

Eve O'Sullivan

Subject: FW: Licence amendment request CR04506
Attachments: DHI Oral hearing submission.pdf; Oral Hearing Report.pdf

From: Heffernan, Mark [mailto:MHeffernan@covanta.com]
Sent: 23 January 2018 17:40
To: Brian Meaney <B.Meaney@epa.ie>
Subject: RE: Licence amendment request CR04506

Brian,

See attached Documentation that I received from AECOM.
I have also made enquiries to DHI for any additional reports they may have from that period.

I will forward on to you if and when I receive anything further in support of this TA.

Regards,

Mark Heffernan
Environmental Manager



Dublin Waste-to-Energy Facility
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From: Brian Meaney [mailto:B.Meaney@epa.ie]
Sent: Thursday, January 18, 2018 12:01 PM
To: Heffernan, Mark <MHeffernan@covanta.com>
Subject: Licence amendment request CR04506

Dear Mark

The report you commissioned from Aecom refers to a hydrodynamic model prepared by DHI Waste and Environment in support of the original IE licence application. I have searched but cannot find the document on the EPA website. In fairness I may have missed it – there is quite a lot of documentation.

What I am looking for is evidence that the environmental assessment was completed on the basis of the temperature rise being calculated on an hourly basis.

Thanks
Brian.

Brian Meaney
Environmental Licensing Programme
Environmental Protection Agency
053 9160600

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Environmental Protection Agency

14 APR 2008

ORAL HEARING
RECEIVED

OH Sub No. 11

Recd From:

Dublin
City
Council

Dublin Waste to Energy Project

EPA Oral Hearing
Combined Brief of Evidence - Water

Mr. Hans Jacob Vested
Dr. Dorte Rasmussen

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Dublin Waste to Energy Ltd

Brief of Evidence
April 2008



Environmental Protection Agency
RECEIVED
ORAL HEARING
14 APR 2005

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- 2 QUALIFICATIONS AND EXPERIENCE
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1 INTRODUCTION

DHI was commissioned by DONG Energy (formerly Elsam) and later Dublin Waste to Energy Limited to investigate the dispersion of cooling water discharged from the WtE facility into the River Liffey and to evaluate the impact on the ecosystem of the receiving waters of the possible use of biocide additives in the discharged cooling water.

A 3D hydrodynamic model that simulates the water levels, currents, salinity and temperature of the lower River Liffey, Dublin Port and a part of Dublin Bay was established.

The model reproduced the existing situation for different tidal and river run-off situations by comparison with measurements of water levels, temperature, salinity and currents.

The model was applied to assess the effect of the discharge and intake of cooling water for the WtE facility on the temperature conditions in the marine environment.

The model also simulated the addition of biocide to the discharged cooling water, the dispersion of the biocides and the decay in nature in order to assess the impact on the marine ecosystem.

Extensive evidence on these issues was presented by us in a joint presentation at the An Bord Pleanála oral hearing in April 2007, in which we elaborated upon Chapter 12 of the EIS and addressed the matters raised in submissions by the public on these topics. I prepared the evidence on the hydrodynamic modelling. My colleague Dr Dorte Rasmussen prepared the evidence on the choice and potential impact of biocide use in the cooling water system. In this joint presentation we intend to address the issues raised in objections to the EPA Proposed Decision in relation to the dispersion of cooling water and the addition of biocides.



2 QUALIFICATIONS AND EXPERIENCE

Mr Hans Jacob Vested

I hold a Master of Science degree in Civil Engineering from the Technical University of Denmark, 1983 majoring in Hydraulics, Soil Mechanics and Structural Engineering. I am a member of the Danish Society of Professional Engineers and the Danish section of the "Conseil National des Ingénieurs et des Scientifiques de France" (CNISF).

I have been active in the field of hydraulics and coastal engineering for 23 years of which 21 years have been with DHI. Since 1988 I have been involved in the development of numerical simulation tools at DHI and was instrumental in the early development of the DHI model for 3-dimensional flow MIKE 3. I have through my career gained extensive experience in estuarine problems and the development and application of numerical hydrodynamic and transport models. This involves special knowledge of hydrodynamics, advection-dispersion, cooling water and thermal plumes, cohesive sediments and storm surge modelling. I have also acted as reviewer for several international journals, the EU Commission, the Norwegian Scientific Council and the Dutch Science Foundation. I am a member of PIANC Working Group 43 on minimisation of siltation problems in harbours.

I am technically responsible for cooling water and thermal plume studies at DHI. Presently I am Head of Projects in the Coastal and Estuarine Department at DHI.

Recent cooling water, thermal plume, estuary and coastal flooding project experience:

- Recirculation Study and Bathymetric Survey Works for 240MW Net Coal-Fired Electric Generating Plant, Quintero Bay, Chile (2006-2007)
- Venice Storm Surge Model System (2006-2007)
- Hydraulic studies for location of cooling water intake and outfall. Q-Chem II. Mesaieed Port, Qatar (2006)
- Ras Laffan Thermal Plume Study (2005)
- Development of storm surge model based on MIKE 21 FM, for the Irish coast (2004)
- Hydraulic Studies for Zawiya Combined Power Plant (2004-2005)
- Simulation of salinity and temperature in the Venice Lagoon. (2002-2004)
- Hydraulic Studies for Benghazi Power Plant (2003-2004)
- Loire Estuary, restoration and decision support (1995-2003)
- Thermal Pollution and Environmental Impact Odense Fjord, Denmark (1998-2000)



Dr Dorte Rasmussen

I hold a Ph.D and a Master of Chemical Engineering from the Technical University of Denmark, 1983, with key qualifications in: Risk Analyses and Hazard Assessments; Computer Modelling of the Fate of Pollutants in the Environment; Modelling of the physical-chemical properties of pure chemicals and mixtures; and database development. I have more than 18 years of experience in project management, research and consultancy assignments for private companies and environmental authorities.

Recent environmental risk assessment and fate modelling of chemicals in coastal areas:

- Assessment of pollutants discharged into the Caspian Sea from an offshore energy production platform (2006)
- Assessment of the consequences of depositing harbour sludge from Rømø Harbour in the Wadden Sea (2005)
- Modelling the concentrations of chemicals in the Lillebælt (Denmark) area from multiple discharges from waste water treatment plants - using ECO lab (2004)
- Risk assessment of leachate from a land-fill with harbour sludge Port of Esbjerg, Denmark (2004)
- Assessment of the consequences of depositing harbour sludge in a confined land fill at Wadden Sea (2004)
- Environmental hazard and risk assessment of PAHs in produced water from oil rigs. Client: Danish Environmental Protection Agency (2002)
- Assessment of the fate of Orimulsion 400 in the water column and the tainting in fish in The North Sea. (2001)
- Assessment of environmental risks associated with enlargement of Copenhagen Harbour by reclamation infill of polluted soil (2000)



3 THERMAL PLUME IMPACT

3.1 Thermal Plume Modelling

The estimated impact of the thermal plumes was determined through the application of the thermal plume model known as MIKE 3.

MIKE 3 is a hydrodynamic and thermodynamic model developed by DHI that has been applied to more than 30 cooling water studies alone at DHI since 2000. The model is part of the DHI MIKE software system and is used under more than 150 licences (see www.dhigroup.com/software). The DHI MIKE software is considered an industry standard that has been scientifically documented and approved in peer reviewed articles. It is recognised by organisations such as Federal Emergency Management Agency (FEMA) in the US.

3.2 Application to River Liffey

A MIKE 3 model was set up and calibrated for the particular conditions of the River Liffey, Dublin Harbour and Dublin Bay. The model simulates the water levels, currents, salinity and temperature distribution depending on the tidal elevations in Dublin Bay, freshwater run-off from the River Liffey, River Tolka and the Dodder, meteorological conditions (wind, air pressure, heat exchange with atmosphere) as well as discharge of heat from Poolbeg, Synergen and North Wall and the water from Ringsend Waste Water Treatment Plant.

The model was calibrated by comparison with field data and information including tidal elevations, current measurements, salinity and temperature measurements. The following information and data were specifically collected and applied for the set-up and calibration of the model:

- Temperature measurements at outfall in June 2004 (prepared for Elsam Engineering by Svend Ole Hansen ApS, Revision 1 March 2005).
- Bathymetric survey of River Liffey near outfall in March 2006 (prepared by DHI).
- Measurements of temperature, salinity, water levels and current measurements in River Liffey in May 2006 (prepared by RPS).
- River run-off data for River Liffey, River Tolka and Dodder (Source - the Irish Environmental Protection Agency).
- Current and Tides Study Dublin Bay (Source - Irish Hydrodata Limited, Rathmacullig West, Ballygarvan, Co. Cork December 1989).



- Open boundary conditions of tidal variation from a larger model of the entire Irish Sea (supplied by RPS).
- Irish Coast Pilot. Offshore and coastal waters round Ireland including routes to the Irish Sea from Atlantic Ocean Landfalls (Thirteenth Edition, The Hydrographer of the Navy, 1994).
- Impact of the River Liffey discharge in nutrient and chlorophyll concentrations in the Liffey estuary and Dublin Bay (Irish Sea). T.G. O'Higgins and G.G. Wilson. Estuarine Coastal and Shelf Science 64 (2005) pp. 323-334

The application of a such a hydrodynamic numerical simulation model of water flow and heat exchange is a recognised and recommended standard method of assessing the impact on the marine environment of thermal plumes from discharge of cooling water (see for example pages 30, 277, 282 and 287 in the Reference Document on the Application of Best Available Techniques to Industrial Cooling Systems December 2001 (BREF-document), Ref. /1/).

3.3 Cumulative Impact

In order to calculate the cumulative impact of thermal plumes, the modelling took into account all discharges of waste heat to the River Liffey from the Poolbeg peninsula, see Figure 3.1.

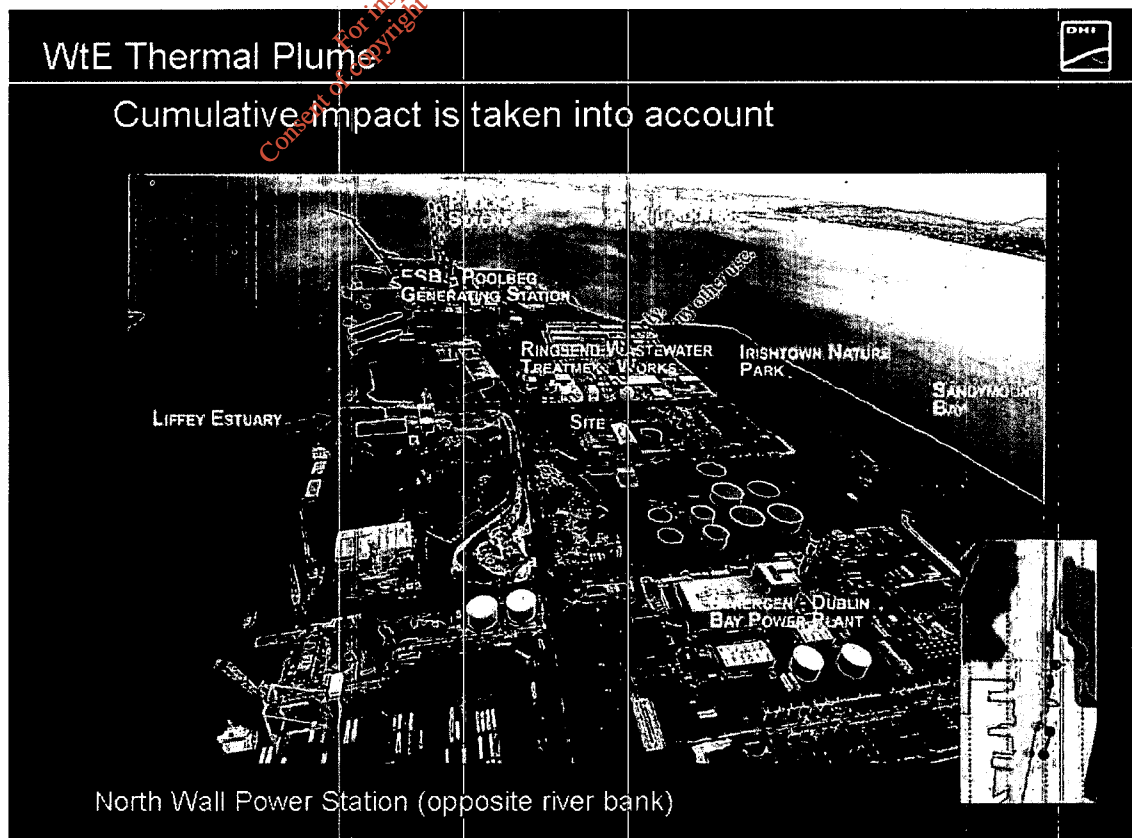


Figure 3.1 Location of all intakes and outfalls included in the modelling

The cumulative impact was determined on the basis of all existing power plants operating at full licensed values. The values adopted in the simulations are given in the tables below. Table 1 identifies the three power plants with thermal discharge to the River Liffey and Table 2 identifies the WtE operating characteristics.

Table 1 – Thermal Discharges to River Liffey

Plant	Discharge (m ³ /s)	ΔT (deg C)	Outlet	Intake	MW
Synergen	8.4	9.5	Surface	Middepth	334
Poolbeg	23.8*	11.5	Surface	Surface	1146
North Wall	5.1	12.5	Surface	Middepth	267
Dublin WtE	3.9	9.0	Surface	Middepth	147

* maximum pump capacity

3.4 WtE Facility Operations

The outfall temperature of the WtE cooling water is equal to the temperature of the water at the point of intake plus the temperature increase in the condenser that is required to cool the steam turbine generator. This is shown schematically in Figure 3.2. The outfall temperature will therefore vary in line with variations in the temperature of the River Liffey. The connection between the intake and outfall temperature is important for calculating the cumulative impact of all the thermal discharges in the River Liffey. The temperature rise of cooling water for the WtE facility relative to the intake temperature will be 9 degrees C for 98% of hourly values over a year (operating at maximum limits).

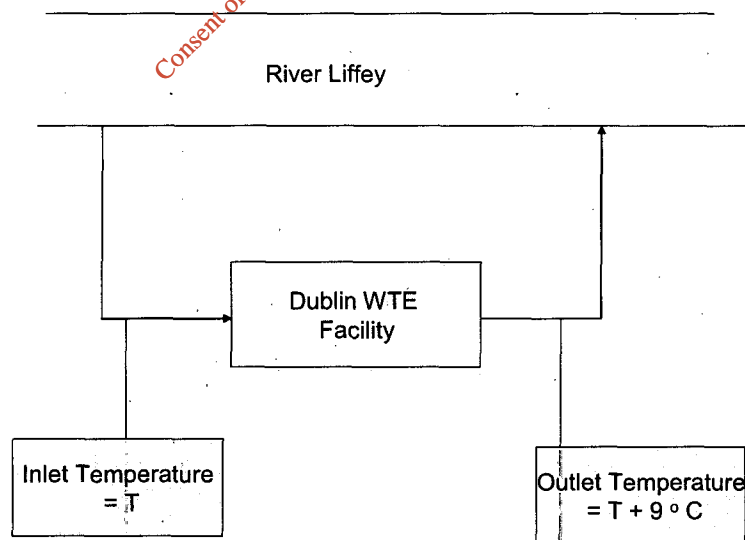


Figure 3.2 The outfall temperature of the cooling water from the WtE is equal to the intake water temperature plus the increase in temperature over the condenser. The maximum water temperature discharged to the River Liffey will be 9° C above the inlet temperature.



3.5 WtE Thermal Discharge

The impact of thermal discharge from the WtE facility is assessed in two steps. Firstly, the baseline situation is simulated with all the existing power plants in operation (Synergen, Poolbeg and North Wall). Secondly, the WtE facility is included and the simulation is repeated. The two simulated temperature results are then subtracted and the excess temperature arising from the inclusion of the WtE facility is determined. In this manner the cumulative effects of all power plants are included in the assessment as well as their possible interaction, i.e. the possibility that the intake temperatures may be higher than in a river where no heated discharges take place and recirculation of intake and outfall water may occur has been taken into account in the modelling.

Figure 3.3 shows the simulated rising tide surface layer thermal plumes from North Wall, Synergen, WtE and Poolbeg power plant. The interaction between the Poolbeg power plant and the WtE / Synergen plumes is observed.

The Liffey Estuary is not salmonid freshwater for the purposes of the European Communities (Quality of Salmonid Waters) Regulations 1988 (the "Salmonid Regulations"), however the impacts of the WtE thermal plume were measured against the standards set out in the Regulations at the request of the Department of Communications, Marine and Natural Resources. The temperature requisites for the purposes of the Salmonid Regulations are as follows:

"Temperature measured downstream of a point of thermal discharge (at the edge of the mixing zone as determined by the local authority) must not-

- a) Exceed the unaffected temperature by more than 1.5° C;
- b) Exceed
 - (i) 21.5° C; or
 - (ii) 10° C, during the period from 1 November to 30 April where species which need cold water for reproduction are present.

A thermal discharge must not cause sudden variations in temperature. (Temperature limits to be conformed with for 98% of the time)."

No mixing zone has been defined for the Liffey Estuary as it is not designated salmonid water.

Figure 3.4 shows that the combined area of impact of thermal plumes from the Dublin WtE and Synergen is estimated to be approximately 25% of the cross section of the River Liffey for the 1.5° C requirement, 25 % of the cross section for the 21.5° C requirement, and 33% for the 10° C requirement. The facility will be operated on a steady basis all year around. Thus sudden variations in temperature conditions due to the operation of the plant will not occur.

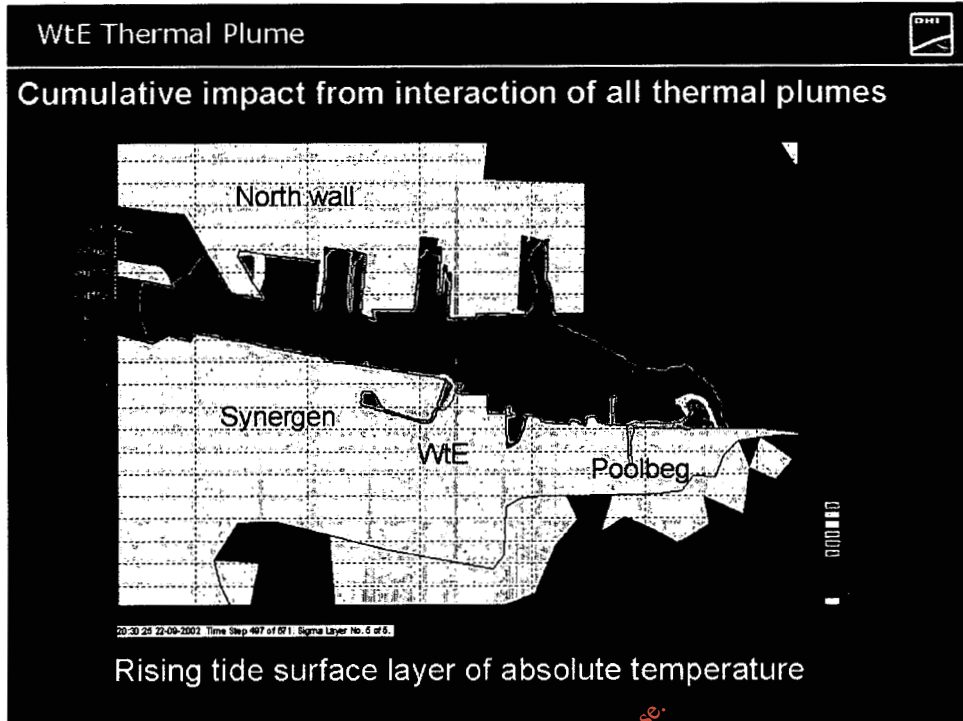


Figure 3.3 The absolute surface temperature at rising tide. The thermal plume from Poolbeg reaches the WtE/Synergen thermal plume.

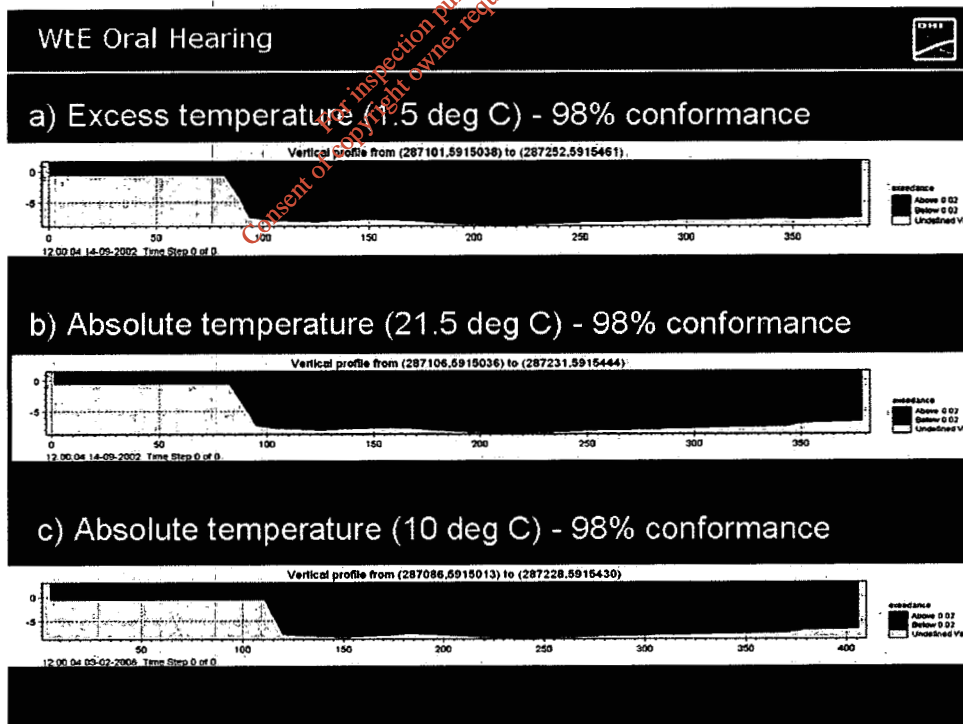


Figure 3.4 Cross section of the Liffey at the WtE/Synergen outfall. The blue colour indicates the area where the temperature is less than excess temperature 1.5° C, 21.5° C in summer and 10° C in winter, for 98% of the time.



3.6 Impact on Synergen

The proposed location of the WtE cooling water intake is at the outlet of the existing open channel that conveys cooling water from the Synergen power plant as well as from the planned WtE facility. The potential impact of the WtE cooling water intake location on absolute cooling water discharge has been taken into consideration.

The simulations based on the MIKE3 model indicate the possible increase in temperature of the intake water for the Synergen facility as a result of cooling water discharged from the WtE facility. The excess temperature is calculated as the difference between the absolute temperatures in the Synergen intake with and without the WtE in operation. The simulation without the WtE (the baseline situation) includes Synergen, Poolbeg and North Wall in operation.

The Synergen intake is located at -3.57m OD Poolbeg. This corresponds to -6.3m below Mean Sea Level (MSL). The water depth at the outfall is approximately 10 metres and the intake is thus approximately 3.7m above seabed. The model applies 5 layers over the vertical. The thickness of the layers varies with the tide and the intake is in between layer 3 and 4. The point of the intake is accordingly put in layer 3, i.e. at mid-depth in order not underestimate the impact on Synergen.

The location of the thermal plume depends on the tide. Figure 4.1 shows the inland movement of the thermal plume at rising tide at the surface as well at mid-depth.

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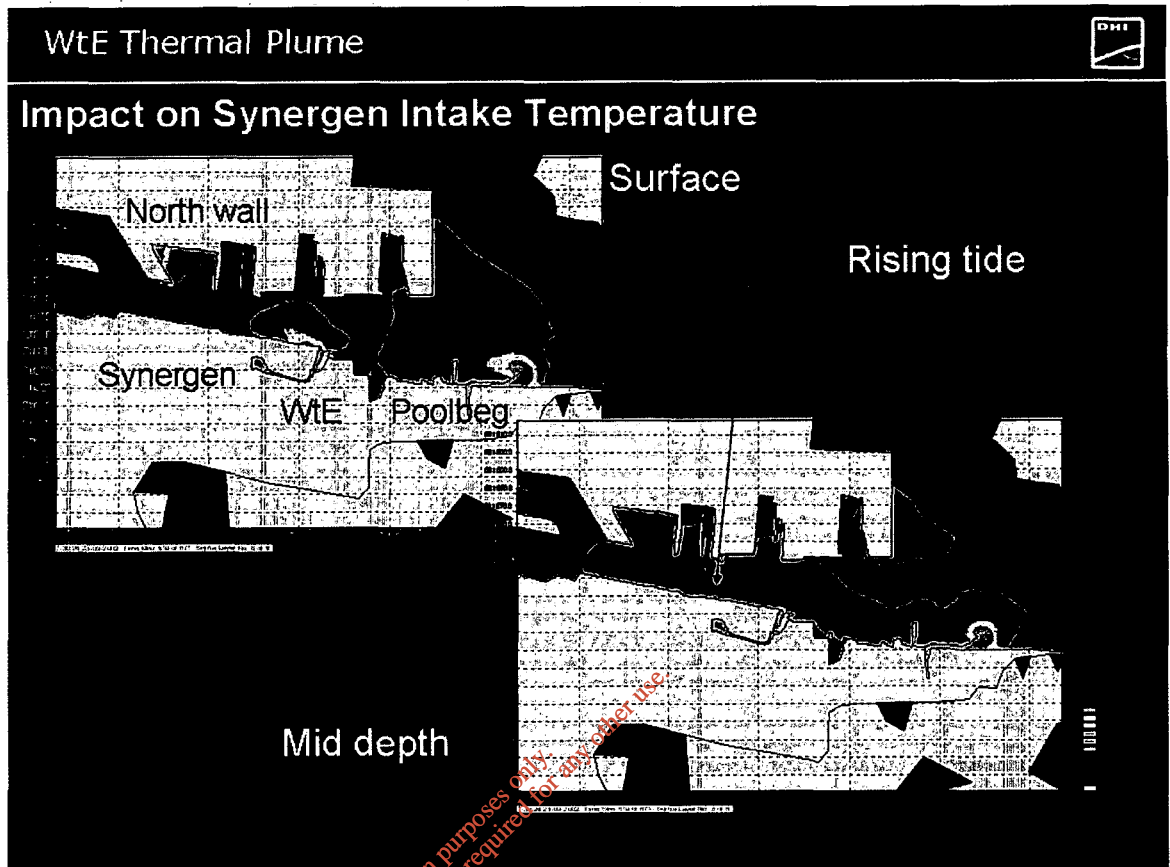
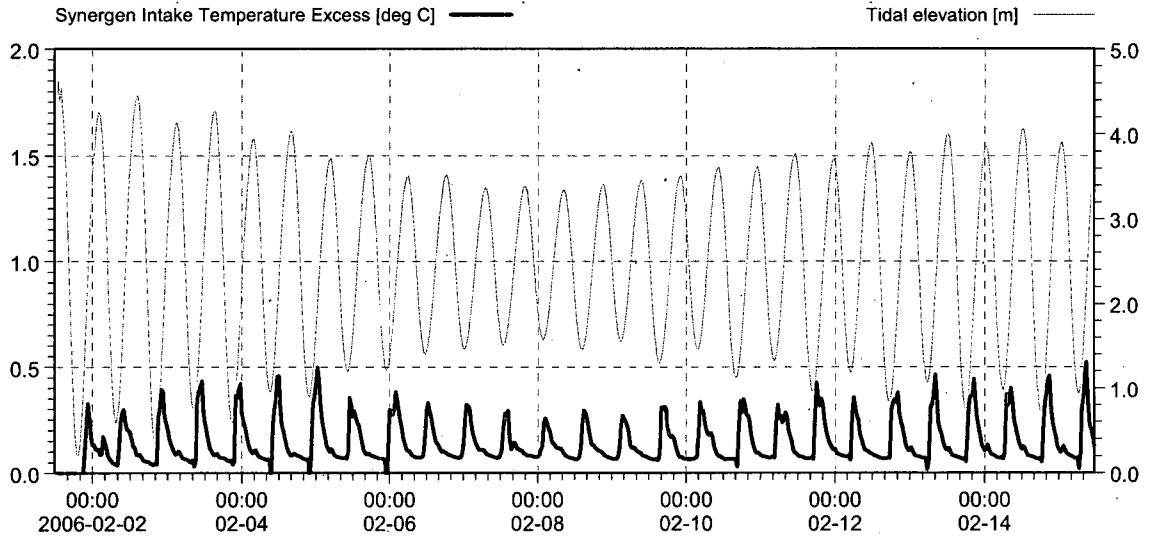


Figure 3.5 Simulation of absolute temperatures of thermal plume at rising tide for surface and mid-depth. Operation at full licensed values, includes WtE facility, summer situation.

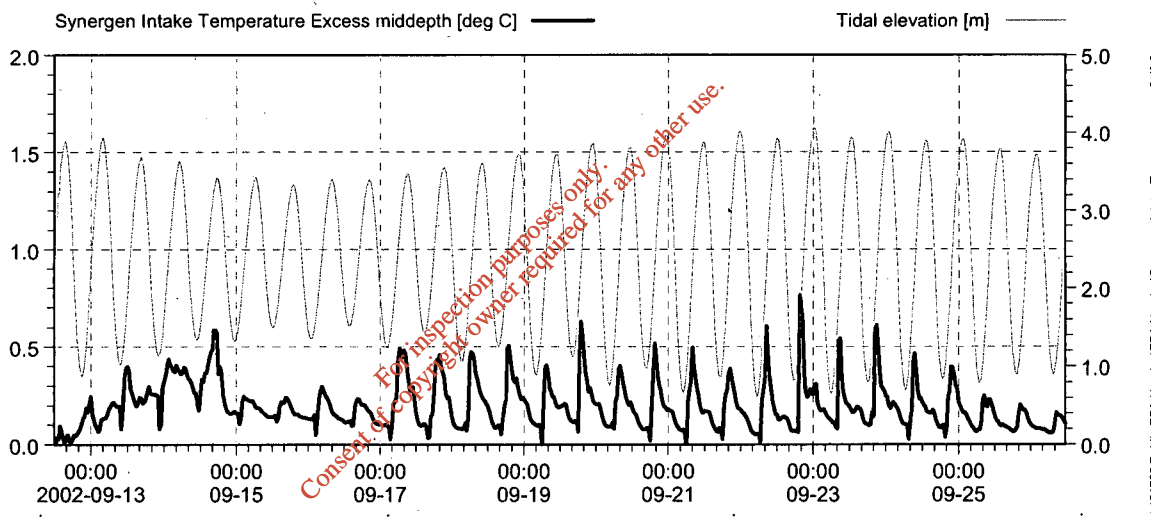
Depending on the water movements in the River Liffey the WtE facility induces an excess or additional temperature increase at the Synergen intake that varies with the tide as shown in Figure 4.2 and 4.3 for the winter and summer situation, respectively. The increase in excess temperature occurs at rising tide when the thermal plume moves inland. This effect is most pronounced at spring tide and less at neap tide.

For the winter situation the maximum increase in excess temperature is 0.50°C and the average increase is 0.15°C . For the summer situation the maximum increase in excess temperature is 0.76°C while the average increase is 0.20°C .



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Figure 3.6 Excess temperature in Synergen intake. Full licensed thermal discharges. Winter situation.



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Figure 3.7 Excess temperature in Synergen intake. Full licensed thermal discharges. Summer situation.

The effect of elevated temperature in the WtE intake was taken into consideration in the assessment of both excess and absolute temperatures for the purposes of the Salmonid Regulation (see above and brief prepared for the An Bord Pleanála hearing Ref. /2/).

The elevated temperature of the WtE intake is shown in Figure 4.4. The figure shows that there is an increase in excess temperature up to about 1.0° C as well as significant sudden reductions of about 1 to 1.5° C. This is explained by the redistribution of the flow around the outfall. The increase in surface outflow is compensated by an increased flow of colder bottom water that reduces the intake temperature.

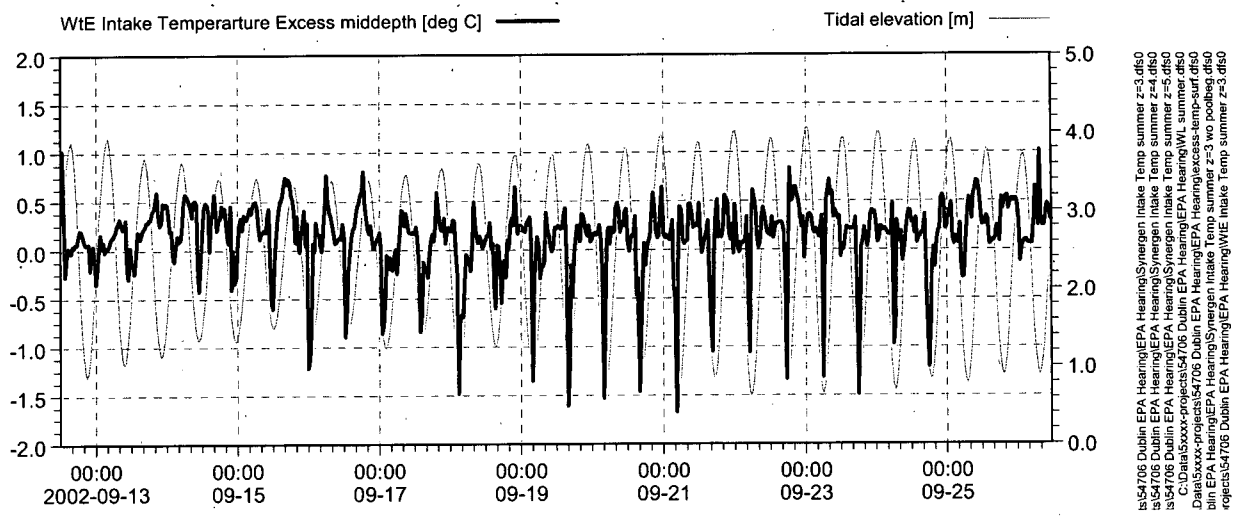


Figure 3.8 Elevated temperature in WtE intake. Full licensed thermal discharges. Summer situation.

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4 BIOCIDES IMPACT

- 4.1 The potential impact of biocide use on water quality has been addressed using internationally accepted methodologies and a conservative approach. The conservative risk assessment showed that even when using a continuous high dosage of 1 mg/L, an environmental impact outside the outfall of the facility is not expected, thus an impact on the water quality is not expected.

It should be noted that Schedule B.2 (Emissions to Water) of the EPA Proposed Decision stipulates a Hypochlorite/Chlorine emission limit value of 0.2mg/l (24hr average), 0.5mg/l (maximum instantaneous) which further highlights the conservative approach of the completed risk assessment.

Based on recorded emission amounts of chlorine and water, it can be calculated that in 2005 Synergen operated with an average emission concentration of 0.1 mg/L chlorine in its discharged cooling water.¹

The dosing of the biocide should be kept at a minimum. A sufficient biocidal treatment is monitored by measuring the total residual chlorine (TRC) in the discharged cooling water at the outlet. The total residual chlorine should be kept at a certain minimum level.

The effect of cumulative biocidal discharges has been considered. The risk assessment and modelling of the use of biocide took into account the cumulative effects of contributions from other plants in the area using the same biocide. The background concentration of the degradation products of hypochlorite/chlorine due to usage at Synergen power plant, Poolbeg power plant and North Wall generating station was estimated and was found to be at least one order of magnitude lower than the concentration level at which no effects on the species in the water are expected.

Reference

Ref. /1/ European Commission. Integrated Pollution Prevention and Control (IPPC). Reference Document on the Application of Best Available Techniques to Industrial Cooling Systems (BREF) December 2001.

Ref. /2/ ABP hearing

¹ Dublin Bay Power Plant. EPA Annual Environmental Report. IPCL no. 486. Reporting period: 1 January to 31 December 2005.

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MEMO

TO: The Board of the Agency

From: Marie O'Connor

DATE: 03 September 2008

SUBJECT : Report on Oral hearing on objections to the proposed determination issued on the waste licence application from Dublin City Council for Dublin Waste to Energy Project, Pigeon House Road, Poolbeg Peninsula, Dublin 4, Register of licence No. W0232-01.

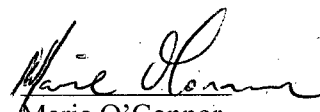
In your letter dated 13 March 2008 you appointed me, in accordance with the provisions under Section 44(1) of the Waste Management Acts 1997 to 2007, to conduct an oral hearing on objections to the proposed determination issued on the waste licence application from Dublin City Council for the Dublin Waste to Energy Project, Pigeon House Road, Poolbeg Peninsula, Dublin 4, Register of licence No. W0232-01. Ms Ann Marie Donlon was appointed to assist me.

The oral hearing was held at the Gresham Hotel, Dublin during the period 14 April to 01 May 2008 and was conducted in accordance with Section 44 of the WMA Acts.

I have considered and assessed, with the assistance of Ms Donlon, the matters raised in the objections submitted to the Agency and the written submissions and verbal presentations made by the applicant and third parties at the oral hearing and I attach my report and recommendations for your consideration.

The report includes a summary record of the submissions and presentations made to the oral hearing, a schedule of the order in which the presentations and questions were made and a report of the assessment and recommendations.

Signed,


Marie O'Connor

**Report on the
Objections and Oral Hearing
on the
Proposed decision of a Waste licence
for
Dublin City Council.**

Register No. W0232-01

Main Report

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Report by: Ms. Marie O'Connor

Assisted by: Ms Ann Marie Donlon

03rd September 2008

Acknowledgements

Ann Marie Donlon and I would like to acknowledge the tremendous assistance given by the Licensing Unit staff that assisted before, during and after the oral hearing in the preparation of the venue, the photocopying, scanning and verification of the various documents and all those things that contributed to the report. A special word of thanks to Jordan for his assistance with the recording.

I particularly want to thank Ann Marie Donlon for her excellent work in contributing and assisting at all stages of oral hearing and the preparation of this report.

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Summary

Dublin City Council made an application to the Environmental Protection Agency for a waste licence on 10 July 2006. A proposed decision was issued by the Agency on 21 November 2007. Fourteen objections including eight requests for an oral hearing were received and the Agency appointed Ms Marie O'Connor and Ms Ann Marie Donlon to conduct an oral hearing.

The oral hearing was held in the Gresham Hotel, O'Connell St., Dublin on 14 -18th April and 21st -24th April and 01st May 2008. There were forty five presentations made at the oral hearing by representatives of Dublin City Council, third party objectors and members of the public.

Having assessed the information on file in relation to the waste licence application and the presentations/submissions to the oral hearing it is recommended that a licence is granted subject to the amendments outlined in the recommendations to this report.

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General Introduction

1.1 BACKGROUND

On 10 July 2006 Dublin City Council (DCC) made an application to the Environmental Protection Agency (the Agency) for a waste licence to operate a Waste to Energy (WTE) facility on a 5.5 hectares site on the Poolbeg Peninsula with a capacity to thermally treat 600,000 tonnes per annum household, commercial and non-hazardous industrial waste. The application was made by DCC on behalf of the four Dublin Authorities and it is proposed that the project will be carried out as a Public Private Partnership (PPP) by Dublin Waste to Energy Ltd which is known in documentation as PPP Co. In the EIS and Waste Licence application the PPP Co were Elsam however it now consists of a joint venture between Covanta and Dong. A total of eighteen submissions were received. The Agency issued a Proposed Decision on 21 November 2007 for the carrying out of the following waste activities;

Licensed waste disposal activities in accordance with the Third Schedule of the Waste Management Acts, 1996 to 2007:

<i>Class 8.</i>	<i>Incineration on land or at sea.</i>
<i>Class 12.</i>	<i>Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule.</i>
<i>Class 13.</i>	<i>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.</i>

Licensed waste recovery activities in accordance with the Fourth Schedule of the Waste Management Acts, 1996 to 2007:

<i>Class 3.</i>	<i>Recycling or reclamation of metals and metal compounds.</i>
<i>Class 4.</i>	<i>Recycling or reclamation of other inorganic materials.</i>
<i>Class 6.</i>	<i>Recovery of components used for pollution abatement.</i>
<i>Class 8</i>	<i>Oil re-refining and other re-uses of oil</i>
<i>Class 9.</i>	<i>Use of any waste principally as a fuel or other means to generate energy.</i>
<i>Class 13.</i>	<i>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.</i>

Fourteen valid objections and three submissions on the objections were received (including eight requests to hold an oral hearing into the objections) from the following parties:

<i>Mr Damien Cassidy</i>	<i>Ringsend, Irishtown & Sandymount Environment Group (RISEG)</i>
<i>Ms Lorna Kelly</i>	<i>Sandymount & Merrion Residents Association (S&MRA)</i>
<i>Ms Sharon McCormack</i>	<i>Poolbeg Quay Residents Association (PQ RA)</i>
<i>Cllr Daithí Doolan</i>	<i>& Ms Mary Lou McDonald -Sinn Féin</i>
<i>Mr John Hawkins</i>	
<i>Ms Frances Corr</i>	<i>Combined Residents Against Incineration (CRAI)</i>
<i>Mr Ruairi Quinn</i>	<i>Labour Party</i>
<i>Mr Marco Salino</i>	
<i>Mr David Farrell</i>	<i>Synergen Power Limited</i>
<i>Mr Matt Twomey</i>	<i>Dublin City Council</i>
<i>Mr Maurice Bryan</i>	
<i>Mr Ryan Meade</i>	<i>Green Party</i>
<i>Mr James Rountree</i>	
<i>Mr Joe McCarthy</i>	<i>& Ms Valerie Jennings</i>

The full text of these objections and submissions are available on the EPA website (www.epa.ie)

Following an appraisal of the nature of the objections the Board of the Agency decided to hold an oral hearing and issued notification to all parties on 08th January 2008. The location and date of the hearing was notified to all parties on 27th February 2008. Ms Marie O'Connor (Chair) and Ms Ann Marie Donlon (Assistant to the Chair) were appointed to conduct an oral hearing of objections to the proposed decision. All parties were notified of the venue and time.

