 Waste, to be sent off site, shall be stored in designated areas, protected as may be appropriate, against spillage and leachate run-off. The waste is to be clearly labelled and appropriately segregated.

8.7 No waste classified as green list waste in accordance with the EU Transfrontier Shipment of Waste Regulations (Council Regulation EEC No.259/1993, as amended) shall be consigned for recovery without the prior agreement of the Agency.

8.8 Unless approved in writing by the Agency the licensee is prohibited from mixing a hazardous waste of one category with a hazardous waste of another category or with any other non-hazardous waste.

8.9 Infectious clinical waste, and other waste as agreed with the Agency, shall be placed straight in the furnace, without first being mixed with other categories of waste and without direct handling.

8.10 Dry residues in the form of dust, such as boiler dust, and dry residues from the treatment of combustion gases, shall be stored in closed containers in such a way as to prevent dispersal in the environment.

8.11 Prior to the commencement of any solidification of waste residues from the incineration process, the licensee shall establish and maintain procedures for the process to be agreed by the Agency.

8.12 Lime grits shall not be mixed with residues.

8.13 Bottom ash and gypsum shall be stored at dedicated areas within the building on concrete hardstanding with contained drainage.

8.14 Boiler ash and flue gas cleaning residues shall be stored at dedicated areas within ***enclosed structures*** ~~***the building in silos***~~ (***incorporating dust***

curtains or equivalent approved, and vented through self cleaning filter***s***), ~~***bulk sacks***~~ or **sealed** bins on concrete hardstanding with contained drainage.

8.15 Metals for recycling that are recovered from the ash shall be stored at a dedicated area within the building on concrete hardstanding with contained drainage.

8.16 ***In the case of waste received at the Transfer Station and with the exception of temporary set-down, no waste shall be stored below a level of 3m OD***.

REASON: *To ensure that the handling of materials does not adversely effect the environment.*

CONDITION 9. Accident Prevention and Emergency Response

9.1 The licensee shall, prior to commencement of waste activities ensure that a documented Accident Prevention Policy is in place which will address the hazards on-site, particularly in relation to the prevention of accidents with a possible impact on the environment.

9.2 The licensee shall, prior to commencement of waste activities ensure that a documented Emergency Response Procedure is in place, which shall address any emergency situation which may originate on-site. This Procedure shall include provision for minimising the effects of any emergency on the environment. This procedure shall be reviewed annually and updated as necessary. ***The procedure should also develop appropriate responses to off-site emergency situations that may have implications for the safe operation of the licensees site.***

9.3 In the event of an incident the licensee shall immediately:-

9.3.1 identify the date, time and place of the incident;

9.3.2 carry out an immediate investigation to identify the nature, source and cause of the incident and any emission arising therefrom;

9.3.3 isolate the source of any such emission;

9.3.4 evaluate the environmental pollution, if any, caused by the incident;

9.3.5 identify and execute measures to minimise emissions/malfunctions and the effects thereof;

9.3.6 provide a proposal to the Agency for its agreement within one month of the incident occurring to:-

- identify and put in place measures to avoid reoccurrence of the incident; and
- identify and put in place any other appropriate remedial action.

9.4 Emergencies

9.4.1 In the event of a complete breakdown of equipment or any other occurrence which results in the shutdown of the incineration plant or process line, any waste:-

(a) arriving at the facility shall be transferred directly to an appropriate facility;

(b) stored or awaiting processing at the facility shall, subject to the agreement of the Agency, be transferred to an appropriate facility within three days of the shutdown.

9.4.2 All significant spillages occurring at the facility shall be treated as an emergency and immediately cleaned up and dealt with so as to alleviate their effects.

9.4.3 A fire outbreak at the facility shall be treated as an emergency and immediate action shall be taken to extinguish it and notify the appropriate authorities.

9.4.4 In the event that monitoring of local wells indicates that the facility is having a significant adverse effect on the quantity or the quality of the water supply this shall be treated as an emergency.

REASON: *To ensure the provision of detailed and documented policies and procedures to prevent accidents and to respond to emergencies.*

CONDITION 10. Remediation, Decommissioning, Restoration and Aftercare

10.1 The licensee shall ***~~within twelve months~~ prior to the commencement of waste acceptance at the facility, ~~of the date of grant of this licence~~*** submit to the Agency for its agreement a Decommissioning and Aftercare plan for the facility. This plan shall be updated when required by the Agency.

10.2 Following termination, or planned cessation for a period greater than six months, of use or involvement of all or part of the site in the licensed activity, the licensee shall, to the satisfaction of the Agency, decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.

REASON*: To provide for the restoration of the facility.*

CONDITION 11. Notifications, Records and Reports

11.1 In the event of an incident occurring on the facility, the licensee shall:-

a) notify the Agency as soon as practicable and in any case not later than 10.00 a.m. the following working day after the occurrence of any incident;

b) submit a written record of the incident, including all aspects described in Condition 9.3(a-e), to the Agency as soon as practicable and in any case within five working days after the occurrence of any incident;

c) in the event of any incident which relates to discharges to surface water, notify the South-western Regional Fisheries Board as soon as practicable and in any case not later than 10:00 a.m. on the following working day after such an incident; and

d) should any further actions be taken as a result of an incident occurring, the licensee shall forward a written report of those actions to the Agency as soon as practicable and no later than ten days after the initiation of those actions.