The site and surrounding area were visited by Ms O'Connor and Ms Donlon prior to the oral hearing.

The oral hearing was held at the Gresham Hotel, O'Connell St., Dublin on 14 -18th April and 21st -24th April and 01st May 2008.

1.2 SCOPE OF THE REPORT

This report (including appendices) has been prepared in accordance with the requirements of the Waste Management Acts, 1996-2008.

The information contained in the waste licence application (including EIS), submissions, objections and presentations to the oral hearing were considered.

Mr McCarthy and others requested that the information relevant to the environmental impact of the facility which was submitted to the An Bord Pleanála (ABP) oral hearing and the ABP inspectors report be considered and both the third parties and applicant quoted extensively from documents from that process. It is considered that the relevant issues were raised in the waste licensing process either in the EIS, waste licence application, additional information received from the applicant, submissions, objections or during the oral hearing and are dealt with in that context.

Documents related to the ABP oral hearing were submitted by Mr McCarthy and others during the various phases of the licence application process.

1.3 ORAL HEARING

The oral hearing commenced at 10:30am on 14 April 2008. Ms O'Connor and Ms Donlon read their letters of appointment into the record. The Chairperson proceeded to give an opening statement outlining the procedure for the oral hearing, the parties involved and the order of presentations. Mr Alan Doyle facilitated drawing up the order of the presentations.

Appendix A is a list of the individuals who asked questions or made presentations and includes a reference to the relevant section in the recording by Digitake. Appendix B contains a summary record of the oral presentations and questioning at the oral hearing. All documents presented to the oral hearing are available on the EPA website and the document number assigned at the hearing is referenced within this report.

During the oral hearing there were requests by third parties (Mr Cassidy, Mr McCarthy) for the adjournment of the proceedings and to require the attendance of representatives of the Health Services Executive (HSE), the Department of Health and Dr Broderick (consultant to ABP oral hearing). There were also requests that the Agency should require the submission of the models and spreadsheets that were used in the assessment so that they could be re-run and all the inputs re-checked.

The Waste Management (Licensing) Regulations 2004 allows for the person appointed to conduct an oral hearing to require the attendance of a party to an objection, an employee of the Agency or a member of the relevant local authority. This power does not extend to the Director General or the members of the Board of the Agency or other persons such as employees of the HSE.

There was dissatisfaction expressed by a number of third party objectors, that the scope of the hearing did not include issues related to the construction phase of the facility, the transport, handling and storage of the ash wastes at off-site locations including the ship loading process and the planning and construction aspects of the Dublin district heating system. It was outlined that the focus of the oral hearing was the objections to the proposed determination (PD) issued by the Agency and extending the scope was not within the remit of the Chairperson.

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Assessment

This section deals with the general issues and the specific licence conditions referred to in the written objections and the presentations to the oral hearing. Issues will be dealt with by topic and they have been collated under headings insofar as possible. All objections raised have been considered and incorporated into the assessment even if not specifically mentioned below.

2.1 WASTE MANAGEMENT OPTIONS AND SITE SELECTION

2.1.1 Waste Treatment, Recovery and Disposal Options

It was contended by third parties (particularly the Green Party, Labour Party and Sinn Fein representatives) that the elected representatives of DCC had not voted for an incinerator as part of the waste management technologies for Dublin rather that they had agreed to the carrying out of studies into the various options which included anaerobic digestion, composting and thermal treatment. The other third party objectors agreed with this and stated that the incinerator was being proposed by the unelected Executive of DCC against the wishes of the people.

Sinn Fein in their objection and presentations to the hearing outlined the economic and social advantages of the Zero Waste Policy. It was also stated that the Regional Plan is under revision and that it may be premature to licence incineration until that process is complete.

Alternatives to the treatment of municipal waste by incineration, such as Mechanical Biological Treatment (MBT), were raised by most third party objectors and it was generally queried whether incineration was the Best Available Technique (BAT) for waste disposal. It was contended that waste reduction policies should be further explored and financed to minimise the quantities of residual waste and thus eliminate the need for incineration at the scale of the facility proposed.

The Green Party (Mr Cuffe, TD) considered that there was a change in Government direction in relation to waste management and he read a letter from Minister Gormley outlining that a review of Government waste policy was underway and giving details of the projections for residual waste quantities for 2012 and beyond. The data indicated that in 2016 the projected municipal solid waste (MSW) arising nationally would be 3,384,429 tonnes and assumes that recycling (49%) will reduce the residual fraction to 1,732,220 tonnes. It is then assumed that landfill can take 823,562 tonnes and that the use of MBT would reduce the available waste for

thermal treatment to 408,896 tonnes. The written objection requests that the capacity of the plant should be reduced in line with ABP Inspectors Report.

DCC (Mr Twomey) stated that the Dublin Authorities were required under the Waste Management Act 1996 to prepare a waste management plan for the region. A Waste Management Strategy was prepared by consultants and the elected council endorsed this in January 1998 including a decision to prepare the draft Waste Management Plan which was prepared, put on public display, adopted by the four Regional Authorities and became operative in 2001.

The plan identified an objective to develop an integrated waste management system which included waste to energy and this was further developed in the 2005-2010 Waste Management Plan.

He explained that the strategy and plans have regard to evolving Government Policy as was contained in the policy documents issued e.g. Changing our ways (1998), Delivering Change- preventing and recycling waste (2002), Waste Management - taking stock and moving forward (2004), National strategy on biodegradable waste (2006) and the National Plan Development Plan 2007-2013. These advocated minimisation of waste followed by re-use and recycling where feasible but the plans also allowed for the residual fraction to be incinerated with energy recovery.

It was stated by DCC (Mr Twomey) and third parties that the contract with the PPP Co. required the Dublin Regional Authorities to supply at least 320,000 tonnes/annum to the facility.

Comment

Plans and policies

Section 40(2)(b)(iv) of the Waste Management Acts, 1996 to 2008 requires that regard must be had 'to the policies and objectives of the Minister or the Government in relation to waste management for the time being extant'. In addition, Section 40(4)(d) requires that the proposal is consistent with the relevant waste management plans and implementation by the local authority of these plans.

The Waste Management strategies and plans referred to by DCC and others are relevant for this application and indicate that thermal treatment of waste is an acceptable waste management system and indeed the National Development Plan states that 'thermal treatment with energy recovery will be the preferred option for dealing with residual waste after achieving ambitious targets in respect of waste prevention, recycling and recovery'. The scale/capacity of the facility was considered and allowed by ABP.

The Programme for Government (2007-2012) refers to incineration insofar as it proposes not to alter the landfill levy in a manner which could give a competitive advantage to incineration and it proposes 'the use of waste for generating sustainable electricity' as a means of bring down the cost of waste management. It also commits to the 'highest operating standards for all waste management technologies', 'community monitoring arrangements', 'including on-line monitoring where appropriate, with specific powers/rights to information' and the introduction of MBT as a means to divert biodegradable waste from landfill. MBT will also divert municipal waste from incineration and can be seen as a method to achieve 'residual waste' as specified in the PD.

Government policy, the Dublin Region Waste Management Plans and the Dublin Development Plan were comprehensively dealt with in the ABP Inspectors Report (Document 21) and it concluded that the proposed facility did not significantly contravene the policies or plans and planning permission was granted to the facility. Although there is currently a review of the waste management policy underway no policy change has been issued since that report. The Department of the Environment, Heritage and Local Government in the April 2004 policy document "Waste Management Taking Stock and Moving Forward" indicated that the concept of Zero Waste is accepted as a desirable goal however it is not considered achievable in the short term and other forms of waste management must be pursued.

It is considered that the proposed facility is in line with the plans and objectives of the local authority and the Government.

Waste Arisings and available for incineration

The Dublin Waste Management Plan gives an overview of the projected wastes arising up to 2020 which indicates that total municipal, commercial and industrial waste would be 1,574,130 tonnes in that year. The waste licence application is for a wide variety of EWC codes which includes non-hazardous municipal, commercial and industrial wastes.

The EPA National Waste Report for 2006 states that the total MSW arising was 3,384,606 tonnes which was an increase of 11% on 2005 figures with a waste recovery rate of 36% excluding WEEE. The total MSW arising for Ireland predicted for 2016 in the Green Party submission Document 42 was 3,384,492 tonnes. It is clear therefore that with increased waste generation predicted on the basis of population and economic growth, the 2016 projections would include a significant

element of prevention/minimisation and it may be unrealistic to expect that a further 49% recovery as outlined in the submission could be achieved. However the EPA report also outlined that the current recovery rate for household waste was only 22% which is significantly below the 50% target for diversion from landfill by 2013.

The EPA 2006 report states that 474,503 tonnes of Household waste was generated in the Dublin Region which is broadly in line with the data provided by DCC in the EIS and application process. In the documents submitted by DCC in relation to the current and future waste arisings a quantity of Commercial waste arising for 2005 (685,430 tonnes) is quoted which appears to include industrial process wastes. This practice was outlined in the EPA Waste Reports as being of some concern in relation to the use of Local Authority data.

The EIS (Chapter 3.7) outlines that it is projected that 1,570,000 tonnes of wastes (MSW -650,000 tonnes and Commercial/Industrial waste -920,000 tonnes) will arise in the Dublin Region in 2020 and the further information submitted predicts that 846,547 tonnes of residual waste will require disposal in 2020 allowing for 46.9% recycling of household waste and 49% recycling of commercial/industrial waste.

The Dublin Waste Management Plan 2005-2010 (Section 4.1.2) goes into some details as to what it considers as Commercial and Industrial waste and cautions that a large quantity of Industrial waste could be reported as Commercial. It appears from the data available that it is the view of the Dublin Regional Authorities that household, commercial and industrial waste are all included in the calculation of the waste arising and thus it is unclear as to the quantities of process industrial wastes generated in the region. In addition it is unclear whether wastes transported into the region and stored/treated prior to shipment are included in the data. It is their intention to provide for the incineration of process related industrial wastes in the facility as outlined in the list of EWC codes provided (Document 30).

This has led to confusion among the public and even in the interpretation of data in the presentations/data given by DCC where it was regularly mentioned that it was an municipal waste incinerator that was being designed with comparisons being made with other municipal waste incinerators and designs.

It is considered that the projected waste arising for the Dublin Region may include a significant portion of commercial/industrial process related wastes and the residual municipal waste is taken as the wastes which the Authorities are contracted to supply under the Project Agreement which amounts to 320,000 tonnes per annum. The balance will be sourced by the PPP Co. from the commercial/industrial sector.

2.1.2 Waste categories applied for and in PD including sludge/residual issue

The PD allows for a wide range of wastes to be incinerated and there was extensive discussion at the oral hearing on the intentions of DCC/PPP Co. regarding the intake of process wastes, sludges, liquid wastes and medical wastes.

DCC presented (Document 30) a revised list of wastes that they wished to accept and this included up to 80,000 tonnes per annum of sludge (wet/dried) from the adjacent municipal wastewater treatment plant.

Comment

The Waste Licence Application is for household and commercial & industrial non-hazardous waste, industrial non hazardous sludge and sewage sludge. The applicant in a response to the Agency submitted a list of EWC codes for the wastes it proposed to treat (received 12 June 2007) and these were revised in Document 30. This revised list of wastes largely excluded clinical type wastes, C&D wastes, separately collected waste fractions and all sludges other than sewage sludge. Of the process related waste codes on the new list many represent potential recyclables such as metal, paper, cardboard and biodegradable wastes and the applicant also included EWC codes xx xx 99 - 'wastes not otherwise specified'.

Reference to waste characterisation was found in the climate impact assessment carried out by DCC (Dr Porter) who used the statistics from the EPA National Waste Reports and other data from the US and EU related to MSW to characterise the wastes to be accepted at the facility. These statistics refer to household waste and commercial/industrial non-hazardous wastes which are similar to household waste and this is also the case in the definitions of MSW in the WID, WMA 1996-2008 and EWC codes. The WID is more specific as definition specifically excludes fractions under 20 01 (separately collected fractions) and 20 02 (garden and park wastes).

The definition of 'Residual waste' in the PD requires pre-treatment of wastes but does not specifically refer to MSW waste. It appears to allow for the concept of source segregation by the generators of the waste, amongst other techniques, if that is deemed to be BAT but it does not specify which form of source segregation e.g. 2-bin, 3-bin etc is required. It also does not require mechanical biological treatment (MBT) as was proposed by some third parties. Since the PD was issued the Waste Permit Regulations (S.I. No. 821 of 2007) provide a definition of Residual Waste as 'the fraction of municipal waste remaining after the source separation of municipal

waste fractions such as food and garden waste, packaging, paper, metals, and glass' and MBT as 'the treatment of residual municipal waste through a combination of mechanical processing and biological stabilisation, in order to stabilise and reduce the volume of waste which requires disposal'. EWC codes 19 05 01 and 19 12 10 were requested by DCC and since these are residues from the treatment of waste they should be retained in the licence however they should be limited to those prepared from the treatment of only municipal waste.

The grant of planning permission is also specific in that it states that 'the waste treated at the facility shall be in the form of municipal non hazardous residual waste generated primarily in the Dublin Waste Management Region as proposed in the application' therefore it appears that it was also the understanding of ABP that other commercial and industrial wastes were not part of the application.

There does not appear to have been any assessment of the input of sewage sludge and ABP did not give planning permission for this aspect of the project. The intake of sludges will be dealt with in more detail under the design and energy efficiency section.

In the absence of any clear assessment of the impact of the inclusion of the broad range of wastes in the PD it is recommended to limit the applicant to that which appears to have been assessed in the EIS/licence application and additional information and Schedule A and definitions in the Glossary should be amended to that effect.

2.1.3 Design of the Facility and Energy Efficiency

Mr McCarthy, Mr Bryan and others queried if the technology being proposed for the incinerator, boiler, turbines, flue gas treatment and monitoring equipment would be those installed and if they constituted Best Available Techniques (BAT) since it was not possible to determine BAT on the information supplied as the specific design of the plant, equipment specification and process parameters were not available. Labour considered that the proposed export of electricity was given too much weight given that it was a requirement of WID. Green party consider that the licence should contain a condition requiring the applicant to state the technology that will be used. Other issues of concern related to the designed efficiency of the plant, the planning requirements for the cooling water system and district heating (DH) pipelines.

DCC (Mr Bahor, Mr Norgaard and Mr Shipsey) and in the EIS/application outlined that the design of the plant was at a preliminary stage but that the technology

proposed was in accordance with the BREF Guidance document and operational on other facilities in Europe. The design specification would be finalised after the required statutory permits and approvals were obtained. They also explained that since the EIS was submitted the PPP Co. had changed and it was now DONG and Covanta but since Elsam was part of DONG the design concept and further refinement would remain with the project team that were Elsam.

The plans for a DH system in Dublin were outlined by DCC (Mr Gaillot) and it appears that work has commenced on the provision of a scheme however its eventual roll-out to further areas depends on the availability of heat from the incinerator and on new residential/commercial developments being built.

Comment

Sections 40(4)(c) of the Waste Management Act, 1996-2003, requires the Agency to ensure that BAT is used and Article 4 of WID requires that the application includes a 'description of the measures which are envisaged to guarantee' that the design, equipment and operation of the facility will comply with the Directive taking account of the waste to be incinerated, the heat generated is utilised where practicable, the residues are minimised and recycled or disposed as appropriate in accordance with legislation.

Guidance on what constitutes BAT is prepared by the European IPPC Bureau (EIPPCB) in the form of a BAT reference document (BREF) and Member States are required to prepare their own BAT Guidance documents. The BREF outlines that the precise design of a plant is dependent on many factors including the location, waste type and the availability of sources to utilise energy generated. It is unclear from the EIS, the waste licence application and the information submitted to the oral hearing if the design phase of the furnace/facility has included all the types of waste specified in Schedule A of the PD.

The incinerator and flue gas treatment technologies specified by the applicant are contained in the BREF and adequate detail was provided in so far as it related to the burning of MSW. In addition the Waste Incineration Directive (2000/76/EC) requires stringent process control and emission limits to be applied to an incineration facility and the proposed decision applies the requirements of the directive. There are no significant changes to the WID in the proposed Industrial Emissions Directive (COM (2007) 844 final and a review of the BREF document has not commenced.

Sludge and non-MSW wastes

The EIS and Waste Licence application provides a description of the measures and design proposed but as was stated by DCC the final design specification of each part of the process is not completed. The furnace is proposed to be a water cooled moving grate type. The BREF indicates that the use of water cooling is an added complexity and cost to the system, that it is suitable for wastes with a calorific value in the range 10-20MJ/kg but that it may not be suitable for powders, liquids or material that will melt through the grate.

It is unclear if sewage sludge as an input (13% per annum) was considered in the initial project design as the EIS does not specifically mention it and ABP did not consider it part of the application before them. Although DCC contended (Mr Shipsey) that the design and operational implications of accepting sludge was addressed by DCC (Mr Bahor) there is no description within the application or provided at the oral hearing as to the characteristics of the sludge (dry/wet) or other non MSW wastes, the means (conveyor, spray into furnace, mix in bunker) by which the sludge will be introduced into the furnace or an impact assessment in relation to emissions (including odour), energy balance, sludge handling etc. DCC (Mr Twomey and others) indicated that this was a contingency arrangement should the option to landspread sludge not be available and thus full details are not available at this time.

The BREF states that 'the precise design of a waste incineration plant will change depending on the type of waste that is being treated' (Chapter 1.5) and outlines that the handling of sludge are design criteria and that there are three modes by which the sewage sludge can be fed to the furnace all of which require additional investment costs. In addition it states that although some MSW incinerators burn wastes other than MSW the detailed design of the plant is dependent on the characteristics of the waste and the choice of each constituent part (grate, combustion chamber, boiler, flue gas treatment systems) is interdependent on each other. In fact for new incineration plant BAT No. 1 states that BAT is 'the selection of an installation design that is suited to the characteristics of the wastes received'.

District heating

WID (Article 6) requires that 'any heat generated by the incineration.... process shall be recovered as far as practicable and the BREF document, particularly in BAT 27 & 28, refers to the location and design of the facility to optimise the use of generated heat. The design of this plant, as outlined in the EIS, and contrary to suggestions within the site selection process, appears to have concentrated on the generation of electricity rather than electricity and heat. Although it is stated that the design will

allow for the production of heat for a DH system it does not specifically indicate the type of turbine that was considered or detail the impacts on the emissions. Since the applicant has repeatedly stated that the design is not finalised and it is in the interest of the PPP Co to ensure that energy export is maximised it is recommended that the requirement in the PD to provide heat to a DH system is amended.

It is unclear from the EIS and waste licence application what impact the diversion of heat to the DH system would have on the choice of cooling system e.g. air cooled/water cooled and the cross media effects. The thermal load from the cooling water to the Liffey Estuary is further discussed in section 2.2.

Energy Efficiency

The BREF provides ranges of acceptable energy efficiency levels which would be expected from plant and recommends that these are maximised in the design.

The calorific value of the incoming waste is an important feature of the design and DCC (Mr Norgaard) using a capacity diagram showed that the process lines were being designed to cater for a range of inputs from 20.5- 41 tonnes/hour and 61-112.8MW and this is in line with the range of calorific values for MSW quoted in the BREF of 7-15 MJ/kg. He also stated that the use of wet sewage sludge would result in a decrease in power efficiency but no details were presented in the application or to the hearing on this or the use of other commercial and industrial wastes.

It is considered that the detailed assessment of the use of sewage sludge and a characterisation of the commercial and industrial waste is required prior to the finalisation of the design of the facility as it has implications for the flue gas treatment systems, emissions, residues and energy balance of the facility.

The BREF document sets out as BAT for new plant energy efficiency criteria which have been incorporated into the latest draft of a proposed waste directive (COM (2005) 667). Having considered the scale of this proposed facility and the information submitted, particularly the references made to site selection in relation to end use of energy, it is considered that the BAT requirements should be inserted into the licence in the form of a minimum energy efficiency rating. It is understood from the application and in particular Document 15 that the facility as proposed can meet these requirements.

The use of waste heat as a means of drying the sludge at the Ringsend WWTP was not discussed in any detail and may form another synergy which should be

investigated. This is also a BAT requirement where feasible and its further investigation should be included in the licence.

2.1.4 Residues- handling, storage and transport

The third parties raised concerns regarding the storage, transport and disposal of the residues. The bottom ash storage bunker was considered of such a size that it would not be possible to adequately take a representative sample as required in the PD or to remove the bottom ash to the shipping area using an overhead crane and trucks. It was considered that the wet ash would compact due to the weight of the ash above it making removal by crane difficult. There was also the increased possibility of cracks in the concrete which could lead to leaching of liquid to the soil/groundwater.

The third parties also considered that the transport and handling of the flue gas treatment residues (FGT) was a hazardous operation and not fully discussed in the application and EIS and as it is hazardous waste the storage of it off-site should be considered.

The climate impact of the movement of trucks was raised and it was considered that for the bottom ash a conveyor system to the ship/quay would be BAT for this type of operation.

DCC (Mr Norgaard and Mr Bahor) outlined that the proposed bunkers and silos would be maintained and operated to the highest standards and that the movement of wastes would be carried out in accordance with the licence, planning permission and relevant legislation.

Comment

The application and EIS outlines that the bunker for the storage of bottom ash is proposed to be suitable for 10,000 tonnes which is considered sufficient for 1 month storage and the FGT residues silos have a capacity of 700m³ which is considered sufficient for 7 days. The bottom ash bunker is to be constructed of water-proof concrete to prevent leachate egress and covered, the FGT silos are to be equipped with high efficiency particulate abatement (HEPA) filters to prevent fugitive emissions and load cells or level indicators. The bottom ash removal off-site is proposed in covered trucks and the FGT residue removal is proposed by sealed containers.

The applicant proposes that since there are no facilities in Ireland for the treatment/recovery of bottom ash or the disposal of FGT residues they would be shipped abroad via the adjacent docks. The removal of the wastes by truck is expected to require more than 400 truck movements per month with approximately

330 movements predicted in one 24 hour period for the removal of bottom ash when the ship is docked. This was considered by ABP in relation to the impact on traffic.

The EIS or waste application does not describe how the bottom ash will be transferred/loaded onto the trucks however DCC (Mr Norgaard) outlined at the hearing that an overhead crane is proposed.

The BREF on Emission from Storage outlines that BAT is to 'make transport distances as short as possible and to apply, where possible, continuous transport modes' such as conveyors, the use of closed containment is also discussed in the BREF on Incineration. The feasibility of the transport of bottom ash by closed conveyor systems to the trucks and/or to the port area should be considered.

The BREF document on waste incineration outlines that fresh bottom ash is not a chemically inert material and generally requires, in addition to the removal of metals, a period of ageing of 6-20 weeks before it may be utilised in road construction or in some cases disposed to landfill. This duration of storage cannot be provided in the on-site bunker. The ABP planning permission has a condition in relation to off-site storage and DCC will have to ensure that movement of incinerator residues off-site is well managed. Conditions 3 and 8 of the PD deal with the storage, handling and classification of the residues and these conditions should be amended to allow for the issues raised above.

2.1.5 Site selection and suitability

The process outlined in the EIS for the selection of the site was generally considered by third parties to be out of date and not consistent with the protection of the environment or health of the community. Third parties stated that since the site selection process commenced the Dublin City Development Plan and other plans have put forward development for the area that is inconsistent with an incinerator (Documents 31, 51 & 58). These plans include a Section 25 order which was published in 'Iris Oifigiúil' on 22nd June 2007 (SI 297 of 2007) which allows the Dublin Dockland Development Authority to prepare plans for the Poolbeg Peninsula area including the Irish Glass Bottle (IGB) site which lies approximately 0.5km to the west of the proposed site for the facility. The draft plans for this area included high rise residential and commercial units. The site selection process used by DCC is outlined in the EIS and was elaborated on in additional information submitted with the application.

Comment

The site selection process appears to have been completed in 1999 and at that time took into account the environmental sensitivities of this and alternative sites. A review of the process in the context of EC and WHO guidance was carried out in 2006 and further assessments of the selected site were undertaken as part of the EIS and waste licence application. It appears that the air quality data collected during the baseline monitoring programme up to 2005 which highlighted a problem with PM₁₀ in the locality was not considered during the initial site selection process however it has been considered during the EIS and waste licence application process. Planning permission has been granted for the site and as outlined in the report of the ABP Inspector (Document 21) it took account of the various zonings and development plans for the area.

The assessment in the EIS (Chapter 8) provides details of air dispersion modelling carried out to assess the impact of the likely emissions from the stack. It shows that the areas of maximum impact from the emissions are to the east and the north west of the proposed facility and would not be significant in terms of human health or the environment. The area for development would be largely to the west and north. In relation to the northwest of the site the modelling indicates elevated ground level concentrations for some parameters whilst not exceeding any air quality standard (AQS).

It is considered reasonable that the applicant should assess the impact of emissions on existing or likely to exist buildings (planning permission granted) at the time of an application. Elevated receptors should be considered as the greatest impact will occur at heights similar to the stack height and these structures are significant with respect to hourly AQS for nitrogen dioxide and sulphur dioxide. In the documentation received by the Agency (on the 11/05/07) the applicant states that the impact of the incinerator on proposed apartments on the South Bank road at ground level and roof height was modelled and the concentrations were below the relevant AQS.

Currently there is no planning permission granted for new high rise residential buildings in the immediate area. Planning applications for high rise developments, particularly residential buildings, in the vicinity of facilities or installations with tall stacks and significant emissions to air should include an assessment of the air quality at various levels of the proposed buildings.

2.2 POTENTIAL IMPACTS

Concerns were raised by third parties over the lack of baseline information on the health of the communities adjacent to the proposed site and anecdotal evidence was given of a high incidence of cancer related deaths in the Ringsend area. Presentations were provided by Dr Staines, Dr Howard and Dr Montanari on behalf of the third party objectors. Dr Staines discussed the issue of baseline health surveys and health impact assessment and Dr Howard outlined the risks associated with exposure to increased levels of dioxins and related compounds and particulates (PM₁₀, PM_{2.5} and ultrafines). Mr Salino, Dr Montanari and others also provided evidence of the impact of the pollutants on health and provided references to studies and projects that are currently funded by the EC. Labour contends that the EIS refers to their being no formal methodology for assessing the extent and degree of impact of some aspects of the environment and that this should be required prior to issue of a licence. In addition it is contended that there are unresolved concerns in relation to health impacts as outlined in the Health Research Board (HRB) report that are not addressed by the Agency.

The impact of the discharge of cooling water on the flora and fauna of the Liffey Estuary was raised by many third parties and responded to by various DCC presentations.

2.2.1 Health Impact of Emissions

2.2.1.1 Dioxins and Furans (PCDD/F)

Concern was expressed in relation to the proposed and possible accidental emissions of dioxins and furans from the facility and their effect on human and animal health. Mr Salino submitted various papers as submissions and objections which dealt with health effects of dioxins and emissions from incinerators. Dr Howard outlined in his presentation the chemistry and the development of knowledge on dioxins and furans and outlined the effect of dioxins where it can interfere with the levels of enzymes, hormones and hormone receptors and growth and differentiation factors and the medical conditions that may be attributed to exposure to and intake of dioxins. Third party objectors stated that in their opinion there was no safe level of dioxins. Several papers were referenced many of which were reviewed by the authors of the HRB report. Dr Howard also stated that there is a risk of brominated dioxin formation within the process due to the presence of brominated flame retardants.

DCC (Dr Porter and Dr Callaghan) outlined that background levels of dioxins were determined by monitoring of air and soils in the vicinity of the site. A maximum emission of 0.1ng I-TEQ/m³ was modelled using AERMOD to determine the maximum ground level concentration and its location and the EIS (Attachment 8-table 8.32) reports that the annual average process contribution to the ground level concentrations of dioxins would be 2.3 fg I-TEQ/m³ which was a 4% contribution to the background. The background level of dioxin in the air, in the EIS, was taken as the mean of the 4-week means of measured values during 2003-2005 (56.2fg I-TEQ/m³) but subsequent monitoring in 2006 reduced this mean to 42.5 – 44fg/m³. Further monitoring referenced in the oral hearing indicated that levels have reduced to 20 –21fg/m³ in the 2007 period.

Further modelling was undertaken using the background and modelled data to determine the maximum dioxin intake levels which could be expected for a person living locally and eating vegetables grown in the vicinity (maximum at risk individual-MARI) and also the typical at risk individual (TARI) on the basis that they sourced their food outside the area. The results of the assessments under maximum operating conditions predicted that the dose for the MARI and TARI from the operation of the plant would be 12.3 and 3.05pg WHO TEQ/kg body wt./week for an adult respectively however in the absence of the plant based on the background concentrations it was predicted to be 11.7 and 3.02pg WHO TEQ/kg body wt/week and it was determined to be below the WHO Tolerable Daily Intake (TDI) of 1-4pg WHO TEQ/kg body weight/day and the EC objective to reduce the Tolerable Weekly Intake (TWI) to 14pg WHO TEQ/kg body weight/week.

Comment

Dioxins and furans are a family of chemically related compounds present in the ambient environment due to natural and industrial combustion related activities. There are 75 possible chlorinated dioxins and 135 possible chlorinated furans. The most toxic is 2,3,7,8-TCDD and is classified, since 1997, by the International Agency on Cancer Research (IARC), as a human carcinogen.

The WHO TDI was derived from NOAEL (no observable adverse effect level) and LOAEL (lowest observable adverse effect level) values from numerous studies with a safety factor of 10 added. A TDI is defined as ‘an estimate of the intake of a substance over a lifetime that is considered to be without appreciable health risk’ and is therefore a long term average. The EC have also assumed that there is a ‘no

effect' threshold and have set weekly tolerable intake levels whilst recognising that in areas of Europe this is being exceeded.

Because the toxicity of dioxins varies, standards are expressed as toxic equivalents (TEQ). The WHO and EC intake guidelines (TEQ_{DFFWHO98}) use different toxic equivalence factors (TEF) to those contained in the Incineration of Waste Directive (2000/76/EC) (the NATO/CCMS I-TEQ_{DF}) as was outlined by DCC (Dr Callaghan) therefore care must be exercised in making comparison. In 2005, WHO published new TEF values but these have not been used in this assessment or in the proposed revision of the WID in the proposed Industrial Emissions Directive.

The emission limit value of 0.1ng I-TEQ/m³ in the Incineration of Waste Directive (WID)(2000/76/EC) was set by the EC with the Precautionary Principle in mind and in order that reliable measurements could be made. However, the Directive also requires that the exhaust gases are discharged 'by means of a stack the height of which is calculated in such a way as to safeguard human health and the environment'. Therefore this means that licensing to that level does not guarantee a safe level of emissions and the licence must also be based on the results of atmospheric dispersion modelling, deposition and uptake studies and subsequent comparison with the relevant air quality standards and tolerable intake levels.

Background levels of dioxins

The background dioxin levels in air measured at this location fluctuated considerably but the maximum values are considered high in comparison with other areas in Ireland. The maximum values occurred in February/March 2004 and were consistently high with the 4-week average given as 178.4fg/m³ (min-max of 75.3 - 304.6 fg/m³) in the EIS Volume 2 - Table 8.6. Details of the sampling regime were not included and no explanation for the high levels were proffered other than that a similar variation was detailed in literature at a site in Germany in the 1990's. It should be noted that 2004 weather data was used by the Applicant as this was considered the Worst Case year for ambient NO₂.

Further monitoring in 2006 found maximum levels of dioxins in the ambient air of 48.8fg/m³ with a further reduction to an average of 21fg/m³ in 2007. An average dioxin level over the monitoring campaign of 2003-2006 data was given as 42.5 - 44.0 fg/m³. This mean value was then compared with measured values at other locations in Ireland and elsewhere and stated to be comparable. There was no dioxin monitoring in the February/March period for other years.

In the AERMOD and the MARI/TARI assessment of the impact of dioxins a value of 56.2fg/m³ was used as background ambient concentration which was a mean of the 4-week means of the 2003-2005 monitoring. Although the use of the maximum value is generally accepted as best practice for this type of assessment it is accepted that if the Feb/March 2004 values were an anomaly then the 56.2fg/m³ value used was an appropriate value. The impact of dioxins are generally assessed in terms of their annual impact and the use of an annual average is realistic. However, in general for the purposes of impact assessment the worst case individual levels have been used for waste licence applications.

Although the results of air dispersion modelling using CALPUFF were presented at the oral hearing by Mr Scire and Dr Porter the inputs and background used were not detailed in the submission and the process contribution of 6% quoted in the report was not verified. However if the 2007 background levels are taken as indicative of falling dioxin levels then the process contribution could be quoted as 11.5% rather than the value of 4% outlined in the application documents.

Soil background concentrations

Soil samples from 5 locations in the vicinity of the proposed site were analysed for dioxins. The highest level recorded was 23ng/kg NATO CCMS I-TEQ at Sandymount Promenade and the next highest was 10ng/kg NATO CCMS I-TEQ at Sean Moore Park. DCC decided to use the Sean Moore Park figure, which equates to 9.5ng/kg WHO TEQ, as it was close to the point of maximum impact, according to the dispersion modelling, and was not close to traffic emissions, which may have contributed to the high background level.

The concept of MARI/TARI and the use of the US EPA methodology, the UK methodology for the selection of MARI and the RISC Human modelling tool as used by DCC is accepted as a valid method for the estimation of the intake levels.

It is acknowledged that the majority of dioxin intake is through the food chain and that up to 80% of this is from meat, milk and fish. The dioxin levels in food, soil and air in Ireland are low when compared with average EU levels and thus when the food is sourced outside the immediate area of the proposed facility (TARI) the predicted dioxin/furan dose with the operation of the facility is ~3.05pg/kg body weight/week which is well below the EU recommended level of 14pg/kg body weight/week. The contribution of the facility is calculated as 0.00819pg/kg body weight/week for the

TARI with the contribution from food sourced outside the area being 2.45pg/kg body weight/week.

If vegetables are sourced within the area the values are significantly higher with the MARI predicted PCDD/F dose at 12.3 pg/kg body weight/week. As noted previously these predictions are not based on the maximum background levels of dioxins measured in air or soil. However it is accepted that in this particular area it is unlikely that an individual would live in the manner of the MARI and the concept of the TARI is more indicative of the 'typical' individual living in the area.

Reviews of research studies (including the recent papers submitted to the oral hearing) which looked at the possible effects of proximity to incineration plants on public health have not establish a conclusive link. In particular it is noted that many of the studies (where incineration plant emissions are referenced) related to facilities which operated outside the emission standards required by the WID. Short term emissions of relatively high concentrations of dioxins as could occur in the accident or incident scenarios outlined by the applicant would not result in significant long term effects.

It is considered that assessment indicates that the facility would not result in a significant impact on human health or the environment from emissions of dioxins and furans.

2.2.1.2 Total dust -PM₁₀, PM_{2.5} and ultrafine particulates

Third party objectors expressed concern in relation to the current ambient levels of particulates as a result of existing facilities and traffic and the impact of any further increase in those levels. The report of the ABP Inspector was referred to extensively. Mr McCarthy questioned the number and extent of PM₁₀ exceedances (24-hour averaging period), the manner in which data was presented, the validity of using the NETCEN calculator and the empirical formula to predict background air quality in 2012. Mr Salino, Dr Montanari and Dr Howard outlined the risks to health associated with ultrafine particulate. DCC (Dr Porter) provided evidence related to the modelling of the emissions, the cumulative impact from the existing facilities and the predicted background level and considered that levels would not exceed the ambient air standards with the facility operational from 2012 onwards.

Comment

Background levels

The World Health Organisation (WHO) issued an Air Quality Guidelines for Europe - update in 2005 which followed a comprehensive review of the health effects of particulate matter (PM) and other pollutants. The authors of many of the publications referenced by Dr Howard were either directly involved in this review or their studies were referenced. The WHO concluded that airborne PM causes adverse health effects and that there is no evidence of a threshold below which there is no adverse effect.

The AQS specified in S.I. No. 271 of 2002 have PM_{10} limits for the protection of human health in accordance with Directive 1999/30/EC and as outlined in Table 1.1.

Table 1.1 Air Quality Standards

Averaging period	Stage 1 (2005)	Stage 2 (2010)
24 hour limit value	$50\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a calendar year	$50\mu\text{g}/\text{m}^3$ not to be exceeded more than 7 times a calendar year
Annual limit value (calendar year)	$40\mu\text{g}/\text{m}^3$	$20\mu\text{g}/\text{m}^3$

The Stage 1, 24 hour limit is a 90th %ile value and came into effect on 01 January 2005 however the Stage 2 limits are assessment criteria until 2010. The CAFE Directive (2008/50/EC) replaces the 1999 Directive and, whilst retaining the Stage 1 limits, removed the Stage 2 limits however this is not transposed into Irish legislation.

The monitoring data presented at the hearing by DCC was analysed and it represented a maximum of 50% data capture for any one calendar year. For the period 2003 to 2007 the annual average ranged from $31\mu\text{g}/\text{m}^3$ to $33.5\mu\text{g}/\text{m}^3$ for the calendar year. No significant downward trend was noted in the annual average for the period 2003 to 2007. The 90th %ile for the dataset for each year was also extracted and for each year the 90th %ile was above $50\mu\text{g}/\text{m}^3$. These results are consistent with the findings reported in the EIS.

The reported PM_{10} data is significantly higher than that recorded for other areas of Dublin City which all comply with the quality standards. The EPA Air Quality in Ireland report, 2006 reports an annual average of $21\mu\text{g}/\text{m}^3$ PM_{10} and 17 exceedances of the 24-hour limit for Coleraine St., Dublin (the worst-case location). No information

was provided on the likely reasons for the localised higher background values in Poolbeg. (It is noted from EPA air quality monitoring reports (1998-2003) that where the annual average PM_{10} readings are approximately 30 or more, then greater than 35 exceedances of the $50\mu\text{g}/\text{m}^3$ is likely to occur.)

Prediction for 2012

The applicant used tools such as the UK NETCEN emission factor tool and the empirical formula to predict a decrease in background PM_{10} levels by 2012 that would be in compliance with Stage 1 limit values (annual average of $28.9\mu\text{g}/\text{m}^3$ and 24 exceedances of the 24-hour limit value).

In the UK local authorities have statutory duties for local air quality management and are required to carry out regular air quality reviews (present) and assessments (likely future) against standards and objectives. The NETCEN emission factor tool and the empirical formula are tools used in this process. In relation to environmental permitting, the UK Environment Agency does not mention the use of these tools when assessing projects¹. The tools have been developed in the context of the UK having achieved a 42% reduction in PM_{10} between 1990 and 2001 as reported in the WHO 2005 update. For the same period Ireland is reported to have achieved a 1% reduction in PM_{10} . The only downward trend reported by the EPA in the Air Quality in Ireland report, 2006 was for Winetavern St., Dublin and this trend was attributed to changes in traffic patterns. Further, there is no air quality management plan for the Poolbeg peninsula that would support a downward trend hypothesis.

The use of the tools has not been justified in these circumstances and consequently the predicted future PM_{10} levels are not regarded as robust. Based on the applicants data the current air quality in the vicinity of the proposed plant would indicate that AQS are not been observed for the 24-hour PM_{10} limit value. It is considered that the applicant should demonstrate, prior to the commencement of the incineration of waste, that the PM_{10} levels in the vicinity of the proposed facility are such as to ensure that the process contribution will not result in a breach the AQS from that time.

$PM_{2.5}$ and nanoparticles

The WHO have set a guideline levels for $PM_{2.5}$ of $10\mu\text{g}/\text{m}^3$ (annual average) and $25\mu\text{g}/\text{m}^3$ (99th percentile 24-hour mean level) but make no recommendation for ultrafine

¹ H1 Environmental Risk Assessment Part2, 2008 and Guidance for the Incineration of Waste and Fuel manufactured from or including waste, 2004.

(<0.1µm) particles, measured as number concentration, as the existing evidence is insufficient.

The WHO reports background levels for Western Europe at 3-5µg/m³ of PM_{2.5} and provided health effects information to the European Commission in support of the CAFE process which gave rise to the new Directive (2008/50/EC) and which specifies a target value and limit value of 25µg/m³ PM_{2.5} annual average. These values aim to avoid, prevent or reduce harmful effects on human health and/or the environment.

The mass concentration guidelines/ limits proposed by the WHO and the EU will capture predominantly the PM between 0.1 and 2.5µm in diameter. Ultrafine particles are characterised by large particle number and negligible mass. Epidemiologically studies of the effects of ultrafine particles continues but at this time the WHO have not made a recommendation. It is likely that a future recommendation would be a guideline based on number concentration (number of particles per cm³).

The proposed facility is a source of primary particulate matter and secondary aerosol precursors (NO_x, SO₂, SO₃, NH₃, VOC, etc.) which also contribute to ambient PM_{2.5} away from the stack as a result of chemical reactions. The formation of secondary particulate matter (e.g. ammonium sulphates, ammonium nitrates, organic compounds) can take from hours to days and air mass can travel long distances in that time. The UK DEFRA Air Quality Expert Group Report on Particulate Matter in the United Kingdom, 2005 states that there is little evidence of health effects from the secondary inorganic particulates but plausible mechanisms exist to link the organic components of PM₁₀ with both acute and chronic adverse health effects. The PM_{2.5} assessment of the proposed plant is based on the in-stack particulate and emissions contributing to secondary particulate matter are not included in the emission limit for dust or the assessment of impact.