11.2 The licensee shall store and maintain the following documents and records at the facility:-

a) a copy of this licence and associated reference documents;

b) all written procedures produced by the licensee which relate to the licensed activities;

c) all reports and proposals prepared in accordance with the conditions of this licence;

d) all written records specified in Condition 11.3; and

e) all notifications to the Agency.

The above documents and records shall be available on site for inspection by authorised persons of the Agency.

11.3 The licensee shall maintain a written record of the following:-

11.3.1 All sampling, analysis, measurements, incidents, inspections, examinations, tests, malfunction, breakdown, calibrations, surveys, maintenance or remedial works carried out in accordance with the requirements of this licence.

11.3.2 For each load of waste arriving at ***(community recycling park excepted)*** and departing from ***any part of*** the facility the following ***(including inter-component transfers, e.g. Transfer Station to Incinerator)***:-

a) the date;

b) the name of the carrier (including if appropriate, the waste collection permit details;

c) vehicle registration number;

d) the name of the producer(s)/collector(s) of the waste as appropriate;

e) the name of the waste facility (if appropriate) from which the load originated or to which the load departed, including the waste licence or waste permit register number;

f) a description of the type of waste including the associated EWC codes;

g) the quantity of the waste, recorded in tonnes;

h) the name of the person checking the load;

i) where loads of wastes are removed or rejected, details of the date of occurrence, the types of waste and the facility to which they were removed; and

j) where applicable a consignment note number (including transfrontier shipment notification and movement/tracking form numbers, as appropriate).

11.3.3 For waste accepted at ***(community recycling park excepted)*** or dispatched from ***any part of*** the facility ***(including inter-component transfers, e.g. Transfer Station to Incinerator)***: -

a) the type, relevant EWC code and total tonnage of waste accepted at the facility for disposal on a daily, monthly and annual basis;

b) the type, relevant EWC code and total tonnage of waste accepted at the facility for recovery on a daily, monthly and annual basis;

c) the type, relevant EWC code and total tonnage of waste sent off site for disposal or recovery on a daily, monthly and annual basis;

d) the type, relevant EWC code and total tonnage of waste disposed of at the facility on an hourly, daily, monthly and annual basis;

e) the type, relevant EWC code and total tonnage of waste recovered at the facility on a monthly and annual basis; and

f) Details of any approved waste mixing.

11.3.4 Off**-**site profiling and ***pre-***characterisation of customer waste ***arriving direct to the incinerator for disposal***.

11.3.5 All training undertaken by facility staff.

11.3.6 Details of all wastes consigned abroad for Recovery and classified as 'Green' in accordance with the EU Transfrontier Shipment of Waste Regulations (Council Regulation EEC No. 259/1993, as amended). The rationale for the classification must form part of the record.

11.3.7 All incidents.

11.3.8 All complaints from third parties.

11.4 The written records of all complaints relating to the operation of the activity shall give details of the following:-

a) date and time of the complaint;

b) the name of the complainant;

c) details of the nature of the complaint;

d) actions taken on foot of the complaint and the results of such actions; and,

e) the response made to each complainant.

11.5 Data Management

11.5.1 The licensee shall, **prior to the commencement of waste acceptance at the facility** ***~~within six months of the date of grant of this licence~~***, develop and establish a Data Management System

for collation, archiving, assessing and geographically presenting the environmental monitoring data generated as a result of this licence.

11.5.2 The licensee shall submit all records of sampling, analysis, measurements, incidents, inspections, examinations, tests, malfunction, breakdown, calibrations, maintenance or remedial works and reports and notifications to the Agency on a quarterly basis unless otherwise specified by a condition of this licence. Such records, reports and notifications shall:-

a) be sent to the Agency's Office of Environmental Enforcement, Cork Regional Inspectorate, Inniscarra, County Cork or other office of the Agency as directed;

b) comprise one original and two copies;

c) be formatted in accordance with any written instruction or guidance issued by the Agency;

d) include whatever information as is specified in writing by the Agency;

e) be accompanied by a written interpretation setting out their significance in the case of all monitoring data; and

f) be transferred electronically to the Agency's computer system if required by the Agency.

The frequency of such reporting may be altered by the Agency having regard to the environmental performance of the facility.

11.6 Annual Environmental Report

11.6.1 The licensee shall submit to the Agency, by the 31st March of each year, an Annual Environmental Report (AER) covering the previous calendar year.

11.6.2 The AER shall include as a minimum:

a) The information specified in *Schedule D: Annual Environmental Report,* of this licence and shall be prepared in accordance with any relevant written guidance issued by the Agency.

b) A report of annual audits undertaken by the licensee of the waste disposal, treatment and recovery sites for the residues and other wastes dispatched from the facility.

c) Pollution Emission Register (PER)

The substances to be included in the PER shall be as outlined in, and shall be estimated in accordance with, any relevant guidelines or methodology issued by the Agency.

11.7 Written records of off-site waste profiling and characterisation shall be retained by the licensee for all active customers and for a two year period following termination of licensee/customer agreements.

REASON: *To provide for the keeping of records and reporting and notification of the Agency.*

CONDITION 12. Financial Charges and Provisions

12.1 Agency Charges

12.1.1 The licensee shall pay to the Agency an annual contribution of €65,383, or such sum as the Agency from time to time determines, having regard to variations in the extent of reporting, auditing, inspection, sampling and analysis or other functions carried out by the Agency, towards the cost of monitoring the activity as the Agency considers necessary for the performance of its functions under the Waste Management Acts 1996 to 2003. The first payment shall ***accompany initiation of any condition of this licence involving Agency approval/consideration/notification, and shall*** be a pro-rata amount for the period from the date of ~~**this**~~ ***that initiation*** ~~**licence**~~ to the 31st day of December ***of that year***, ~~**and shall be paid to the Agency**~~ or ***shall be paid*** within one month of the date upon which demanded by the Agency. In subsequent years the licensee shall pay to the Agency such revised annual contribution as the Agency shall from time to time consider necessary to enable performance by the Agency of its relevant functions under the Waste Management Acts 1996 to 2003, and all such payments shall be made within one month of the date upon which demanded by the Agency.

12.1.2 In the event that the frequency or extent of monitoring or other functions carried out by the Agency needs to be increased the licensee shall contribute such sums as determined by the Agency to defraying its costs in regard to items not covered by the said annual contribution.

12.2 Financial Provision for ***Environmental Liabilities*** ~~***Closure, Decommissioning and Aftercare***~~

12.2.1 Prior to the acceptance of waste, the licensee shall arrange for a comprehensive and fully costed Environmental Liabilities Risk Assessment for the facility to be carried out ***by an appropriately qualified professional firm***. The Environmental Liabilities Risk Assessment shall have particular regard to any accidents, emergencies, or other incidents, which might occur at the facility and their effect on the environment. The Environmental Liabilities Risk Assessment shall include the cost of making such Financial Provision as is required for the purposes of Section 53(1) of the Waste Management Act, 1996 to 2003. The Financial Provision shall include the costs entered into or incurred in the carrying on of the activities to which this licence relates or will relate including the closure, restoration, remediation and aftercare of the facility.

12.2.2 The licensee shall prior to the acceptance of waste establish and maintain a fund, or provide a written guarantee, for the costs determined under Condition 12.2.1. The type of fund established and means of its release/recovery shall be agreed by the Agency prior to its establishment.

12.2.3 The amount of financial provision, held under Condition 12.2.2 shall be reviewed and revised as necessary, but at least annually.

Any proposal for such a revision shall be submitted to the Agency for its agreement.

12.2.4 The licensee shall within two weeks of establishment**,** purchase, renewal or revision of the financial provision required under Condition 12.2.2, forward to the Agency written proof of such indemnity.

12.2.5 Unless otherwise agreed any revision to the ***Decommissioning and Aftercare component of the*** fund shall be computed using the following formula:

Cost = (ECOST x WPI) + CiCC
Where:

Cost = Revised ***decommissioning and ~~restoration~~*** aftercare cost.

ECOST = Existing ***~~restoration~~ decommissioning*** and aftercare cost.

WPI = Appropriate Wholesale Price Index [Capital Goods, Building & Construction (i.e. Materials & Wages) Index], as published by the Central Statistics Office, for the year since last closure calculation/revision.

CiCC = Change in compliance costs as a result of change in site conditions, changes in law, regulations, regulatory authority charges, or other significant changes.

12.2.6 The licensee shall as part of the AER provide an annual statement as to the measures taken or adopted at the site in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events (including closure) or accidents/incidents, as may be associated with the carrying on of the activity.

REASON: *To provide for adequate financing for monitoring and financial provisions for measures to protect the environment.*

SCHEDULE A : Limitations

A.1 Waste Acceptance: Community Recycling Park

Maximum annual quantity to be accepted shall not exceed: 260 tonnes.

Waste Type	European Waste Catalogue (EWC)
Wood and wood products	EWC 20 01 38 Household only
Paper and paper products	EWC 20 01 01 Household paper
Natural &manmade fibres	EWC 20 01 10 Household only EWC 20 01 11 Household only
Vegetable oil	EWC 20 01 25 Household only
Dried paints, dried varnish & dried lacquer	EWC 20 01 27 Household only EWC 20 01 28 Household only
Glass	EWC 20 01 02 Household only
Solid fully polmerised plastics	EWC 20 01 39 Household only
Electronic and electrical waste	EWC 20 01 35 Household only EWC 20 01 36 Household only
Ferrous metals	EWC 20 01 40 Household only
Non-ferrous metals	EWC 20 01 40 Household only
Footwear	EWC 20 01 11 Household only
Other ~~*Non-Hazardous*~~ **Waste**	To be agreed by the Agency [Note 1]

Note 1: Quantity and handling/storage details to be agreed by the Agency prior to waste acceptance.

N.B. deleted text

A.2 Waste Acceptance: Waste Transfer Station

Maximum annual quantity to be accepted shall not exceed: 15,000 tonnes.