Particulate matter (primary and secondary) emanating from traffic exhaust and combustion processes such as the proposed facility is primarily fine particles (PM_{2.5}). The applicant measured PM_{2.5} at the IGB site (M1) for 60 days and reported a level of 11µg/m³. The standard deviation of the PM_{2.5}/PM₁₀ ratios (derived from the monitoring data) is approximately 60%, giving poor confidence in the data gathered. The EPA Air Quality in Ireland report 2006, reported PM_{2.5} levels of 9µg/m³ as an annual average for a Cork location which equated to 56% of the PM₁₀ annual average (16µg/m³). The EU CAFE working group reported that PM_{2.5}/PM₁₀ ratios

were in the order of 0.65. Based on current PM_{10} levels, the $PM_{2.5}$ fraction in the vicinity of the site could be as high as $20\mu\text{g}/\text{m}^3$.

Overall the proposed development is significant in the context of the $PM_{2.5}$ AQS. The resultant increase in traffic from waste delivery is the significant contributor to the impact of $PM_{2.5}$ levels whereas process emissions are 0.9% of the limit value. However, even under worst case scenario, the assessment indicates that the target/limit value shall be observed.

Although there is no justification for requiring a second bag filter for flue gas treatment at the facility DCC did outline that a leak detection system for the bag filters would be considered and these are proposed to be added to Schedule C.1.1. In addition the feasibility of methods/techniques for the determination of the number and size distribution of ultrafine particles in the stack emissions is proposed to be investigated as it will lead to a better understanding of the nature of the emissions and provide data in the event of any proposed WHO guideline or standard being considered. DCC provided a paper (Document 22) on this type of analysis of emissions from incinerators to the oral hearing but it is unclear whether robust techniques/methods exist for in-stack measurement.

2.2.1.3 Nitrogen Oxides

Third Parties expressed concern regarding the background levels of NO_x and NO_2 and the validity of the data provided by the applicant.

Comment

Nitrogen oxides (NO_x) include nitric oxide (NO) and nitrogen dioxide (NO_2), and are produced by combustion processes such as power plants, incineration plants and motor vehicles. NO_x contributes to the formation of acid rain and is also a recognised ozone precursor. The health effects of short-term exposure to NO_2 are reduced lung function and airway responsiveness, and increased reactivity to natural allergens whilst long-term exposure is associated with increased risk of respiratory infection particularly in children.

Directive 1999/30/EC (transposed into Irish legislation by S.I. 271 of 2002) set ambient levels for NO_2 and NO_x for the protection of human health and vegetation and these have been retained in the CAFE directive (Directive 2008/50/EC). Monitoring at locations around Ireland has been in place for approximately 20 years and this data is reported annually by the EPA who have stated that 'although NO_x

emissions from individual vehicles continue to fall as a result of technological advances and cleaner fuel, improvements to date have been largely offset by the significant increase in the number of vehicles on the road. The achievement of the NO₂ standards in urban areas will therefore depend largely on the effectiveness of traffic management measures and on the degree to which further growth in road traffic can be curtailed in cities.'

The Department of Environment, Update and Revision of the National Programme for Ireland under Article 6(3) of Directive 2001/81/EC for the progressive reduction of national emissions of transboundary pollutants by 2010, 2007 predicts non-compliance with the NO_x ceiling for 2010.

Background levels

The EPA Air Quality for Ireland report 2006 states that the annual average NO₂ levels in urban areas of Dublin ranged from 22 to 35µg/m³ in 2006 and the NO₂ values for monitoring point on the IGB site (M1) are consistent with these results. There was no reported exceedance of the hourly AQS. Dublin as a whole is regarded to be above the upper assessment threshold for nitrogen dioxide.

The applicant is only concerned with air quality in the year of opening, 2012 and predicts levels will continue to decrease as a result of EU legislation which has focused on reducing emissions from vehicles and large combustion plants. The applicant used the UK emission factors to predict NO₂ levels in 2012. The annual average was predicted to be 27.6µg/m³ in 2012 in the EIS and was updated to 23.2µg/m³ in the brief of evidence for the hearing.

There is no requirement for the combustion plants in the vicinity to reduce their emissions prior to 2012 and given the difficulties in reaching national reduction targets and that no downward trend is noted from national monitoring data as reported by the EPA, it is considered inappropriate to predict a reduced NO₂ level for 2012. Therefore the background annual nitrogen dioxide levels are taken as recorded and reported in the EIS (approximately 30µg/m³).

The applicant used the UK recommendation of doubling the predicted annual average value to get the short-term background. The continuous NO₂ monitoring data supplied by the applicant was analysed to obtain the 99.8th %ile value. The average 99.8th %ile for the entire period 2003 to 2007 was 102µg/m³ which exceeds the double of the annual average but is similar to the value reported in the EIS. It is considered that the use of 99.8th %ile 1-hour value as background would represent the worst case scenario even though there will be spatial and temporal differences in the occurrence of the 99.8th %ile value for background and process contribution.

The average NO_x levels reported for the protected areas is approximately 30µg/m³ for the entire period, which is the limit value for the protection of vegetation. However none of these monitoring locations meet the sampling point criteria for vegetation as set out in the Air Quality Standards Regulations 2002.

It should be noted that the Sean Moore and Irishtown Parks are public spaces and are not listed as protected areas. The South Dublin Bay SAC (site code:000210) is an extensive sand and mudflat habitat. The North Dublin Bay SAC (site code:000206) includes the dune system of the North Bull Island and is also a nature reserve. It is appropriate that the grasses of the dune system are provided protection from nitrogen oxides. The current average annual NO_x levels measured at Bull Island is 20.6µg/m³.

Process contribution

The worst case process contribution of NO₂ to the hourly ambient levels was reported in documentation received on 24/07/07 as 77.6µg/m³ NO₂ based on AERMOD modelling and an input of 400mg/m³ NO₂ emission from both stacks. The table below includes the values as discussed above and those supplied by the applicant from modelling and monitoring.

Table 2.1 Predicted environmental concentrations

Pollutant	NO ₂		NO _x
	µg/m ³		µg/m ³
Averaging period	1-hour	Annual	Annual
Background	102*	29	20.6
Cumulative impact and traffic	5.8	2.9	--
Process emissions	77.6	3.3	3.7
Predicted environmental concentration	185.4	35.2	24.3
Air quality standard	200	40	30

* average 99.8th %ile for period 2003 to 2007

The proposed activity, whilst not causing a breach of the AQS, would be considered significant in relation to nitrogen oxides and nitrogen dioxide.

2.2.1.4 Chromium

Mr Rountree outlined that chromium (VI) was not fully considered in the EIS and in particular the derivatives of chromium trioxide and other chromates produced in the incineration process and their subsequent environmental decomposition. In relation to chromium monitoring he requested regular monitoring and included a test method in his submission (Document 48(A)).

Comment

Based on information provided in the application the predicted environmental concentration of total chromium is 2.2ng/m³ annual average (background 1ng/m³ and process contribution 1.185ng/m³). There is no information on what proportion of total chromium in the emissions comprises of chromium VI. The BREF document states that total chromium levels below 0.2mg/l will provide for the control of chromium VI and the EIS anticipates that chromium levels will be in the order of 0.052mg/m³.

There are no statutory air quality standards for chromium in Ireland. The WHO 'Air Quality Guidelines for Europe, 2nd edition' state that at an air concentration of chromium(VI) of 1 µg/m³, the lifetime risk is estimated to be 4 × 10⁻² but it does not give any further guideline levels. A recent UK consultation document on 'Guidelines for metals and metalloids in ambient air for the protection of human health, May 2008' recommends 0.2ng/m³ for Cr(VI) as annual average.

It is considered appropriate that the licence should assess the feasibility of monitoring for chromium VI in the emissions so that the relationship with total chromium can be established.

2.2.1.5 Shoreline Fumigation

The use of SCREEN 3 and CALPUFF to model the impact of adverse weather conditions such as shoreline fumigation were discussed and DCC (Mr Scire) provided information on the assessment using the CALPUFF model. Third parties were concerned that the assessment of the emissions from the facility under adverse meteorological conditions indicated that AQS would be breached and referred extensively to the ABP inspectors report.

Mr McCarthy queried the reference in the report of the ABP inspector that there was a predicted exceedance of the cadmium annual average limit value. Dr. Porter stated that the predicted cadmium levels were based on a high frequency of shoreline fumigation, using SCREEN 3 and assuming abnormal operation for 60 hours per year for all pollutants with very high background levels. He considered that the

SCREEN 3 modelling results was now redundant as the CALPUFF model assessment was undertaken.

Comment

Meteorological conditions leading to shoreline fumigation are predicted to occur at a worst case of 6.25% of the year (frequency of east winds). There is no information available as to the frequency, duration and occurrence of fumigations events in Dublin. The PM_{10} 24-hour limit value is a 90th %ile and therefore shoreline fumigation episodes can be accommodated within the air quality standard. With regard to PM_{10} it is considered satisfactory that the significance of the impact should be primarily assessed under typical meteorological conditions.

In documents received on 24 July 2007 DCC outlined that under conditions of shoreline fumigation the predicted process contribution is $142\mu\text{g}/\text{m}^3$ NO_2 (1-hour) based on 0.2 conversion factor at the maximum emission rate which can only occur 3% of the time. The occurrence of the 3% emission rate at the same time as a shoreline fumigation is about 0.19% of the year and thus the episodes can be accommodated within the air quality standard

Under conditions of shoreline fumigation, the process contribution to nitrogen oxides levels are likely to occur to the east of the site. Consequently, it is considered that the AQS for nitrogen oxides at Bull Island (north east) will not be exceeded.

The PD includes emission limit values for cadmium and chromium which as a maximum cannot exceed $0.05\text{mg}/\text{m}^3$ Cd or $0.5\text{mg}/\text{m}^3$ Cr based on periodic monitoring. The comment in the ABP report by Dr. Broderick is based on a shoreline fumigation event of 6.25% of the year which, by his own admission, is conservative. The predicted annual average cadmium concentration of $0.01\mu\text{g}/\text{m}^3$ is based on 6.25% of hours being proportioned between maximum and abnormal operations. The predicted concentration based on maximum operation using Dr. Brodericks formula results in an annual average concentration of $0.006\mu\text{g}/\text{m}^3$. Given the conservative basis of the calculation and ground level concentration during shoreline fumigation being to the east of where the annual average is predicted to influence, the likely predicted environmental concentration will be lower.

2.2.2 Impact of Cooling System

2.2.2.1 Thermal impact

Mr Bryan, Ms Kelly, Ms Cavendish, Mr Price (S&M RA) and other objectors raised concern in relation to the impact of the cooling water discharge from the proposed facility on the flora and fauna of the Liffey Estuary and in particular the passage of migrating species such as salmon.

The Eastern Regional Fisheries Board in its submission (dated 28/08/06) also outlined, among other things, the importance of the River Liffey catchment for salmonid fisheries and the need to monitor water, sediment and biota as a result of biocide use, thermal impact and entrainment mortality. Synergen objected to the PD as they are concerned about the impact that the thermal plume would have on its intake water and thus the efficiency of their installation. They are also concerned about the effects on the quality of the intake water during construction of the cooling water channel. Neither parties made presentations to the oral hearing.

DCC (Mr Vested & Dr Rasmussen -Document 18) dealt with the thermal plume and the biocide. Validation of the model was undertaken in June 2004 by measurement of the plume and comparison with the simulated values. Mr Vested in his presentation stated that under abnormal conditions the emissions to water would be $6.6 \text{ m}^3/\text{s}$ with a ΔT of 9.5K but under normal operation was $3.9 \text{ m}^3/\text{s}$ and ΔT 9.0K. The PD allows for abnormal conditions for 2% of the hourly values in a year. DCC (Mr Brophy) stated that the thermal plume would not affect the migration of salmon.

Comment

The application proposes that the discharge of cooling water to the River Liffey will occur into the same channel as the Synergen power plant cooling water discharge. It is approximately 380-400m upstream of the ESB Poolbeg intake and outfall and the Ringsend WWTP outfall. The Synergen intake is at mid depth (~ 3m above the seabed) and is approximately 370m upstream of the proposed discharge point. The facility intake is proposed for mid depth at the mouth of the cooling channel for the combined discharge with Synergen.

The study carried out by Mr Vested for the EIS did not take account of the licensed maximum discharge from Synergen or ESB Poolbeg. In documentation received on the 08/05/07 Mr Vested undertook additional simulations with the IPPC licensed

maximum thermal discharges of ESB North Wall and Synergen power plants in combination with the facility and further evidence was given at the oral hearing on these simulations. The maximum licensed flow for ESB Poolbeg was not used with the flow being based on the maximum pump capacity as advised to DCC by the ESB. It would appear that the abnormal cooling water discharge scenario, considered in the EIS, was not considered in these revised simulations.

Chapter 12.1.21 of the EIS states that 'although eels can be found in the upper reaches of the River Liffey, the deoxygenated conditions in the port reach probably at times restrict the passage of the more demanding migratory fish'. With reference to the Salmonid Regulations (SI No. 293 of 1988), this section of the River Liffey is not a designated salmonid area but is recognised by the Fisheries Board as important for salmon, trout and eels. The EPA document on proposed 'Environmental Quality Standards (EQS) for general components in surface water, EPA July 2007', recommends that the mixing zone should not exceed 25% of the cross sectional area at any point for an excess temperature of 1.5°C in all waters and is also based on the standards in the Salmonid Regulations. For rivers the mixing zone is taken to be no more than 50 meters downstream of a thermal discharge but for coastal and transitional waters the mixing zone must not exceed 25% of the cross sectional area at any point. Readings must be taken outside and at the boundary of the mixing zone to establish the rise above the unaffected temperature.

The combined thermal impact area (mixing zone) was estimated to be approximately 25% to 33% of the cross section of the River Liffey at 98% conformance:

- 25% of the cross section of the River Liffey would exceed 1.5°C above the unaffected temperature;*
- 25% of the cross section would exceed 21.5°C, and*
- 33% of the cross section would exceed 10°C (Nov- May).*

It is noted from the document received on 08/05/07 that the impact area for the excess temperature (1.5°C) was defined relative to the existing situation (without the facility) and not unaffected temperature. No explanation was provided for this change. The larger cross section occupied during the winter (area exceeds 10°C) may be a concern but salmonid reproduction will not occur in this area due to saline conditions.

The effect of elevated temperature on the cooling water intake and recirculation was taken into consideration in the impact assessment. The Synergen IPPC licence (Register No. P0486-01) requires that 'No effluent shall be discharged which results in a temperature increase at the edge of the mixing zone of greater than 1.5°C in the receiving system. The mixing zone shall not exceed 25% of the estuarine cross sectional area at any point.' The impact on the Synergen intake temperature was considered when the model was re-run for normal operation only. The maximum excess temperature was 0.76°C. DCC indicates that even with their additional thermal load, the extent of the mixing zone will be 25% of the cross sectional area. Synergen in their objection do not indicate their tolerance range for excess temperature.

The PD does not define the extent of the mixing zone with reference to excess temperature and this should be included in the licence. The PD requires a biannual thermal survey and it is proposed to extend this to include the determination of the extent of the mixing zone. Condition 5.8 should be modified and Schedule C.6.4 inserted to provide for monitoring of the receiving water.

2.2.2.2 Entrainment and biocides

S&MA (Ms Kelly, Ms Cavendish) and Labour (Mr Quinn) referred to the cooling water intake and discharge and the impact on fish and other organisms from entrainment in the intake screens and the use of biocides. The fate of the biocides in the estuary and the uptake of chemicals by shellfish, fish, birds and humans and was raised by a number of third party objectors and reference was made to the submission by the Eastern Regional Fisheries Board.

DCC (Dr Rasmussen) gave a presentation on the details contained in her report in Chapter 12 of the EIS. Several biocides were evaluated in relation to their environmental fate and impact and it appears that chlorine/hypochlorite is the chosen system. The modelling showed that the Predicted Environmental Concentration (PEC) was below the chronic Predicted No Effect Concentration (PNEC) for sodium hypochlorite in the estuary except for the area in close proximity to the outfall.

In the document submitted on 08/05/07 DCC (Mr Brophy/Mr Emblow) advocated 'aquatic ecological monitoring in conjunction with other waterfowl and contaminant monitoring (sediment and water)'.

Comment

The principal legislation governing water quality in Ireland is the European Communities (Water Policy) Regulations 2003 (S.I. 722 of 2003), which transposed the requirements of the Water Framework Directive (WFD) (2000/60/EC) into Irish law. The WFD has set out that a Member State shall implement the necessary measures to prevent deterioration of the status of all bodies of surface water, and shall protect, enhance and restore all bodies of surface water with the aim of achieving good status by 2015. The Liffey Estuary in the vicinity of the cooling water discharge is classified as being of 'intermediate' status.

Chlorine/hypochlorite dosing for industrial cooling water systems is widely used for discharges to seawater and is accepted as BAT in the BREF for Industrial Cooling Systems subject to local environmental considerations. The EIS (Chapter 12.4.37) states that hypochlorite/chlorine is very reactive with organic compounds in the water and although it is not persistent in the environment, it may form halogenated organics (AOX) such as trihalomethanes and halophenols which have the potential for bioaccumulation in biota and sediments. It is stated that 0.05- 5% of the initial amount of free chlorine will be transformed into halogenated organic compounds and halogenated amine. These substances are Priority List substances under the WFD and there does not appear to have been any study carried out of the levels of AOX and THM in the estuary to establish a background although it has been estimated that the levels would be insignificant due to their reactivity.

It is considered that the assessment in the EIS and waste licence application adequately addressed the impact on water quality in the estuary of the emissions of total residual chlorine in the cooling water discharge. The conditions of the PD should be amended to allow for additional monitoring and regulation of the discharge.

The impingement and entrainment of fish and other organisms in the cooling water intake were addressed in the EIS (Chapter 15.5.28) and the planning permission requires monitoring for fish diversity prior to commencement of construction and the design of the discharge point (in consultation with the Eastern Regional Fisheries Board) to prevent impingement and entrainment.

Conditions 6.17 to 6.20 should be amended to alter the monitoring of the impact of the cooling water discharge in line with the concerns above. Monitoring for total residual chlorine in the receiving water is proposed in Schedule C.6.4.

2.2.3 Health Impact Assessment (HIA)

There was a concern amongst the third party objectors regarding a lack of baseline data on health in the locality, the current level of pollutants in the environment in the vicinity of the site and the impact of the emissions on public health. The third party objectors considered that there was a cluster of ill health and cancer related deaths in the area. It was queried if there were comments from the HSE in relation to the development and it was considered that there was insufficient resources in the Irish health system to carry out adequate risk assessments and routine monitoring of the local community. In addition it was considered that a systematic programme of communication of unbiased information on waste management issues was required with the Labour and Green Parties calling for an independent HIA.

It was concluded by third parties that the health impacts of the development had not been adequately assessed in the waste licence application or EIS. There were references to the recommendations of the HRB report on 'Health and environmental effects of landfilling and incineration of waste – a literature review'. Dr Staines and Dr Howard both stated that in their opinion a HIA should be completed as part of an EIS for such a facility and that the information in the EIS was inadequate.

DCC outlined that the EIS contained a literature survey of the health effects of incinerators and a baseline health status assessment for Ringsend, carried out with the assistance of Dr Staines. In addition an assessment of the impact of the emissions of dioxins on a theoretical 'Most At Risk Individual' (MARI) and the theoretical 'Typical At Risk Individual' (TARI) was carried out using risk assessment modelling and this showed that the impact of the emissions from the facility would be negligible however the background concentrations were not insignificant and this is discussed above.

Comment

The EIS in Chapter 13 and Appendices contains an evaluation of the impact that the facility would have on human beings. This included a 'Baseline health status assessment for Ringsend' based on available mortality data (1994-1999), routinely collected prescribing data (2002) and cancer incidence data (1994-2000) analysed at the level of District Electoral Division (DED). The limitations of the study are discussed in detail and relate mainly to a lack of available data in a format that can be relied on to assess the health of a small area. However it concludes that the results are consistent and indicate a poor level of health in the locality particularly in

the Pembroke East A DED which is closest to the proposed facility (Figure 13.1 in the EIS).

The documents submitted by DCC during the waste licence application process included assessments of the impact of the emissions from the facility on ambient air quality and the calculation of a theoretical intake of dioxins, based on soil concentrations, food intake and inhalation values for the MARI and TARI. The results do not indicate that any ambient standard or intake guideline will be breached. The EIS therefore includes an assessment of the impact of the operation of the facility on human health.

The HSE –Dublin/Mid Leinster in a submission to the Agency on the waste licence application identified ‘matters of particular importance with regard to the impact on the health of present and future generations’ but did not request that a HIA be prepared. These matters were addressed in the PD and no objection to the proposed decision was received from the HSE. No submission or objection was received from the Department of Health and Children.

HIA is defined in the Institute of Public Health of Ireland (IPHI) and Dept. Health & Children Guidance (2003) as a combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population. The document goes on to say that HIA overlaps with EIA but that HIA has a broader outlook on health. In the EU, the Amsterdam Treaty makes provision for HIA in policy making and it is at an early stage of development in Ireland. The relationship between the existing statutory decision making instruments (EIA and waste licensing) and HIA as purported at the hearing is not well defined. HIA may be best placed in informing decision makers in favour of health and reducing health inequalities at the scoping stage of national and regional waste management plans. The HRB report makes no specific recommendation that a HIA for individual incineration or landfill projects should be carried out.

The IPHI Guidance outlines that a HIA may be done at three stages of a project; Prospective (developmental stage), Concurrent (during implementation) and Retrospective (after implementation). Given that the timeframe for commencement of the operation of the facility would be at least two years and that there has been a significant amount of baseline data made available in recent years, there is adequate time for a HIA to be carried out by or on behalf of the Department of Health and

Children, the HSE or other relevant body but it is not considered that it is a requirement of an EIS or the waste licence application process.

2.2.4 Impact on SAC, NHA, SPA etc

Mr Bryan, Ms Kelly, Mr Price (S&M RA) and others were concerned that the construction and operational phases of the proposed facility would have a significant impact on the Special Areas of Conservation (North Dublin Bay and South Dublin Bay), Irishtown Nature Park, proposed National Heritage Area (Dolphins, Dublin Docks), Special Protection Area and the migration of atlantic salmon.

There was concern that the short duration of the surveys carried out were insufficient to be considered an adequate baseline for the purposes of the EIS. It was proposed that 12 month survey/monitoring of the Liffey Estuary should be undertaken in consultation with the various bodies including the Fisheries Board, Marine Institute, NPWS and Irish Whale and Dolphin Group to ascertain a proper baseline of the species present and to facilitate a comprehensive impact assessment.

DCC (Ms Mayes & Mr Brophy) outlined the results of the various studies and reports and the proposed measures to mitigate against impact in the areas adjacent to the site and Ms Lyden summarised the cumulative impacts. Mr Twomey outlined that the PPP Co was required to undertake an ecological survey of Irishtown Nature Park at intervals of 3 years following the baseline survey in the EIS.

Comment

It is accepted that the proposed site is located on reclaimed land in Dublin Port with the majority of the land classified as built ground and recolonising bare ground and as such the facility or its construction would have no significant impact on the site.

The EIS in Chapters 14 and 15 contains a baseline assessment of the flora and fauna species and a baseline study of the marine and estuarine ecology within and around the site for the proposed facility.

In relation to terrestrial ecology, site visits were undertaken in late May and mid August 2003 and April 2006 which comprised a systematic walk-over of the site area recording habitats, fauna, birds, plant species and vegetation types present. In addition a specific survey of Irishtown Nature Park was undertaken in August 2004.

A baseline study of the marine and estuarine ecology comprising littoral (13 & 14th August 2003) and sublittoral (14th August 2003) surveys was undertaken. The littoral survey comprised 14 sites in five areas (Irishtown, Tolka estuary, Liffey estuary, Dollymount Strand and Sutton) at low spring tides. The sublittoral survey comprised 13 sites with biological dredge and ecological (van Veen grab) samples collected.

The EIS concluded that the emissions from the facility would have no impact on the Booterstown Marsh or Grand Canal proposed NHA's or on the terns nesting on the Dolphins, Dublin Docks pNHA. The brent geese which feed during winter on the grassland to the southwest of the site may be disturbed during the construction activity but the report concludes that there are other sites they can retreat to. In relation to the requirement of the brent geese for drinking water, the area where they currently get their water is outside the proposed boundary of the site but may be used for construction purposes.

The Dublin City Biodiversity Plan 2008-2012 outlines a series of actions that are to be undertaken to halt the loss of biodiversity in Dublin and identified that a knowledge gap was one of the key issues. In its Strategic Directions section the Plan sets out that knowledge gaps exist for priority species and this is carried through the document in the protection and enhancement measures proposed. It is recommended that the applicant should tie in with the Biodiversity Plan where surveys and studies are required in the licence.

2.2.5 Construction related impacts

Third parties raised the issue of the impact of the construction phase of the project on the water and air quality in the vicinity of the site and were concerned that the oral hearing would not address that phase of the project. Synergen was particularly concerned about the impact on their intake cooling water as there may be an increase in suspended solids in the water and the intake air for their process may be compromised by increased levels of dust.

Comment

The planning process deals with impacts related to the construction phase and this was outlined to ABP in the letter of 27th September 2006 from the Agency. The decision of ABP contains conditions which relate to the minimisation of construction related impacts including consultations with relevant authorities such as the Regional Fisheries Board. Article 41 of the WMA 1996-2008 specifies the type of conditions which are attached to a waste licence and allows for conditions which are directly related to the operation of the facility such as specifying the standard that the plant or storage facilities must be constructed to in order to provide protection for the environment during operation of the activity.

It was repeated on several occasions by DCC that the design of the facility was not finalised. In light of this and the proposal to supply heat to the Dublin DH scheme

which could reduce the cooling needs of the facility, a BAT reassessment of the choice of cooling system prior to the commencement of construction is proposed in the licence. This will allow for a further assessment of the use of an air cooled system which could possibly be catered for within the proposed licence.

2.3 LICENCE ENFORCEMENT

The third party written objections and presentations at the oral hearing expressed distrust and a lack of confidence in the ability of DCC, as the licensee, to control the operations of the PPP Co and to ensure that the licence conditions are enforced. In addition they were concerned at the frequency and type of monitoring required to be carried out by the licensee in the PD. Several references were made to problems associated with the regulation of the existing operations in the locality by DCC and the inaction of DCC and the EPA when pollution incidents were reported to them by third parties. It was outlined that the HSE and the Department of Health did not have the ability or resources to identify and cater for any health problems associated with the operation of the proposed facility.

It was considered that a licence should not be granted until independent enforcement mechanisms are available.

2.3.1 Management of the Facility/Operator and Licensee responsibility

The third parties were unhappy with the explanations given of the responsibilities of the PPP Co and the licensee regarding the design, construction and operation of the facility. The initial project team of Elsam has been substantially changed and now Covanta are the main project partner. Clarification was sought on the understanding of the applicant regarding the division of responsibility for the requirements of the waste licence between the applicant (DCC) and the PPP Co. Mr Bryan in his objection and submissions considers that Condition 2 is flawed as it sets out ideal conditions for the management of the facility which because of capacity, operational and economic restraints would encourage the operators to minimise, conceal and even ignore excursions from correct operating practice. He considers that this would be exacerbated by the split responsibilities of DCC and PPP Co.

The competence of DCC to operate or control the plant was questioned by third parties and the experience of the community with the apparent lack of action in dealing with odours from the WWTP and the lack of communication on the issues was raised repeatedly. It was considered that the PD supposes that DCC are the operator whereas DCC consider that the PPP Co are the operator and this leads to a

confusion of responsibility. Labour Party representatives considered that the PPP Co should be subjected to the Fit and Proper Person scrutiny as outlined in the WMA.

DCC (Mr Twomey and Mr Babor) outlined that the Project Agreement set out the responsibilities between DCC and the PPP Co and it was in line with Department of Finance Guidelines for structuring Public Private Partnerships to ensure their technical and financial success.

Document 54 outlined the relationship between the licensee and the PPP Co. DCC consider that they fulfil the definition of 'operator' as it 'controls' the plant and they consider that they will delegate the operation of the facility to its partner, the PPP Co under the Project Agreement of the public private partnership arrangement. Details of the project agreement are contained in Appendix 1 of their submission on third party objections and Mr. Twomey's brief of evidence (Document 1). The project agreement makes provision for communications between the applicant and its partner, delegates the responsibility for operating the plant to its partner and sets performance criteria to which failures will result in payment reductions. The facility manager would be an employee of the PPP Co, and had responsibility for the operation of the facility including compliance with the waste licence, submission of reports to DCC as required by the Project Agreement for on-ward distribution to the Agency. The decision to shut-down any part of the plant would be taken by the facility manager.

The project agreement also has step in rights, suspension and termination clauses for breaches of obligations. During the hearing Mr Twomey advised that a DCC representative would be on-site, a management committee with representatives of the company and applicant would be formed and he also commented that the Community Liaison arrangement would be made aware of the incidents which the PPP Co were required to make DCC aware of within 5 working days of it occurring.

Third parties had queries regarding documents which appear to indicate that the contract with DCC is on a Tip Fee basis which from Document 51(a) appears to mean that the Local Authority agrees to pay a per tonne fee for processing the waste with an agreement to deliver a minimum quantity of waste, the PPP Co retain 100% of the energy revenues and can source and receive the revenue for the additional waste which they can incinerate.

Comment

The WID requires that ‘the management of the plant shall be in the hands of a natural person who is competent to manage the plant’ and also defines the ‘operator’ as the person that operates or controls the plant or, where it is provided in national legislation, ‘to whom decisive economic power over the technical functioning of the plant has been delegated’.

Public private partnership arrangements have a statutory basis in Ireland² and are recognised as common in the BREF document on Incineration. The local authority function is performed by its partner (PPP Co) subject to the general superintendence and control of the State authority concerned. Project agreements have performance criteria normally linked to the payment mechanism.

It appears that DCC will delegate the ‘day to day’ running of the plant to the PPP Co and DCC ‘controls’ the operation of the facility through the Project Agreement where the PPP Co warrants that it will operate the plant in accordance with the waste licence amongst other things. It can be considered that DCC meet the criteria set out in WID to be a licence holder/operator.

This arrangement is relatively new to environmental licensing and careful consideration of the enforcement of licences in this context must be made. In practical terms, the licensee needs to be in a position to provide for Agency access to the facility, a responsible person in charge, and accurate and certified records and reports.

Regardless of the project agreement or the waste licence the EPA Act and Waste Management Act provides powers to authorised persons to have access to the facility at all reasonable times. The PD requires the licensee to employ a facility manager who is experienced and designated as the ‘person in charge’. Under the WMA 1996-2008 the ‘person in charge’ is the ‘holder’ of the waste at the facility and as such has specific responsibilities in the legislation.

The PD requires a management structure which details the responsibilities of the personnel. It is considered that this requirement provides for the delegation of responsibilities for reporting and investigating incidents, keeping of records and submitting these records to the Agency however the Agency can prosecute the licensee and/or any other person deemed responsible for violations of the terms of the licence. The PD should be amended however to ensure that reports submitted to the Agency should be certified as accurate by the facility manager (or deputy).

² STATE AUTHORITIES (PUBLIC PRIVATE PARTNERSHIP ARRANGEMENTS) ACT, 2002

The financial agreement between the PPP Co and the DCC is not a matter for the waste licence.

2.3.2 Monitoring/notification by the applicant

Mr Bryan, Ms Kelly, Mr McCarthy, Ms Corr and others expressed a significant lack of trust in DCC's abilities to operate the facility, to carry out the monitoring proposed and to notify the public/Agency of incidents. The Green Party requested a condition requiring monitoring in the local community with the data available to the residents. They also referred to the papers submitted by the applicant from Zurcher et al. (Documents 21 & 22) and considers that this technology should then be required by the licence.

DCC (Mr Bahor) stated that they would comply with the relevant standards, manufacturers recommendations and EPA requirements, however, the detailed design for the site had not been carried out as yet.

There was concern over the delay between sampling, analysis and reporting of results and the possibility that there could be incidents or significant exceedances of emissions (particularly dioxins) before the applicant (DCC) would be aware and that it could be longer before the Agency and the public were informed as there was no provision for the notification of the affected local residents. There were suggestions by third party objectors that a nominated member of the public would be on-site to watch the monitoring taking place.

Comment

The WMA 1996-2008 specifies that a local authority is considered a 'fit and proper person' for the purposes of carrying out a waste management activity. In addition, DCC outlined that in the tender process for procuring an operator for the facility they applied the requirements of the WMA Act. The PD requires the facility manager and deputy to have extensive experience of the operation of an incinerator and it places specific responsibilities on the facility manager and licensee regarding the operation, monitoring and control of the facility and the notification of incidents.

Condition 6 of the PD outlines the monitoring requirements and standards to be used. It is recognised that there will be more frequent start-up and shut down episodes in the first year of operation and this is the time when dioxin formation is possible and a continuous sampling system is required in Schedule C.1.2 of the PD.

The PD also caters for the provision of on-line information via the internet. An important aspect to enforcement is communication, in particular responding to enforcement actions. This is specified in conditions in the PD however it is considered that the licence should clearly state that the facility manager/deputy is responsible for notifying the Agency in the event of an incident to ensure that prompt action is taken.

2.3.3 Abnormal Events, Breakdown and Emergencies

Third party objectors felt that abnormal events such as plant failure, monitoring equipment failure, hazardous material in municipal waste input, accidents etc were not addressed by DCC. They also feared that since the PPP Co were not the licensee there would be less of an obligation to comply with the licence. Dr Howard and others referred to Document 43(c) which were papers related to the high levels of emission of dioxins during the start-up period of incinerators which is attributed to the 'memory effect'.

DCC stated that abnormal events had been assessed in terms of their projected emissions and impacts and that mitigating measures were to be put in place to minimise their occurrence. In addition they have requested in their objection and at the oral hearing that the WID definition of abnormal events in line with the Directive be included in the licence.

Mr Shipsey in the DCC closing statement stated that in the event that the process lines were shut-down the emissions from the waste bunker area would continue to vent through the 100m stack and in the event that the fans were not operating the waste would be sprayed with odour suppressing solutions and/or covered in lime.

Comment

The waste licence application (Attachment J.1) includes the outline of an Emergency Response Plan but specific abnormal events are not mentioned. The site is classified as coming under the Seveso II Directive (98/82/EC as amended by 2003/105/EC) as implemented by S.I. 74 of 2006 due to the storage of flue gas treatment residues, gas oil and ammonium hydroxide. The Health and Safety Authority (HSA) is the Competent Authority for the Seveso regulations and reports submitted to the HSA were received by the Agency on 05/03/2007. These reports assessed various types of accident scenario (such as failure of the FGT system) and the relevant prevention and mitigation systems proposed. The EIS in Section 8 also presents the results of air dispersion modelling of specific scenarios. The PD requires the preparation of an

Accident Prevention Policy and an Emergency Response Procedure prior to commencement of waste treatment activities on-site.

The WID, sets out what it considers as 'abnormal events' to provide for circumstances when there is a problem with either the FGT system or the continuous monitors and remedial action can be undertaken within 4 hours and thus avoid complete shut-down of the furnace. It is reasonable to provide for such circumstances as it is BAT to minimise planned and unplanned shut-down and start-up operations.

In Article 13, the competent authority can permit the plant to operate where there are exceedances of some emission limit values for up to 4 hours with a cumulative duration of up to 60 hours in a year. Feed to the furnace must be stopped but the auxiliary burners can be used to ensure that the required temperature is maintained to burn out the waste on the grate and in the combustion chamber, the total dust limit must be below $150\text{mg}/\text{m}^3$, there must be no exceedance of CO and TOC and the operating conditions specified in Article 6 (relating to temperature, residence time and bottom ash TOC) must not be exceeded.

The assessment of the impact of emissions to air considered some abnormal situations such as $10\text{ng}/\text{m}^3$ dioxins for 48 hours/annum and $4000\text{mg}/\text{m}^3$ total dust for 4 hours/annum.

Abnormal operations are defined in the PD (Glossary) as set out in WID and Conditions 5.1, 3.18.8 and 3.19 address the issue of abnormal operation and possible exceedance of ELVs however these conditions should be strengthened to specify the hours so that the 'as soon as practicable' is clarified for the purposes of enforcement. The definitions of breakdown should be amended in the Glossary of the PD to ensure that there is no ambiguity with regard to the requirements of the licensee in these events.

The accumulation of dioxins in wet scrubbers with possible breakthrough and release during start-up was outlined in the BREF document for waste incineration and BAT No. 42 is 'where wet scrubbers are used, to carry out an assessment of PCDD/F build up (memory effects) in the scrubber and adopt suitable measures to deal with this build up and prevent scrubber breakthrough releases.' The requirements for monitoring and compliance with emission limit values for dioxins apply during start-up and shut-down and thus even if there are releases of dioxins during that time they will be detected and subject to enforcement.

It is considered BAT to make provision for the control of odour (and other potential fugitive releases) when the incinerator is not available by:

- (a) avoiding waste storage overload, and/or*
- (b) extracting the relevant atmosphere via an alternative odour control system.*

DCC had requested that Condition 9.4.1(b) regarding the storage time for waste in the bunker following shut-down of the facility is increased to 7 days however no alternative odour control systems were proposed or assessed. DCC proposed that in the event that the induced draft fans were not operating odour suppressing sprays and lime would be used. However, the bunker is considered as the firewater retention area and it would not be desirable for the capacity of the bunker to be compromised by large volumes of waste or lime. It is considered that emission through the stack is adequate for the 3 days however in the absence of an alternative odour control system it is not considered appropriate to allow for 7 days storage in the bunker.

2.3.4 Monitoring by the EPA

Concern was expressed in relation to the capabilities of the EPA to adequately monitor the emissions from the plant and it was outlined that existing facilities in the area were, in the opinion of third parties, not being adequately monitored and the response by DCC, the EPA and other bodies was inadequate.

Comment

The EPA is the statutory body charged with licensing, monitoring and enforcement of specified facilities such as that proposed by the applicant. In light of the requirements of the WMA 1996-2008 and the 'polluter pays principal' the resources to carry out such monitoring is partly funded through the fees payable to the Agency by the industries. The fees stipulated in the PD allow for this. The Agency and the Office of Environmental Enforcement (OEE) carry out an extensive programme of monitoring and auditing and should ensure that adequate resources are made available in relation to the requirements of the PD.

2.4 DIRECTIVES, TREATIES AND PRINCIPLES

Third party objectors made reference to the obligations of the EPA in relation to various EC Directives and communications

2.4.1 EIA Directive

Third parties stated that the EIS for this site was inadequate and did not contain the information required to make an adequate assessment of the impacts and cumulative impacts associated with the proposed facility. Mr McCarthy, Mr Bryan and the Green Party made reference to a lack of detailed design specifications for the facility and the amendments to documentation submitted in the EIS throughout the planning and licence application process which did not allow for a detailed critique of the data by third parties. In general it was considered that the submission of additional information in a piecemeal manner was not consistent with the requirements of the EIA regulations.

DCC outlined in various submissions that the impact of emissions and the cumulative impact of the proposed facility were assessed in accordance with the EU Directives and Irish and EC Guidance. They stated that the submission of additional data to the planning and licensing processes was in accordance with the EIA process and was to update data and facilitate an understanding of the impacts of the project.

Comment

In the EPA guidelines referred to above, EIA is defined as “a process for anticipating the effects on the environment caused by a development” and an EIS is “the document produced as a result of that process”. An EIS is therefore a living document that can be amended as new information becomes available through the various stages of the assessment process (including planning and licensing).

The EIS was received with the waste licence application on 10 July 2006. ABP requested additional information to be submitted under Section 175(5)(b) of the Planning & Development Act 2000. This was submitted to the Agency by the applicant on 14 March 2007 and relates mainly to the noise impacts associated with traffic. The applicant submitted to the Agency, on 08 May and 24 July 2007, the Brief’s of Evidence from their experts to the ABP oral hearing and these are also available to the public on the DCC website.

During the oral hearing a considerable number of documents amending and updating the data in the EIS and application, particularly related to the impact assessments were submitted. An update of the EIS Non-Technical Summary was submitted at the

oral hearing (Document 30). It is considered that this made assessment of the new data difficult for third parties in the context of the oral hearing and undermined any confidence or trust they had in DCC and the PPP Co.

However, having assessed the EIS and waste licence application, including all the additional data submitted as part of the EIA and licensing process, it is considered that they adequately deal with the likely significant impacts of the proposed development and that the information supplied in the EIS and amendments complies with the statutory requirements of the EIA and waste licensing process.

2.4.2 Water Framework Directive

S&M RA (Ms Kelly) considered that the requirements of the WF Directive ‘to provide for enhanced protection and improvement of the aquatic environment by reducing/phasing out of discharges, emissions and losses of priority substances.’

Comment

The EPA in July 2007 published a consultation document on the setting of EQS for surfacewaters. There was no specific reference to chlorine however several of the halogenated organic compounds were mentioned with associated EQS levels. The DCC (DHI) modelling indicates that other than immediately adjacent to the discharge these levels would not be exceeded. The Commission proposal (COM (2006) 397) which proposes to set EQS also states that MS must define the ‘transitional areas of exceedance/mixing zones. Although no definition of ‘mixing zone’ was outlined in the EPA document for these parameters the recommended definition for temperature is 25% of the cross sectional area. This was also discussed in section 2.2.2 above and it is considered that the PD with the proposed amendments ensure that the requirements of the WFD can be met.