Waste Type	European Waste Catalogue (EWC) Note1,2	DESCRIPTION
Waste oil	13 01 00 13 02 00 13 03 00 13 05 00 13 07 00	All waste oils including, hydraulic oils, oil/water mixtures and waste fuels
Oil filters	16 01 07	Oil filters from cars and machinery/plant.
Asbestos	17 06 01 17 06 05	Insulation materials and construction materials containing Asbestos
Oil/sand mixtures or mixtures of oil and other material	17 05 03	Soil containing fuel oil, diesel and other dangerous substances.
Wood preservation waste	03 02 00	Organic and inorganic wood preservative wastes
Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal	05 01 00	Waste from Petroleum refining.
Wastes from inorganic chemical processes	06 01 00 06 02 00 06 03 00 06 04 00 06 05 00 06 13 00	Wastes from MFSU of acids, bases, salts, metallic oxides including spent activated carbon
Wastes from organic chemical processes	07 01 00 07 02 00 07 03 00 07 04 00 07 05 00 07 06 00 07 07 00	Wastes from MFSU of organic chemicals, plastics, dyes, pharmaceuticals, soaps and detergents
Agrochemical wastes	02 01 05	Waste chemicals for the treatment of animals. Examples include sheep dip and louse powder.
Infectious Healthcare Waste	18 01 00 18 02 00	Wastes from the treatment, diagnosis or prevention of diseases in animals or humans.
Photographic processing waste	09 01 99	Solid and liquid waste from the photographic industry.
Paint, inks, adhesives and resins	08 01 00 08 03 00 08 04 00	Obsolete paints and inks and paint related material.
Batteries and accumulators	16 06 01	Lead Batteries.
Florescent tubes and other mercury containing waste	20 01 21	Fluorescent tubes and other mercury containing waste.
Wastes from the mining	01 01 00	Wastes from mineral

N.B. addition of #2 to 'Note'

industry	01 03 00	excavation and from the physical and chemical processing of minerals.
Meat and bone meal	02 02 02	Meat and bone meal/ specified risk material from the rendering of animals.
Other Agricultural and food processing wastes	02 01 00 02 02 00 02 03 00 02 04 00 02 05 00 02 06 00 02 07 00	Materials unsuitable for consumption or processing or other wastes from the dairy or food processing industries.
Wastes from the leather, fur and textile industries	04 01 00 04 02 00	
Inorganic wastes from thermal processes	10 01 00 10 04 ***01 10 11 99***	Wastes from power stations and other combustion plants.
Inorganic metal containing wastes from metal treatment and the coating of metals and non ferrous hydrometallurgy	11 01 00 11 03 00 11 05 00	Wastes from the surface treatment and coating of materials and waste sludges.
Wastes from shaping and surface treatment of metals and plastics	12 01 00	Machining oils, sludges and emulsions.
Wastes from organic substances used as solvents, (other than 07 and 08)	14 06 00	Solvents and mixtures containing halogenated and non-halogenated solvents and CFCs.
Wastes packaging; absorbent, wiping cloths, filter materials and protective clothing not otherwise specified	15 01 00 15 02 00	Hazardous packaging, filters, absorbents and protective clothing.
Wastes not otherwise specified	16 02 00 10 03 00 16 05 00 16 06 00 16 07 00 16 08 00 16 09 00 16 11 00	Electrical equipment containing CFCs, televisions, off specification batches, laboratory chemicals, oxidising substances, car batteries and waste linings and refractories.
Wastes from treatment facilities, off-site waste water treatment plants and the water industry	19 19 08 19 19 09	Boiler ash, fly ash, waste from water treatment plants and wastes from the preparation of water.
Municipal wastes and similar commercial, industrial and institutional wastes including separately collected fractions.	20 01 00	Solvents, acids, alkalines, pesticides, paints, inks adhesives, resins, detergents containing dangerous substances, cytotoxic and cytostatic medicines and waste electrical and electronic equipment.
Paper and paper products	20 01 01	Waste newspapers, magazines, cardboard and other paper products.

Note corrections

Non-infectious health-care waste	18 01 02 18 01 04 18 02 01 18 02 03	Sharps and other non-infectious wastes from human and animal healthcare and research.
Street cleaning residues	20 03 03	
Gully emptyings	20 03 99	
Septic tank sludge	20 03 04	
Food stuffs	20 00 00	Foodstuffs unsuitable for consumption or processing.
Vegetable oil	20 01 25	Edible oils and other oils and fat.
Electronic and electrical waste	20 01 36	Non-hazardous electrical and electronic waste.
Waste from incineration or pyrolysis of municipal and similar commercial, industrial and institutional wastes	10 01 00 10 11 99	Non-hazardous residues from thermal processes.
Waste packaging absorbents, filters and protective clothing	15 01 00 15 02 00	Non-hazardous packaging, filters, absorbents and protective clothing.
Wastes from chemical surface treatment of metals and other materials	11 01 10 11 01 12	Non-hazardous sludges, filter cakes and washing liquids.
Wastes from waste management facilities and the water industry	19 01 12 19 01 14 19 01 16 19 09 04	Non-hazardous ashes and dusts. Spent activated carbon.
Municipal, commercial and institutional wastes	20 01 28 20 01 32 20 01 34	Non-hazardous paints, inks adhesives, resins and batteries.
Wastes from the production of alcoholic and non-alcoholic beverages	02 07 04	Materials unsuitable for consumption or processing.
End of life tyres	16 01 03	Waste tyres.
Other Waste		To be agreed by the Agency Note 1

Note 1: Quantity and handling/storage details to be agreed by the Agency prior to waste acceptance.

Note 2: **The use of '## 00 00' or '## ## 00' in acceptable waste codes is intended to mean all wastes in the specified chapter '##' or sub-chapter '## ##' as may appear in the EU waste catalogue.**

New note 2

A.3 Waste Acceptance: Incineration Plant

Fluidised Bed Incineration Plant **Maximum annual quantity to be accepted shall not exceed: 100,000 tonnes.**			
Waste Type	**European Waste Catalogue (EWC)** Note1,3	**DESCRIPTION**	**Nominal Tonnes per Annum**
Hazardous Waste			
Waste oil	13 00 00	Oil and fuel wastes.	45
Oil filters	15 02 **0**2 16 01 07	Waste Oil filter.	5
Oil/sand mixtures or mixtures of oil and other material	13 05 01 15 05 08 15 02 02	Mixtures from grit chambers and oil/water separators.	20
Wood preservation waste	03 00 00	Waste from wood processing and production and processing of pulp, paper and cardboard.	10
Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal	05 00 00	Waste oils, tars and sludges from refining operations.	20
Wastes from inorganic chemical processes	06 00 00	Inorganic chemical process waste including spent activated carbon.	900
Wastes from organic chemical processes	07 00 00	Wastes from the MFSU of organic chemicals including chlorinated/non-chlorinated solvents and aqueous washing liquids.	40,000
Agrochemical wastes	02 01 08	Obsolete products and off specification batches.	100
Infectious Healthcare Waste Healthcare Waste	18 01 01 18 01 02 18 01 03 18 01 04 18 02 01 18 02 02 18 02 03 18 00 00	Wastes from the treatment, diagnosis or prevention of disease in animals or humans.	100
Paint, inks, adhesives and resins	08 01 00 08 03 00	Waste paint, inks and aqueous ink/paint solutions.	800
Waste packaging, absorbents, filters and protective clothing	15 00 00	Hazardous packaging, filters, absorbents and protective clothing.	2,000

N.B. addition of # '3' to 'Note'

N.B. correction

Off specification batches containing organic or inorganic wastes	16 03 03 16 03 05	Waste pharmaceutical products.	2,000
Commercial wastes	20 01 00	Wastes including solvents, paints, inks and medicines from industries and institutions.	2,000
Sludges from physio-chemical treatment plants	19 02 05	Sludges containing dangerous substances.	2,000
Non-Hazardous Waste			
BIODEGRADABLE WASTE			
Wood and wood products	20 01 38		
Paper and paper products	20 01 01		
Vegetable Matter	20 01 08		
Non-infectious health-care waste	18 01 04 18 02 01 18 02 03		
Street cleaning residues	20 03 03		
Gully emptyings	20 03 99		
Septic tank sludge	20 03 04		
Food stuffs	02 00 00		
Vegetable oil	20 01 25		
Oil and fat	20 01 26		
Animal faeces, urine and manure (including spoiled straw) effluent, collected separately and treated off-site	02 01 06		
Animal blood	18 02 03		
Sludges from treatment of urban waste water	19 08 05		
Sludges from physico/chemical treatment other than those mentioned in 19 02 05	19 02 06		
Wastes from aerobic treatment of solid waste	19 05 00		
Wastes from aerobic treatment of waste	10 06 00		
Wastes from the preparation and processing of meat, fish and other foods of animal origin	02 02 02		
End of life tyres	16 01 03		
Other wastes (including mixtures of	19 12 12		

materials) from mechanical treatment of wastes other than those mentioned in 19 12 11			

Moving Grate Incineration Plant	
Maximum annual quantity to be accepted shall not exceed: 100,000 Tonnes.	
Waste Type	**European Waste Catalogue (EWC)**
Wood and wood products	20 01 38
Paper and paper products	20 01 01
Vegetable Matter	20 01 08
Non-infectious health-care waste	18 01 04 18 02 01 18 02 03
Street cleaning residues	20 03 03
Gully emptyings	20 03 99
Septic tank sludge	20 03 04
Food stuffs	02 00 00
Vegetable oil	20 01 25
Oil and fat	20 01 26
Animal faeces, urine and manure (including spoiled straw) effluent, collected separately and treated off-site	02 01 06
Animal blood	18 02 03
Residual Municipal Waste Notes 1 & 2	20 03 01
Sludges from treatment of urban waste water	19 08 05
Sludges from physico/chemical treatment other than those mentioned in 19 02 05	19 02 06
Wastes from aerobic treatment of solid waste	19 05 00
Wastes from **an**aerobic treatment of waste	19 06 00
Animal-tissue waste	02 02 02
End of life tyres	16 01 03
Other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	19 12 12

N.B. Corrections

Note 1: Household waste (as well as commercial and other waste, which because of its nature or composition, is similar to household waste) that, in so far as is practicable, has been pre-sorted or segregrated to remove reusable and recyclable materials.

Note 2: Residual Municipal waste may also be incinerated in the fluidised bed incinerator after the moving grate incinerator has commenced operations.

Note 3: **The use of '## 00 00' or '## ## 00' in acceptable waste codes is intended to mean all wastes in the specified chapter '##' or sub-chapter '## ##' as may appear in the EU waste catalogue.**

New text

SCHEDULE B : Emission Limits

B.1 Emission limits to Air.