2.4.3 Precautionary Principle

The Precautionary Principle was raised by several objectors on the grounds that, the design features, input characteristics and emissions are unknown and cannot be assessed, the health impacts have not been fully addressed and as such the EPA should take the precautionary approach and refuse the licence.

Comment

The PD sets out the conditions under which the licensee can operate the facility. In reaching that decision the Agency assessed the information submitted and applied the available standards and guidelines to ensure that the facility will not have a significant impact on the environment or on human health. In line with the

Communication from the EC Commission on the Precautionary Principle -COM (2000)1 the assessment contained (a) an identification of the potentially negative effects, (b) a scientific evaluation of the effects and (c) an evaluation of the level of scientific uncertainty associated with the results.

It is clear that there are some questions that remain unanswered. These include the final design of the facility and whether the predictions of the air quality in 2012 will be achieved. However it is considered that the proposed amendments to the PD will address these issues and that the Agency has taken a precautionary approach to the granting of the licence.

2.4.4 Kyoto Protocol

Third party objectors contended that the carbon dioxide (CO₂) emissions from the proposed facility would contribute to Ireland's production of greenhouse gases and result in fines under the Kyoto Protocol for which the taxpayer would be liable. Mr McCarthy critiqued the calculations of DCC (Dr Porter) who had compared incineration (with energy recovery) with landfill (with and without anaerobic digestion) and concluded that the facility would make a beneficial contribution to Ireland's obligations. There were four versions of the calculation presented by DCC in the EIS/planning and waste application process.

Comment

The Member States of the EU and EC are signatories to the Kyoto Protocol. The Emissions Trading Directive (2003/87/EC) and Irish regulations (S.I. No. 437 of 2004) are being implemented to achieve the targets. Municipal waste incineration is not included in the scheduled activities.

The Intergovernmental Panel on Climate Change (IPCC) sets out detailed guidelines on compiling national inventories of anthropogenic greenhouse gas emissions and removals. DCC used this methodology to calculate the contribution of the incineration facility to the total greenhouse gas emissions in Ireland and compared it with other options such as landfill and landfill with anaerobic digestion.

It is clear that the use of the IPCC methodology is dependent on the characterisation of the waste stream, the gas capture rate and the quantification of the energy exported. These parameters can be varied leading to different conclusions however it would appear that neither of the waste management options would significantly impact on the annual percentage of Irelands total emissions and as such would not be a significant factor in the choice of waste management technique.

The so-called Poolbeg 1,2,3 & 4 models provided by DCC and critiqued by Mr McCarthy indicate that the contribution of DH is significant and should be considered.

2.4.5 Report of the EP Committee on Petitions

Document 5 is a letter from the EP Committee on Petitions submitted by RISEG (Mr Cassidy) which includes an abstract from the report of a site visit to Ireland by a delegation from the Committee on 26/27 June 2007. The report was submitted as part of the objection by Mr Cassidy and was referred to by others including the Sinn Fein and Labour Parties representatives.

In relation to the proposed facility the report gave an outline of the concerns of the local people, the discussions with DCC and the consultants and the visit to the proposed site. It stated that there were unanswered questions related to the suitability of the Poolbeg Peninsula as the site of the incinerator and referred to the 'exiguity of access, the proximity of the housing estates and residential areas, the lack of roads adapted to heavy lorries and the potential for an alternative style of local development designed to improve the quality of life of the local population'. The Committee recommended that 'serious consideration' should be given by, amongst others, the EPA, to the level of compliance with the EC Directives mentioned:

- Waste Incineration – 2000/76/EC
- Integrated Pollution Prevention and Control – 96/61/EC
- EIA Directives – 85/357/EEC and amendments
- Habitats Directive – 92/43/EEC and amendments
- Birds Directive – 79/409/EC

DCC (Mr Shipsey) clarified that the proposed waste input to the facility in the letter was incorrect and should refer to 600,000 tonnes/annum and third parties clarified that the input figures in the letter were based on the EIS.

Comment

The right of petition was created to provide EU citizens and residents with a simple way of contacting the institutions with a request or complaint. Anyone living in an EU Member State can petition the European Parliament and this right is embodied in the EC Treaty in Articles 21 and 194, and in the EU Charter of Fundamental Rights. A petition must relate to a subject falling within the sphere of activity of the European Community and concern the petitioner directly. Petitions are sent to the European Parliament's (EP) Committee on Petitions and if admissible the Committee has options as to how it deal with the issue as outlined.

(i) It may put a question to the Ombudsman or ask the European Commission (EC) for information or its opinion on the matter raised. It sometimes consults other parliamentary committees, especially in cases where a change in the law has been requested. It may also hold hearings or carry out fact-finding missions.

(ii) The petition can be put on the agenda for a committee meeting, to which the EC is invited. At the meeting, the Commission makes an oral statement and comments on its written reply to the issues that have been raised. Within the EC, the Secretary-General is responsible for coordination with the EP and each Directorate General deals with the substance of the complaint by preparing the draft contribution.

(iii) Where there is a special case requiring individual treatment, the EC may contact the appropriate authorities including the permanent representative of the Member State concerned. This often settles the matter. Otherwise, where there is a matter of general importance, for example, if the EC finds that a Community law has been infringed, it can consider the opportunity to ask the Member State concerned to submit its observations and, eventually, it can open the procedure of Article 226 of the Treaty on the European Community.

(iv) Finally, the petitioner will receive a reply setting out the action that has been taken.

It is my understanding that the petition is at Stage (ii) above having been discussed at the committee meeting of 30 January 2007.

In relation to the EP report, the directives which are referred to have been considered in the licensing process, in the oral hearing and elsewhere within this report. The issues related to the location as regards traffic, roads and housing are a matter for the Planning Authority and were dealt with by ABP.

2.5 SPECIFIC LICENCE CONDITIONS

The written objections and submissions to the oral hearing by the applicant and third parties dealt with specific conditions of the PD. For clarity these will be taken in the order in which they appear in the PD.

Glossary

Consignment Note- Mr Bryan & CRAI considers that the definition does not adequately address the EU legislation on the transfrontier shipment of ash residues.

Comment

The definition should be amended to reflect the relevant legislation and definitions for other documents added to cater for recent EU Regulations on the transport of waste.

Inert Waste – Mr Bryan & CRAI considers it unsatisfactory and open to interpretation

Comment

It is proposed to amend the PD such that the reference to 'inert' is removed from the condition other than in the context of the Landfill Directive (1999/31/EC).

Liquid Waste – Mr Bryan & CRAI objects as the transport of liquid waste was not applied for.

Comment

Having regard to section 2.1.2 the import of liquid waste is not considered as an input to this facility for incineration, and the definition should be amended to refer to waste liquids removed from the facility which could include the washings from the silo or other cleaning liquids that are not suitable for input to the waste bunker.

Residual Waste - S&MRA (Ms Kelly) indicates an apparent conflict with the waste codes in Schedule A. Mr Bryan & CRAI states that this conflicts with the applicants intention to mass burn unsorted waste stated in the EIS and to ABP. The Labour Party considers that the definition is unclear as to whether (a) existing processes of household segregation of waste is acceptable and (b) the PD requires the Local Authority to carry out additional processing prior to incineration.

The Applicant considers that a three-bin source segregated collection system is consistent with the requirements in relation to pre-treatment.

Comment

This issue is dealt with above under Section 2.1.2. The proposed changes to Schedule A will ensure that only residual municipal waste can be input to the

incinerator as it does not include separately collected fractions or other specific biodegradable waste fractions (EWC codes 20 01 and 20 02). In addition, the definition of residual waste in the Glossary in combination with Condition 11.11, which requires the Agency to agree with the proposed level of pre-treatment, ensures that the waste input to the facility is in some way pre-treated.

Sludge –Mr Bryan & CRAI states that the definition does not restrict the facility to the burning of municipal sewage sludge. DCC in their revised list of wastes (Document 30) limited the requested sludges to those from the Ringsend WWTP.

Comment

The burning of sludges, municipal and others are dealt with above in sections 2.1.2 and 2.1.3. The definition is not specific to municipal sewage sludge.

Part I – Activities Licensed

Mr Bryan & CRAI objects to the inclusion of Class 12 in the Third Schedule and Classes 3,4,6 and 8 of the Fourth Schedule as these activities are not proposed to be carried out on the site.

DCC outlined that they applied for a wide variety of activities and wastes as they were unclear what specific activities were applicable to this type of facility. They outlined that they would be engaged in the incineration of municipal waste and would not be treating the incoming waste or the residues from the process on-site.

Comment

It is considered that the:

- *Third Schedule*

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

and

- *Fourth Schedule*

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

activities are refused as they have not been demonstrated to be proposed to be carried on at this facility and have not been assessed in terms of their impact on the

emissions or wastes generated. The footprint of the proposed facility appears to preclude the additional infrastructure required to carry out these activities and as such should form the basis of a new application to the Agency should the applicant wish to pursue them.

In addition the blending, mixing and storage of waste other than as an integral part of the incineration process is not proposed and the storage would not be in excess of six months. There is also no space available within the footprint of the site to accommodate it and as such Class 11 should be refused and Class 13 should be omitted from both the Third and Fourth Schedules.

In relation to Fourth Schedule, Class 8 – Oil re-refining and other re-uses of oil – the applicant proposes to operate the burners on a re-useable oil product which would not be a waste activity. The use of waste oils in the incinerator or auxiliary burners has not been assessed in the application and could, depending on the characteristics of the waste oil, be an activity using a hazardous waste which is not allowed in the PD.

In relation to Fourth Schedule, Class 9 the recent proposals in relation to a revised Waste Framework Directive use the concept of energy efficiency to determine if the incineration of municipal waste can be regarded as a recovery operation. A formula, which is discussed above in relation to energy efficiency, outlines that if a plant achieves a certain standard then it can be classified as a Recovery operation. Although DCC were asked if they wished to elaborate on this no further information was supplied other than to indicate that they considered the process to be a waste disposal operation.

In that event it is considered that Class 9 should be removed from Schedule A. If the proposed waste framework directive becomes law the applicant may wish to have the classification reviewed by the Agency particularly as this report proposes that the energy efficiency criteria are met by the facility and they have indicated that this is more than achievable by the proposed plant.

Condition 1

Condition 1.1 – DCC request the addition of a statement to the condition which specifically refers to WID (2000/76/EC)

Comment

The requirements of the WID are included in the licence.

Condition 1.3 – Mr Bryan & CRAI considers that this condition should include legislation under European Directives.

Comment

The licence would be issued in accordance with the obligations of the EPA under the Waste Management Acts 1996 to 2008 however as stated in the condition it does not negate the obligations of the licensee as regards other legislation including European Directives.

Condition 1.5 – Mr Cuffe (Green Party) object to the fact that the condition and Schedule A allows the applicant to apply on a case-by-case basis for additional wastes.

Comment

It is considered that the WID does not allow for this and it is recommended that Note 2 is removed from Schedule A and the condition amended to clarify that it is a waste disposal activity that is being licensed.

Condition 1.7 – Mr Bryan & CRAI requires that a definition of 'hazardous waste' needs to be included.

Comment

Condition 1.6 and Condition 1.7 are providing further clarification to Schedule A which specifies the wastes which can be incinerated at the facility.

Condition 1.8 – Mr Cuffe (Green Party) objects to this condition on the basis that it allows the Agency to alter the licence without public participation.

Comment

The condition ensures that plans and programmes become part of the licence and this ensures that monitoring programmes, test programmes etc which are agreed with the Agency are required to be implemented by the licensee.

Condition 1.9 – Mr Bryan & CRAI objects to the fact that this condition only deals with the operational aspects of the facility and considers that the design and construction should include an adequate mechanism to ensure compliance in the operation of the facility and reference is made to the problems associated with the WWTP due to infrastructure not being provided.

Comment

These issues are dealt with in various sections above and Condition 3 of the PD deals with infrastructural matters.

Condition 1.10(b) – Mr Bryan suggests that the word ‘possible’ is added to the sentence.

Comment

The first part of the sentence requires the licensee to address likely events which can also deal with the issue of ‘possible’ adverse environmental significance.

Condition 2

Condition 2.1.1 – DCC requests that the condition is amended to allow for persons with power plant experience be considered for the post of facility manager. Third parties generally disagreed with this.

Comment

It was indicated by the applicant that the proposed plant was similar in its operation to a solid fuel power plant. This appears to be a significant understatement of the complexity of the facility proposed. It is considered that due to the input of largely unclassified wastes which make up municipal waste and the potential issues around this lack of homogeneity and the hazardous nature of the FGT produced that the facility is more complex than a large combustion plant installation. It is considered that its proper operation would require the facility manager to have an indepth knowledge of the issues and problems associated with the incineration industry and the specific type of equipment proposed.

Condition 2.3.1 to 2.3.8 –Mr Cuffe (Green Party) considers that since the EMS, Waste Recovery Report, records of off-site waste profiling are not specified in the documentation list in Condition 11.2 they are not required to be included in the programme in Condition 2.3.2.8 and also objects to it being drawn up after the licence is granted.

Comment

Condition 11.2(b) requires all reports to be stored and maintained at the facility and all reports submitted to the Agency are available to the public on-site and at the EPA office. Condition 2.3.1 requires that the procedures are put in place before the waste activity is commenced.

Condition 2.3.2.2 – CRAI objects to this condition and considers it does not make sense given that the applicant is required to carry out these functions under waste legislation.

Comment

The requirement to prepare a Schedule of Environmental Objectives and Targets is part of the on-going improvement programmes that the licensee is required to carry out.

Condition 2.3.2.5 – Mr Bryan & CRAI considers that this should be agreed before any testing takes place. S&MRA considers that a conflict of interest could arise due to the PPP nature of the project.

Comment

Condition 2.3.1 requires that the procedures are put in place before the activity is commenced.

Condition 2.3.2.7 – Mr Bryan & CRAI objects to the list of process control parameters being prepared by the licensee given its inexperience.

Comment

The licensee is a local authority and therefore is 'fit and proper' under the WMA 1996-2008. The PD requires an experienced manager/deputy to be the 'person in charge'. The preparation of a programme to ensure there is adequate control of processes is linked to the Test Programme in Condition 3.17 which will require the manufacturers of the plant to be involved in its preparation and Condition 3.17.2(f) deals with the equipment necessary on-site to cater for a breakdown. Condition 2.3.2.7 should be amended to provide the link.

Condition 2.3.2.8 – Mr Bryan & CRAI states that a significant distrust of DCC exists and requests that any programme is monitored and verified by a completely independent body. He also request that part (b) is modified to require the information to be available at all times and that the licence must stipulate what information is to be made available and its frequency of update. Green Party asks that the Agency revise the condition in relation to the provision of real-time data.

Comment

Section 2.3.2 deals with this issue and it is considered that the condition should be amended to broaden the scope of the on-line data that can be provided as outlined is capable by Covanta/DCC. As technology in this area is rapidly evolving it is proposed that prior to the commencement of the activity the scope should be agreed with the Agency.

Condition 3

Condition 3.3.2 – CRAI indicate that the information on the proposed display board would be useful if it could be relied upon but wants effective enforcement of any breach of conditions as they feel that self-regulation is unsatisfactory given their experience of DCC and other enforcement issues.

Comment

The licensee is required to maintain the Facility Notice Board such that it is legible and the information on the Board should be maintained also so that it accurately reflects the data required. The licence will be enforced by the EPA-OEE.

Condition 3.4.2- Mr Bryan & CRAI considers that the CCTV system should include the wharf area as transport and ship loading of waste ash is an integral part of the operation of the facility. The loading of the bottom ash onto ships in the open quay has not been addressed in the application.

Comment

The waste licence applies to the area referred to in Condition 1.2 and this does not include the port area where loading and unloading of residues will take place.

Condition 3.5 – Mr Bryan & CRAI considers that these requirements would require modification to the building layout and thus additional planning permission.

Comment

It was outlined by several experts on behalf of the applicant that the plans for the building included a waste inspection and quarantine area. It is considered that these areas would be suitable for MSW wastes however they would not be suitable for the inspection/storage of several of the other wastes listed in the EWC codes such as 02 02 02 Animal tissue waste, 02 07 03 wastes from chemical treatment, 04 01 05 tanning liquor free of chromium etc. No details were provided by the applicant as to how wastes other than MSW wastes would be dealt with under this condition and it is proposed to amend Schedule A to reflect this.

Condition 3.5.3 – Mr Bryan & CRAI objects to this condition as there is no certainty that the drainage would be suitable as process water.

DCC requests that the condition is amended to allow for drainage to the waste bunker in the event that the water quality was unsuitable for re-use as process water.

Comment

It is agreed that the condition should be amended to allow for the waste water to be input to the bunker in the event that it is unsuitable as process water however it must be clarified that it cannot be discharged to sewer or surfacewater drainage systems.

Condition 3.9 – Mr Bryan & CRAI considers that the storage area for ash stipulated is inadequate.

DCC requests that in part (b) the wording is amended to include the term flue gas residues.

Comment

The waste licence application contains details regarding the proposed removal of wastes off-site at intervals that would be consistent with the quantities proposed for on-site storage. In the event that there were shipping difficulties the applicant would have to ensure that suitable off-site storage facilities were provided but that is not within the remit of this licence and would be subject to waste and planning legislation. The planning permission does not allow for the storage off-site of hazardous wastes which would result in that area becoming an Establishment for the purposes of the Seveso II Directive. The condition should be amended to clarify the nature of the residues.

Condition 3.10.1- Mr Bryan states the condition can only be complied with when the induced draught fans are running and thus if the plant was shut-down odours/dust problems will occur. He also requests that the ship-loading operations should be considered as an integral part of the licence. The Labour Party objection considers that a detailed plan for odour control and management systems are to be submitted to the Agency for agreement in line with other conditions.

Comment

This is dealt with in section 2.3.3 above and under Condition 9.4.1(b). It is considered that the condition should be amended to include the additional mitigation measures proposed by the applicant.

Condition 3.13.2- In relation to the Fisheries Board Guidelines S&MRA consider that this relates to upriver works that can be isolated from the main river body and not this type of estuarine situation but that the EPA 'must ensure that no deterioration occurs, temporary or permanent in the receiving environment'

Comment

This condition relates to the construction phase of the facility and is dealt with by ABP. As such the condition should be deleted.

Condition 3.14.2- S&MRA considers that this should deal with the construction phase of the project as not to do so would breach EU law particularly the Birds Directive.

Comment

This condition relates to the construction phase of the facility and is dealt with by ABP. As such the condition should be amended to ensure that the traps and separators are installed prior to the commencement of the activity and Condition 6.17 amended to cater for the on-going operation of the facility.

Condition 3.15.2- Mr Bryan & CRAI objects to the requirement to move the waste off-site during these times as it would lead to further traffic congestion. He also referred to the lack of provision for special precautions at the loading quay or on the ship and stated that the port is proposed to be relocated with the vacant land being used for housing. CRAI also request that the hours of operation during the construction phase are curtailed. The Labour Party objection requests that the health based HSE proposals regarding hours of operation in their submission is revisited. DCC requests that the wording is amended to ensure that it does not apply to the management and export of waste such as the ash and other residues and suggest an alternative wording.

Comment

The probability of traffic congestion was dealt with by ABP and although it was noted that a reduction in the scale of the development proposed would be of benefit in alleviating the problems no restriction on the scale of the development or the times for the movement of waste were imposed in the grant of permission. The planning permission does however require waste deliveries/return trips to be in accordance with the strategy proposed by DCC and that the trucks use the M50 and Dublin Port Tunnel. The strategy outlined that waste would be accepted at the facility from 08:00 to 22:00 Monday to Saturday but that the majority of deliveries would take place between 10:00 and 12:00. Removal of incinerator residues would not impact on the roads outside the port area and to a large extent will depend on the shipping schedules therefore it is proposed to remove the time restriction in relation to those wastes. In relation to extending the timeframe for other waste removal off-site it is noted that the waste must be taken to a licensed or permitted facility such as a

transfer station or landfill and these would generally have restrictions in terms of their hours of acceptance of waste. It is not considered necessary to amend that aspect of the condition and Condition 3.15.3 can deal with specific occasions where there is a need to remove waste at other times.

Condition 3.16.2 – Mr Bryan & CRAI considers that an additional requirement to re-examine the sensitivity of the site to marine flooding should be inserted.

Comment

It is considered that the possibility of marine flooding was dealt adequately in the application and EIS and was further considered by ABP in their decision to grant planning permission at this site.

Condition 3.17.2 – Mr Bryan wants the licensee to demonstrate prior to the licence being issued that the thermocouples offer the most reliable and accurate measurement and the condition should be modified to include a list of back-up equipment and methodology for the proposed control and SCADA system. DCC provided details of the thermocouples that were being considered.

Comment

The Test Programme, as outlined in Condition 3.17.2, provides that all measurement equipment or devices, including thermocouples, are tested to ensure that they are fit for purpose. The Test Programme should inform the licensee as to the requirements for efficient process control and as such Condition 2.3.2.7 should be amended to link with this the results of the Test Programme.

Condition 3.18.1 – Mr Bryan & CRAI considers that the condition has no requirement for immediate shut-down or other action in the case of an excursion or as to how it will be monitored.

Comment

Condition 3.19 deals with abnormal operation and the requirement to shut-down and this is dealt with below.

Condition 3.18.2 – Mr Bryan & CRAI objects to the capacity of the incinerator insofar as he considers that the applicant has not demonstrated an available supply of residual waste.

Comment

This issue was dealt with above in sections 2.1.1 and 2.1.2.

Condition 3.18.3 – Mr Bryan & CRAI considers that the applicant has not demonstrated competence to prepare the standard operating procedures (SOP).

Comment

It is agreed that the licensee has no experience in this type of facility however Covanta and Dong as partners in the PPP Co have demonstrated that they have experience. The Test Programme/Commissioning Plan will inform the requirements of the procedures for the operation of the plant and the facility manager and deputy will also have extensive experience which they will apply to the preparation of the SOP's.

Condition 3.18.5 to Condition 3.18.8 – Mr Bryan considers that these conditions should be revisited to ensure that they facilitate the safe operation of the facility in light of the inertia inherent in the plant due to its size. In addition he considers that the technical specification should be more detailed at this stage to ensure that the designed plant can comply with the condition imposed.

Condition 3.18.5 – Mr Bryan requests that the temperature requirement is expanded to all across the gas stream and objects that spot measure is inadequate and that laminar flow could arise.

Condition 3.18.6 – Mr Bryan requests that trend monitoring be required to allow for the start of the auxiliary burners before the temperature drops and that the response time should be stipulated in the licence.

Condition 3.18.7 – Mr Bryan questions if the supply of hydrocarbon fuels will be met.

Comment

The temperature of the combustion chamber will be in excess of 850°C and the WID requires that the temperature of the gas leaving the chamber is above this and maintained for 2 seconds. It is a continuous measurement as required in Schedule C.1.1. The licensee is required to maintain the temperature above 850°C and trend monitoring would form a part of the monitoring system. It is not considered necessary to further stipulate either trend monitoring or response time. The requirement to maintain an adequate supply of fuel for the auxiliary burners lies with the licensee.

The conditions are requirements of WID and of BAT and as such they are requirements of many European incinerator plant. The issue of the technical specification is dealt with in section 2.1.3.

Condition 3.19- Mr Bryan objected to this condition as above and considers that it should be refined to ensure the facility operates as safely as possible.

DCC requests that the wording to Condition 3.19 is amended to clarify that both process lines would not have to be shut down in the event of a problem with one line. They also request that the definition of abnormal operating conditions is defined in the terms of the WID (2000/76/EC).

Comment

In relation to the shutting down of both process lines in the event of a problem with one line, the definition of abnormal relates to times when the discharges to air may exceed the emission limit values. In light of the inertia within the system, the WID allowed for short period of time when emission limits may be exceeded and this is dealt with in section 2.3.3 above. As the emissions from each line has separate flue gas treatment systems and are separately monitored it is considered adequate that the relevant line is shut-down.

Condition 3.23 – Mr Bryan considers that standards and a monitoring mechanism should be stipulated.

Comment

Condition 3.14.3 requires the drainage systems etc to be inspected weekly, desludged as necessary and properly maintained at all times. This is considered adequate for this type of site and system. Conditions 3.23 and 6.14 relate to the same issue and should be deleted.

Condition 3.24.1 – Mr Bryan & CRAI states that the Agency should define 'appropriately qualified'.

Comment

The term 'appropriately qualified' is used as there are many different stages to the construction works and requirements of the supervisory role would vary thus the onus is put on the licensee to ensure that an appropriate person is in charge at all times.

Condition 4

Condition 4.2 – Mr Bryan & CRAI objects to the cooling water discharge to the Liffey Estuary and considers that air cooling of the condensers should be adopted.

Comment

This is dealt with above in section 2.2.2.1.

Condition 5

Condition 5.3 –Mr Bryan & CRAI considers the condition too vague and that 'significant' required definition.

Comment

The term 'significant' is used in the context of the definition of 'environmental pollution' and the requirements of Section 40 of the WMA 1996-2008 and the EPA Act 1992 to 2007.

Condition 5.5- Mr Bryan & CRAI requests that the condition is clarified in light of the designations of the adjoining area as Special Protection Areas of particular relevant to birds.

Comment

The definition of 'environmental pollution' in the WMA 1996 to 2008 specifically deals with places of special interest and it is appropriate that the condition is amended to provide for contact with the NPWS in determining appropriate methods to deal with minimising the impact of vermin, birds, flies, mud, dust and litter associated with the facility.

Condition 5.7 – Mr Bryan & CRAI objects to this condition on the basis that it does not contain a provision for the measurement of nano-particulate matter and that annual submission of reports is inadequate.

Comment

Condition 5.7 is a repeat of the requirements in Schedule C.1.2 where quarterly monitoring of PM₁₀ and PM_{2.5} is required. Condition 11.5.2 requires certain reports to be submitted to the Agency on a quarterly basis.

The issue of fine particulate and nanoparticulate was dealt with in section 2.2.1.2 above and the condition should be amended to provide for a carrying out monitoring of nano-particulate in the emission in the form of a count of the particulates.

Condition 6

Condition 6.2 and Schedule C.6.2 – Mr Bryan & CRAI considers that yearly monitoring for noise levels is inadequate particularly in the early stages of the project.

Comment

The site is located in an industrial area with significant noise sources. The impact of the facility was assessed and is required to be monitored quarterly for the first three years. The PD allows the Agency to request further monitoring if there is reason to

suspect that noise from the facility is an issue. Notes 1 and 2 to Schedule B.4 should be amended to reflect that noise during the construction phase is dealt with by the conditions of the planning permission.

Condition 6.4 – Mr Bryan requests that compliance with this condition is audited by a competent independent agency.

Comment

To ensure the validity of monitoring results Conditions 6.1, 6.5, 6.6, 6.7 and in particular Condition 6.8 require that the staff are competent, the equipment is adequate, calibrated and maintained and in addition the Agency carries out monitoring and auditing of facilities.

Condition 6.8- Mr Bryan & CRAI considers the frequency for surveillance and calibration to be inadequate given the complexity of the proposed systems.

Comment

The frequency stipulated mirrors the minimum requirements of the WID. Condition 6.4 requires that the monitoring results accurately reflects the emission and it is usual that facilities would have a more frequent calibration and maintenance programme. This will be identified as part of the Test Programme/Commissioning Plan.

Condition 6.10 – Mr Bryan & CRAI refers back to Condition 5.5 and states that this condition requires further definition. Labour considers that the monitoring is inadequate and should be at least daily.

Comment

Waste handling occurs solely within the facility buildings and thus a weekly inspection is considered adequate for the inspection of the facility and its immediate surroundings. Should the licensee receive a complaint in relation to any nuisance they are required to carry out an investigation and a report under Condition 11.4.

Condition 6.16 – S&MRA are concerned that the requirements of the operator will override the effects on the receiving water and organisms when the regime is to be agreed with the Agency.

Comment

To ensure the protection of the aquatic environment it is necessary to ensure that the dosing regime is maintained and there is no shock dosing of the system and this is catered for in the emission limits. It is proposed to amend Condition 5.8 to provide further protection of the receiving water.

Condition 6.17 & 6.18 – Mr Bryan & CRAI considers that ‘final effluent’ should be defined. S&MRA consider the condition unsatisfactory as it refers to after the commencement of the activity.

Comment

The cooling water is the only discharge to water from the facility. The impact of the cooling water discharge is dealt with in section 2.2.2 and 2.2.3 and it is considered the main parameters are temperature and chlorine which are being measured continuously as per Schedule C.2.2. However it is proposed to amend the biological monitoring survey and the receiving water monitoring to provide enhanced protection for the estuarine environment.

Condition 6.19 & 6.20 – S&MRA state that thermal and biological surveys after commencement are inadequate and further research should be undertaken prior to issue of licence. Mr Bryan feels that no actions are stipulated if damage is evident and that it would be not be possible after 12 months to abandon the plant or revert to air cooling.

Comment

This issue was dealt in section 2.2 and the conditions should be amended.

Condition 7

Condition 7.1 –S&MRA considers that this condition influences future planning issues as there is no district heating scheme in existence. Mr Bryan, CRAI and Mr McCarthy considers that the electricity generating capacity of the plant would be reduced by district heating, that it is not capable of reaching its stated efficiencies and that an engineered and costed proposal should be required before the licence is issued. Labour considered that the licence should be based on actual proposals for District Heating and how it would affect the overall efficiency of the development. Green Party consider that the requirement to submit the proposals after the licence is granted should be revised.

DCC outlined the plans in relation to District Heating for Dublin.

Comment

It appears from the DCC presentations to the oral hearing that a District Heating scheme is well advanced with pipes being laid etc. In line with BAT it should be made a requirement of the plant that it is designed to input to that system insofar as it appears to have been fully considered as part of the proposal since it was first

mooted and indeed it appears to have been part of the criteria used in the site selection.

The issues are dealt with in section 2.1.2 and the condition should be amended to require the energy efficiency of the facility to be maximised.

Condition 8

S&MRA consider that the waste and residue inspection and testing need further elaboration

Comment

The inspection and testing of waste as outlined in the conditions provides for adequate monitoring given the robust nature of the grate and flue gas treatment systems and the limitation on the waste type to residual municipal waste as proposed in Schedule A.

Condition 8.2.3 and Condition 8.3 – Mr Bryan & CRAI states that no proposal other than ‘spot checking’ for waste inspection is in the EIS or in the design of the plant and he considers that the requirements of the licence would significantly impact on the proposed design. In relation to part (e) of this condition he states that it is vague and needs to be further defined. S&MRA consider that the monitoring of incoming wastes needs to be clarified.

DCC requests that the wording of part (a) is amended to remove the reference to a materials recovery facility.

Comment

The Applicant in Section D of the waste licence application outlines the areas within the facility where waste inspection and quarantine will take place and Conditions 3.5 and 8.2.3 provide for waste inspection and that these areas are constructed and maintained adequately. The condition should be modified to clarify the waste acceptances and waste handling procedures and as there is no waste recovery facility proposed this reference should be removed.

Condition 8.5 to Condition 8.12 – Mr Bryan contends that these conditions have an impact on the design of the facility and that the implications for the cost and the performance of the proposed plant cannot be guaranteed particularly as the PPP Co has changed since the project commenced.

Comment

The conditions are required to ensure that waste disposal is carried out in accordance with the requirements of the legislation. As was repeatedly stated at the

oral hearing the design of the plant and equipment is not completed and the cost and performance issues will have to be taken into consideration in the final design. The licensee will need to consider the requirements of the licence when issued in the final design of the facility.

Condition 9

Condition 9.4.1(b) – Mr Bryan requests that it be stated that this condition does not apply to fly ash, boiler ash or bottom ash.

DCC requests that the wording is amended to allow for the removal of the term 'process line' and to increase the timeframe to 7 days. Details of odour abatement techniques were provided in the closing statement by Mr Shipsey.

Comment

It is agreed that this condition should not apply to wastes such as the flue gas treatment residues, fly ash and bottom ash but to the putrescible wastes arriving in trucks or already in the bunker. It is also agreed that the term process line be removed as the plant can function if only one line is operational. The issue of storage time is considered in section 2.3.3.

Condition 10

Conditions 10.1- Mr Bryan considers that the condition has limited relevance given that this facility is unlikely to be closed in the near future.

Comment

The condition is relevant to the facilities as it provides for safe decommissioning of the plant and is in line with current legislation.

Condition 11

Condition 11.1 to Condition 11.7 and Schedule D – Mr Bryan requests that the applicant be required to devise and implement a modern and safe system of archive management and safe storage of all the relevant records and that the Annual Environmental Report (AER) be available at a reasonable cost to the general public. Green Party requests a revision of Condition 11.1 to require automatic notification of an incident to the EPA, the public, Minister for Environment, DEHLG, HSE, National Emergency Response Unit (NERU), Port Authority, ESB, sewage treatment plant and other adjacent industrial units. Ms Carvill queried the measure in place to deal with fires, explosions etc and the permanent closure of the plant if it fails to operate to standards.

Comment

The licensee has obligations under legislation to notify other relevant bodies where incidents or accidents occur and particularly where they may impact on members of the public e.g. the HSA and Fire Authorities. Condition 2.3.2.8(a) provides for information on the performance of the facility including the AER to be available to view free of charge on site. The offices of the EPA also provide access to the reports correspondence to/from the facility with a possible nominal cost for photocopying if required. Having regard to the PPP nature of this project it is proposed that the facility manager (as the person-in-charge of the facility) should be responsible for the initial notification of an incident to the Agency and the Fisheries Board. Subsequent reports are the responsibility of the licensee.

DCC (Mr Bahor) outlined that at some Covanta facilities in the US on-line data was made available to the public via the web and that it could be provided for this facility. It is considered that in light of progress in both monitoring and internet technology the licensee can provide access to specific data via the internet and is required to in Condition 2.3.2.8(b) which must be agreed before the commencement of the activity.

Condition 11.11.1 – Mr Bryan objects to this condition as it appears that the activities referred to are not proposed to be carried on at the site and it would not fall within the scope of the applicant. The Labour Party stated that this condition appears to require that the Agency agree the level of treatment of acceptable waste however it is unclear in light of comments on Residual waste definition. The Green Party consider that the condition should be strengthened to ensure that residual waste is that from which all recyclable and reusable components are removed and that the reference to 'imported waste' is clarified.

Comment

A Waste Recovery Report as outlined in the condition would provide useful information to the Agency and the public as to the exact processes which the licensee are carrying out to ensure that the waste accepted is residual municipal waste and also to ensure that the methods used for the recovery of residues have been sourced insofar as possible. The use of 'imported' is not necessary in the context of this condition and the condition should be amended to reflect this and the amendments to Schedule A.

Condition 12

Mr Bryan contends that it is the duty of the Agency to ensure that any significant risk is removed at the design stage and that the Agency should not grant a licence until that has been completed. He feels that the financial section of the PD is founded on the assumption that financial compensation is an adequate remedy for loss of life/health or damage to property.

Comment

The condition puts in place requirements for a financial contribution to the costs of monitoring and enforcement of the licence by the Agency and the financial provisions regarding liabilities as stipulated in the WMA Acts 1996-2008. The adequacy of the level of design provided in the application has been discussed elsewhere.

Condition 12.2.6 – Mr Bryan considers that it is unlikely that the facility will close other than for short periods for turbine maintenance.

Comment

The condition provides for the annual review of the financial provisions in the case of closure or accidents/incidents which will ensure that the costs are updated.

Schedule A

Schedule A.1 – Mr Bryan considers that the treatment capacity of 600,000 tonnes per annum is in excess of the requirements for the Dublin region. Third parties objected to the extensive list of wastes that were allowed to be accepted into the facility particularly as they considered that the applicant had not request most of them.

DCC provided a revised list of waste and EWC codes in Document 30.

Comment

This issue is dealt with in section 2.1.

Schedule B

Schedules B.2 & B.3- S&RMA query if the temperature rise relative to the intake temperature has been fully assessed. Mr Bryan considers that emissions to sewer should be stipulated as it is proposed that the emissions will go to the adjoining waste water treatment plant.

Comment

The temperature rise and its impact have been dealt with above. The application states that the only emissions to sewer are from the sanitary services and as such

are not process emissions and subject to a Schedule in the licence. It was proposed by DCC that 'grey water' from the Ringsend waste water treatment plant could be used as process water however there is insufficient information supplied in the application or at the oral hearing to assess the impact of this on the emissions and it is proposed that that the condition is deleted.

Schedule C

Schedule C.1.1 –Mr Bryan considers that the list of key equipment is unduly restricted and in relation to the residues that the monitoring of 'quantity and type of ash' would not be meaningful given the size of the proposed bunker. He also objects to there being no condition to require adequate built-in redundancy for critical measurements in case of equipment failure.

Comment

The Schedule in the PD allows in Note 1 for other emissions control/monitoring equipment to be installed. Other sections of this report recommend additional/amended monitoring/control measures.

Schedule C.1.2 – Mr Bryan considers that the quarterly measurement of parameters is inadequate.

Comment

The requirements of the Schedule are considered the minimum and if required the Agency can increase the frequency of monitoring under Condition 6.3 but it cannot be decreased for parameters specifically dealt with by WID.

Schedule 2.1- S&MRA query the requirement that the dosage and interval for hypochlorite/chlorine is to be agreed with the Agency. Mr Bryan objects to the requirement for spares and considers that there should be 'hot' back-up of key equipment.

Comment

It is considered that spare temperature probe and flow meter/recorder held on-site would be adequate for the control of the cooling water temperature and flow. If equipment required changing there are other in-process measurements that would demonstrate compliance in the short-term which should be agreed under Condition 6.9.

Schedule C.3.1 – Mr Bryan objects to the fact that emissions will go to sewer without any control or monitoring stipulated in the licence.

Comment

The application states that other than sanitary effluent, there will be no discharges to the sewer. Process effluent will either be recirculated for use in the process or discharged into the waste bunker. Amendments proposed for Condition 3.5.3 also provides for the storage of process water and ensure that it is not discharged to sewer or surface water drainage systems.

Schedule C.4.2 – Mr Bryan contends that given the size of the bottom ash bunker it will be unlikely that representative testing will be possible.

Comment

The schedule should be amended to provide for the other proposed changes to the PD.

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Recommendation

The information in the waste licence application and additional information, submissions, objections and presentations to the oral hearing have been considered and it is recommend that a waste licence with the following 47 recommendations to the proposed decision is granted.

1. Reword and add specific terms in the Glossary as follows:

Breakdown	Any malfunction or technical stoppage, disturbance, or failure of the incineration plant or equipment.
Consignment Note	As specified in the Waste Management (Movement of Hazardous Waste) Regulations 1998 (S.I. No. 147 of 1998)
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.
Liquid Waste	Any waste in liquid form and containing less than 2% dry matter.
Notification document	As specified under Article 4(1)(a), Annex 1A of Regulation (EC) No. 1013/2006.
Movement document	As specified under Article 4(1)(b), Annex 1A of Regulation (EC) No. 1013/2006.

2. Reword Part I – Activities Licensed to read as follows:

Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Acts 1996 to 2008

Class 8. Incineration on land.

3. Reword Part II – Activities Refused to read as follows:

Refused Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Acts 1996 to 2008

Class 6. Biological treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 7 to 10 of this Schedule. <i>Reason: The addition of biocides to the cooling water is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.</i>

Class 7.	<p>Physico-chemical treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 8 to 10 of this Schedule (including evaporation, drying and calcination).</p> <p><i>Reason: The operation of the flue gas abatement system is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.</i></p>
Class 10.	<p>Release of waste into a water body (including a seabed insertion)</p> <p><i>Reason: The discharge of cooling water is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.</i></p>
Class 11.	<p>Blending or mixture prior to submission to any activity referred to in a preceding paragraph of this Schedule</p> <p><i>Reason: The blending and mixing of municipal waste in the bunker is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.</i></p>
Class 12.	<p>Repackaging prior to submission to any activity referred to in a preceding paragraph of this Schedule</p> <p><i>Reason: The loading of incinerator residues into containers prior to shipment is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.</i></p>
Class 13.	<p>Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on premises where the waste concerned is produced.</p> <p><i>Reason: The storage of municipal waste in the bunker and quarantine areas is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.</i></p>

Refused Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Acts 1996 to 2008

Class 3.	<p>Recycling or reclamation of metals and metal compounds</p> <p><i>Reason: The infrastructure/processes for the recycling or reclamation metals and metal compounds is not specified or assessed in the waste licence application.</i></p>
Class 4.	<p>Recycling or reclamation of other inorganic materials</p> <p><i>Reason: The infrastructure/processes for the recycling or reclamation of other inorganic materials is not specified or assessed in the waste licence application.</i></p>
Class 6.	<p>Recovery of components used for pollution abatement</p> <p><i>Reason: The infrastructure/processes for the recovery of components of components used for pollution abatement is not specified or assessed in the waste licence application.</i></p>
Class 8.	<p>Oil re-refining or other re-uses of oil</p> <p><i>Reason: The use of a fuel in the auxiliary burners is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.</i></p>
Class 9	<p>Use of any waste principally as a fuel or other means to generate energy.</p> <p><i>Reason: The generation of energy from the incineration of municipal waste is a normal and integrated step in the facility technical processes and is not an independent waste recovery process for wastes imported to the site.</i></p>
Class 13.	<p>Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on premises where the waste concerned is produced.</p>

Reason: The storage of municipal waste in the bunker and quarantine areas is a normal and integrated step in the facility technical processes and is not an independent waste treatment process for wastes imported to, or produced on, the site.