Emission Point Reference No.: **A1-1 (Fluidised Bed Incinerator Stack)**

Location: Main Process Building

Volume to be emitted: Maximum rate per hour: 101,927 m^3

Minimum Discharge height: 55 m above ground

Parameters	Units	Half Hour Average		Daily Averag	Periodic
		A	B		
Total dust	mg/m^3	30 Note 1	10 Note 1	10	-
Gaseous and vaporous organic compounds expressed as total organic carbon	mg/m^3	20 Note 1	10 Note 1	10	-
Hydrogen chloride (HCl)	mg/m^3	60 Note 1	10 Note 1	10	-
Hydrogen fluoride (HF)	mg/m^3	4 Note 1	2 Note 1	1	-
Sulphur dioxide (SO_2)	mg/m^3	200 Note 1	50 Note 1	50	-
Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	mg/m^3	400 Note 1	200 Note 1	200	-
The sum of Cadmium (as Cd) and thallium (as Tl), and their compounds Note 2	mg/m^3	-		-	0.05
Mercury (as Hg) and its compounds Note 2	mg/m^3	-		-	0.05
The sum of antimony (as Sb), arsenic (as As), lead (as Pb), chromium (as Cr), cobalt (as Co) copper (as Cu), manganese (as Mn), nickel (as Ni), and vanadium (as V) Note 2	mg/m^3	-		-	0.5
Arsenic and its compounds Note 2	mg/m^3	-		-	0.2
Dioxins/furans (TEQ) Note 3	ng/m^3	-		-	0.1
Carbon monoxide (CO) Note 4	mg/m^3	100 Note5		50 Note 6	150 Note 7

Note 1: None of the half-hourly average values shall exceed any of the emission limit values set out in column A, or, 97 % of the half-hourly average values over the year shall not exceed any of the emission limit values set out in column B;

Note 2: All average values over the period of a minimum of 30 minutes and a maximum of 8 hours. Metals include both gaseous, vapour and solid phases as well as their compounds (expressed as the metal or total as specified).

Note 3: Average values shall be measured over a sample period of a minimum of 6 hours and a maximum of 8 hours. The emission limit value refers to the total concentration of dioxins and furans calculated using the concept of toxic equivalence in accordance with Annex I of Directive 2000/76/EC.

Note 4: The emission limit values of carbon monoxide (CO) concentrations shall not be exceeded in the combustion gases (excluding the start-up and shut-down phase).

Note 5: Taken in any 24 hour period.

Note 6: 97% of the daily average value over the year does not exceed this emission limit value.

Note 7: 95 % of all measurements determined as 10-minute average values shall not exceed the emission limit value.

Emission Point Reference No.: **A1-2 (Moving Grate Incinerator Stack)**

Location: Main Process Building

Volume to be emitted: Maximum rate per hour: 80,453 m³

Minimum Discharge height: 55 m above ground

Parameters	Units	Half Hour Average		Daily Average	Periodic
		A	B		
Total dust	mg/m^3	30 Note 1	10 Note 1	10	-
Gaseous and vaporous organic compounds expressed as total organic carbon	mg/m^3	20 Note 1	10 Note 1	10	-
Hydrogen chloride (HCl)	mg/m^3	60 Note 1	10 Note 1	10	-
Hydrogen fluoride (HF)	mg/m^3	4 Note 1	2 Note 1	1	-
Sulphur dioxide (SO_2)	mg/m^3	200 Note 1	50 Note 1	50	-
Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	mg/m^3	400 Note 1	200 Note 1	200	-
The sum of Cadmium (as Cd) and thallium (as Tl), and their compounds Note 2	mg/m^3	-		-	0.05
Mercury (as Hg) and its compounds Note 2	mg/m^3	-		-	0.05
The sum of antimony (as Sb), arsenic (as As), lead (as Pb), chromium (as Cr), cobalt (as Co) copper (as Cu), manganese (as Mn), nickel (as Ni), and vanadium (as V) Note 2	mg/m^3	-		-	0.5
Arsenic and its compounds Note 2	mg/m^3	-		-	0.2
Dioxins/furans (TEQ) Note 3	ng/m^3	-		-	0.1
Carbon monoxide (CO) Note 4	mg/m^3	100 Note5		50 Note 6	150 Note 7

Note 1: None of the half-hourly average values shall exceed any of the emission limit values set out in column A, or, 97 % of the half-hourly average values over the year shall not exceed any of the emission limit values set out in column B;

Note 2: All average values over the period of a minimum of 30 minutes and a maximum of 8 hours. Metals include both gaseous, vapour and solid phases as well as their compounds (expressed as the metal or total as specified).

Note 3: Average values shall be measured over a sample period of a minimum of 6 hours and a maximum of 8 hours. The emission limit value refers to the total concentration of dioxins and furans calculated using the concept of toxic equivalence in accordance with Annex I of Directive 2000/76/EC.

Note 4: The emission limit values of carbon monoxide (CO) concentrations shall not be exceeded in the combustion gases (excluding the start-up and shut-down phase).

Note 5: Taken in any 24 hour period.

Note 6: 97% of the daily average value over the year does not exceed this emission limit value.

Note 7: 95 % of all measurements determined as 10-minute average values shall not exceed the emission limit value.

B.2 Emission limits to Water

No Schedule

B.3 Emission limits to Sewer

No Schedule

B.4 Noise emission limits

Day dB(A) L_{eq}(30 minutes)	Night dB(A) L_{eq}(30 minutes)
55	45

SCHEDULE C : Control & Monitoring

In addition to the requirements of Condition 6 the following monitoring shall be undertaken.

C.1.1

Process Control monitoring of incineration.