4. Reword Condition 1.5 to read as follows:

- 1.5 The waste disposal activity at this facility shall be limited to the waste categories and quantities as set out in *Schedule A: Limitations*, of this licence.

5. Reword Condition 2.3.2.7 to read as follows:

2.3.2.7 Efficient Process Control

The licensee shall, in accordance with the Test Programme/Commissioning Plan, establish and maintain a programme to ensure there is adequate control of processes under all modes of operation. The programme shall identify the key indicator parameters for process control performance, as well as identifying methods for measuring and controlling these parameters. Abnormal process operating conditions shall be documented and analysed to identify any necessary corrective action.

6. Reword Condition 2.3.2.8(b)(i) to read as follows:

- 2.3.2.8(b)(i) real time data from on-line monitoring of the incinerator (the parameters, format and timeframe for publication to the internet shall be agreed by the Agency but as a minimum shall include combustion chamber temperature as outlined in Schedule C.1.1);

7. Amend Condition 3.2.3 to read as follows:

- 3.2.3 The licensee shall install at all monitoring locations and 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 points.

8. Reword Condition 3.5.3 to read as follows:

- 3.5.3 Drainage from these areas shall be directed to a process water storage tank which is not connected to the stormwater system. Water from the storage tank shall be used either as process water in the incineration plant, or if unsuitable, directed to the waste bunker. It shall not be discharged to the surfacewater or foul sewer system.

9. Amend Condition 3.9 to read as follows:

3.9 Incinerator residues

- 3.9.1 The licensee shall provide, on-site and in accordance with Condition 8.8, the following minimum incinerator residue storage capacity:

- (a) bottom ash/non-hazardous boiler ash: 6000m³ ; and
(b) fly ash/flue gas treatment residues/hazardous boiler ash: 700m³.

- 3.9.2 The licensee shall carry out an investigation into the feasibility of the use of an enclosed conveyor system for the transfer of bottom ash to truck/containers and to the off-site storage area with reference to the EC Reference Document on Best Available Techniques on Emissions from Storage. A report on the methods to be used for the handling/transfer of the incinerator residues shall be submitted to the Agency, for agreement, prior to the commencement of the waste activity.

10. Amend Condition 3.10.2 to read as follows:

- 3.10.2 Implementation of an odour and fugitive dust management system to include periods when process lines and/or induced draft fans are not operational.

11. Reword Condition 3.13.1 to read as follows:

- 3.13.1 Effective surface water management infrastructure shall be provided and maintained at the facility.

12. Delete Condition 3.13.2

13. Reword Condition 3.14.2 to read as follows:

- 3.14.2 The licensee shall install and maintain silt traps and oil separators at the facility to ensure that all storm water discharges (other than roof rain water) from the facility pass through a silt trap and oil separator prior to discharge. The separator shall be a Class I full retention separator and the silt traps and separator shall be in accordance with I.S. EN 585-2:2003 (separator systems for light liquids).

14. Reword Condition 3.15.2 to read as follows:

- 3.15.2 Incinerator residues destined for ships within the Dublin Port Area may be removed from the facility at any time. Otherwise waste may be removed from the facility only between the hours of 0800 hrs to 1830hrs Monday to Friday inclusive and 0800 hrs to 1400 hrs on Saturdays.

15. Insert Condition 3.16.3 to read as follows:

- 3.16.3 Prior to the commencement of the waste activity, the licensee shall submit an updated report on air quality in the vicinity of the site and the predicted impact of the development with particular reference to the air quality standards specified in S.I. 271 of 2002 or those pertaining at the proposed date of commencement of the waste activity. The report shall, as a minimum,

- (a) include ambient air quality monitoring at the locations specified in the application (or otherwise agreed with the Agency) for at least three years prior to the commencement of the waste activity,
- (b) provide a comparison of the actual measurements from (a) above with the predictions for air quality post 2012 as outlined in Section 8 of the EIS, and
- (c) update the impact assessment of the development having regard to the measurements from (a) above.

The licensee shall not commence the waste activity at the facility until it has received the prior written agreement of the Agency with the Air Quality report.

16. Reword Condition 3.18.8 to read as follows:

- 3.18.8 Each process line of the incineration plant shall have and operate an automatic system to prevent waste feed to that line:
- (a) At start-up, until the temperature of 850°C has been reached;
 - (b) Whenever the temperature of 850°C is not maintained;
 - (c) Whenever the continuous measurements show that any emission limit value is exceeded due to disturbances of the purification devices; and

- (d) Whenever stoppages, disturbances, or failure of the purification devices or the measurement devices may result in the exceedance of the emission limit values.

17. Reword Condition 3.19 to read as follows:

3.19 Abnormal operation/breakdown

3.19.1 In the case of a breakdown, the licensee shall reduce or close down operation of the relevant process line(s), as soon as practicable, until normal operations can be restored. The licensee shall not resume incineration operations without the agreement of the Agency.

3.19.2 In the case of abnormal operations:

- (a) the licensee shall under no circumstances continue to incinerate waste in the relevant process line for a period of more than four hours uninterrupted where emission limit values specified in Schedule B.1 are exceeded, and
- (b) the cumulative duration of abnormal operation over one calendar year shall be less than 4 hours, and
- (c) the total dust content of the emissions from the combined stacks (A2-1 and A2-2) shall under no circumstances exceed 150 mg/m^3 (expressed as a half-hourly average) and the emission limit values specified in Schedule B.1 for CO and TOC shall not be exceeded.

18. Delete Condition 3.23

19. Reword Condition 3.25 to read as follows:

3.25 The licensee shall in combination with Conditions 7.1 and 7.5, re-evaluate the proposed process cooling system having regard to the EC Reference Document on the application of Best Available Techniques to Industrial Cooling Systems, November 2000 and the cooling needs of the facility. The review shall include an assessment of the feasibility of an air cooled system and shall be submitted to the Agency prior to the commencement of construction.

20. Reword Condition 4.2 to read as follows:

4.2 Emission limit values for emissions to waters in this licence shall be interpreted in the following way:-

4.2.1 Continuous monitoring

- 4.2.1.1 98% of all flow values over the year, calculated as m^3/hr , shall not exceed the emission limit value.
- 4.2.1.2 No daily flow value shall exceed the emission limit value.
- 4.2.1.3 98% of all temperature values over the year, calculated as an hourly average, shall not exceed the emission limit value.
- 4.2.1.4 No temperature value shall exceed the emission limit value by more than 0.5°C .
- 4.2.1.5 No total residual chlorine value shall exceed the emission limit value.

21. Reword Condition 5.5 to read as follows:

5.5 The licensee shall ensure that all or any of the following:

- vermin
- birds

- flies
- mud
- dust
- litter,

associated with the activity do not result in an impairment of, or interference with amenities or the environment at the facility or beyond the facility boundary or any other legitimate uses of the environment beyond the facility boundary. Any method used by the licensee to control or prevent any such impairment/interference shall be agreed with the National Parks and Wildlife Service (where relevant) and not cause environmental pollution.

22. Reword Condition 5.7 to read as follows:

- 5.7 The licensee shall, prior to the commencement of the waste activity, submit a report to the Agency on the feasibility and reliability of monitoring methods/techniques to determine the Cr(VI) fraction of the Total Cr and the particle size distribution and the particle number of the ultrafine (<PM_{0.1}) fraction of the total dust from Emission Point Reference No's A2-1 & A2-2. The licensee shall carry out such monitoring as is agreed with the Agency following an evaluation of the recommendations of the report.

23. Reword Condition 5.8 to read as follows:

- 5.8 No emission of process cooling water shall cause, in the receiving water at the edge of the mixing zone,
- (a) the temperature to exceed the unaffected temperature by more than 1.5°C, or
 - (b) the temperature to exceed 21.5°C, or
 - (c) the total residual chlorine level to exceed 0.005mg/l (as HOCl).

The mixing zone shall not exceed 25% of the estuarine cross sectional area at any point. The thermal discharge shall not cause sudden variations in temperature in the receiving water.

24. Delete Condition 6.14

25. Reword Condition 6.17 to read as follows:

- 6.17 The licensee shall undertake an aquatic and biological survey of the receiving water upstream and downstream of the cooling water outfall within twelve months of commencement of the waste activity and biennially thereafter. The licensee shall have regard to the Dublin City Council Biodiversity Plan in scoping the survey and shall consult with the Agency and the Eastern Regional Fisheries Board on the timing, nature and extent of the survey. The survey shall, as a minimum, include a fish diversity study, monitor the level of entrainment and impingement at the intake and determine the acute toxicity of the cooling water discharge.

A report on the survey shall be submitted in the AER.

26. Delete Condition 6.18

27. Reword Condition 6.19 to read as follows:

- 6.19 The licensee shall, within twelve months of the commencement of the activity, undertake a thermal survey of the receiving water. The licensee shall consult with the Agency on the timing, nature and extent of the survey which shall, as a minimum, link to C5.8

- (a) review the surveys and modelling undertaken in the EIS and application and determine the edge and extent of the mixing zone at the maximum flows and temperatures and under all tidal conditions,
- (b) assess the design and effectiveness of the cooling water discharge system.

A report on the survey shall be submitted in the AER and the survey shall be repeated as required by the Agency.

28. Reword Condition 7.1 as follows:

- 7.1 The licensee shall, prior to the commencement of construction of the facility, review the energy efficiency aspects of the design to maximise the recovery of the energy generated from the incineration of waste. Surplus energy from the operation of the facility shall be exported to the Dublin district heating system (when available) and the National Grid. The licensee shall include in the Schedule of Environmental Objectives and Targets (Condition 2.3.2.2) a feasibility study on the export of energy to the Ringsend WWTP for the drying of WWTP sludge which shall be reported annually in the AER.

29. Reword Condition 7.2 as follows:

- 7.2 The licensee shall carry out an audit of the energy efficiency of the facility within one year of the date of commencement of waste acceptance. 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, as a minimum, include:
 - (a) A review of opportunities for increasing the overall efficiency of the facility over the coming year,
 - (b) Progress with those opportunities identified in the previous report,
 - (c) The energy efficiency of the facility.

The report shall include a full breakdown of each parameter in the equation including the net usable energy produced per tonne of waste processed.

The audit shall be repeated annually and submitted to the Agency in the AER.

30. Insert Condition 7.5 as follows:

- 7.5 The licensee shall build and operate the facility to achieve an energy efficiency of, as a minimum, 0.65 using the formula below to calculate Energy Efficiency:

Energy Efficiency = $[E_p - (E_f + E_i)] / [0.97 \times (E_w + E_f)]$ where

E_p = annual energy produced as heat or electricity (GJ/year) (heat produced for commercial use is multiplied by 1.1 and electricity is multiplied by 2.6)

E_f = annual energy input to the system from fuels contributing to the production of steam (GJ/year)

E_w = annual energy contained in the waste input using the lower net calorific value of the waste (GJ/year)

E_i = annual energy imported excluding E_w and E_f

and 0.97 is a factor accounting for energy losses.

The Energy Efficiency shall be reported annually in the AER.

31. Reword Condition 8.2.3 to read as follows:

- 8.2.3 Prior to the commencement of the waste activity 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 shall include the following:
- (a) Procedures for waste profiling from new and known customers, inspection at the point of entry to the facility and waste characterisation ,
 - (b) Methods for the characterisation of waste sent off-site for disposal/recovery, in order to distinguish between non-hazardous and hazardous wastes. In the case of materials dispatched to landfill, such methods shall have regard to 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 landfill of waste.
 - (c) Procedures for the reception and weighing of the incoming and outgoing wastes.
 - (d) Procedures for the handling of waste and incinerator residues including bunker and silo management.
 - (e) Procedures to determine the mass of each category of waste in accordance with, and by reference to, the relevant EWC codes as outlined by Commission Decision 2000/532 of 3rd May 2000, as amended.

32. Delete Condition 8.9 and Condition 8.13

33. Reword Condition 9.4.1 to read as follows:

- 9.4.1 In the event of a breakdown or any other occurrence where both process lines of the incineration plant are being shut-down, waste (with the exception of incinerator residues):-

- (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.

34. Reword Condition 11.1 to read as follows:

- 11.1 In the event of an incident occurring on the facility;
- (a) the facility manager shall notify the Agency as soon as practicable and in any case not later than 1000hrs on the working day after the occurrence of any incident;
 - (b) the licensee shall submit a written report 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) where the incident relates to discharges to the surface water, the facility manager shall notify the Eastern Regional Fisheries Board as soon as practicable and in any case not later than 1000hrs on the working day after the occurrence of 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.

35. Reword Condition 11.3.2(f), 11.3.2(j) to read as follows and delete Condition 11.3.2(l):

- 11.3.2(f) the type, relevant EWC code and total tonnage of waste accepted at the site for disposal on a daily, monthly and annual basis;
- 11.3.2(j) where applicable a consignment note number, the notification document number and movement document number as appropriate;

36. Add Condition 11.5.2(g)

- 11.5.2 (g) be certified as accurate and representative by the facility manager/deputy.

37. Reword Condition 11.11 to read as follows:

11.11 Waste Recovery Report

The licensee shall prepare a report setting out the proposed methods for the recovery of wastes which shall be submitted to the Agency for agreement three months prior to commencement of the activity. This report shall address the actions and the contribution of the facility to the achievement of the recovery targets stated in regional, national and European Union waste policies and plans and shall, as a minimum, include details of the methods used for:

- (a) the pre-treatment of the municipal waste prior to being accepted at the facility,
- (b) the recovery of incinerator residues off-site and their final use.

The report shall be revised annually as part of the AER.

38. Reword Schedule A to read as follows:

A.1 Waste Categories and Quantities for Acceptance at the Incineration Plant

Maximum quantity to be accepted shall not exceed 600,000 tonnes per annum

Waste Type	European Waste Catalogue (EWC)
Mixed municipal waste ^{Note 1}	20 03 01
Waste from markets	20 03 02
Street-cleaning residues	20 03 03
Bulky waste ^{Note 1}	20 03 07
Wastes from aerobic treatment of solid waste ^{Note 2}	19 05 01
Combustible waste (refuse derived fuel) ^{Note 2}	19 12 10

Note 1: This shall consist of the residual waste fraction as defined in the Glossary.

Note 2: Derived from the treatment of the residual waste fraction of municipal waste only.

39. Reword Schedule B.2 as follows:

B.2 Emissions to Water

Emission Point Reference No:	SW-1 Cooling Water Discharge		
Name of Receiving Waters:	Liffey Estuary		
Location:	Cooling Water Outfall		
Volume to be emitted:	Maximum in any one day:	570,000m ³	
	Maximum rate per hour:	14,040m ³	

Parameter	Emission Limit Value
Temperature rise (ΔT) relative to intake	9.0 °C
Total residual chlorine (as HOCl)	0.5mg/l and 0.2mg/l (as 24 hour average)

40. Delete Note 1 and Note 2 from Schedule B.4

41. Insert additional line in Column 2 Schedule C.1.1 under 'Baghouse Filter' to read as follows:

Location	Item/parameter	Monitoring Equipment
Baghouse Filter	Pressure Differential across filters	Pressure differential indicator
	Collection unit level	High level alarm on collector unit
	Filter bag leak detection	Leak detection system

42. Delete lines containing River Biological & Thermal Survey and Toxicity and Note 1 from Schedule C.2.2

43. Insert Schedule C.2.3 as follows:

C.2.3. Monitoring of Storm Water Emissions

Emission Point Reference No: Surface water overflow from reservoir

Parameter	Monitoring Frequency	Analysis Method/Technique
pH	Continuous	pH meter and recorder
TOC	Continuous	TOC analyser and recorder

44. Amend Schedule C.4.1 as follows and delete Schedule C.4.2:

C.4.1. Monitoring of incinerator residues

Waste	Frequency	Parameter ^{Note 1}
Liquid and solid material from the cleaning of the flue gas treatment system and storage areas	per consignment	TOC, metals ^{Note 2} and their compounds, chloride, fluoride, sulphate, dioxins/furans and dioxin-like PCB's.
Bottom ash, fly ash, boiler ash and flue gas treatment residues	per consignment ^{Note 3}	TOC, metals ^{Note 2} and their compounds, chloride, fluoride, sulphate, dioxins/furans and dioxin-like PCB's.
Other ^{Note 4}		

Note 1: The scope and methods of analysis shall take account of the total soluble fraction and the metals soluble fraction and be submitted with the Test Programme and agreed with the Agency prior to the commencement of the waste activity.

Note 2: Metals shall include Ba, Cd, Mo, Sb, Se, Zn, Tl, Hg, Pb, Cr, Cu, Mn, Ni, As, Co, V and Sn.

Note 3: The TOC of the bottom ash and slag shall be determined on a weekly basis.

Note 4: Analytical requirements to be determined on a case by case basis.

45. Amend Schedule C.6.2 as follows:

Replace 'Annual' in column 2 with 'as specified in Condition 6.2'.

46. Insert Schedule C.6.3 as follows:

C.6.3 Ambient Air Monitoring

Location: M1 (Irish Glass Bottle site)^{Note 1}

Parameter	Monitoring Frequency	Analysis Method/Techniques
PM ₁₀	Continuous	EN12341
PM _{2.5}	Continuous	To be agreed with the Agency
Oxides of Nitrogen	Continuous	Chemiluminescence (ISO 7996:1985)

Note 1 The licensee may, with the prior written agreement of the Agency, use an alternative site which would approximate to the area of predicted maximum ground level concentration as outlined in the application.

47. Insert Schedule C.6.4 as follows:

C.6.3 Receiving Water Monitoring


Location: To be agreed^{Note 1}

Parameter	Monitoring Frequency	Analysis Method/Techniques
Dissolved oxygen	Biannually	Note 2
Temperature	Biannually	Note 2
Total residual chlorine	Biannually	Note 2

Note 1 The licensee shall determine the edge of the mixing zone in accordance with Condition 3.19 and carry out monitoring at that location.

Note 2: Third Schedule of S.I. No. 293 of 1988 or other method/techniques as agreed by the Agency.

Signed

 on 03rd September, 2008
Marie O'Connor

Appendices

APPENDIX A SCHEDULE OF WITNESS/PRESENTATIONS

APPENDIX B SUMMARY RECORD OF THE ORAL HEARING

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Appendix A - Schedule of Speakers at W023-01 Oral Hearing

Monday 14th April 2008

Take	Start Time	Finish Time	Speakers
A	10:00:00	10:10:15	MOC/AMD
B	10:10:00	10:20:15	MOC/SW/FC/RQ/LK/YC/JH
Take	Start Time	Finish Time	
C	10:30:00	10:40:15	blank
D	10:40:00	10:50:15	MOC/JMcC/BS/JH
E	10:50:00	11:00:15	JH/MOC/MB
F	11:00:00	11:10:15	MB/JH/MOC/DD/CW/DL/KH/JC
G	11:10:00	11:20:15	JC/MOC/SW/KH/LK/BS
H	11:20:00	11:30:15	MOC/BS/DC
J	11:30:00	11:40:15	DC/DD/DMcS/KH
K	11:40:00	11:50:15	DMcS/DC/MOC/MB/CW/BS/JH/FC
L	11:50:00	12:00:15	blank
M	12:00:00	12:10:15	blank
N	12:10:00	12:20:15	MOC/BS/
O	12:20:00	12:30:15	BS
P	12:30:00	12:40:15	BS/MOC/JMcC/MB/JH/
Take	Start Time	Finish Time	
Q	14:00:00	14:10:15	MOC/MB/DD/JMcC/BS
R	14:10:00	14:20:15	MOC/LK/JMcC/BS/FC/MT
S	14:20:00	14:30:15	MT
T	14:30:00	14:40:15	MT
U	14:40:00	14:50:15	MT
V	14:50:00	15:00:15	MT
W	15:00:00	15:10:15	MT
X	15:10:00	15:20:15	MT
Y	15:20:00	15:30:15	MT
Z	15:30:00	15:40:15	MT
AA	15:40:00	15:50:15	MT/MOC
Take	Start Time	Finish Time	
BB	16:00:00	16:10:15	MOC/BS/JMcC/CW/MT

Legend

MOC- Marie O'Connor	JB- John Brophy
AMD- Ann Marie Donlon	FJC - Fergal Callaghan
SW - Siobhan Windle	JS- Joseph Scire
FC - Frances Corr	MLM - Mary Lou McDonald
RQ- Ruairi Quinn -Lab	VJ- Valerie Jennings
LK- Lorna Kelly	SM- Stefano Montanari
YC- Yvonne Clooney	MS- Marco Salino
JH- John Hawkins	MC- Mary Carvill
JMcC- Joe McCarthy	SMcC- Sharon McCormack
BS- Bill Shipsey	MP- Maria Parodi
MB- Maurice Bryan	RH- Rory Hearne
DD- Daithi Doolan	CCu - Christy Cullen
CW- Claire Wheeler	PD- Patsy Doolin
DL- Dermot Lacey	FH- Francis Healy
KH- Kevin Humpreys	EB- Elizabeth Buckley
JC- Judy Costello	FCMcL - Frances Cassidy-McLaughlin
DC- Damien Cassidy	OD- Owen Dunne
DMcS- Daithi MacSitigh	JR- James Rountree
MT- Matt Twomey	VH- Vyvyvan Howard
OG- Olivier Gaillot	AC- Anita Curtis
PL- Philip Lee	AS- Anthony Staines
CN- Claus Norgaard	RL- Ria Lyden
MK- May Kane	BM- Bronwen Maher
BB- Brian Bahor	CC- Ciaran Cuffe
GK- Gunnar Kjaer	CCa- Catherine Cavendish
HJV- Hans Jacob Vested	GK- Gunnar Kjaer
BP- Brendan Price	HJV- Hans Jacob Vested
DR- Dorte Rasmussen	BP- Brendan Price
EM- Eleanor Mayes	DR- Dorte Rasmussen
	EM- Eleanor Mayes

CC	16:10:00	16:20:15	MT/MOC/CW/DMcS
DD	16:20:00	16:30:15	MT/DMcS/MOC/LK
EE	16:30:00	16:40:15	LK/MT/MOC
FF	16:40:00	16:50:15	LK/MOC/MT/SW/CW
GG	16:50:00	17:00:15	CW/MT/MOC/FC/
HH	17:00:00	17:10:15	MT/FC/MOC
JJ	17:10:00	17:20:15	MB/MT/MOC/BS
KK	17:20:00	17:30:15	MB/MT/MOC/JMcC
LL	17:30:00	17:40:15	MOC/JMcC/BS/MB/MT/LK
MM	17:40:00	17:50:15	LK/MT/BS/MOC/JMcC

Tuesday 15th April 2008

Take	Start Time	Finish Time	
A	9:30:00	9:40:15	MOC/BS/JMcC/PL/CN
B	9:40:00	9:50:15	CN/MOC
C	9:50:00	10:00:15	CN/PL/MOC
D	10:00:00	10:10:15	CN/MOC/BS
E	10:10:00	10:20:15	MOC/CN/PL
F	10:20:00	10:30:15	CN/
G	10:30:00	10:40:15	CN/MOC/MK/LK
H	10:40:00	10:50:15	LK/PL/MOC/DMcS
J	10:50:00	11:00:15	CN/DMcS/MOC/BB/PL/CW
K	11:00:00	11:10:15	CW/CN/MOC/DD/PL/BS
L	11:10:00	11:20:15	BS/MOC/MB/JMcC/
Take	Start Time	Finish Time	
M	11:30:00	11:40:15	MOC/FC/BS/CN/MB
N	11:40:00	11:50:15	MB/CN/MOC/BB
O	11:50:00	12:00:15	MB/CN/
P	12:00:00	12:10:15	MB/CN/BS/MOC/PL
Q	12:10:00	12:20:15	MB/CN/MOC/PL
R	12:20:00	12:30:15	CN/MB/MOC/
S	12:30:00	12:40:15	CN/MB/MOC/
T	12:40:00	12:50:15	MB/CN/MOC/PL/CW/LK/BS/JMcC
U	12:50:00	13:00:15	BS
Take	Start Time	Finish Time	
V	13:30:00	13:40:15	MOC/JMcC/MOC/CN

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For inspection purposes only.*

W	13:40:00	13:50:15	JMcC/CN/MOC/BS
X	13:50:00	14:00:15	MOC/CN/JMcC
Y	14:00:00	14:10:15	JMc/CN/MOC/PL/BS
Z	14:10:00	14:20:15	MOC/JMcC/CN/
AA	14:20:00	14:30:15	CN/JMcC/MOC/PL/BB/
BB	14:30:00	14:40:15	JMc/CN/
CC	14:40:00	14:50:15	CN/JMcC/MOC/LK/GK/PL/BB/BS/DC
DD	14:50:00	15:00:15	DC/MOC/PL/CN
Take	Start Time	Finish Time	
EE	15:10:00	15:20:15	MOC/PL/MB/LK/OG
FF	15:20:00	15:30:15	OG
GG	15:30:00	15:40:15	OG/MOC/PL/LK
HH	15:40:00	15:50:15	LK/OG/MOC
JJ	15:50:00	16:00:15	OG/LK/
KK	16:00:00	16:10:15	OG/LK/MOC/MB/FC
LL	16:10:00	16:20:15	OG/FC/MOC/MB/
MM	16:20:00	16:30:15	OG/MB/MK/DC/
NN	16:30:00	16:40:15	DC/MOC/PL/
OO	16:40:00	16:50:15	DC/MOC/LK/MB/BS
PP	16:50:00	17:00:15	BS/MOC/MB/PL/BS

Wednesday 16th April 2008

Take	Start Time	Finish Time	
A	9:30:00	9:40:15	MOC/PL/HJV/
B	9:40:00	9:50:15	HJV/MOC/BS
C	9:50:00	10:00:15	HJV/MOC/PL
D	10:00:00	10:10:15	HJV/MOC/CW/BS
E	10:10:00	10:20:15	LK/HJV/MOC/PL
F	10:20:00	10:30:15	HJV/MOC/AMD/BS/BP
G	10:30:00	10:40:15	HJV/BP/BS/LK/DC
H	10:40:00	10:50:15	HJV/DC/MOC/PL
J	10:50:00	11:00:15	HJV/MOC/MB
K	11:00:00	11:10:15	HJV/MB/MOC/BP/LK/
L	11:10:00	11:20:15	MOC- mostly blank
M	11:20:00	11:30:15	MOC/DR/CW/BP
N	11:30:00	11:40:15	BP/DR/BS/MOC/CW/MB

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O	11:40:00	11:50:15	DR/MB/MOC/DD/PL/EM
P	11:50:00	12:00:15	EM
Q	12:00:00	12:10:15	EM/MOC
Take	Start Time	Finish Time	
R	14:00:00	14:10:15	MOC/PL/MB/BP/EM
S	14:10:00	14:20:15	BP/EM/MOC
T	14:20:00	14:30:15	BP/MOC/EM/MB
U	14:30:00	14:40:15	MB/PL/EM/MOC
V	14:40:00	14:50:15	MB/EM/MOC
W	14:50:00	15:00:15	MB/EM/MOC/FC/LK
X	15:00:00	15:10:15	MOC/BS/LK/EM
Y	15:10:00	15:20:15	EM/LK/MOC
Z	15:20:00	15:30:15	EM/LK/MOC/CW/
AA	15:30:00	15:40:15	CW/EM/MOC/JMcC/BS
BB	15:40:00	15:50:15	blank
CC	15:50:00	16:00:15	MOC/EP
DD	16:00:00	16:10:15	EP
EE	16:10:00	16:20:15	EP
FF	16:20:00	16:30:15	EP
GG	16:30:00	16:40:15	EP
HH	16:40:00	16:50:15	EP
JJ	16:50:00	17:00:15	EP/MOC/JMcC
KK	17:00:00	17:10:15	EP/JMcC/MOC
LL	17:10:00	17:20:15	EP/JMcC/MOC
MM	17:20:00	17:30:15	EP/JMcC/MOC/BB/PL/JB
NN	17:30:00	17:40:15	JB/MOC/BP/BS
OO	17:40:00	17:50:15	MOC/BP/PL/
PP	17:50:00	18:00:15	JB/MOC/BP/PL
QQ	18:00:00	18:10:15	MOC/BP/JB/PL
RR	18:10:00	18:20:15	BP/JB/MOC/LK/MB
SS	18:20:00	18:30:15	MB/JB/PL/MOC/
TT	18:30:00	18:40:15	JB/BP/MOC/BS/LK/MB

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Thursday 17th April 2008

Take	Start Time	Finish Time	
A	9:30:00	9:40:15	MOC/BS/EP/JMcC

B	9:40:00	9:50:15 MOC/EP/BS
C	9:50:00	10:00:15 EP/JMcC/BS/MOC
D	10:00:00	10:10:15 EP/MOC/JMcC
E	10:10:00	10:20:15 JMcC/EP/BS/MOC
F	10:20:00	10:30:15 EP/JMcC/MOC/PL/CW/MB
G	10:30:00	10:40:15 EP/MB/JMcC/LK/
H	10:40:00	10:50:15 LK/EP/MOC/JH/PL/JMcC/FC/DMcS
J	10:50:00	11:00:15 DMcS/EP/MOC/MB/JMcC/BS
K	11:00:00	11:10:15 MOC/BS

Take	Start Time	Finish Time
L	11:15:00	11:25:15 MOC/FJC/
M	11:25:00	11:35:15 FJC/MOC
N	11:35:00	11:45:15 FJC/MOC/MB
O	11:45:00	11:55:15 FJC/MOC
P	11:55:00	12:05:15 FJC/MOC
Q	12:05:00	12:15:15 FJC/MOC/CW/
R	12:15:00	12:25:15 FJC/MOC/JH/LK/FC
S	12:25:00	12:35:15 MOC/LK/FJC/FC/DC/MB/BS
T	12:35:00	12:45:15 MOC/BS - mostly blank

Take	Start Time	Finish Time
U	13:30:00	13:40:15 MOC/BS/MB/JMcC
V	13:40:00	13:50:15 MOC/JS/JMcC
W	13:50:00	14:00:15 JS/JMcC/MOC
X	14:00:00	14:10:15 JS/JMcC
Y	14:10:00	14:20:15 JS/JMcC/MOC/BS
Z	14:20:00	14:30:15 JMcC/BS/MOC/JS/MS/MB/MT
AA	14:30:00	14:40:15 MT/MOC/BS/
BB	14:40:00	14:50:15 MT/MOC/BS/MB/LK/FC
CC	14:50:00	15:00:15 FC/MT/MOC/MB

Take	Start Time	Finish Time
DD	15:10:00	15:20:15 MOC/MB/MT/
EE	15:20:00	15:30:15 MB/MT/MOC/BS/
FF	15:30:00	15:40:15 MB/MT/MOC
GG	15:40:00	15:50:15 MB/MT/MOC
HH	15:50:00	16:00:15 MB/MT/MOC/BS/
JJ	16:00:00	16:10:15 BS/MOC/JMcC/MB/

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Consent of copyright owner required for any other use.

KK	16:10:00	16:20:15	MOC/BS/EP/JMcC/MB/MT
LL	16:20:00	16:30:15	JMcC/MT/BS/
MM	16:30:00	16:40:15	JMcC/MT/MOC/BS
NN	16:40:00	16:50:15	JMcC/MOC/BS/LK
OO	16:50:00	17:00:15	MOC/LK/BS/JMcC/PL/
PP	17:00:00	17:10:15	JMcC/MT/
QQ	17:10:00	17:20:15	MT/JMcC/PL/MOC/
RR	17:20:00	17:30:15	JMcC/MOC/MT/
SS	17:30:00	17:40:15	JMcC/MT/
TT	17:40:00	17:50:15	MT/JMcC/MOC/FC/
UU	17:50:00	18:00:15	JMcC/MT/MOC
VV	18:00:00	18:10:15	JMcC/MT/MOC/MB

Friday 18th April 2008

Take	Start Time	Finish Time	
A	9:30:00	9:40:15	MOC/MLD/BS/
B	9:40:00	9:50:15	MLD/BS/MOC/CW/MB/DMS/DC
C	9:50:00	10:00:15	MLD/MOC/DC/LK/DD
D	10:00:00	10:10:15	DD/MOC/BS
E	10:10:00	10:20:15	BS/DD/MOC/CW/LK/DC
F	10:20:00	10:30:15	DD/DC/CW/FC/MOC
Take	Start Time	Finish Time	
G	10:40:00	10:50:15	MOC/BS/JMcC/MT/BS/VJ/CW
H	10:50:00	11:00:15	MOC/CW/JMcC/MT/BS/
J	11:00:00	11:10:15	BS/JMcC/MOC/
K	11:10:00	11:20:15	MT/MOC/JMcC/CW
L	11:20:00	11:30:15	CW/MT/MOC/DMS/LK/
M	11:30:00	11:40:15	LK/MT/MOC/MB/
N	11:40:00	11:50:15	LK/MT/MOC/DC/BS
Take	Start Time	Finish Time	
O	12:00:00	12:10:15	MOC/BS/BB/VJ/CW/
P	12:10:00	12:20:15	BB/BS/
Q	12:20:00	12:30:15	BB/BS/MOC/MS/
R	12:30:00	12:40:15	MS/BB/MOC/CW
S	12:40:00	12:50:15	MOC/MS/BB/CW/JR/LK/
T	12:50:00	13:00:15	BB/LK/MOC/JMcC/MB/

Consent of copyright owner required for any other use.
For inspection purposes only.

U	13:00:00	13:10:15	MB/BB/MOC/DMcS/JMcC
Take	Start Time	Finish Time	
V	14:00:00	14:10:15	MOC/SM/
W	14:10:00	14:20:15	SM
X	14:20:00	14:30:15	SM
Y	14:30:00	14:40:15	SM
Z	14:40:00	14:50:15	SM/MOC
AA	14:50:00	15:00:15	SM/
BB	15:00:00	15:10:15	SM/MOC/MS/
CC	15:10:00	15:20:15	SM/MS/MOC/BS/
DD	15:20:00	15:30:15	MOC/BS/SM/BB/
EE	15:30:00	15:40:15	BB/SM/BS/MOC
FF	15:40:00	15:50:15	SM/BS/MOC/JMcC/MB/JR/CW/
GG	15:50:00	16:00:15	SM/MOC/CW/JMcC/BS/
HH	16:00:00	16:10:15	MOC/RQ
JJ	16:10:00	16:20:15	RQ/MOC/CW/MS/DL
KK	16:20:00	16:30:15	DL/MOC/CW/KH/MB
LL	16:30:00	16:40:15	MB/KH/LK/MOC

Monday 21st April 2008

Take	Start Time	Finish Time	
A	9:30:00	9:40:15	MOC/BS/BB/MB
B	9:40:00	9:50:15	MB/BB/
C	9:50:00	10:00:15	MB/BB/MOC
D	10:00:00	10:10:15	BB/MB/JMcC/
E	10:10:00	10:20:15	MB/BB/MOC
F	10:20:00	10:30:15	MB/MOC/BB
G	10:30:00	10:40:15	MB/BB/BS/MOC/
H	10:40:00	10:50:15	MB/BB/MOC/FC/
Take	Start Time	Finish Time	
J	11:00:00	11:10:15	BS/MOC/JMcC/MB/
K	11:10:00	11:20:15	MOC/BS/JMcC/BB
L	11:20:00	11:30:15	JMcC/BB
M	11:30:00	11:40:15	JMcC/BB/MOC/BS
N	11:40:00	11:50:15	Blank
O	11:50:00	12:00:15	BS/MOC/BB/JMcC

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Consent of copyright owner required for any other use.

P	12:00:00	12:10:15	JMcC/BB/MOC/PL
Q	12:10:00	12:20:15	BB/JMcC
R	12:20:00	12:30:15	JMcC/BB/MOC/PL/BS
S	12:30:00	12:40:15	BB/JMcC/BS/MOC
T	12:40:00	12:50:15	JMcC/BB/MOC
U	12:50:00	13:00:15	MOC/JMcC/BB
V	13:00:00	13:10:15	JMcC/BB/MOC/BS
Take	Start Time	Finish Time	
W	14:00:00	14:10:15	MOC/BS/JMcC/AS
X	14:10:00	14:20:15	AS/MOC/
Y	14:20:00	14:30:15	AS/MOC/BS/
Z	14:30:00	14:40:15	BS/AS/MOC/MB/BS/
AA	14:40:00	14:50:15	AS/MB/BS/MOC/LK/CW
BB	14:50:00	15:00:15	AS/MOC/JMcC/BS/RL
CC	15:00:00	15:10:15	RL
DD	15:10:00	15:20:15	RL/MOC/CW/MB/
EE	15:20:00	15:30:15	RL/MB/MOC
FF	15:30:00	15:40:15	MB/MOC/CW/LK/JMcC
GG	15:40:00	15:50:15	RL/JMcC/MOC/LK/MB/
Take	Start Time	Finish Time	
HH	16:00:00	16:10:15	MOC/BS/JMcC
JJ	16:10:00	16:20:15	JMcC/MOC/BB/BS/
KK	16:20:00	16:30:15	JMcC/BB/BS/
LL	16:30:00	16:40:15	MOC/JMcC/BS/BB
MM	16:40:00	16:50:15	MOC/JMcC/BB/
NN	16:50:00	17:00:15	BB/JMcC/
OO	17:00:00	17:10:15	JMcC/BB/MOC/LK/BS/DC
PP	17:10:00	17:20:15	DC/BB/MOC/CW
QQ	17:20:00	17:30:15	CW/BB/MOC/FC/MB
RR	17:30:00	17:40:15	BB/MB/MOC/JMcC/BS
SS	17:40:00	17:50:15	MOC/JMcC/LK/

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Tuesday 22nd April 2008

Take	Start Time	Finish Time	
A	9:30:00	9:40:15	MOC/BM/BS
B	9:40:00	9:50:15	BM/MOC/CW

C	9:50:00	10:00:15	MOC/CW/
D	10:00:00	10:10:15	CW
E	10:10:00	10:20:15	CW/MOC/CC
F	10:20:00	10:30:15	CC
G	10:30:00	10:40:15	CC/MOC/BS/
H	10:40:00	10:50:15	BS/CC/MOC/MB/
J	10:50:00	11:00:15	MB/CC/MOC/CW/FC/LK/
K	11:00:00	11:10:15	LK/CC/MOC/BS/BM/FC/
L	11:10:00	11:20:15	BM/FC/MOC/LK/
Take	Start Time	Finish Time	
M	11:30:00	11:40:15	MOC/JMcC/EP
N	11:40:00	11:50:15	JMcC/EP/MOC
O	11:50:00	12:00:15	EP/JMcC/MOC/BS
P	12:00:00	12:10:15	MOC/JMcC/EP
Q	12:10:00	12:20:15	JMcC/EP/MOC
R	12:20:00	12:30:15	EP/JMcC/MOC/CW/BS
S	12:30:00	12:40:15	EP/JMcC/MOC/VH
T	12:40:00	12:50:15	EP
U	12:50:00	13:00:15	EP/MOC/BS
Take	Start Time	Finish Time	
V	14:00:00	14:10:15	MOC/VH
W	14:10:00	14:20:15	VH
X	14:20:00	14:30:15	VH
Y	14:30:00	14:40:15	VH
Z	14:40:00	14:50:15	VH
AA	14:50:00	15:00:15	VH/MOC/BS
BB	15:00:00	15:10:15	BS/VH/PL/MOC/CW/
CC	15:10:00	15:20:15	CW/VH/MOC/LK/BB/
DD	15:20:00	15:30:15	VH/BB/AC/MOC/CW
EE	15:30:00	15:40:15	MOC/EP
FF	15:40:00	15:50:15	EP
GG	15:50:00	16:00:15	EP/MOC/BS/CW
HH	16:00:00	16:10:15	EP/CW/MOC/LK/
JJ	16:10:00	16:20:15	LK/EP/MOC/CW/
KK	16:20:00	16:30:15	CW/EP/MB/MOC/
Take	Start Time	Finish Time	

For inspection purposes only.
Consent of copyright owner required for any other use.