Fluidised bed Incinerator

Control Parameter	Monitoring (continuous unless otherwise stated in licence) Note 5	Key Equipment Note 1,5
Combustion	Combustion chamber temperature Note 2	Thermocouple
Exhaust gas	% O_2 in exhaust gas	O2 analyser
Exhaust gas	Exhaust gas temperature	Thermocouple
Exhaust gas	Exhaust gas pressure	Pressure monitor
Exhaust gas	Water vapour content Note 3	Standard method
Sand bed	Differential pressure over the sand bed	Pressure monitors
Boiler output	Steam pressure temperature and output load in the boiler	-
Furnace pressure	Pressure in the furnace	Pressure monitors

New Note 5

Moving grate Incinerator

Control Parameter	Monitoring Note 5	Key Equipment Note 1,5
Combustion	Combustion chamber temperature Note 2	Thermocouple
Exhaust gas	% O_2 in exhaust gas	O_2 analyser
Exhaust gas	Exhaust gas temperature	Thermocouple
Exhaust gas	Exhaust gas pressure	Pressure monitor
Exhaust gas	Water vapour content note 3	Standard method
Waste input	Feed rate	Low level detector and visual
Burnout of waste in the furnace	CCTV monitoring of flame front Temperature of last section of the furnace	CCTV cameras with recorded Temperature probes
Boiler output	steam pressure temperature and output load in the boiler	
Combustion	% O_2 in combustion gases	O_2 analyser
Furnace pressure	Pressure in the furnace	Pressure monitors

New Note 5

Process Control Monitoring of Flue gas abatement

Fluidised bed Incinerator

Location /Control Parameter	Monitoring Note 5	Key Equipment Note 4,5
Boiler /NOx abatement	Reagent dosage rate	Flow meter
Boiler/ Boiler output dust	Voltage and current to electrostatic precipitator	Voltmeter/Ammeter equipment with data recorder
Evaporating Spray Towers/ Temperature and acid gas removal	Flue gas temperature	Temperature probes
	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
	Water dosage rate	Flow meter
Bag house filter with Activated Carbon/Lime Injection / Removal of metals, trace organics and dioxins/furans	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
	Pressure differential across filters	Pressure monitors
Wet scrubber/ Acid gas removal	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
Bag house filter with Activated Carbon/Lime Injection and reheat / Final polish and plume suppression	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
	Pressure differential across filters	Pressure monitors
	Flue gas temperature	Temperature probes

Moving Grate Incinerator

Location/Control Parameter	Monitoring Note 5	Key Equipment Note 4,5
Boiler /NOx abatement	Reagent dosage rate	Flow meter
Evaporating Spray Towers/ Temperature and acid gas removal	Flue gas temperature	Temperature probes
	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
	Water dosage rate	Flow meter
Bag house filter with Activated Carbon/Lime Injection / Removal of metals, trace organics and dioxins/furans	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
	Pressure differential across filters	Pressure monitors
Wet scrubber/ Acid gas removal	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
Bag house filter with Activated Carbon/Lime Injection and reheat / Final polish and plume suppression	Reagent dosage rate	Flow meter
	Reagent quality	To be agreed by the Agency
	Pressure differential across filters	Pressure monitors
	Flue gas temperature	Temperature probes

New Note 5

Note 1: The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the system.

Note 2: Near the inner wall of the combustion chamber (or other representative location agreed by the Agency)

Note 3: Not necessary if gases are dried prior to analysis.

Note 4: The licensee shall maintain appropriate access to standby and/or spares to ensure the operation of the abatement system.

Note 5: **Or other methods/equipment agreed in writing in advance by the Agency.**

C1.2 Monitoring of Emissions to Air

Emission Point Reference No.s: **A1-1 (Fluidised Bed Incinerator Stack) and** **A1-2 (Moving Grate Incinerator Stack)**		
Parameters	**Monitoring Frequency**	**Analysis Method or equivalent/Technique** [Note 1]
Total dust	Continuous	Iso-kinetic/gravimetric
PM_{10} and $PM_{2.5}$	**Quarterly**	**To be agreed with Agency**
Gaseous and vaporous organic compounds expressed as total organic carbon	Continuous	Flame Ionisation Detector
Hydrogen chloride (HCl)	Continuous	Infra red analyser
Hydrogen fluoride (HF)	Quarterly	To be agreed with Agency
Sulphur dioxide (SO_2)	Continuous	Infra red analyser
Oxides of Nitrogen (NO and NO_2 expressed as NO_2)	Continuous	Infra red analyser
Nitrous oxide (N_2O)	Quarterly	To be agreed by the Agency
Cadmium (as Cd) and thallium (as Tl), and their compounds	Quarterly	To be agreed by the Agency
Mercury (as Hg) and its compounds	Quarterly	To be agreed by the Agency
Antimony (as Sb), arsenic (as As), lead (as Pb), chromium (as Cr), cobalt (as Co), copper (as Cu), manganes (as Mn), nickel (as Ni), and vanadium (as V) and their compound	Quarterly	To be agreed by the Agency
Dioxins/furans	Quarterly [Note 2] Fortnightly [Note 3]	
Carbon monoxide (CO)	Continuous	Infra red analyser

New row

Note 1: Or other methods agreed in advance by the Agency.
Note 2: Average values shall be measured over a sampling period of 6 hours and a maximum of 8 hours.
Note 3; Fortnightly based on continuous sampling.