LL	18:30:00	18:40:15 MOC/MC/
MM	18:40:00	18:50:15 MC/MOC/SW/SMcC/MP/
NN	18:50:00	19:00:15 MP/MOC/RH/SW/CC
OO	19:00:00	19:10:15 CC/MOC/PD/FH/EB
PP	19:10:00	19:20:15 EB/MOC/FCMcL/OD/SW/MC/CC
QQ	19:20:00	19:30:15 CC/MOC

Wednesday 23rd April 2008

Take	Start Time	Finish Time
A	9:30:00	9:40:15 Blank
B	9:40:00	9:50:15 MOC/JMcC/BS/MB
C	9:50:00	10:00:15 MOC/BS/JMcC/MB/JR
D	10:00:00	10:10:15 JR
E	10:10:00	10:20:15 JR
F	10:20:00	10:30:15 JR/MOC
G	10:30:00	10:40:15 JR/MOC/MB/
Take	Start Time	Finish Time
H	10:50:00	11:00:15 MOC/BS/JMcC/EP/
J	11:00:00	11:10:15 EP/JMcC/MOC/
K	11:10:00	11:20:15 EP/JMcC
L	11:20:00	11:30:15 EP/JMcC/BS/MOC
M	11:30:00	11:40:15 MOC/JMcC/EP/
N	11:40:00	11:50:15 EP/JMcC/MOC/FC
O	11:50:00	12:00:15 FC
P	12:00:00	12:10:15 FC
Q	12:10:00	12:20:15 FC
R	12:20:00	12:30:15 FC
S	12:30:00	12:40:15 FC
T	12:40:00	12:50:15 FC/MOC
Take	Start Time	Finish Time
U	14:00:00	14:10:15 MOC/BS/MB/
V	14:10:00	14:20:15 MB
W	14:20:00	14:30:15 MB
X	14:30:00	14:40:15 MB/MOC
Y	14:40:00	14:50:15 MB/MOC
Z	14:50:00	15:00:15 MB

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AA	15:00:00	15:10:15 MB
BB	15:10:00	15:20:15 MB/MOC
CC	15:20:00	15:30:15 MB
DD	15:30:00	15:40:15 MB
EE	15:40:00	15:50:15 MB
FF	15:50:00	16:00:15 MB
GG	16:00:00	16:10:15 MB/MOC/CW/
HH	16:10:00	16:20:15 Blank
JJ	16:20:00	16:30:15 MOC/DC/CW/MB
KK	16:30:00	16:40:15 CW/MB/MOC/PL/DC/LK/
LL	16:40:00	16:50:15 MOC/PL/DC/JMcC
MM	16:50:00	17:00:15 JMcC/PL/MOC
NN	17:00:00	17:10:15 JMcC/PL/MOC
OO	17:10:00	17:20:15 JMcC/PL/MOC/CW/VJ
PP	17:20:00	17:30:15 MOC/JMcC
QQ	17:30:00	17:40:15 MOC/JMcC/PL
RR	17:40:00	17:50:15 JMcC/PL/MT/MOC/EP/
SS	17:50:00	18:00:15 MOC/PL/LK/DC/JMcC
TT	18:00:00	18:10:15 MOC/LK/DC/PL

Thursday 24nd April

Take	Start Time	Finish Time
A	10:00:00	10:10:15 Blank
B	10:10:00	10:20:15 MOC/MB/PL/LK
C	10:20:00	10:30:15 LK
D	10:30:00	10:40:15 LK
E	10:40:00	10:50:15 LK/MOC
F	10:50:00	11:00:15 LK/MOC
G	11:00:00	11:10:15 LK
H	11:10:00	11:20:15 LK
J	11:20:00	11:30:15 LK/MOC/MB
Take	Start Time	Finish Time
K	11:45:00	11:55:15 MOC/MB/LK
L	11:55:00	12:05:15 LK/MB/MOC/CCa/
M	12:05:00	12:15:15 MB/LK/MOC/
N	12:15:00	12:25:15 MOC/MB/LK/CW/PL

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O	12:25:00	12:35:15 PL/LK/MOC/DC/CCa/
P	12:35:00	12:45:15 CCa/MOC/CW/FC/LK/DC
Q	12:45:00	12:55:15 DC/MOC/CW
R	12:55:00	13:05:15 MOC/CW/DC/FC/MB/PL
S	13:05:00	13:15:15 MOC/MT/MB/
T	13:15:00	13:25:15 Adjourn

Thursday 01 May 2008

Take	Start Time	Finish Time
A	9:30:00	9:40:15 MOC/BS/EP
B	9:40:00	9:50:15 EP/BS/MOC
C	10:00:00	10:10:15 blank
D	10:10:00	10:20:15 MOC/EP
E	10:20:00	10:30:15 EP/MOC
F	10:30:00	10:40:15 MOC/EP/JMcC
G	10:40:00	10:50:15 JMcC/EP/MOC/PL
H	10:50:00	11:00:15 EP/MOC/JMcC
J	11:00:00	11:10:15 EP/JMcC/MOC
K	11:20:00	11:30:15 blank
L	11:30:00	11:40:15 MOC/JMcC/EP
M	11:40:00	11:50:15 EP/JMcC/MOC
N	11:50:00	12:00:15 EP/JMcC
O	12:00:00	12:10:15 JMcC/EP
P	12:10:00	12:20:15 JMcC/EP/MOC
Q	12:20:00	12:30:15 JMcC/EP
R	12:30:00	12:40:15 EP/JMcC/MOC
S	12:40:00	12:50:15 EP/JMcC/MOC
T	12:50:00	13:00:15 EP/JMcC/MOC
U	13:00:00	13:10:15 JMcC/EP/MOC/PL
V	13:10:00	13:20:15 EP/JMcC/MOC
W	13:20:00	13:30:15 JMcC/MOC
Take	Start Time	Finish Time
X	14:30:00	14:40:15 MOC/JMcC/BS
Y	14:40:00	14:50:15 JMcC/BS/MOC
Z	14:50:00	15:00:15 JMcC
AA	15:00:00	15:10:15 JMcC/CW/MOC/BS

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BB	15:10:00	15:20:15 BS/JMcC
CC	15:20:00	15:30:15 JMcC/BS/MOC/DC
DD	15:30:00	15:40:15 JMcC/DC/MOC/LK/FC
EE	15:40:00	15:50:15 CW/JMcC/MOC
FF	15:50:00	16:00:15 blank
GG	16:00:00	16:10:15 blank
HH	16:10:00	16:20:15 MOC/JMcC/MB
JJ	16:20:00	16:30:15 JMcC/MOC/BS
KK	16:30:00	16:40:15 BS
LL	16:40:00	16:50:15 BS
MM	16:50:00	17:00:15 BS
NN	17:00:00	17:10:15 BS/MOC/PL
OO	17:10:00	17:20:15 PL/BS
PP	17:20:00	17:30:15 BS
QQ	17:30:00	17:40:15 BS
RR	17:40:00	17:50:15 BS/PL/MOC/JMcC/LK

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Summary Record of Oral Hearing

Register No. W0232-01

Dublin City Council

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INTRODUCTION

The following is a summary record of the proceedings of the oral hearing into objections to the EPA proposed determination of a waste licence to Dublin City Council Reg W0232-01. It does not purport to be a complete transcript of all that was said and you are referred to the Digitake recording for the complete record. I have listened to the recording and used it as an aide memoire during the preparation of the record and the report.

Appendix A Schedule of Speakers is provided to facilitate locating the presentations within the recording.

PROCEDURAL ISSUES

The opening statement of the chairperson outlined that persons who had not made objections to the Agency could make presentations to the oral hearing and be available for cross examination. Several parties availed of this opportunity. There was no serious disruption of the proceedings. An evening session was held on Tuesday 22 April 2008 to facilitate objectors making statements and this was attended by approximately 60 people. Ms Windle, Mr McCarthy, Mr Cassidy and others stated on several occasions that they considered that the system was unfair as they needed to take time from work to attend and it did not allow for third parties to call experts due to the costs involved.

Call for additional witnesses, requests for adjournment and clarification of issues

There were several requests for the chairperson to call additional witnesses and to adjourn the oral hearing to allow for their attendance. These related mainly to Dr Broderick, a consultant who assisted An Bord Pleanála (ABP) during their oral hearing into the planning application.

It was outlined by the chairperson that the terms of reference of the oral hearing were set out in Waste Management legislation and the power of the chairperson to call witnesses applied only to Agency and local authority staff and parties to the objections.

There were several calls for adjournment from third parties to allow them time to consider additional data which the applicant was presenting during the course of the hearing. In light of a specific request to allow time to consider additional data presented on the air and climate impact assessment the hearing was adjourned from 24th April to 01st May 2008.

Another adjournment was requested on 01st May 2008 following the presentation of further additional documentation by the applicant however it was not considered necessary at that stage.

General issues

Third parties expressed dissatisfaction with the process and in particular the manner in which Dublin City Council (DCC) amended documents and data during the oral hearing. It was considered that this did not allow time for a proper assessment of the relevance/significance of the new data and thus did not afford a proper opportunity to ask questions.

Mr. Hawkins interjected on 17th April 2008 to request a recess for the chair and DCC manager to visit the dockland to see the effect of the easterly winds which were prevailing at the time site as this will effect the dust from loading of waste ships from the facility. DCC agreed to accompany Mr Hawkins to the site.

ORAL HEARING

Monday 14th April 2008.

The Oral Hearing commenced at 10:30am with the reading into the record of the letters of appointment by the Chair (Ms O'Connor) and Assistant (Ms Donlon). The opening statement outlined the purpose and format of the hearing, the names of the objectors and the proposed running order. Mr Alan Doyle assisted with the preparation of the running order with individuals and groups agreeing a time when they or their expert witnesses would be available to give presentations etc. The order was amended as necessary with the agreement of all parties.

As questions were asked at various times in the proceedings they have been combined insofar as they relate to an individual/organisation.

No. 1 – Mr John Hawkins (14/04/08 – D-E)

He stated that he was a Ringsend resident and member of St. Patrick's rowing club. He spoke to a text (Document No. 4):

He feels that over the years DCC has used the area as a location for activities such as a hospital ship, power plant, wastewater treatment, coal depot, dump, glass company, animal by-products treatment, car dismantler, container yards etc which created dust and odours. There is high truck traffic movement in the area due to the existing industry and this incinerator project would result in an additional 30,000 trucks per annum using the roads in Ringsend.

Mr Hawkins spoke about a facility called Bioburn that operated in the area and which he feels contributed to the deaths of some of his friends and club members due to cancer which he attributes to the emissions from Bioburn. He then referred to an article in a newspaper regarding the ABP oral hearing and the submission of Dr Imelda Shanahan, who was retained by Dublin Port. He outlined that Councillor Dermot Lacey had indicated to him that although DCC had issued a statement welcoming the decision of ABP it was the view of the City Manager and not the elected councillors.

Mr Hawkins detailed environmental pollution issues related to discharges to water associated with the Liffey tunnel works. He outlined a particular instance when he looked to report the matter he was passed from DCC to the EPA and then back to DCC. When the discharge was investigated and stopped it recommenced almost immediately and he states this undermines his confidence in the monitoring and control by DCC. He is also not happy with DCC issuing licences for their own projects.

He works in the container shipping area and has concerns regarding the possibility of incidents involving the containers of fly ash which would result in the dust being released and polluting the area.

Question:

Mr. Bryan queried the implications on the health of rowing club members insofar as rowing was a strenuous activity and members would be breathing the air in the vicinity of the proposed incinerator. He also queried if there was any evidence of ash deposition from of the Bioburn facility. He asked if there was ever a health survey carried out in the area.

Response- Mr. Hawkins indicated that rowing was a strenuous activity and that when the Bioburn facility operated the upturned boats would need to be washed to remove a black deposit prior to training. He also stated that he had lived in his house for 62 years but he was not aware of any health survey.

Sinn Fein -Cllr. Doolan queried whether DCC had ever visited the club to discuss issues of concern.

Response –The club had received no contact with DCC

Green Party– Ms Wheeler queried the direction of the winds in the area e.g. was it south westerly most of the time.

Response – Mr. Hawkins outlined that in his opinion there are local winds which blow the dust from the cement trucks using the port in all directions but that the rowing would also be determined by the tides.

Labour Party- Cllr. Lacey stated that he agreed with the comments attributed to him by Mr Hawkins. Cllr. Humphreys asked his opinion of the enforcement record of DCC.

Response – Mr. Hawkins indicated that in light of his experience he uses his camera to take photos if he sees an incident.

Ms. Costello – stated that her son is ill with respiratory problems and cannot join the rowing club as it would be a hazard to his health due to the air. She also outlined that the sand was black.

No. 2 –Ms Siobhan Windle (14/04/08 – G)

Ms Windle read from her submitted text (Document 5). She outlined that there is a problem with the damage caused by the vibration from the current truck movements and this will get worse when the increased truck movements (30,000/annum) due to the incinerator. She stated that an RPS environmental consultant indicated to her that vibration studies were not necessary for an EPA licence application and she feels that this issue is not taken seriously.

Questions

LP -Mr Humphreys asked questions related to the traffic volumes and vibration.

Response- Ms Windle stated that at peak times the area was like a carpark.

Sandymount & Merrion Residents Assoc -Ms Kelly queried the dust levels experienced in the area.

Response – Ms Windle indicated that she couldn't see the dust but that it was on the windows and that the health effects of inhaling it are not known as a health survey baseline has not been carried out.

No. 3 Ringsend, Irishtown and Sandymount Environment Group – Mr Damien Cassidy (14/04/08 – H –K and 24/04/08 O-S)

Mr Cassidy outlined the background to a letter from the EP Committee on Petitions which he read into the record (Document 6). Three people from the community (Ms Maye, Ms Corr and himself) met with the Petitions Committee in the EP to make the case that the site was not suitable for the incinerator as much of the maps relating to the application are out of date. The letter outlines that members of the Petitions Committee visited the site in 2007 and that the report of the Committee and its considered opinion should be brought to the attention of the oral hearing as a means of demonstrating the Committee's support for the petitioners and local people. The Committee recommended that serious consideration be given to the suitability of the site and to the level of compliance with EC Directives demonstrated in the application. Mr Cassidy also outlined that he wants waste treated and not incinerated either in Poolbeg or elsewhere.

Mr Cassidy added to his submission on 24 April 2008

Mr Cassidy read from the submission of the Ringsend, Irishtown and Sandymount Environmental (RISEG) Group (Document 56) where he outlined that he was chairperson of the group and he had a history of involvement in several successful conservation campaigns since 1960 including the restoration of Kilmainham Gaol and Ringsend Community Centre. He referred to the sewerage treatment plant in Ringsend which is adjacent to the proposed site for the incinerator and mentioned that there are estimates of 300-600 truck movements bring waste to the incinerator with a possible sewage sludge burner.

He stated that the EPA was set up to protect the environment and that the planning authorities had failed them by granting permission against the wishes of the TD's and Councillors of the City of Dublin. RISE Group maintain that the planning permission is invalid due to matters that came to light during the EPA oral hearing such as the change in operator and concerns over who will have responsibility on-site. In addition, permission was given based on designs still being evaluated and the points raised by the objectors have not been dealt with even though upwards of €20 million has been spent to date.

In relation to site selection, he stated that no solution has been presented to the traffic issue which was the reason for a previous refusal by ABP for an incinerator on this site in 1995 and which with the addition of the sewerage plant and three cement depots has increased 100 fold. The grant of a licence will further escalate the traffic problems.

Mr Cassidy outlined that the application should be refused on the basis that the maps submitted in 2006 are now incorrect as there has been further planning permissions granted adjoining the incinerator site (Bottle Works site) for residential development. This means that the assessments are now incorrect as they were based on the nearest residences being over a mile from the site. He reminded the hearing of the letter that he read from the EU Petitions Committee.

He then outlined that he was not in favour of the incinerator being sited elsewhere as the RISE Group feel that waste can be cleaned, recycled and re-used. He states that DCC had been told about their concerns regarding the design of the Sewerage plant and that a 'fail safe or alarm' system should have been installed but that at the time they were not allowed to see the plans and now there are difficulties with the operation of the plant.

He stated that during the hearing evidence was presented, appeals made by the community and many unanswered questions arose that indicate that something is wrong with the application. He feels that the Shelly Bank Beaches are to be used by developers to access the site.

He feels that the community had to put up with the landfill for 30 years, the toll bridge traffic and the sewerage plant but that this is too much for them to take. He felt that if it was attempted in other parts of Dublin it would not be accepted by the residents and that it is not a level playing field as public money was used to try to ridicule them but he feels that the EU is on their side.

He does not consider that the proposed plant is safe for the environment and has serious concerns about the traffic emissions, dioxins, fire and other hazards. He finally asks DCC to throw away the plans for the incinerator and prepare a plan to clean and recycle the waste.

On 24/04/08 there was clarification provided by Mr Twomey to Mr Cassidy and others in relation to the maps of the site for the waste licence application and the Planning Application and CPO issues. Document 57 was submitted to assist providing a map for the purposes of the licence.

Questions

Cllr. Doolan indicated that the letter was strong in its support of the residents and asked if they were happy with the response by DCC.

Response –He is aware that the Committee has a lot of issues to deal with but a full delegation came twice from the Committee and he believes that action will follow as the delegation were not happy with the site.

Lab- Mr MacSithigh - He asked whether the EPA inspectors report of June 2007 was still valid in light of the letter from the Petitions Committee. S.I No. 297 of 2007 designates the area for the purposes of the Dublin Docklands Development Authority Act for development and he asked if the future uses of the site had been adequately taken into account. Cllr Humpfeys confirmed that as a member of the DDDA which is a part owner (with McNamara) of the Irish Glass and Bottle Co. (IGB) site that the draft plans outline that the 26 acres would be developed as a residential site.

Response -Mr Cassidy feels that the report is out of date and that other developments proposed in the area since it was issued also render the maps inaccurate. The Ringsend area was a rough area but it is now a sought-after location for property.

Mr. Bryan asked if the action by Committee that he referred to was a fine by the EC.

Response – He hoped that this would not be the case as the Committee made their feelings known to the minister for Environment and DCC.

Green Party- Ms Wheeler asked what epidemiological or other health studies had been carried out in the area. She asked questions related to the use of the beach as an amenity, the traffic and the IGB site.

Response – He was not aware of any studies. He had lived all his life in the area and had played and picnicked on the beaches and that this amenity is being destroyed. He stated that since 1983 when the toll bridge opened the traffic has increased to such an extent that the jams extend back up the Sean Moore Road and sometimes onto the Strand Road causing trouble and danger to the communities. In relation to the proposed use of the IGB site he referred to Cllr. Humpfries who is on the Docklands Authority had said that there would be mixed development on the site.

DCC – Mr Shipsey queried if Mr Cassidy was involved in the preparation of the submission to the Petitions Committee which refers to 760,000 tonnes/annum waste being burned.

Response – Mr Cassidy outlined that he was not responsible for the content of the submission and that the number should be 600,000t/a and that they did not attempt to mislead the Committee. He also referred to the proposal to double the size in the wastewater treatment plant. On 15/04/08 Mr McCarthy explained that the number comes from the Waste Licence application which appear to add the sludges (industrial and municipal) to the 600,000 tonnes waste per annum.

Ms Corr (CRAI) clarified that the visit took place in January of 2007 and asked if accurate information was available at that time.

Response He agreed that the date was January 2007 and that it was thought that the information was accurate as they found it so difficult to obtain details from DCC.

No. 4 Dublin City Council –Mr Bill Shipsey (14/04/08 – M,N,O,P)

Mr Shipsey stated that he was acting as counsel to DCC and not giving evidence but wished to draw attention to the letter of 17 December 2007 (Objection No. 15) which raised 8 objections and a

clarification on the Inspectors report and proceeded to go through each point. He then referred to Document 7 which outlines in more detail the reasoning behind the objections.

- Condition 2.1.1 – power plant operation is similar to incinerator plant operation and Covanta will supply training. A local person may have 10 years power plant experience.
- Condition 3.5.3 – water from certain process areas such as the tipping hall would be re-used in the process. Bottom ash areas should be cleaned by broom and therefore there would be no water.
- Condition 3.15.2- further amendment requested than in objection as during preparation for hearing it was noted that the hours of removal of incinerator residues and wastes were not compatible with the proposed operation.
- Condition 3.19 – there are two lines with separate systems therefore they wish to allow for the operation of a line and not shutdown of entire facility in the event of an abnormal event. They also wish to have the condition amended to use the definition of the term abnormal operation as set out in Directive 2000/76/EC.
- Condition 9.4.1 – The condition should be amended to ensure that it refers to a complete shutdown of the facility and that the timeframe for removal of waste from the pit is extended to 7 days.

He outlined that other experts could deal with the specific issues.

Questions

Mr McCarthy and Mr Bryan asked that specific experts be made available to deal with the issues outlined in the objection/submission and that a timeframe and duration of presentation be supplied.

Mr Hawkins requested the loading and unloading times for the ships.

Response –Mr Shipsey stated that a list of the experts would be prepared and gave approximate timeframes subject to the duration of questioning.

No. 5 –Dublin City Council –Mr Matt Twomey (14/04/08 – S –LL, 17/04/08 AA-VV and 18/04/08 G to N)

Mr Twomey read his submission (Document 1) which was set out as an introduction to the proposed facility and the process by which the proposal evolved.

He is one of five Assistant City Managers and he has responsibility for the Environmental and Engineering Services sections which include water, waste management and fire & emergency services and he also chairs the Regional Steering Groups from the four Dublin Authorities.

Proposed Development

Mr Twomey outlined that the proposed facility will treat up to 600,000 tonnes/annum of residual waste and supply electricity to the National Grid to meet the needs of approximately 50,000 homes. In addition the facility will have the capacity to provide district heating for approx. 60,000 homes in the Poolbeg and adjacent areas. During the lifetime of the facility at least 200 acres of land would be diverted from landfill. He stated that a capacity of 600,000t/a is required to cater for current and future waste arisings in the Dublin area and any spare capacity can be utilised by the Greater Dublin area within the provisions of the Greater Dublin Strategic Planning Guidelines.

He considers that waste to energy (WTE) is compatible with a strong recycling ethos and that the WTE project is in the interest of the people of Dublin. In relation to sewage he confirms that the application includes a provision for 80,000t/a of sewage sludge from the adjacent wastewater treatment plant as

well as non-hazardous industrial sludges and that the proposed decision allows this but that the combined tonnages would remain at 600,000t/a. He also confirmed that the planning approval did not allow for the acceptance of sludge but that it would have a positive impact on traffic as it would reduce the number of trucks travelling to and from the facility.

Waste Management Strategy and Planning

Mr Twomey outlined the background to the waste management plan for the region which was required under the Waste Management Act 1996 (WMA). A Strategy prepared by a consortium of experts was presented to the four Authorities in 1998. It was endorsed by the elected members of the Council and the draft plan, based on the strategy was presented to the Councils and the revised Plan became operative in July 2001 on a Regional basis. The plan included an objective to develop an integrated waste management system which included separate collection of dry recyclables and biological waste, civic amenity centres, landfill, biological waste treatment and WTE.

Mr Twomey stated that the four Dublin Authorities considered alternative technologies, including MBT, before adopting the Waste Management Plans. The Authorities decided to pursue a policy using source separated organic waste to make clean compost rather than MBT whose compost is of a lesser quality. They also consider that MBT is not an alternative to WTE and it is not necessary for compliance with the Landfill Directive.

He detailed the process by which the replacement Waste Management Plan 2005-2010 was made during 2004 and 2005 and this plan included a specific objective to develop WTE on the Poolbeg Peninsula.

National Waste Management Policy

The policies which were taken into account during the making of the plans were stated and he elaborated on specific statements within these documents:

- Changing Our Ways – Sept 1998
- Preventing & Recycling Waste – March 2002
- Taking Stock & Moving Forward – April 2004
- The National Strategy on Biodegradable Waste – April 2006
- The National Development (NDP) Plan 2007-2013
- Ireland's Progress towards Environmental Sustainability – The NDP Plans 2000-2013: Achievements to date and key challenges ahead.

In addition, Mr Twomey referred to the 2008 proposal to amend the Waste Framework Directive and in particular the proposal to include an energy efficiency threshold above which municipal incineration would be considered a recovery operation.

Implementation of the Waste Management (WM) Plans in the Dublin Region

Mr Twomey outlined the various ways that the four Authorities are implementing the WM Plan:

- Range of service including door-to-door collection, bring centres, street cleaning, separate collections
- Prevention through support for local Race Against Waste campaigns, Free Trade facility, Environmental Awareness campaigns and employment of Environmental Awareness Officers.

He stated the quantities of waste collected for recycling in 2006 and the number of facilities available for recycling including the provision of mobile collection for hazardous wastes. Pilot projects for the separate collection of household kitchen and garden waste have commenced in Fingal County and

Dublin City Councils and two treatment facilities have been identified for Ballyogan in Dun Laoghaire Rathdown CC and Kilshane in Fingal CC.

Mr Twomey outlined the Government and Local Authority Policy in relation to the segregation of waste and how the definition of 'residual waste' specified in the Proposed Decision would be achieved. This included the implementation of the WM Plan, the enforcement of the Local Authority Bye-Laws and compliance of the PPP Co. with the requirements of the proposed waste licence regarding inspection and waste quarantine.

Procurement process and PPP Co.

Mr Twomey stated that the procurement of the facility was by way of a public/private partnership. A public sector benchmark was approved by the DoEHLG and an Affordability Cap was fixed. From 1999 feasibility and site selection studies were carried out. In 2001, a Client's Representative was retained to advise the Dublin Authorities on the procurement and planning aspects of the project. In 2002 DCC began the procurement process and a total of thirteen proposals were received of which four were invited to submit final tenders with three being received. Elsam A/S of Denmark was considered to be the most advantageous offer and further contract negotiations were commenced however in this period Dong Energy Group acquired Elsam A/S. Dong decided to take on a project partner (Covanta) and in April 2007 DCC agreed to enter into a contract for the project with the Dong-Covanta entity which makes up PPP Co. A Project Agreement between PPP Co. and DCC was drawn up which Mr Twomey outlined in some detail. It includes the requirements of the PPP Co. in relation to the submission of reports and environmental performance, the employment of staff and public involvement.

Requirements of proposed licence

Mr Twomey outlined that the proposed decision set out detailed requirements in relation to the management of the facility including details of the personnel involved and the establishment of an Environmental Management System. In addition a Public Awareness and Communications Programme was required and the planning approval required a Community Liaison Committee to be set up which would have ten members to include DCC, facility operator, community and elected representatives. A community gain fund to support facilities and services which would be to the benefit of the community within the general catchment area is to be set up which will consist of a lump sum of €8million with €500,000 being made available each year. The operation of the fund would be with the agreement of the Community Liaison Committee and DCC.

Mr Twomey finished by stating that technical experts would deal with the various issues of concern that were raised by the objectors.

Mr Twomey resumed on 17/04/08 and read Document 26 -Details of Project Agreement- which outlined the requirements that the Project Agreement places on the PPP Co. including

- Waste inspection, segregation and removal of unacceptable waste
- Environmental Management, off-site cleanliness
- Reporting requirement – PPP Co. is required to submit an **Annual Operation Report** to DCC which includes reports submitted to the EPA and a **Monthly Operations and Gate Fee Report**
- Records – DCC requires the PPP Co to maintain and make available to DCC representatives specific records such as **Duty Operator's Records** which he listed.

He clarified that this information was available to DCC and that it may be available to the Community Liaison Group when set up. He outlined that the Agreement signed by DCC and PPP Co. is a commercially sensitive document and those aspects cannot be discussed but he went through the

general terms which were included in the submission on the objection submitted to the Agency in January 2008. He stated that there would be a DCC advisor on-site to supervise the construction and operational phases of the project.

Questions

Mr Twomey was questioned at different times and the questions/responses have been summarised for clarity. In some cases similar questions were asked by different third parties but are dealt with as a single composite response.

GP- Ms Wheeler asked if the 1989 Waste Management Plan meant that incineration was the only method for final disposal of waste and thus precluded other forms of treatment such as Mechanical Biological Treatment (MBT) being used and whether the councillors that voted for the plan thought it was to allow a cost-benefit analysis to be undertaken on the feasibility of thermal treatment.

She asked what kind of MBT was assessed to indicate that the effect of its use would be negligible on volumes for residual waste and if MBT used would we be able to satisfy the Landfill Directive. In relation to site selection she asked where the figures were in relation to truck miles and was there any assessment of the wind speed and direction on all the sites. She asked what were the figures for waste arising if there was enforcement of the Bye-Laws.

Ms Wheeler stated that the existing power stations could provide the heating for the District Heating System.

Ms Wheeler asked if any study was carried out as regards the energy content of the waste and the comparison of burning versus recycling.

She asked if the Health Authorities had been notified about the need to carry out studies on the flora and fauna and as such that they would be interested in carrying out a health survey

Response –Mr Twomey stated that it was the 1998 Waste Management Plan and that although a proposal was put forward to defer the adoption of the plan so as to carry out a feasibility study the councillors rejected that motion and adopted the Plan as prepared with the explanatory memorandum from the City Manager. This included a feasibility study of thermal treatment and of biological treatment and a siting study which were presented and accepted by the Council.

Mr Twomey outlined that he had dealt with the National Biodegradable Waste Strategy. Also during the consideration of the 2005 Waste Management Plan consideration was given to MBT however the conclusion was that with the separate collection system and central biological treatment the effect of an MBT plant would be minimal. A proposal for an MBT plant was received during the procurement process however the company went into liquidation. He considered that the Bye-laws were being enforced and there was an increase proposed in Litter Wardens.

The siting study was the focus of the ABP process and the handling of traffic and truck numbers and planning permission has been obtained. In terms of policy the wind speed and direction was not looked at although the air experts may have done some work on it.

Mr Twomey stated that a life cycle assessment of the various options was studied including the comparison of the energy usage in the waste. He outlined that the HSE is a Statutory Consultee and the EIS was sent to the HSE.

Labour –Mr. MacSithigh queried the definition of residual waste in the Bye-laws and the licence and how DCC would satisfy the requirements of the licence. He asked why recent Policy Statements by the Minister were not dealt with in the submission.

He queried the destination of waste trucks that do not go to incineration, the submission made by the HSE, the reference to the proposed decision of the EU on amending the Waste Framework Directive

Response – Mr Twomey stated that the definition in the licence required 'to the maximum extent practicable' and that this was met through the operation of the Bye-laws and inspection of loads. Also it should be noted that the contamination rate of segregated waste is low by European standards.

He reiterated that his submission deals with current policy as circulated and although he is aware of recent comments regarding changes to waste policy there has been no change notified as yet. The Minister for Environment has commenced a review of the National Waste Plan which will take some time to complete.

There is provision in the Waste Management Plan and applications on-hand for a landfill in Nevitt. He was not aware of the submissions by the HSE regarding hours of operation. He considered that the amendment of the Waste Framework Directive which contains proposals in relation to revising the classification of incineration as 'recovery' has undergone various stages and would be going to its final stages by end of 2008. The application is for a disposal operation and not for a recovery operation.

Sandymount & Merrion Residents – Ms Kelly asked if problems with the tunnel had any impact on the emergency routes to an from the incinerator and whether the chemicals for flue gas treatment were allowed through the tunnel. In relation to transport of waste from outside the Dublin Area she queried the distances that would be involved, if that was in line with the Proximity Principle and whether the sewage sludge displaced other waste inputs. She queried if the contract with PPP Co as stated on pages 24 & 25 of the presentation referred to the construction phase, what was meant by the Quality and Environmental documentation and who would appoint the qualified person. She asked about the availability of documents related to the District Heating System and stated that these should be available in the public arena and a discussion on the environmental impact of such a system discussed. Ms Kelly queried the destination of the wastes generated by the process and how the records related to incidents would be made available.

She queried the quantity of water that would be discharged to the Ringsend WWTP and issues related to upgrading the plant as outlined in Document 29. In relation to incidents/accidents she queried who would be responsible for making contact with DCC or other Agencies. She asked for details of the quantity of water taken from the mains and River Liffey in drought conditions and if details of income from the sale of DH has been studied.

Response- There have been times when the tunnel was closed but the only chemical that requires escorting at this time through the tunnel is petrol. There is a pilot project on-going in terms of escorting but no conclusions as yet. The Regional Waste Management Plans require that the waste arising in the Greater Dublin Area (includes Wicklow and Kildare) are taken into account in the sizing of infrastructure. DCC cannot predict if sewage sludge (currently 25,000t/a dried sludge) can continue to be sent to its current disposal/recovery outlet and so has proposed as a contingency to input up to 80,000 t/a wet sludge to the incinerator. There would be a reduction in waste truck movement as a result.

Mr Twomey stated that the obligations with regard to the PPP Co. applied to the operation and construction phases and that the company was required to submit its documentation to DCC for review and audit. He stated that DCC would appoint the person responsible for public involvement.

The facility can provide input to a District Heating System, the planning approval required a feasibility study to be carried out which will be published in June/July 2008 and the environmental impact insofar as it relates to the facility will be dealt with by other experts.

Mr Twomey stated that if the destination of the wastes generated was off-shore then the TFS regulations would apply but if on-shore documentation would have to be obtained and available by the Operator although its not included at present. The Community Liaison arrangement would be made aware of the incidents which the PPP Co were required to make DDC aware of within 5 working days of it occurring.

He stated that an assessment was undertaken to ensure that the Ringsend WWTP could take the stormwater and domestic effluent from the WTE plant. The WWTP is at its biological capacity but it can handle the flows. The extension to the WWTP requires an EIS and the cumulative effects will be carried out for this. The legal responsibility to notify incidents rests with the operator and this will be set out in contracts but the Fire Services etc are available as per normal and in accordance with the Local Emergency Plans. He stated that he felt that the issues related to quantities were dealt with in the EIS and other documents submitted. The commercial aspects of the supply of DH has been considered in terms of the loss of electricity to the operator but the details are considered commercially sensitive information.

Ringsend Env Group-Ms Windle asked what were the plans for the PPP Co or DCC to undertake a baseline health survey and follow –on studies in the area to assess the impact of the incinerator and if there was any liaison between health authorities and DCC. **Mr Cassidy** asked if the structural changes, such as the demolition of the Irish Glass Bottle Works, which have occurred in the area since 2006 had been taken into account in the application. He asked if there was a 'fail safe system' proposed and referred to issues with the WWTP since 2003.

Response – Mr Twomey stated that the health functions are vested in the Department of Health and the HSE. The EIS was carried out in accordance with legislative requirements and the HSE were a statutory consultee on the process.

In response to Mr Cassidy, he outlined that there were no changes to the application and that other experts would deal with the operational aspects. He stated that there were issues related to the operation of the WWTP but that all relevant documentation had been prepared for the WTE plant.

CRAI – Ms Corr queried the provision of segregation systems for flat complexes in local authority apartment complexes and the commitment of DCC to recycling. In relation to the sludges there are different numbers in different documents and she asks where does the 80,000t/a come from. She asked if the dried pelleted sludge could be exported rather than burned. In relation to truck movements she asked for clarification in relation to wastes moved from incinerator site. She queried the circumstances that would lead to the reject of a waste load and would all trucks from that area be sent back. She queried who was responsible for the waste between the plant and the quays.

Response – Mr Twomey stated that there is provision in some complexes for recycling and a contract is place that provides a service to all complexes. In relation to sludges there was 25,000t/a sent for recovery, 16,000t/a comes from houses with the remainder from commercial or industrial sources and he explained that the process of drying reduces the quantity of sludges thus leading to the higher number for wet sludge. There is no proposal to export the sludge but this is a contingency in the event that there is no other outlet.

If waste loads were rejected they would be sent back through the tunnel. Mr Twomey referred to the text and outlined that the spot checking may result in a load being sent back and may result in further loads from that operator being checked or even the banning of the operator. He stated that the responsibility for waste in law lay with the holder of the waste at any particular time and that the arrangements are not

yet in place as to whether it will be a broker or the PPP Co. The exact details of the recovery/disposal routes for the ash has not yet been finalised.

Mr. Bryan queried the Government policy that DCC has regard to and what is the status of the Ministers statements regarding incineration. He asked for the basis of the statement that incineration is a safe and proven technology considering that there is a large body of information on the internet in relation to incinerator accidents. He queried the sizing of the incinerator stating that 627,200 tonnes waste was projected as requiring thermal treatment in 2016. He queried if the trucking in of waste from the Greater Dublin area would lead to an increase in the CO₂ footprint. He asked if recycling areas were not accepting plastics due to the fact that it was needed for incineration and if MBT has been revisited in light of recent improvements in technology. He queried if the amount of commercial waste had been estimated and if they have a separate collection system and also what process was proposed for polystyrene wastes. He queried some of the statements on Page 6 of the text in relation to the economics of incineration in light of increased recycling of combustible material. He queried the issue of who controlled the plant in the event of an exceedence and the timelag that would ensue if the EPA control DCC and then DCC control the Operator.

Mr Bryan resumed at page 10 of Document 1 and queried waste prevention statistics, the use of RDF in the incinerator, the Dublin Waste Management (WM) Plans, range of services, prevention, and charges for waste services including the current variation to the WM Plan which may affect the commercial viability of the incinerator. He asked questions on the proposed biological treatment of waste, the definition of residual waste, BAT evaluation as per the BREF Document on Economics and Cross Media Effects and available data on other forms of recycling used by householders. He queried the possible inputs of hazardous waste in MSW, segregation in large fat complexes, enforcement and the level of inspection on incoming waste proposed. He queried the 'Affordability Cap' and the Diagrams in the presentation related to European treatment of MSW, the procurement process for an operator and the authority of the DCC representative on-site.

Response – Mr Twomey reiterated that DCC has regard to the stated policy of the Government and if this changes they will have to reassess the projects that they are pursuing. The statement was based on a feasibility study carried out on behalf of DCC and there has been extensive consultation and evidence presented on the health impacts of the project. He agreed that trucking of waste would probably increase the footprint and that it should be factored into the calculations. Plastic bottles are to be collected separately in the Green Bin as there is a market for this type of waste.

Mr Twomey stated that MBT had not been revisited since 2004. He outlined that the operators taking commercial waste were also collecting separated wastes but there was no outlet for polystyrene but a group (including Ms Kelly) has been set up to try to find an outlet. He stated that these statements were not his but that there were many reasons for incinerators closing down including inability to comply with new regulations.

He referred to the annual EPA report on waste arisings which showed that there is still an increase in waste at roughly 3% per annum. RDF was not considered for the DCC project as it has a higher calorific value than that considered for the MSW incinerator. The 2001 WMA Amendment was passed in the context of Local Authorities outside Dublin not agreeing Plans. Mr Twomey stated that the record of recycling is high and the amount of contamination is low in Dublin partly due to householders getting into the habit of recycling. As part of the review of the WM Plans consideration is being given to Prevention. He outlined that there should be no increase in waste charges due to the use of incineration as landfilling costs are currently higher. He stated that no waste permits had been revoked but that there

was a Variation to the Waste Management Plan. He outlined that in Ballyogan it is proposed to continue producing compost but no decision has been made with regard to Kilshane as it is still under tender.

Mr Twomey outlined that DCC didn't object to the definition of residual waste but that they wanted to clarify that they understood that the three bin system complied with the requirements of the PD. The 2006 BREF document was not specifically dealt with as the evaluation of the technology took place originally in 1996- 1999. An allowance is made for the number of home compostors that's being sold and a reduction in the waste arising due to this.

He stated that there were plans and programmes in place to try to minimise the amount of hazardous waste, including CFL bulbs, getting into the MSW streams through the provision of facilities at Bring Centres etc. He stated that segregation was being done in Apartment Blocks and that the design of new apartments included such facilities. He outlined that enforcement has stepped up significantly with a two-pronged approach at a National and Regional level. He stated that spot checking would be at 5% of incoming waste or whatever the EPA required.

Mr Twomey stated that in the event that the incinerator had to be shut there were alternatives for the treatment of waste, that in the event that the project was to cost more there would have to be further consultation with DEHLG regarding the costs. He felt the Figures demonstrate that incineration does not crowd out recycling but that some MS may have overcapacity due to the sizing not taking recycling fully into account. He outlined that looking at the waste arisings in the Dublin Region there is no indication to suggest that the incinerator is oversized.

He outlined that DCC were assisted in the Procurement process by a Client Representative (includes legal, financial, environmental and engineering consultants) who evaluated the tender documents. The proposed PPP Co is a wholly owned subsidiary of Covanta and Dong Energy who have extensive experience in the WTE business and there are clauses within the contracts to ensure financial agreements are kept. The DCC representatives on the site will be suitably qualified and report to DCC as required including the examination of the relevant reports. Mr Twomey considered that the EPA was the independent authority but they were going above that by having the DCC Representative on-site.

Mr McCarthy asked questions related to the author of the EIS and Non-Technical Summary and the sizing of the plant, the basis of the payment of the Community Gain Fund and the acceptance of sludges and their EWC codes. He queried the impact of the burning of sludge on energy output from the incinerator, electrical efficiency, and CO₂, incineration and landfill levies. He queried the transport and shipment of ash wastes particularly the bottom ash in relation to approximately 2% that fails testing (Danish example) as being unsuitable for recycling or where there is no outlet for the ash and it requires disposal in landfill in Ireland. He asked if it had been taken into account in light of current policy changes that all the CO₂ in the waste would be released immediately when it was burnt and asked for a Mass Balance.

Mr McCarthy asked several questions related to the name and ownership of the PPP Co. and he stated that Covanta had 510 shares with Dong having 490 shares. He also queried the financial status of Covanta vis a vis being in bankruptcy in 2002, the change from the PPP Co being the applicant for a licence, the roles of the Facility Manager, Project Representative and PPP Co Quality and Environmental Manager.

He asked questions about the source of waste, the fate of waste which fails spot checking and the recycling of plastics and ancillary sites. He had questions on the Submission on Objection of 28th January 2008 as to why there was no parent company termination guarantee as there is one from Covanta but not Dong, appointment of sub-contractors, Dong's involvement in the design of the plant

and he stated that there are 15 agreements in place between the companies which shift the responsibility and he asked for an outline of who really is responsible for the operation of the plant.

Mr McCarthy queried the factors that influenced the assessment of alternative technologies following the review of the Waste Management Plan in 2005 and asked if a revision of the document 'Technical Studies and Dublin Waste Model, 1997' which he states is the only document where the costs and energy are assessed.

He queried statements in Document 1, as to how a reduction in waste trucks would arise if the sludge from the WWTP was incinerated, the significant environmental effects, in Document 26 -the Project Agreement, health surveys and payment of any waste levy.

Response: Mr Twomey stated a team of consultants (RPS) dealt with the EIS and that it was prepared using the scope set out in legislation. The terms of reference for the project emanated from the Project Information Memorandum (PIM) but some of the figures may be out of date. A proposal came from the two-stage procurement process for a plant of capacity 600,000t/a. The Local Authorities waste input is expected to be 320,000t/a household MSW not including sludges however if the sludges are dried to 92% dry matter it will be about 26,000 tonnes weight but if dealt with as wet sludge it could be up to 80,000 tonnes which was what was applied for. The burning of sludge is a contingency arrangement and the Community Gain Fund of €1 per tonne imposed by ABP has not yet been finalised with respect to this waste nor has ABP given approval for the burning of sludge. He clarified that the only wastes being applied for was residual waste (MSW or similar non-hazardous industrial/commercial) and sludge (up to 80,000 tonnes) from the DCC Waste Water Treatment Plant but that they were unclear as to what EWC codes to use so they put down the ones that they considered relevant. He re-iterated that they did not intend to apply for burning hospital wastes but that they had applied for 600,000 tonnes of waste but he could not add further to the details provided by other Technical Experts on the assessment of the implications of the burning of wet sludge. Mr Twomey stated that drying the sludge on the WWTP also consumed energy that should be taken into account and that the detail of taking of dry or wet sludge into the incinerator has yet to be worked out. He stated that the electrical output and how it is priced is part of the commercial aspect of the contract and not available for discussion however if there is a provision in the contract to cater for changes in legislation such as the imposition of a CO₂ or incineration levy. DCC pay a landfill levy of €110-120 per tonne which is steady as we are landfilling to Arthurstown for some time.

Mr Twomey was not aware of the shipment of wastes being carried out in other facilities but he felt it was feasible but there was no provision for subsidies in the contract. There is a contractual arrangement to recycle the bottom ash where feasible and it will be tested when it gets to the destination but the service provider will make arrangements to have it dealt with if it fails. He stated that all policy and changes had been taken into account in assessing the impact of the proposed WTE .

The name of the PPP Co. is Dublin Waste to Energy Company Limited owned by Dublin Waste to Energy Holdings Ltd which is owned by Covanta Holdings and Dong Energy Generation. The applicant referred to in the Submission on Objection (January 2008) was the tenderers Covanta was assessed by the Client Representatives financial consultants and they met the criteria. Mr Twomey stated that the practice in the Dublin region is that DCC apply for the licences and hold the licence with the primary responsibility for compliance resting with DCC who then has contractual arrangements with PPP Co.

Mr Twomey outlined that the responsibility for the operation of the plant lay with the Facility Manager who has a requirement to comply with the contract and indicated that the EPA would be responsible for shutting the plant if there was an issue. Above the Facility Manager and Project Representative there is

a Management Committee with representatives of the company and DCC. The PPP Co Quality & Env Manager is not the same person as the Project Representative.

He stated that waste will be sourced from the Greater Dublin Area which doesn't include Meath. The waste arisings were revised in 2005 based on the 2003 data available but sewage sludge was not included. DCC's preference is to continue to recover biosolids by landspreading. Waste which is rejected will go back to a waste depot and a more suitable disposal location found with the cost being borne by the owner of the waste e.g. DCC or other broker. He stated that there were no ancillary sites and that the reference in the document was no longer relevant.

Mr Twomey clarified that plastics are still being accepted but that some specified plastics are no longer being taken at the recycling depot as they have to be separated and sent to landfill.

Mr Twomey said that he understood that there was a similar requirement in relation to guarantees from Dong and that there were collateral warranties with the sub-contractors but that they would not have a role in their selection. It was clarified on 18/04/08 by Mr Shipsey that there was no backing guarantee by Dong. He agreed that the subcontractors would be involved in the design, construction and operation of the incinerator and engaged in the procurement process but DCC have a role in the process via the Clients Representative. The EPC and OEM companies have been appointed (Covanta Europe Operations Ltd and Covanta Europe Engineering Ltd) following the grant of planning permission. Dong will be represented in the design phase of the project and DCC own the intellectual rights to the design of the incinerator. He stated that DCC would be the licensee and they would have contractual arrangements in place to deal with the operation of the plant in compliance with the licence in a similar way to Arthurstown Landfill and proposed for Nevitt Landfill.

Mr Twomey stated that the progress made in relation to each of the elements of the plan influenced the choice of technologies and there were significant financial commitments made in relation to incineration at that stage. The economic aspects of the plan were reviewed in 2005 taking into account the submissions made but he was not aware that the 1997 document was revised.

He clarified that the use of sludge would result in less MSW being taken into the plant and thus less truck movements. He was unaware of whether there was another contract but the Project Agreement was signed with Dublin Waste to Energy limited August 2007. The definition of significant environmental effects had not been defined as yet and there is no requirement on PPP Co. to carry out surveys of human health as public health is a matter for the Department of Health and the HSE and not the function of a local authority. He stated that there is a document prepared by Dr Staines within the EIS dealing with health issues.

Mr Twomey stated that there is no legislation regarding a levy on incineration and the contract allows for this to be dealt with at the time.

Tuesday 15th April 2008.

The oral hearing commenced at 09:30 and the timing of Dr Porters presentation was moved to Tues/Wed. Chair stated that there would not be an adjournment at this stage.

No. 6 Dublin City Council –Mr Claus Norgaard (15/04/08 – A - DD)

Mr Norgaard provided documents as background to his presentation (Documents 3, 14 & 15). He stated that he had a BSc in Mechanical Engineering which specialised in power plant design and thermodynamics and has worked with Dong Energy for 10 years mainly on waste to energy and project

management. He outlined the architecture of the building and how it was going to be transparent so that the flue gas treatment system could be seen from Pigeon House Road. There are two weighbridges proposed for incoming and two for outgoing waste and a right-turning lane on Pigeon House Road (which would give a capacity for 120 trucks per hour) to allow 50 waste trucks per hour to be received at the facility without queuing.

Mr Norgaard then described, showing photographs of similar facilities, the waste reception hall, bunker, viewing areas, cranes and feed hopper deck with shredder to shred large items such as mattresses that may be in the waste loads. He continued to go through the presentation and clarified that the lines shown were 24 tonnes/hour which is slightly smaller than the lines proposed but that the width of the boiler grate would be slightly larger. He outlined new technologies such as a water cooled grate (which acts as a primary NO_x reduction measure as less primary air is needed to cool grate) and inconel lining (which enables faster shut-down and start-up, reduces cleaning interval and working hours inside the boiler). Infra-red monitoring systems allow better control of primary and secondary air and grate movement to achieve improved burn-out of the waste.

He then showed the Capacity Diagram to explain the amount of waste that can be burnt in terms of the thermal efficiency. He used the diagram to explain how the quantity of waste to be burnt could range 25 - 41 tonne/hr depending on the calorific value of the waste on maximum load or 20.5-25 tonne/hour at 60% load. A 10% overload has been catered for as the waste is not homogenous and there might be a possibility of a waste with a high heating capacity being introduced. He stated that depending on the form of sludge being introduced its addition would change the heat output of the plant.

He then discussed the benefits of inconel lining from the point of view of fast start-up which means that within 3 hours the furnace has reached its operating temperature, waste can be introduced and the auxiliary boiler shut off. Likewise it can be shut-down rapidly. This is a significant advantage over the refractory lining systems which could take up to 24-48 hours to start-up.

In terms of the cooling water, in the event of a shut-down of one line, the quantity of water (thermal output) would be reduced by 50% within 3 hours or it could be prolonged if there was an environmental impact to 12 hours if that was deemed appropriate for fish life. There is an advantage to reducing one line.

Mr Norgaard describes secondary NO_x reduction method- the SNCR system- where ammonia/water is injected into the furnace at ~1000°C to ensure NO_x values are reduced to below the Incineration Directive requirements. On-line cleaning by ramping on the superheaters will avoid the need for soot-blowing and prolong operation to up to 5 years between maintenance shut-downs. The fly-ash is then collected.

He describes the different areas of ash collection – bottom ash from boiler/furnace section (~20%wt of input), boiler ash collected in 2nd and 3rd pass of the boiler, fly ash is collected from the superheater section and is much finer particles and finally there is the flue gas treatment residues which is a mixture of fly ash and treatment chemicals. The latter three will be mixed until the analysis of the boiler ash shows if it would be suitable to mix with the bottom ash for re-use/recycle. Sewage sludges would not have a major impact on the quality of the ash because in Dublin it is not very industrialised and there would not be expected to be high levels of metals in the sludge.

Mr Norgaard then described the flue gas cleaning system where activated carbon and lime is injected into the vertical pre-reaction chamber and also into the baghouse filter section. Experience has shown that the majority of the reaction to remove dioxins, mercury and other heavy metals takes place on the surface of the bags. The pH system determines the addition of lime to control HCl/H₂SO₄ emissions and scrubbers are also added to ensure that any spikes which may result from a high chlorine content

(PVC) waste are caught. A small proportion of the water from the scrubbers is re-injected back into the boiler line and semi-dry section of the flue gas treatment section.

He also detailed the location and operation of the waste inspection/quarantine areas within the reception hall. Odours would be minimised as the primary air for the combustion process is drawn through the hall leading to negative pressure during operation. There is one bunker with two feed hoppers feeding the lines and if the amount of waste was only sufficient for one line then the other line would be shut-down but if more than one line is needed it is proposed to operate both lines below optimal.

Thermal Efficiency section –

Mr Norgaard used his presentation to compare the energy efficiency of the proposed Dublin facility with other facilities in Europe. Poolbeg would have a net power output of 29% (i.e. of energy input the amount exported to the grid). The new line of the Amsterdam plant has a considerably more complex technical design (boiler and turbine) and this achieves a net power efficiency of 30% by using a reheat feature but on the other hand the complexity can lead to longer downtimes. It burns MSW and can burn sludge but is not currently doing so. The other plants have lower power efficiency (18-26%) but their total efficiency is much higher because they operate in backpressure mode i.e. they input to a District Heating system. If the Dublin facility was operating in full district heating mode it could have a total efficiency of greater than 90%.

He then explained the reason why the electrical efficiency is lower when you have district heating which essentially is due to the removal of heat from the a proportion of the steam which is then not available for the turbine. With no district heating the proposed plant would generate ~59MW_e which is the figure used in the climate model and is slightly more conservative than the EIS (60MW_e). The plant is being designed to allow for ~55MW District Heating production (and 48MW_e) and would need a retrofit to give more heat. If the boiler is operating at 100% approximately 0.2MW_e is lost for every 1MW district heating produced.

The Dublin plant has a gross power output of 66MW (from the shaft) but this is reduced to 59MW as there is internal usage of power in the plant (motors etc). The slide shows the total net efficiency as 29% which is without district heating. The internal power usage is calculated as 0.1MWh/t of waste treated which is in line with the BREF document on Incineration. He explained how the system could be changed as the season changes to produce different types of energy- heat & power.

Questions

CRAI- Ms Kane asked what measures were in place to prevent the waste coming off the wheels of the trucks and into their areas and there had been a previous problem with trucks from a coal distributor.

Response – Mr Norgaard regular maintenance of the reception area ensures that unlike a landfill there is very little waste on the ground. Coal is fine and black and thus a wheelwash would be appropriate but not on a WTE facility.

S&MRA – Ms Kelly queried if there was another entrance proposed as there are planning proposals to put new roads on the other side of the road. She outlined that these were not dealt with by ABP as they are more recent. She also queried if contamination from the adjacent cement plant would cause problems with the water intake. She queried how many lines were operational in Vestforbraending, Copenhagen.

Response – Mr Norgaard stated that this was the only entrance proposed by DCC. There is suspended particles in the Liffey water and this is catered for in the design of the plant and any spillage of particulate can be dealt with. He explained the route of the intake and discharge of the cooling water

and the course and finebar screens and pumps which can handle large particles. The condenser has a rubber ball cleaning system which is effective at removing any particulates. The cooling water will be taken in at 5-7.5m below sea level and so there will be no surfacewater debris taken in. Mr Kjaer Cowi A/S interjected to state that Vestforbraending had 2 new units in operation producing electricity and one old unit as a standby.

Lab – Mr MacSitigh queried where the waste inspection, segregation and quarantine areas and whether the spot check and visual inspection as required by the licence (Condition 3.5). He asked what was considered good industry practice for spot checking.

Response – Mr Norgaard agreed that a visual inspection would be carried out in the Reception Hall and that it formed part of the spot check, in addition there was a visual check from the control room and crane operator who has CCTV. If rejected waste cannot be put back onto the truck it will be quarantined in a painted section of the floor in the waste reception hall until it can be removed which is not the same as the waste inspection area marked in a different colour. Spot checking is usually frequent in early stages of plant operation. Mr Bahor (Covanta) stated that in the beginning it would be 1 in 10 as a deterrent and Mr Lee outlined that the Project Agreement has a detailed system for reporting by the Operator to DCC.

GP – Ms Wheeler asked about the net power efficiency at minimum load, if there are examples of smaller plant (140,000tonnes/annum) and in light of our mild climate is it possible to use waste heat in industry as process heat and what kinds of industry. She asked if the plant could accept diseased cattle carcasses or hazardous/hospital wastes.

Response – He outlined that the plant would be operating at full load when possible. The efficiency figures are not dependent on scale therefore a small plant would be as efficient as a large one and process heat for large industry can be extracted with a slightly larger loss of power than district heating. He indicated that Mr Galliot would deal with whether there was any such industry in the vicinity of the plant. Normally there is a separate feeding system for hazardous or hospital waste and that is not proposed here.

SF – Cllr Doolan asked for clarification regarding the minimum capacity of operation, if the design or a future modification could use the river to transport waste to the plant and can the plant burn wastes other than those listed.

Response – Mr Norgaard explained the 29% net power output and that the plant could accept waste from any mode of transport with modification and also burn other wastes with modification.

CRAI- Ms Corr asked how will the rejected waste to be removed from the bunker, how can the waste be rejected if DCC are the holders and where will it go.

Response – Mr Norgaard outlined that waste, such as a large refrigerator, would be detected by personnel in the Control Room and a roller shutter door can be opened into the Reception Hall to allow a crane and loader to remove the waste. The waste then will be put into the waste quarantine area. DCC/Covanta will deal with the other questions.

Mr Bryan queried if the design was completed and the ownership of the design and stated that no detail design had been made. He asked if there was an increase in mercury in feedstock would it have an impact on the design of the plant. He asked several questions in relation to the recovery, storage,

leachate generation and disposal, and transfer of bottom ash and indicated that if it was proposed to treat the waste in Ireland it would have implications for truck movements and the carbon footprint. He asked if nanoparticulate matter would be abated in the proposed flue gas system and if double bagfilter should be used to provide additional safety in case of a rupture and improve ultrafine particulate removal albeit with some loss of power output from the plant. He queried the stack height in the presentation in relation to the proposed licence.

Mr Bryan asked questions in relation to the use of air-cooled condensing. In relation to the control system (DSC/SCADA) he queried the level of built-in redundancy, the sensors/thermocouples to be used etc and indicated that the licence should require more detailed monitoring systems. He queried the waste inspection/checking system and the reliability of water-cooled grates, time lag from temperature measurement to grate speed change and in relation to truck deliveries the impact of a delay in waste movements.

He asked questions around the noise emissions from the Rapping system, sludge composition, dosing of activated carbon, air changes in the reception hall and raw flue gas monitoring. He queried if high levels of cement dust would affect the combustion system

Response – Mr Norgaard stated that the design has been made up to the level that is required by a licence application and will contain the inconel feature. A project organisation has been set up which includes Dong and Covanta who will deal with the detailed design of the facility.

He considered that the predominant mercury is particle-bound and would be collected in the baghouse filter. The lesser amount is vaporous and would be collected at the HCl stage of the 2-stage scrubber. Mr Bahor interjected that the bottom ash would be shipped off-site for recovery. A concrete bottom ash bunker is proposed to be 10,000 tonnes capacity with a residence time of one month although other incinerator sites removed the ash on a 1-2 day interval. The trucks would drive in and an overhead crane would load the ash into a truck and it is not expected that the composition (it is not fine but more like gravel) would be affected by storage time. It is not expected that there would be leachate pooling in the bottom of the bunker. The transfer of waste in the manner proposed is sufficient if it is to be sent by ship in the short term with a long term proposal of recovery in Ireland.

The baghouse filter system will collect the majority of the fine particles and in the flue gas cooler the temperature is reduced to 55°C which creates a mist which binds the fine particles and they get collected in the scrubber. He feels that a double bagfilter system is not necessary and BREF for Incineration does not consider it BAT due to a much higher internal power consumption.

Mr Norgaard outlined that the stack height was 100m but that it would be 105m OD. If air-cooled condensers were used there could be 10-20% loss in power output. Each line would have its own control system with redundant servers but common items such as the steam turbine would have two servers. All sensors are not duplicated but some are which means that if there is a difference between sensors the operator can determine if there is something wrong.

Thermocouples are to be used for monitoring furnace temperature but there will also be back-up as from a process point of view the SNCR system requires accurate temperature measurement.

He stated that in general the quality of the waste input depended on the amount of recycling being undertaken in the area and the decision regarding the waste being rejected but the system can cope with large items using the shredder. Sewage sludge is being burnt with MSW in other facilities and if it is wet sludge it will result in a small loss of power efficiency as a result of higher internal power usage. Following inspection and rejection a front loader would reload the waste to the truck and the floor would be cleaned. The grab is approximately 10m³ but can pick up PC screen or laptop. The reception hall is

kept under negative pressure with the combustion air being taken in through the openings (doors/curtains) which will insure that the odours are minimised.

The water-cooled grate systems have 20 years operational experience and are reliable enough to operate for short periods under air-cooled mode if necessary if there was a problem with leakage. There is a lag only of the order of milliseconds from monitoring to giving signal to grate and this is divided into four sections which allows different speeds to ensure burn-out. He outlined that if 10 trucks arrived at the same time the queuing facility (2-3trucks) on-site and in the right hand lane on Pigeon House Road would cater for this.

Mr Norgaard stated that it is an impulsive noise but hearing protection was not required in the area adjacent to the rappers and he clarified that the industrial sludge referred to in the application was sewage sludge from the Ringsend plant and the operation of the activated carbon dosing system where the volume added would be excess to ensure the removal of dioxins and furans as there is no continuous monitoring from those parameters. He stated that raw flue gas monitoring is carried out on the plant illustrated on the diagram but is not specifically proposed for Dublin however it is of limited cost and can be done if required. It would give more details showing the control of the system and is desirable from an operational aspect. He did not think that the cement dust would affect the system.

Mr McCarthy asked a series of questions around the design of the facility, the combustion efficiency of the plant, efficiency of the turbines and comparisons with the Amsterdam plant and the derivation of various power output numbers that were used in the documentation in particular in Dr Porter's calculations. He then asked more detailed questions around the selection of the various items of plant and how the cost of the plant could be so much less than that of the Amsterdam plant (Dublin €266m Vs Amsterdam ~€400m). He queried whether there was a local driver for the use of a second bagfilter and the removal efficiency of bagfilters for nanoparticles (<PM_{0.1}).

Mr McCarthy then asked a series of questions around heat, energy and mass balance calculations, the maximum mass of waste to be burned and the efficiency of burning sewage and industrial sludges. He asked for clarification of the types and quantities of sludge that were being requested. He asked for clarification of the expected normal hours of operation of the lines as it effects the efficiency data and the Dr Porters calculations.

Response -Mr Norgaard outlined that he and Mr Van Paulton were responsible for the design and were part of the Elsam Engineering within Dong Energy. Following the acquisition the other people that dealt with the design are still employed by the same legal entity and the company are still involved in the design of the Dublin facility with Covanta. He expects to still be involved in carrying the design forward. There was a team of design engineers that were involved in the combustion calculations and that although it is a conceptual design the main features of the project are in place. It was made public in the EIS that the plant would generate ~60MW_e to the grid and the comparisons in the presentation with other plant show that this is realistic. The 66MW is the gross power output which does not take into account the losses to internal power consumption and is not considered the most useful measure of performance. The input figure is 205MW. He did not know the efficiency of the turbine but the gross power output of the generator is expected to be 66MW_e which is based on a generic turbine design. He revisited the reheat aspect of the design of the Amsterdam plant and indicated that it was a more complex and less reliable system but did not think that it was a BAT requirement for incinerators. He also stated that the quality of steam from a WTE plant would be similar to a coal fired power plant but that the best electrical efficiency from a WTE plant that they operate was 21-23% as it operates in District Heating mode.

In the EIS and Climate calculations a conservative figure of 59.15MW was used. He stated that he did not do a cost optimisation of the turbine design but designed it on the basis of having less complexity. The main design considerations for selecting the boiler were the waste input at 600,000t/annum and the economics of scale which resulted in lines of 35t/hr grate lines which were considered reliable. The support burners will have refractory lining but efficiency is not affected by this.

Mr Norgaard outlined that the person charged with the purchase of bagfilters would decide if two bagfilters in series was to be used but that he did not think it was necessary in light of the local drivers such as air quality. The design as presented with bagfilters combined with scrubbers will result in the lowest possible emissions of nanoparticles and no monitoring is proposed or required in the proposed licence. He is also not aware of any measurement techniques for them.

He stated that the heat and energy balance calculations including a thermodynamic mass balance are in the documentation. A complete mass balance of inputs and outputs was not available. The figure of 80,000 tonnes/annum sludge was agreed by the PPP Co and DCC but the effect on the net power output will be small based on his experience but without the use of a calorific value for the sludge which depends on the water content. The sludge applied for is the sewage sludge from the adjacent waste water treatment plant.

Mr Norgaard clarified that in his experience the hours of for waste acceptance and removal off-site would normally be the same. Full load operation is expected to be in the range 7500-8500 hours per annum and Dr Porter used 8,000 hours in his calculations.

RISEG – Mr Cassidy asked if this was a 'turn-key' project and if a fail safe system was built in

Response – Mr Lee stated that Mr Twomey would deal with the issue of the project and Mr Norgaard indicated he couldn't deal with the fail safe issues

No. 7 Dublin City Council – Mr Olivier Gaillot (RPS) (15/04/08 – EE - PP)

Mr Gaillot read his submission (Document 2) which outlined the process for the implementation of a District Heating (DH) system in Dublin. He is an engineer with 10 years experience on waste to energy projects and works for RPS Consulting Engineers.

Feasibility studies have been completed and work has commenced on the early stages of pipe-laying in Spencer Dock with the supply of heat from the Poolbeg WTE being fundamental to the roll-out. District heating will use water as a transport medium for heat and will involve circulating medium pressure hot water in a large network through supply and return piping. In Europe it is a familiar and successful concept and he outlined the situation in Denmark (Aarhus), the UK (Sheffield) and Italy (Turin).

Background to the Dublin project

In 2002 Sustainable Energy Ireland (SEI) in a report entitled –The barriers and opportunities for district heating in Ireland- pointed out that the project needed a 'project champion' such as a local authority and DCC appointed RPS and COWI to examine the feasibility of district heating in Dublin and in particular the Dublin Docklands area. In 2006 the study was reviewed to take account of new developments and increased energy prices and a funding application was made to SEI to study a city-wide system. The study is being carried out currently.

Implementation Plan

The DH project will be carried out in phases starting with the local network in the Dublin Docklands based on gas-fired boilers. In future the network will be extended to new and existing developments with

heat suppliers such as the power station in Poolbeg and the CHP plant in Guinness. A key objective of the project is to identify large new build developments and the Docklands area was identified as such. The proposed system will include technical specifications and features such as individual billing and user control and these are summarised in a brochure – District heating for Dublin, 2003. A company will be appointed to run the system.

New Developments

The implementation of the 'Energy performance of buildings Directive (EPBD) requires that for large buildings district heating must be considered if available. An Energy Management Plan for Dublin is being developed by the City of Dublin Energy Management Agency (CODEMA) which may place a greater impetus on district heating as will higher energy costs and the Kyoto targets. Every kWh of heat replaced by district heating represents a saving of natural resources and a reduction in GHG emissions.

Poolbeg WTE

Mr Gaillot outlined that the recently published National Climate Change Strategy 2007-2012, the ABP approval and the EPA proposed decision support the view that the WTE facility would be a supplier of heat to the district heating system. In addition to providing increased efficiency the facility would also have less impact on the River Liffey with reduced thermal discharge and it would reduce Dublins reliance on imported fuel.

He concluded that DH is a modern, competitively priced utility that provides a cost-effective and environmentally sustainable utility for Dublin. The existence of the network is most important.

Questions:

S&MRA – Ms Kelly asked several questions around whether the DH would go ahead regardless of the Poolbeg WTE and whether the reference to potential users related to current planned development and how much of the information was in the public domain. She queried the proportion of heat in Sheffield and Copenhagen that came from WTE. In relation to the Dublin Docklands Master Plan (2003) she queried his interpretation of 'green design', the status of CODEMA, the company to run the scheme and any reduction in electricity output. She queried if wave power would generate heat, if DH would reduce the thermal input to the Liffey and if there was a financial gain from DH.

Response – Mr Gaillot stated that the proximity of the Poolbeg WTE to the potential users was important and he outlined that he was speaking of proposed and zoned areas and reports published by DCC in relation to proposed plans over a 50 year timeframe. He indicated that without a WTE facility the district heating may not happen on the same scale and may be developed as 'block heating'. He felt that Spencer Dock in itself justified the system but stated that only 45,000MWh is needed which is a small fraction of what the WTE can produce. The distance undertaken to supply a user would depend on a cost-benefit analysis which includes the pipe laying cost.

In Sheffield the majority of the heat comes from geothermal and in Copenhagen it is a combination of industrial sources. Much of the discussion with industry is commercially sensitive and not in the public domain. Mr Gaillot agreed that 'green design' could include better build and insulation, he was unsure as to the status of CODEMA but the company to run the scheme would be procured by a tender process. He stated that wave power would not generate heat for district heating and that the cooling water temperature would be reduced with district heating. The operators of the DH system would buy heat from the WTE facility.

CRAI- Ms Corr queried when the roll-out of the system would take place, how conversion would be done and what happens if WTE is not operating including variation in cost. She also confirmed that she

had written the section of the report referred to by Ms Kelly and that 'green design' at that time meant orientation of buildings etc and she also outlined that page 3 of the submission was a misquote. She asked in relation to the closure of the WTE in 30 years where would the heat come from. **Ms Kane** asked about the route of the pipelines.

Response – Mr Gaillot stated that roll-out had commenced using a gas source but that to optimise the system it would be preferable to have the Poolbeg WTE on-line otherwise new sources of heat would have to be found. A back-up boiler system would ensure a supply of heat and the cost would be agreed regardless of source.

Mr Bryan queried if the district heating system depended on the WTE facility and what the contingency plans were in the event that other industries were unavailable to connect or off-line. He asked what was known of the design since the type of WTE plant design depended on whether it was energy only or combined energy and heat.

Response – Mr Gaillot reiterated that the district heating system was going ahead but that the WTE facility would make it more affordable with a faster roll-out however there was no specific contingency plan in place. The provision of stand-by heat in the event of a heat source shutting down would be a matter of hours. He understood that the WTE facility was being designed on the basis that it would supply the district heating system.

RISEG – Mr Cassidy asked some questions around the differences between the use of boilers, green energy and a WTE plant for a heat source and whether the justification for the WTE facility was district heating.

Response – Mr Gaillot stated that a presentation on the plans for district heating was given to a CODEMA seminar which was attended by DCC Chief Planner. This dealt with the use of waste heat from all sources for district heating.

Adjourned at 17:00

Wednesday 16th April 2008

The oral hearing resumed at 09:30.

No. 8 Dublin City Council –Mr Hans Jacob Vested (16/04/08 A – K)

Mr Vested read his submission (Document 11) which outlined the background to DHI's involvement with the project, his qualifications and experience and recent projects he has worked on. He outlined through various slides the impact of the thermal plume on the River Liffey and the Synergen intake/outfall.

The model used was MIKE 3 which is a hydrodynamic and thermodynamic model developed by DHI and has been used by them since 2000. The model was set up and calibrated for the location by comparison with field data and information such as tidal elevations and specific data available from various studies of the area.

The cumulative impact was assessed by taking account of all the discharges of waste heat to the River Liffey as shown in Figure 3.1 of presentation. He stated that the temperature rise of the WTE facility relative to the intake temperature is predicted at 9°C for 98% of hourly values over a year operating at maximum limits. The possibility of recirculation of intake and outfall water has been taken into account.

Mr Vested discussed the impact of the discharge with reference to the Salmonid regulations (1988). He stated that no mixing zone had been defined for the Liffey Estuary and that the combined impact of the WTE facility and Synergen would be

- 25% of the cross section of the River Liffey would exceed 1.5°C above the unaffected temperature
- 25% of the cross section would exceed 21.5°C and
- 33% of the cross section would exceed 10°C (Nov- May)

Impact on the Synergen installation

Mr Vested outlined that the WTE cooling water intake is proposed for the outlet of the existing open channel that conveys cooling water from Synergen. The MIKE3 model simulations indicate that there may be an increase in the temperature of the intake to Synergen. The effect is most pronounced at spring tide. For the winter situation the maximum increase in excess temperature is 0.50°C and the average increase is 0.15°C. For summer the maximum increase in excess temperature is 0.76°C while the average is 0.20°C.

There were typographical errors in the document in relation to the numbering of figures and Figures 4.1, 4.2, 4.3 and 4.4 should read Figure 3.5,.3.6,.3.7 and 3.8

Questions:

Chair used Synergens objection to ask questions

- Point 1 & 2
Chair queried Synergens licensed thermal discharge as 250MW_{th}, flow is 8.4m³/s and ΔT as 9.0-9.5 but modelling appears based on lower figures.
 - Mr Vested said that in the EIS Chpt 12 the average discharge for 2004/2005 was used but the model was rerun with the new values which is what is presented here and were submitted with ABP documents
- Point No. 3 &4
 - This is dealt with in Figures 3.6 and 3.7 of Document 11
- Point 5
 - Validation of the plumes was undertaken in June 2004 by measurement of the plume and comparison with the simulated values – (page 6 Document 18) and the shape of the plume is comparable using the best estimate for Synergens output for that day as 7.6m³/s and ΔT 6.6°C.
- Clarification of last paragraph on page A-3-7 Document 11
 - Mr Vested showed the model simulation of the thermal plume and outlined that the plume would disperse and get to steady state after approximately 12 hours. He then referred to Figure 3.4 and the distribution of the plume across the channel but it referred to winter conditions. The location of the WTE and Synergen intakes was shown to be mid depth and below the warm surface waters.
 - The 25% is a simple calculation of the red colour in Figure 3.4 -

Ms Wheeler asked if the model was done with or without DH and why the waste heat from the other power plants would not be used for DH.

Response Mr Vested stated that it was without DH and he had no opinion on the other plants.

S&MRA -Ms Kelly queried the location of the wastewater treatment plant outfall on the presentation Figure 3.1 and the numbers in Table 4.1 in relation to the modelled values as they relate to the letter from Synergen. She queried the Bathymetric survey done by DHI. She queried the effect of the variation in waste heat being taken by DH at different times of the year. **Mr Price** asked if the plume spanned the width of the river and that a temperature of 21.5°C is alarming in terms of a salmonid river. He then outlined that the river was a salmonid river and asked if the cumulative intakes exceed the total flow of the river resulting in a recycling of the river. He questioned if the plume presented a barrier to the movement upriver of species including salmon. He asked if the tidal slacks (slow water either side of a tide) were considered and whether there would be an accumulation of heat during that period.

Response Mr Vested clarified that the WWTP outfall discharges through the Poolbeg ESB cooling water channel although it used to discharge directly at one time. He reiterated that for the initial EIS the model was run at the lower values but that the higher Synergen inputs were used subsequently and present here. At certain times the plume extends almost the entire width. The discharge from the abstraction points exceeds the flow of the River Liffey during summer but the location of the intakes and outfall is at a point where the flow is dominated by the tides and therefore the volume is much greater. Mr Vested stated that the boundary of the model extended up to the weir which is freshwater and simulates the distribution of salt. During the Winter period (30m³/s) there is a saltwater wedge lying in the harbour area and a freshwater plume at the surface.

He stated that DHI carried out the Bathymetric (sea map) survey in March 2006 on behalf of Elsam and the temperatures measurements were done in 2004 in June and April (~6days total). The model takes into account the movement of the plume during tide and the impact of the river currents. Since DH removes heat the thermal impact of the cooling water when DH was in operation would be reduced.

RISEG- Mr Cassidy queried the location of the outfall in relation to the WWTP and Synergen and any meetings that may have taken place. He asked what checking had been done on the data used and feels that DHI should have done so.

Response Mr Vested stated that the outfall would be shared with Synergen and that he had met with them a month previously. Input data regarding the WWTP was provided by Elsam/Dong Energy and he feels that those numbers were appropriate and they were checked against the EPA licences.

DCC- Mr Lee asked what the effect of DH would be on the thermal plume, the impact on the water levels below the surface layer and the relative impact of the WTE facility.

Response – Mr Vested outlined that DH would reduce the heat wasted to the environment and the plumes would be reduced. He also dealt with the middepth plumes and how there would be a decrease in the temperature e.g. surface layer has a temperature of 19°C but going down into the water column shows a decrease in temperature due to the warmer layer staying at the surface during the summer period (its less buoyant). The ESB Poolbeg installation is the largest thermal input to the estuary and is several times larger than the WTE facility. He outlined the history of DHI – environmental consultancy company dealing mainly with water issues founded in 1964 and now with approximately 650 people in 19 countries.

Mr Bryan asked the effect of location on the impact. He asked several questions around the limits of error of the MIKE 3 model, the effect of cold start-up of both plants and the effect of the closure of one of the power plants and inputs from new proposed developments and infills.

Response – Mr Vested agreed that there would be a different impact depending on the location and that is why they do the modelling. He outlined the model was verified using a study in Denmark where extensive measurement were taken and the uncertainty was calculated and published which was $<0.5^{\circ}\text{C}$ and the model was calibrated for the River Liffey against data collected for Elsam in 2004. The model assumes that the temperature of the cooling water is at maximum when entered into the channel and this the most conservative case as in reality the plants would start-up over a long period of time. If there were less thermal inputs e.g. the ESB Poolbeg there would be a reduction in the temperature of the thermal plume which would be a beneficial impact. The new developments were not taken into account.

No. 9 Dublin City Council –Dr Dorte Rasmussen (16/04/08 M –O)

Dr Rasmussen read her submission (Document 11) which outlined her qualifications and experience and recent projects she has worked on. She outlined the impact of the biocide use in the cooling water on the water quality. Conservative risk assessment showed that even if there was a continuous dosage of 1mg/l biocide no impact would be expected outside the outfall. The emission levels in the proposed decision stipulates a hypochlorite/chlorine level of 0.2mg/l (24hr average) and 0.5mg/l(max instantaneous). The effect of the cumulative biocidal discharges in the area was considered and estimated to be less than an order of magnitude lower than the concentration at which no effects on the water species is expected.

In response to queries from the Chair Ms Rasmussen provided the following additional information- The values used in the modelling were those of the original data for Synergen and therefore they should be a bit higher but the impact would be very low. There is no difference in whether chlorine or hypochlorite is used and the choice of biocides was undertaken after screening the documentation on biocides used including the BREF document which stipulates certain biocides for use in estuarine systems. A shortlist was then looked at in terms of impact and chlorine was chosen as the best environmental option.

Questions:

GP- Ms Wheeler asked if interaction was possible between the chlorine and other pollutants in the water particularly in relation to possible dioxin formation. She asked if the sediment had been analysed and if organisms had been tested by subjecting them to the biocidal concentrations.

Response – Dr Rasmussen outlined that chlorine is very reactive and will react with organic matter forming halophenones, halomethanes and chlorinated benzenes and alkanes. They are not considered to be bioaccumulative but they will stick to the sediment but it is not expected to be a lot. The risk assessment dealt with the organic matter content of the water and not its composition. She stated that no experimental work had been undertaken.

S&MRA –Mr Price asked her to elaborate on the chemical reaction products from the interaction with organic matter and whether there would be a public health or wildlife health issue

Response – Dr Rasmussen stated that different degrees of chlorination can be formed depending on the amount of chlorine and the organic matter. She stated that swimming in swimming pools would have a similar public health issue and no health impact assessment was done other than a rough calculation regarding eating fish which indicated that a lot of fish from the area would have to be consumed to reach the same level of risk as swimming in a pool.

Mr Bryan stated that the EIS outlined the choice of biocides. He asked if the outfall referred to in the presentation was the channel or the river, what were the methodologies used, whether the reactions with chlorine were temperature dependent and if climate change had been factored into the assessment.

Response – Dr Rasmussen outlined using a slide from page 7 Document 18 that the predicted impact area was just reaching into the river for chlorine/hypochlorite. She stated that there was a guidance document on how to carry out risk assessment and that was used but it is a generic method and not specific to the River Liffey and therefore likely to be more conservative. She stated that the reactions between the organic matter and chlorine were to some extent temperature dependent that climate change was not factored in. She agreed that if cooling water was not used it would not have an impact.

SF- Cllr Doolan asked if the WTE facility would undermine Irelands commitments under Kyoto but Dr Rasmussen had no response.

No. 10 Dublin City Council –Ms Eleanor Mayes (16/04/08 O –AA)

Ms Mayes read her submission (Document 9) which outlined her qualifications and experience and recent projects she has worked on. She outlined her involvement with the WTE project which included an assessment of the potential impacts on wintering wildfowl and recommended mitigation measures in the context of the Special Area of Conservation (SAC) and Special Protection Area (SPA) designations in Dublin Bay. She stated that she has been retained by DCC to carry out the requirements of condition 13(b) of the planning approval. She then dealt with submissions related to the EPA on the project:

Condition 5.5 and 6.10 – Although the potential for 'nuisance' is limited in comparison to a landfill site there will be some potential for birds and rodents to enter the facility and a control programme is necessary due to the potential for secondary poisoning of birds of prey. The legal requirements for the protection of birds apply nationally and are not restricted to designated sites. She outlined the control methods proposed based on the requirements of condition 5.5.

- Design considerations - a project ecologist and an accredited pest control service will be employed to liaise with the National Parks and Wildlife (NPWS) field staff to provide advice to the design team on exclusion measures such as internal cladding of the Reception Hall to prevent bird perching/nesting.
- Rodent control –The pest control service and project ecologist will liaise with the NPWS on the control and monitoring programme. The methodologies normally employed are snap traps, live trapping and use of rodenticides. She indicated that there was a new type of plant based rodenticide which appears not to result in secondary poisoning but she has no reference and cites the Barn Owl Trust as the source of current recommendations.
- Birds – The project ecologist is to develop a protocol in consultation with the NPWS for dealing with birds entering and remaining within the facility. Although all bird species are protected under the Wildlife Acts of 1976 and 2000 derogations are applicable to certain facilities such as the WTE plant under a Declaration made under Regulation 3(1)(A) of SI No. 254 of 1986. This specifies the species that can be controlled, the purposes for which the control can be carried out, the period of control and the types and methods which can be used. Some methods require a permit from the NPWS such as trapping and removal of bird species not on the Schedule.

Birds Directive (79/409/EC) and Habitats Directive (92/43/EC) – she refers to submissions which related to general breaches of the directives and also specific references to the impact of the construction phase and the air emissions.

- Impact of emissions to air on invertebrate and bird fauna in Dublin Bay – She refers to her Brief of Evidence to the ABP hearing (Document 9B). This outlines that the baseline survey of dioxin levels in sediments and the potential additional loading associated with the WTE plant over a 30year operational period were assessed in relation to UKEA proposed guideline levels which are based on the most sensitive species and life stage of fauna currently know (*Salvelinus naymacush*). The limit value is based on Biota Sediment Accumulation Factors (BSAFs) which take account of all routes of dioxin uptake. Table 5 of the Document lists the UKEA limit values and the measured values for six locations in Dublin Bay and shows that they are all below the limit values.
The predicted location of maximum deposition from the WTE facility is close to Sample Site 5 and modelling carried out by AWN Consulting predicted an increase in sediment PCDD/F concentration from 0.0848 ng(TEQ)/kg to 0.1071 ng(TEQ)/kg over the lifetime of the project. This is likely to be conservative as it did not take account of the impact of sediment transport and removal by tides. These levels are below the OSPAR natural baseline value of 1ng(TEQ)/kg. On that basis she concludes that waterfowl populations and the ecological integrity and conservation status of the area will not be adversely affected by the WTE project. She states that these issues have been considered as part of the EIA process by ABP and the EPA as not being in breach of the directives.
- Disturbance of birds during construction phase – Condition 13(b) of the planning approval requires mitigation measures to be taken and a monitoring programme before during and for 3 years following construction. The proposed temporary construction compound is zoned for industrial type development and is currently classifiable as spoil and bare ground habitat (ED2) using the definition of the Heritage Council Guide to Habitats in Ireland.
- Management of the former pitch and putt course is not within the remit of the WTE Project.

Questions:

S&MRA- Mr Price stated that he was a biologist and a member of Biology Institute of Ireland. He asked questions related to consultation with NPWS, limited species surveys available due to the NPWS being under-resourced and studies of the movement of species into and out of the designated areas (birds and aquatic species), studies of the bioaccumulation of dioxins in species and he referred to a survey of dioxin levels in fish in the Irish sea (Eugene Dixon- Fisheries Institute). He wanted a more detailed study of the aquatic systems to be included similar to that required for the birds by ABP – see his submission (Document 19 & 19A).

Ms Kelly asked if Ms Maye had only dealt with wintering species and she feels that the impact on the birds of the WTE facility outside the site should be addressed particularly in relation to the construction and operation under the Directives. She asked for information on sediment monitoring locations around the cooling water channel and the location of the 'compensatory habitat' which is a source of drinking water for the geese and other wildfowl and any impact of dioxins in the water from the facility. Ms Kelly stated that there was a lack of information and assessment around the impact of dioxin levels in these areas. Ms Kelly asked some questions regarding other species such as 'little egrets'

Response – Ms Maye stated that she had informal contact with the regional ecologist and local conservation ranger and that there were problems nationally with the number of conservation rangers available with rangers covering large areas. Formal consultation with the Development Applications Unit which would take input from NPWS and Built Heritage which may be on the website in relation to the

ABP hearing and it didn't anticipate any impact on terrestrial eco-systems. She restated that the legislation protecting birds applies nationally and not just to the designated areas. She outlined that the Bay and the birds within it are the main focus of her work and the proposed licence requires a study of the aquatic species. The dioxin in sediment in Dublin Bay was studied and she thinks it's the first study of marine and intertidal sediment in Ireland and most studies come from highly contaminated areas. Since the levels were low it was decided that there wasn't an issue in relation to other species.