C.2.1 Control of Emissions to Water

No Schedule

C.2.2 Monitoring of Emissions to Water

No Schedule

New text

C.2.3 Monitoring of Surface Water Emissions

Emission Point Reference No.: **SW1 - Incineration Plant (monitoring chamber up stream of location SW37 on Drawing 103 of the waste licence application), and** **SW2(a) – Waste Transfer Station: Hard standing and marshalling areas (between SW18 and SW18A on Drawing 106 of waste application).**		
Parameter	**Monitoring Frequency**	**Analysis Method/Technique**
PH	Continuous	pH electrode/meter with data logger
TOC	Continuous	TOC meter with data logger
Visual Inspection	Weekly	Sample and examine for colour and odour
Emission Point Reference No.: **SW2(b) – Waste Transfer Station (at location SW12 on Drawing 106 of waste licence application), and** **SW3 -Community Recycling Park (at location SW07 on Drawing 106 of waste licence application):**		
Parameter	**Monitoring Frequency**	**Analysis Method/Technique**
Visual Inspection	Monthly	Sample and examine for colour, odour and oil.

C.3.1 Control of Emissions to Sewer

No Schedule

C.3.2 Monitoring of Emissions to Sewer

No Schedule

C.4 Waste Monitoring

Note additional text

Residue Monitoring		
Waste Description	Parameters	Frequency **Note 1**
Bottom Ash, Boiler Ash	TOC, metals (Ba, Cd, Mo, Sb, Se, Zn, Tl, Hg, Pb, Cr, Cu, Mn, Ni, As, Co, V, Sn) and their compounds, chloride, fluoride, sulphate, dioxins/furans and dioxin-like PCBs, **Asbestos fibre**.	Quarterly for the first year biannually thereafter
Electro filter ash, Flue gas residuals and Gypsum	TOC, metals (Ba, Cd, Mo, Sb, Se, Zn, Tl, Hg, Pb, Cr, Cu, Mn, Ni, As, Co, V, Sn) and their compounds, chloride, fluoride, sulphate, dioxins/furans and dioxin-like PCBs.	Biannually

Note 1: ***All analysis to be undertaken at an accredited laboratory employing accredited procedures; and in the case of in-house analysis, at least one sample per year to be tested at an independent accredited laboratory.***

C.5 Meteorological Monitoring

Monitoring Location: Data to be obtained from location to be agreed by the Agency.

Parameter	Monitoring Frequency	Analysis Method/Technique
Precipitation Volume	Daily	WMO Standard Note 1
Temperature (min/max.)	Daily	WMO Standard Note 1
Wind Speed and Direction	Continuous	WMO Standard Note 1
Atmospheric Pressure	Continuous	WMO Standard Note 1

Note 1: World Metrological Organisation Standards and Recommendations.

Note new line in table

C.6.1 Ambient Groundwater Monitoring

Location: Two downgradient and one upgradient monitoring boreholes

Parameter	Monitoring Frequency	Analysis Method/Technique
TOC, Ammonia (NH4), Conductivity	**Monthly**	**Standard Method**
PH	Biannually	pH electrode/meter
BOD	Biannually	Standard Method
Nitrate	Biannually	Standard Method
Nitrite	Biannually	Standard Method
Total Ammonia	Biannually	Standard Method
Conductivity	Biannually	Standard Method
Chloride	Biannually	Standard Method
Fluoride	Biannually	Standard Method
Metals(Cd, Tl, Hg, Pb, Cr, Cu, Mn, Ni, As, Co, V, Sn) and their compounds	Biannually	Standard Method
Organohalogens Note 1	Biannually	GC-MS

Note 1: Screening for priority pollutant list substances (such as US EPA volatile and/or semi-volatile compounds).

C.6.2 Noise Monitoring

Measured at the monitoring locations indicated in Table 8.7 of the EIS or as otherwise agreed by the Agency.

Parameter	Monitoring Frequency	Analysis Method/Technique
$L(A)_{EQ}$ [30 minutes]	Annual	Standard Note 1
$L(A)_{10}$ [30 minutes]	Annual	Standard Note 1
$L(A)_{90}$ [30 minutes]	Annual	Standard Note 1
Frequency Analysis(1/3 Octave band analysis)	Annual	Standard Note 1

Note 1: "International Standards Organisation. ISO 1996. Acoustics - description and Measurement of Environmental noise. Parts 1, 2 and 3."

SCHEDULE D : Annual Environmental Report

Annual Environmental Report Content
Reporting Period.
Details of waste activities carried out at the facility.
Summary of quantity and composition of waste received, recovered and disposed of in reporting period.
Summary report on emissions.
Summary of noise survey.
Summary of all environmental monitoring.
Resource and energy consumption summary.
Tank, drum, pipeline and bund testing and inspection report.
Summary of Reported Incidents and Complaints.
Summary of audits of waste disposal, treatment and recovery sites for the residues from facility
Environmental management programme – report for previous year
Environmental management programme – proposal for current year
Pollution emission register – report for previous year
Pollution emission register – proposal for current year
Review of Decommissioning & Aftercare management Plan
Statement of measures in relation to prevention of environmental damage and remedial actions (Environmental Liabilities)
Environmental Liabilities Risk Assessment Review (every three years or more frequently as dictated by relevant on site change including financial provisions)
Any other items specified by the Agency.

Signed on behalf of the said Agency

_____

on the x day of xx xxx

Authorised Person