She stated that shellfish are unaffected by dioxins as they don't have a biochemical mechanism and as dioxins are lipophilic they tend to accumulate in fatty tissue of higher invertebrates but not significantly above sediment levels. Bioaccumulation would occur up the food chain in animals that feed on the invertebrates. Ms Maye stated that she had dealt specifically with the wintering species but that **Mr Brian Madden** had dealt with the other birds in his terrestrial ecology inputs and he proposed mitigation measures around vegetation in the temporary construction compound.

She stated that the cooling water channel was not included as they were looking at intertidal sediments which were wintering waterfowl habitats and also the cooling water channel would be fast flowing and unlikely to accumulate the type of sediments being discussed. Mr Madden dealt with the tern and other species. The 'compensatory habitat' or 'Goose Green' as it is known locally is the subject of Condition 13(b) of the planning approval and the mitigation measures discussed earlier and the monitoring was commenced in November 2007. She carried out a total of nine counts (04 December 2007 – 10 April 2008) and she drew up transects for doing goose dropping counts at different distances from the proposed temporary compound and also noted other birds in the area. The UKEA limit values take in all sources of pollutants and the main source is food so the report addresses this issue. Section 8.2.2.3 of Document 9B deals with the potential additional dioxin loading from the WTE facility at Site 5 which is located on the southern side of the Great Wall and this was chosen as it is predicted to be the site of maximum deposition. It cannot be directly compared to the other area but this would be considered the maximum and the effect in other areas should be less. There has been no sampling of the soils in the other areas. Ms Maye stated that she saw a 'Little egret' to the west of the site of the construction compound on one occasion

Mr Bryan queried the existence and applicability of legislation and case law other than the Birds Directive in a conservation area. He queried the contracts that were to be drawn up by the PPP Co. and feels that Condition 5.5 is not adequate. He asked what the design measures proposed were and stated that birds should be controlled within the entire site not just the building. He asked if she had inquired from other conservation organisations (such as Royal Society for Protection of Birds) if there were any studies near industrial site and specifically Mass Burn facilities and its effect on the sensitive Birds areas. He queried if the EU limits for dioxins in humans was the limit of detection of the laboratory doing the tests and if levels below that were harmful but not detectable. He asked several questions around the mitigation measures, goose populations, monitoring of geese in the Coalfields site.

Mr Bryan asked Chair to invite the Conservation Ranger (Terry Doherty) to attend and Mr Bryan, Ms Corr and Ms Kelly stated that the coalfields site which will be a temporary compound during the construction phase was not dealt by ABP and is now not being dealt with here and objected to that on the basis of the EU Directives and cited a Judgement against Ireland on works got to do with the UWWTP.

Response – Ms Maye agreed that there were additional measures applicable to the habitat related to the birds including any threats from outside the designated area and this is catered for under the

assessment required in Article 6 of the Habitats Directive. She stated that the protocol for the Project Ecologist had been drawn up and agreed and that she was currently an employee of the PPP Co.

She outlined that the detailed design phase would consider the measures appropriate for the limitation of bird ingress in consultation with the NPWS Conservation Ranger who has a lot of experience with this matter.

Ms Maye stated that the UK guidelines was based on an extensive literature review. She outlined that the guidelines referred to no adverse effect levels and that there are studies in areas of high contamination.

She stated that the requirement for a setback was a condition of the planning approval and she had recommended a distance of 20m on the basis of her observations of goose behaviour. The peak count of goose populations last season was 3819 which was up on the previous year and generally they roost at night on the two lagoons in Dublin but may graze further inland. The geese seem to be fairly adaptable when it comes to finding grazing areas and have been found in previously unused areas however this may be due to the larger population and not stress. Monitoring of the Coalfields site has been carried out this year

GP- Ms Wheeler asked if she was aware of any other location where an incinerator was situated in an environmentally sensitive area such as an SPA or SAC. She asked which species were the most sensitive to dioxins as she felt looking at sediments didn't give a complete picture of the issue and was there a threshold that would affect the fish in Dublin Bay. She queried if there was a Conservation Plan for Brent Geese and whose job it is to protect them.

Response – Ms Maye didn't have any information on other locations and the UKEA guidelines were based on a fish species (Arctic Char) that were found to be the most sensitive and does not occur in Dublin Bay. The limit value is 2000ng/kg organic carbon and this is equivalent to 20ng (TEQ)/kg for sediments with an organic carbon content of 1% (Page 17 Document 9B). Ms Maye stated that legally it was the responsibility of the NPWS. There doesn't appear to be a conservation problem with the Brent geese at the moment and the population is expanding.

Mr McCarthy asked if herons were a protected species as they were sighted on the 'Pitch & Putt course'.

Response – Ms Maye stated that herons will use all kinds of areas but they do not breed on the site as the type of trees that herons use are not present and their nests are particularly large and noticeable.

No. 11 Dublin City Council –Mr John Brophy (16/04/08 MM –TT)

Mr Brophy read his submission (Document 10) which outlined his qualifications and experience, he joined EcoServe in 2004. In 2003 EcoServe conducted a baseline marine and estuarine ecological study of the area and in March 2006 they reviewed the baseline study and wrote the chapter of the EIS for the WTE facility.

He read his response to objections:

EU Habitats Directives

He stated that the SAC's in the vicinity of the proposed development are South Dublin Bay (000210) and North Dublin Bay (000206) and that the boundary of these sites is formed by the Bull Wall and the Great South Wall which enclose the Liffey and Tolka estuaries. In his opinion any effect of the proposed cooling water discharge in terms of thermal and biocidal effects would be limited to the vicinity of the

outfall and would not extend to the SAC's. He stated that emissions to air would not have a negative impact on the status of the designated sites.

Biocides and fisheries

Mr Brophy referred to the EIS and stated that the potential impact of the proposed facility on the aquatic ecology of the River Liffey (including fisheries) was addressed and also referred to the DHI work on the choice of biocide. He referred to Conditions 3.13.2, 3.14.2, 6.19 & 6.20 of the proposed licence which he feels deals with the Eastern Regional Fisheries Board submission and recommendations which include requirements for thermal and biological monitoring to be carried out within 12 months of the date of commencement of the facility.

He concludes by stating that the concerns raised have been addressed in the planning process and in the proposed decision.

He clarified for **Mr Lee** that the species referred to in the Salmonid Regulations were salmon and trout and that the reference to the 10°C temperature increase related to areas where reproduction takes place and that they did not reproduce in the estuary therefore that section was not relevant to this location.

Questions:

S&MRA - Mr Price asked for clarification on whether the River Liffey was a salmonid river and he then referred to letters from the Eastern Regional Fisheries Board to ABP and the EPA and asked about fish surveys as there had been no studies done since the 1990's. He asked several questions relating to studies of fish and dioxin levels in the fish in the River Liffey and stated that there was a dearth of studies of the ecology of the area either as a baseline and/or as a requirements to monitor the on-going impact of the facility once operational and that the Habitats and Water Framework Directives required this. He queried if there was to be an attenuation pond as recommended by the Fisheries Board. He stated that the EIS was flawed as he had viewed species in the area but these were not accounted for in the EIS and reiterated that the absence of seeing them was not evidence that they were not there. **Ms Kelly** stated that she would present photographic evidence of species present.

Response – Mr Brophy outlined that the Liffey was not designated a Salmonid river under the 1988 Regulations but that there was salmon and trout in the river. More recent legislation is the Water Framework Directive which aims to protect freshwater, estuarine and coastal waters. He stated that there was a significant amount of published data in relation migratory fish and thermal plumes and that a further study within the scope of an EIS would not be appropriate and he quoted two relevant books (Document 10A). He stated that a study in 1983 of a thermal discharge from Ironbridge power plant into the River Severn which caused the temperature to range 27-31°C over the width and depth of the river for over 45years (with ΔT of 5-9°C) there was no evidence of an impact on migratory salmon. Also in US another study showed that fish either avoid or continue their migration when faced with a thermal plume. The plume as modelled will not cover the entire estuary and as such the fish would be able to pass avoiding the plume if they wished. He was not aware of any Irish studies other than ESB studies which was not publicly available. ESB Ardnacrusha is a hydropower station and not relevant in relation to thermal plumes.

Mr Brophy outlined that no fish survey had been carried out for the EIS and that in his opinion there was no need to carry out a full study over a year but the proposed licence (Condition 6.19 & 6.20) and planning approval requires a fish survey to be carried out. The Directives require designated areas to be protected but the River Liffey has not been so designated for salmon. In relation to dioxin sampling these were taken in the sediment.

Mr Brophy did not know whether there was a proposal for an attenuation pond for surface waters. He felt that the work carried out for the EIS was sufficient and that although it would be ideal to carry out long term studies its not really realistic.

Mr Bryan stated that the Birdwatch Ireland website would provide details of bird counts. He queried the scope of the brief that EcoServe received from Arup and if too much heed was given to surveys and not enough to conservation and protection. He asked questions in relation to the ERFB letter (Document 19).

Response – Mr Brophy outlined that he wasn't with EcoServe at the time but in general the scope would involve a recording of the species present to provide a baseline for the EIS which would have regard to any SAC's or Conservation Plans. The aim is to protect the habitat and the survey is to identify the baseline and further survey would be to see trends or impacts that may occur. It would be preferable not to impact on the environment but that is not realistic so mitigation or engineering solutions should be used. Mr Brophy outlined that it was unlikely, due to plant practices, that contaminated water would arise as the impact of the biocide were dealt with by DHI.

No. 12 Dublin City Council –Dr Edward Porter- Air (16/04/08 CC-MM, 17/04/08 A –K, 22/04/08 M-S, 23/04/08 H-N, RR, 01/05/08 A-V)

In his initial presentation **Dr. Porter** read from his submitted text (Document 12) and questions were taken, however, on 01/05/08 Dr Porter submitted Documents 60 and 61 which revised some of the NO₂/NO_x and PM₁₀ data in his original presentation. Document 60 relates to the normalisation of data and Dr Porter outlined on 01/05/08 that following a review of continuous NO_x data, inconsistencies in relation to data between 2003 and 2005 were noted. The earlier data was normalised/standardised to 0°C (273K) when converting from ppb to µg/m³. Now all data have been standardised to 293K, which had the effect of reducing slightly reported values for the earlier period.

A second inconsistency was noted in the earlier data where NO and NO₂ were added in µg/m³ in error to get NO_x. The NO and NO₂ data were converted back to ppb (original measurement), then added and converted to µg/m³. This had the effect of increasing the NO_x data for 2003 to 2005. The NO_x is not used directly but used to establish the ratio between NO₂ and NO_x, which reduced from 0.81 to 0.78. However the default conversion ratio 0.75 NO₂:NO_x was used in the assessment.

Transcription errors occurred in the CALPUFF modelling run results relating to PM₁₀ and Table 6.2 in Document 12 didn't reflect the final model run.

Document 61 includes the update and to avoid repetition the summary below reflects the amendments.

Dr Porter summarised that the air quality impact of the WTE facility was assessed using AERMOD and SCREEN 3 and CALPUFF (for shoreline fumigation). Cumulative impacts of all major sources in the area, background levels, the proposed facility, existing industrial sources and traffic, was also assessed. The assessment had regard to published guidance and Directives and the AERMOD assessment used on-site meteorological data (2004 & 2005) which was compared with Dublin Airport data and the year which gave the highest ambient concentrations was on-site data 2004. A receptor grid measuring 20km by 20km, centred on the facility and with terrain information was used in the model. In addition boundary, residential and sensitive receptors (schools) were discretely mapped.

Conservative assumptions adopted include: for the cumulative assessment, emissions from the facility and all significant existing facilities were assumed to be operating at their maximum emission level and volumetric flow, 24 hours/day over the course of a full year and maximum predicted ambient concentrations were reported in this study even though, in most cases, no residential receptors were near the location of this maximum.

Dr Porter outlined that baseline monitoring of the existing air quality was undertaken at five locations in the Poolbeg area and two points located at Clontarf and Bull Island. Dublin City Council and EPA ambient air quality data was also evaluated in deriving appropriate baseline ambient air concentrations. He gave a summary of the monitoring results and stated that the data indicates a downward trend for nitrogen dioxide and particulate matter, sulphur dioxide levels are low, metals, HCl and HF levels are insignificant and levels of dioxins are similar to those reported in Ireland and lower than urban locations in the UK and Europe.

He stated that three scenarios were considered in the air dispersion modelling (typical, maximum and abnormal) using AERMOD. The results for maximum operation scenario (WID ELV's and max. volumetric flowrate) are summarised below from Document 61:

Parameter	Result at worst case sensitive receptor (including background)
Nitrogen dioxide (NO ₂)	62-80% of AQS ^{Note 1}
Sulphur dioxide (SO ₂), Carbon monoxide (CO), total dust (PM ₁₀ & PM _{2.5})	11-73% of AQS
TOC, HCl & HF	17-37% of AQS
Dioxins & Furans	4% above existing background
B[a]P (benzyl a pyrene)	20% of AQS
Hg	0.2% of AQS
Cd & Tl	43% of AQS
Metals (Sb, As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Tl, V)	19% of worst case AQS
As	24% of AQS

Note 1: NO₂ was used to select stack height of 100m and the facility accounts for 11% of the short-term NO₂ limit value

He stated that cumulative impact assessment indicated that the facility had no significant impact on the cumulative air quality in the Poolbeg and surrounding area and assuming all industrial facilities were simultaneously operating at maximum capacity for a full year, in addition to the WTE plant, levels will be significantly below all relevant air quality standards.

Modelling using CALPUFF has also been undertaken. The meteorological data is derived from surface meteorological stations, buoys, upper air stations and the output from mesoscale numerical weather modelling simulations. A receptor grid measuring 80km by 80km with terrain information derived from Shuttle Radar Topography Mission (SRTM) with 90m resolution was input to the model. The CALPUFF model results were summarised and Dr Porter stated that it confirms the conclusions of AERMOD and

SCREEN3 modelling that all air quality emissions from the facility will be in compliance with the ambient air quality standards.

Dr Porter dealt with issues raised in Third party Objections:

Issue 1: Shoreline fumigation

Shoreline fumigation may occur when tall stacks are located near shorelines however SCREEN 3 and CALPUFF model assessments showed that no exceedance of ambient air quality standards would occur under conditions of shoreline fumigation.

Issue 2: Baseline monitoring results

Dr Porter outlined that nitrogen dioxide and nitrogen oxides have been measured continuously at the IGB site (M1) over the period 2003-2007 and a correlation between NO₂ and NO_x has been derived which shows that at low concentrations of NO_x, there are high levels of NO₂. Nitrogen dioxide has been monitored at six other locations over the last four years with three locations broadly representing the average NO₂ in the region of SAC, SPA and NHA. These three locations have been averaged to determine existing and predicted NO₂ levels on an area wide basis in the region of the SAC, SPA and NHA.

He stated that levels of NO₂ have decreased over the period 2003-2007 and there is a protocol for deriving background concentrations in future years. Guidance from the UK predicts levels will continue to decrease in future years as a result of EU legislation which has focussed on reducing emissions from vehicles and large combustion plants. Using the recommended UK emission factors for future years leads to a predicted downward trend over the period 2008-2012. Using the correlation between NO₂ and NO_x and the measured and predicted NO₂ levels, existing and predicted levels of NO_x in future years was calculated and based on this analysis, the background level of NO_x in the SAC, SPA & NHA is predicted to be 22.1ug/m³ in 2012. He stated that based on an analysis of existing process emissions from the nearby power plants (1.0ug/m³) and the proposed additional traffic due to the facility (0.1ug/m³), the existing NO_x concentration in the SAC, SPA & NHA is predicted to be 23.2ug/m³ in 2012.

In relation to background levels of PM₁₀ Dr Porter stated that it indicates a gradual decrease in annual average data from 36ug/m³ annual average in 2004 to 30ug/m³ annual average in 2007. He took a similar approach as for NO₂ to predict future levels of PM₁₀ using the approach outlined in the UK DEFRA Publication 'Local Air Quality Management' for extrapolating from the current year to the year of opening of the facility (2012). The emission factor tool incorporates the predicted reductions in PM₁₀ concentrations in future years. Using this tool, levels in 2012 are predicted to reduce to 28.9ug/m³ as an annual average (including cumulative impacts and additional traffic due to the scheme). The UK guidance has derived an empirical relationship between the number of 24 hour exceedances of 50ug/m³ and the annual mean concentration. It is predicted that there will be 24-25 exceedances of the 50ug/m³ limit value (35 exceedances are allowable per year). The predicted 24 hour and annual average concentration is within the ambient air quality standards. The release of PM₁₀ from the facility will be very low and during maximum operation will account for less than 1% of the ambient annual average limit value.

The summary of the AERMOD and CALPUFF model results for PM₁₀ are set out in the revised Tables 6.1 and 6.2 of Document 61.

He then outlined that dioxin measurements averaged 20-21fg/m³ over the most recent survey period in 2007 which is similar to previous ambient measurements in urban and suburban areas of the UK and Europe.

Issue 3: Impacts on Wildlife, Flora & Fauna

Dr Porter referred to Annex VI of the EU Directive 1999/30/EC which specifies that monitoring to demonstrate compliance with the NO_x limit for the protection of vegetation should be carried out at distances greater than:

- 5km from the nearest motorway/dual carriageway,
- 5km from the nearest major industrial installation,
- 20km from a major urban conurbation.

As a guideline, monitoring station should be indicative of approximately 1000 km² of surrounding area. As a worst case approach, these air quality standards have been applied in the region of the surrounding SAC, SPA and NHA which covers Bull Island, Dublin Bay, an area of approximately 80 km² and he concluded referring to Tables 6.3 and 6.4 of Document 12 that current SO₂ levels are low and the impact of the facility will be insignificant.

He stated that mindful of the guidance in the Directive, the process NO_x emissions from the facility were averaged over the region of the SAC, SPA and NHA (80 km²) and in line with the approach to derive the background levels in the region.

Tables 6.5 and 6.6 in Document 61 show the results for NO_x based on this approach using AERMOD and CALPUFF and he stated that compliance with the ambient air quality standards for NO_x is achieved.

Issue 4- Dust, PM₁₀, microparticles, toxic metals

Dr Porter outlined that dust emissions were assumed to consist solely of PM₁₀ and the model results indicated that ground level concentrations due to the facility were less than 0.6% of the ambient annual limit value. In relation to metals, each specific metal has been modelled to ensure ambient levels are below the relevant ambient air quality limit values.

The proposed Directive COM (2005) 447 on ambient air quality and Cleaner Air for Europe (21/09/2005) has recently outlined proposals to revise existing air quality standards and proposed to set new ambient standard for PM_{2.5} of 25ug/m³ annual average by 2010.

The assessment also assumed all dust emissions from the facility were PM_{2.5} and ground level concentrations were significantly below the proposed air quality standard. Process contributions are less than 1% of the annual limit value.

No ambient air quality standards are expressed in terms of particle numbers or in size distributions. Dr Porter referred to a 2001 research paper by Zucher et al. which he stated concluded that waste incineration plants with up to date flue gas cleaning systems are not a relevant source for the emission of ultrafine particles into the environment.

Issue 5 Construction dust

He stated that a dust minimisation plan will be formulated for the construction phase and will include the implementation of a number of measures and procedures, such as road sweeping and road and wheel washing.

Issue 6 Dioxins, PAHs causing health impact

Dr Porter outlined that the modelling indicates that air quality standards or guidelines will be observed for all compounds emitted even under abnormal operating conditions. A cumulative assessment was also undertaken. The results show that the combination of emission limits laid down in WID and selected stack height are appropriate in ensuring that the ambient air quality standards are not exceeded.

Questions:

Dr Porter was questioned at different times and the questions/responses have been summarised for clarity. In some cases similar questions were asked by different third parties but are dealt with as a single composite response.

Chair asked for clarification on the extent of the new information submitted during the oral hearing.

Response- Dr. Porter identified the CALPUFF model assessment as new information. In addition the background monitoring has been updated to 2007 as monitoring has continued. In relation to Document 60 he considered that the errors in the NO_x data were minor. The raw data is in parts per billion (ppb) and is manually converted to µg/m³ for comparison with the air quality standards. For NO₂ the values reported are conservatively higher and he has checked every data point in his review.

Mr. McCarthy asked several questions related to particulate matter and concerns related to the assessment and monitoring of PM_{1.0} and PM_{0.1} and the quality of the Zurcher et al. paper on 'Ultrafine particles from municipal solid waste incineration' referenced in his brief (Document 22). He queried the initial project brief given by DCC how it had evolved and the raw data which was used in the assessment. He asked questions on Document 33, regarding the location, measurement, frequency of monitoring and confidence in the data and detailed queries related to Figure 6.4 of Document 12. He queried the exceedances of statutory limits particularly of NO_x and PM₁₀ in the baseline data gathered and asked detailed questions related to the comments by Dr Broderick in the ABP Inspectors report particularly in relation to the issue of predicted exceedances of the AQS and the CALPUFF model. He queried if the impact of odour and abnormal operating conditions, such as filter bag failure and the dispersion of dust from bottom ash loading at the quays had been assessed.

He asked questions, related to the flue gas calculation (Document 37), and in Appendix 8.1 of the EIS, the input MW of 112.8MW specified on the spreadsheet and the relevance to the capacity of the plant. Mr McCarthy asked questions related to Documents 60 and 61 and the identified errors in calculation of NO_x data and the significance of the increase from 23 to 27 µg/m³NO₂. He asked, with reference to the Excel spreadsheet downloaded from the DCC website (with extras), if the reported value of 26.9µg/m³ NO₂ (measured at all locations point 2004 on graph) was an average of averages having been derived from incorrect data. He considered that the error carries across all 4 measuring periods and through the NO_x and the reported average was lower than what should have been reported.

Mr McCarthy had questions regarding Documents 62 and 64 which contained the various legislation, standards and guidelines for particulate matter and the report of Dr Broderick (the ABP consultant engaged for the planning oral hearing).

Mr. McCarthy stated that the new material being presented by the applicant during the oral hearing was burdensome and oppressive with a new data being submitted with little or no time to review it available to third parties.

Response- Dr. Porter said that he considered recent publications could be up to 10 years old but what was important was how relevant the information was to the situation. In assessing dust he had regard to the relevant guidelines, namely the EU ambient air quality standards for PM₁₀ and the proposed CAFÉ Directive which specifies guidelines for PM_{2.5}. The ultrafine particles are a subspecies of PM_{2.5}. For particular fractions such as dioxins, the deposition and concentrations of a range of fractions, 0.3µm to 10µm, were considered but particle numbers were not considered. He said there are no standard for nanoparticles and that although the 2005 WHO guidelines identified health concerns for all sizes of particle they could not give guidelines at this stage. He stated that he was not an epidemiologist and would take the guidelines on face value but that it was possible that the challenges of measuring nanoparticles could be the reason that the WHO did not set a standard. The measurement of dust was carried out using a gravimetric technique.

In relation to the research paper he accepted that the paper was not peer reviewed in a respected scientific journal but still has value and **Mr Shipsey** later clarified that it was published in the Journal of Aerosol Science with the other authors being eminent professors with significant publications. Dr Porter confirmed that the paper deals with particles above 1 micron but could not provide details of the plants studied but argued that industrial installations might require anonymity to participate. He hasn't done a detailed search of the literature but didn't think that there was much information in relation to incinerators.

He stated that the initial brief for the study was dictated by the Waste Incineration Directive his own suggestions from his experience of other projects. Since the ABP hearing, Dr. Brodericks report was taken on board and consequently CALPUFF model assessment was undertaken.

Particle size studies

Dr Porter stated that particle size studies were undertaken looking at particles from 0.3µm to 10µm. The actual particle size distribution used was the USEPA default values. He also stated that his company do not undertake stack measurements but that there are a number of commercial providers. **Mr Brian Bahor** interjected and said that in their USA facilities they use the approved EPA methods for stack measurement of PM_{2.5}. The test method separates the solid particulate fractions into greater than PM_{2.5} and less than PM_{2.5}. While there is no specific size categorisation, as there is no measuring technique, there is the ability to look at the gas phase (vapour) that condenses and the larger particulate, so that the complete range is considered. There are test methods that can demonstrate compliance with the proposed decision limits.

Baseline data

In relation to baseline levels of PM₁₀ and predictions for 2012 Dr. Porter said that the PM baseline levels reported follows four years of monitoring at the site with 50% data capture and the data shows a clear trend in the annual average. In any year there will be fluctuation due to meteorological variation and thus the longer the dataset, the better it is to get trend. With 4 years of data you can extract some information in terms of trends. The continuous analyser (NO_x) has 32,000 hours of data, the diffusion tubes has about 300 points.

He stated that at the time of the ABP oral hearing there was 3 years of data and it was averaged. Now there is an additional year of data and all the data has been looked at in more detail and it shows a trend of improving air quality, in line with other European experience due to legislation causing reductions in HGV's and power plants. The most recent data is used as it is an indicator of air quality in future years and is most relevant. The background levels are now lower than that considered by Dr. Broderick.

Dr. Porter said for comparison with health standards, only M1 was used which is the worst case location. Bull Island monitoring results are only used in the assessment of the SAC to determine the overall background. He only used M1 (fixed monitoring location) for the baseline NO₂ concentration is 25.5µg/m³ for 2007. This number has been extrapolated to 2012 (22.7µg/m³), cumulative impact and the additional traffic (0.1µg/m³) are added to come up with a total background assessment (23.2µg/m³).

Dr. Porter said he had studied PM₁₀ exceedences by counting them and comparing to the allowable number and had reported these in the EIS. He cannot derive a trend from the number of exceedences due to variability year on year and there is no way to extrapolate to future years. The data captured at the site was 50% (3 month winter and 3 month summer monitoring) and there are difficulties in extrapolating this data to a full year to calculate the number of exceedences. Dr Porter agreed that the new background monitoring data presented at this hearing has been averaged but detailed monitoring data can be provided. The worst case year was 2004 and levels have been decreasing ever since. DCC wanted as good as possible background data and consequently the monitoring has continued and the data was made available on the DCC website during the course of the hearing.

Dr. Porter said that the readings in Document 33 were actual daily PM₁₀ measurements taken at the Irish Glass Bottle site from 2003 to 2007. The instrument samples continuously for a 14-day period and the batch of samples were analysed in the UK by an accredited laboratory, Bureau Veritas. For the period 2003 to 2004, monitoring was daily initially and then every second day, representing 25% data capture for cost saving reasons. Following a gap of 10 months, monitoring began again in January 2005 and continued to 2007 with 50% data capture (90 samples per quarter). Occasional problems with the instrument have led to gaps in the data. Dr. Porter considered the measurements representative given the extensive nature and duration of monitoring but he did not know how many measurements in total were taken.

In relation to the exceedences he said that the period of time is relevant and also that the data capture is not 100%. The 90th %ile of the data set and not the 36th exceedance is the important factor although it has not been presented here. He considered that there has been high levels of PM₁₀ and exceedences of the 90th %ile but when the data is analysed there are improvements and what needs to be predicted are the levels in 2012.

He outlined that the S2S project (Document 62) was a short-term survey with an episode from 8th to the 15th December 2001. The episode might occur once or twice a year. In relation to the baseline monitoring he has said that the data indicates that currently the 24-hour limit value is likely to be exceeded. However, the long term trend is downwards and using the data produced can look forward to 2012. The main source of the pollution is from vehicle traffic and the fleet is being rapidly replaced and there is going to be an improvement in air quality. The Large Combustion Directive requires the power plants to meet stringent limits. There is a momentum to improve air quality. This baseline monitoring report is an appendix to the EIS.

In relation to the EIS, he didn't monitor for the full year and therefore the exceedences were expressed as a percentile (90th %ile). He was concerned with the impact of the facility and in terms of particulates, it is insignificant as defined by the UK as the impact is less than 1% of annual average. Because it was an insignificant impact, a really detailed analysis of the data was less important. The number of exceedences is a difficult quantum to predict for the year of opening.

He didn't mention the number of exceedances of PM₁₀ in Document 12 as his approach is to use the empirical formula to derive the number of exceedances in future years. He accepts that exceedances are still quite high in 2007 but these are not used in the assessment.

The monitoring location was at the Point Depot (cycle way baseline 2001-2006) which was an urban background. He had acknowledged that exceedances occurred and he has highlighted them but he is only concerned with 2012 – the date of commencement of the incinerator.

With reference to Section 4.3 of Dr Broderick's report (Document 62) Dr Porter understood that the 90th percentile for PM₁₀ was in daily terms the 36 highest day but the percentile isn't in the Directive with the problem being that there isn't a full data set and therefore he couldn't look at the 36th exceedance in any one year. He had applied a 90th percentile rather than 90.41th percentile and agreed that the exceedance was approximately 10% above the standard.

Dr. Porter stated he did not agree with the statement in section 4.8 of that report that the air quality standard for NO_x was already being exceeded. He also stated that he was not involved in the site selection process and became involved in 2003.

In relation to background contribution from traffic and the change from 0.5µg/m³ NO_x in the EIS to the use 0.1µg/m³ NO_x Dr. Porter said 0.5µg/m³ was conservatively high. For the EIS, they did two assessments; a screening assessment (DMRV) and a detailed traffic assessment CAL3QHCR. This latter assessment gives 0.1µg/m³, which is in the original EIS. The traffic details was given to him for the opening year and 15 years later and this change was made between the ABP hearing and this hearing (page 19, Document 12).

He outlined that NO₂ data at various locations was measured by diffusion tube, which is a monthly average. The on-site monitor is a continuous NO analyser for NO₂ and NO_x data, giving hourly values.

UK Guidance and empirical formula

Dr Porter stated that he has studied the approved methodology to predict exceedances in future years and had taken on board comments by Dr Broderick in his report to ABP (Document 62). The approach taken, which is in line with the UK DEFRA publication on Local Air Quality Management (LAQM), was to assess the annual average and then use the UK empirical formula to assess likely exceedances in 2012. He explained that the empirical formula is based on data from the UK automatic network sites over the period 1997 to 2001. They looked at the correlation between the annual mean and the number of exceedances at 100 sites and the formula describes that relationship. The emission factor tool is used to extrapolate from current year to a future year. This tool is referenced in the LAQM but it is a spreadsheet known as the NETCEN on the AEA website and is used to forecast forward to predicted levels. When predicting forward you need to look at the annual mean in 2007 and the primary, secondary and residual fractions of particulate. The primary, secondary and residual fractions are based on a Dublin site in the EPA sponsored Jennings et al. publication on source apportionment of particulates. The primary, secondary and residual fractions was 42%,14%, 44% respectively. The residual fraction is not predicted to change from 2007 going forward as it relates to sea salt and fugitive dust which cannot be regulated. Primary and secondary fractions can be regulated and they have their own particular forecasted decreases in future years.

The UK have general recommendations on data capture which is; minimum 3 month data, preferably 6 months for seasonal variation and ideally a year of continuous data and he is satisfied that the monitored data meets the criteria.

In relation to the calibration of the NETCEN and LAQM PM₁₀ mean and exceedances forecasts with data from Poolbeg (Document 62) he said it was not reliable to use a small dataset and try to fit it. The LAQM was developed from 100's of stations over many years. He undertook a detailed cumulative assessment and air quality assessment in the region. He said a small dataset has variability as it not just influenced by local drivers but can be affected by regional pollution episodes from the UK and Europe.

In relation to forecasting exceedances, the mean is a better representation. He considered that conclusions cannot be drawn from the graphs as there is no full dataset (measuring every second day) and you need 3-4 years of full data to get detailed analyses.

With reference to the IPPC H1 extract, box 3.3.4 (Document 62), about the establishment of exceedances by multiplying background level by 2 the for short-term episodes and its application in this instance he said short-term related to 1 hour and it did not apply to 24 hour.

In relation to Figure 6.4 of Document 12 he said that the long-term trend in the average PM₁₀ data was being considered. A running 30 day monthly mean was carried out on the data measured (30 days averaged, looking at the next result and updating the 30 day period etc). This averaged out high and low values. The trend line was generated by excel and is an indicator of trend. The five data points to the right of the graph were generated using the emission factor tool. He conceded that in retrospect, the empirical relationship should have been used in the EIS to calculate the number of exceedances and that it predicts that there will not be an exceedance of the 24hr limit value in 2012.

He stated that for the purposes of the prediction of 2012 levels he used data from 2005 onwards (including 30 days from 2004). He didn't consider that the use of the 2004 data made much of an impact on the overall trend.

CALPUFF

Dr Porter stated that the shoreline fumigation effect was assessed using the SCREEN 3 model, which is very conservative. CALPUFF modelling was undertaken subsequent to the ABP oral hearing and the results can be directly compared to AERMOD. In terms of the process emissions, results from CALPUFF are lower than SCREEN 3. He referred to sections 5.3 and 5.4 of Document 12 for information on the CALPUFF model assessment. Figures 5.1a and 5.1b show the correlation between CALPUFF and AERMOD. CALPUFF explicitly deals with shoreline fumigation. The AERMOD model cannot deal with shoreline fumigation and the SCREEN 3 model gave conservatively high results. Dr Porter said he never used CALPUFF before but worked in conjunction with Joe Scire of TRC, the main model developer.

He stated that the CALPUFF input file related to maximum operation (WID levels) with the emission rates for PM₁₀ in g/s and the volumetric flowrate is actual. The EIS quoted the normalised flowrate, having been corrected for temperature. The facility can emit PM₁₀ at a rate of 2.29g/s for 3% of the time (30mg/m³ 100th%ile 1hour) but has also 24 hour and 97th%ile 1-hour limit values of 10mg/m³. He modelled the 1 hour maximum emission rate and then post processed to get the daily mean (divide by 3). Emission rates depends on averaging periods and what's relevant here is the 24 hour emission rate. He stated that all these models are linear, thus pollutants can be scaled with the exception of deposition. The original input for AERMOD was 1 g/s and then scaled appropriately.

In relation to section 7.28 and 7.29 of Dr Brodericks report (Document 62) Dr. Porter said that in line with the UK approach, he looked at the annual average without the facility and derived the number of

exceedances and then added annual average of the facility to the existing annual average and derived the number of exceedances. The models gives the annual average and daily concentrations. The reason for the reported exceedance in CALPUFF is the change in annual average. He can't predict the number of exceedances but said that an abnormal event will cause an exceedance which is predicted to occur once per year.

With reference to section 7.39 of the Dr Broderick's report regarding exceedance of cadmium annual average limit value Dr Porter said the results were based on a high frequency of shoreline fumigation, using SCREEN 3 and assuming abnormal operation for 60 hours per year for all pollutants with very high background levels. This assessment approach taken by Dr Shanahan is very conservative and reiterated that all SCREEN 3 modelling is now redundant as CALPUFF model assessment was undertaken.

He stated that although no specific air dispersion modelling of odour was carried out, in terms of releases from the stack, it was his view that odour will be insignificant due to the high combustion temperatures and low resultant concentrations of VOC's. This was a screening assessment of the odour risk.

Abnormal Conditions

Dr Porter said the abnormal operations which were assessed are outlined in the EIS and are pollutant specific. He considered the pollutant, concentration, frequency of the event and duration of occurrence and read from Appendix 8.1 of the EIS (page 9); total dust abnormal operation; 4000mg/m³ for 4hours, 5 times over a 5 year period and for Dioxins and Furans, 10ng/m³ for 48hour, once over a 5 year period. Normal levels for total dust is 10mg/m³. He outlined that the project engineers assessed the likelihood of abatement failure and its frequency and the concentration and duration of that occurrence and he used this data in his assessment. It was his understanding that for dust emission it would be bag filter failure. In relation to whether the 4 hour dust exceedance was averaged over the annual operating time for assessment purposes he said in terms of the air quality standards for PM₁₀, there is a 24 hour limit value as well as an annual average limit value. If this event occurred for a 4 hour period, that day will have an exceedance of the air quality standard. The standard allows 35 exceedances of the 24 hour limit per year. In the brief of evidence it was outlined that due to background levels in 2012 the standard will be exceeded 24 days per year but with an abnormal event that will rise to 25 days per year which is below the 35 allowable days. He stated that dust emissions from bottom ash handling were not considered in the modelling assessment.

In relation to Dr Brodericks report (Document 62) and in particular the criticism of his treatment of exceedances (section 2.9) Dr Porter accepted that in the Waste Incineration Directive there are 97thile 1 hour, 100thile 1hour and 24 hour emission limit for all the major parameters and he had re-run the model for relevant pollutants which are those with less than 24 hour limit values; NO₂, SO₂, HF and HCL.

With reference to section 7.14 of the report relating to Dr. Shanahans appraisal, about the maximum emissions for PM₁₀ (3%) showing a huge concentration of 3110µg/m³ Dr Porter said all of her modelling was based on SCREEN 3, continuous shoreline fumigation, high background levels, maximum operation of one hour when the relevant standard is 24 hour. He considered that the results were not now relevant as the issue of shoreline fumigation has been dealt by CALPUFF which did not show a particular concern. He stated that this has been the most detailed ever assessment carried out in

Ireland as it was the first time CALPUFF has been used for regulatory application in Ireland or the UK. It specifically treats shoreline fumigation.

Flue Gas Spreadsheet

Dr Porter said the figures he used are as outlined in the EIS. He said two scenarios were considered using typical and maximum volume flows. Maximum volume flow is 115% above typical. He agreed that the last figure on the spreadsheet (Document 37) (239,589Nm³/h) was not the typical volume flow figure (238,905Nm³/h) but very close. He said the model used actual flow rates (dry, 11%O₂, actual temperature), which are not reported in the spreadsheet. The spreadsheet was not the source material for his assessment.

He outlined that the only figure he used was the 59.2MW, which was the energy available for export but he thought it was derived from a total figure for the facility of 102.5MW. He agreed that the firing diagram of Claus Noorgard (Document 14) showed 102.5MW. He did not know how the MW figure or the stoichiometric volume flow was derived.

Errors in NO_x data – data normalisation

In relation to Section 4.2 of Document 61 the value of 23µg/m³ was a typo and was corrected to 27µg/m³. The diffusion tube data is corrected by using the continuous on-site analyser. Two diffusion tubes were co-located with the on-site analyser to generate a direct correlation. An on-site analyser has an accuracy of about 10% whereas the diffusion tube has an accuracy of 20%. The correction factor from the correlation is applied to all diffusion tubes.

With reference to the Excel spreadsheet and the NO_x data made available on the website he said the average of averages was what was been targeted. He agreed that what was shown wasn't right and that the error was not in his updated brief but accepted that the error occurred in the spreadsheet on the website. He proceeded to go through his correct spreadsheet. In terms of the SAC/SPA the three monitoring locations M2, M3, and M6 are relevant. The fixed monitoring station results have been updated to take account of inconsistencies. The raw data has been included on the spreadsheet this time. The annual average analyser result corrects the data for all the other diffusion tube locations. For the SAC, the measured average for the 3 locations in 2007 is taken (20.1µg/m³NO₂) and converted to NO_x using the default value 0.75. He used the UK year adjustment factor based on background NO_x reduction for future year. The current year NO_x is 26.8µg/m³, which reduces to 25.7µg/m³ and in 2008 comes down to 22.1µg/m³ in the year of opening (2012). The NETCEN tool was used for these calculations.

Legislation, Standards, Guidelines

Dr Porter outlined that his understanding of the current Irish air quality standards for PM₁₀ specifically statutory instrument of 271 of 2002 was that the standard was 40µg/m³ as annual average and 50µg/m³ as a 24 hour average which can be exceeded 35 days per annum. In the original Directive 1999/30/EC, there were two stages. Stage 1 standards are just quoted. Stage 2 had lower levels of 20µg/m³ as an annual average and 50µg/m³ for 24 hour limit value, not to be exceeded more than 7 days per annum. However, the CAFÉ Directive on Clean Air for Europe has been recently approved and will be soon published as a Council Directive. This Directive retains Stage 1 PM₁₀ but Stage 2 PM₁₀ will not come into force. Instead the focus is now on PM_{2.5}. The approach taken has been to improve the overall level of PM_{2.5} rather than focusing on hot spots as there is no safe level. The Directive has several standards

for PM_{2.5} including an absolute limit value of 25µg/m³ which is applicable in 2015 but should be achieved in 2010 and a guideline value of 20µg/m³. The Directive has also an average exposure index where each member state must define a background level of PM_{2.5} for urban areas and undertake reductions over a ten year period.

Dr Porter agreed that the Irish law requires Stage 2 to take place in 2010 but he said they won't come into place and he did not consider Stage 2 in his document.

In relation to the WHO air quality guidelines for PM₁₀ and PM_{2.5} and the discussion therein, the European Environment Agency reference that there is no safe level of PM (Document 62) he said he is an air quality consultant and takes the air quality standards at face value and he was not in a position to comment on the appropriate standard whether it's EU or WHO or to discuss the reasons for the statement 'no safe level'.

Dr Porter elaborated that the Irish regulations are a transposition of the Directive 1999/30/EC and it is almost word for word, however the third schedule is missing an important note. The footnote to Stage 2 in the Directive states 'indicative limit values to be reviewed in light of further information on health and the environment effects, technical feasibility and experience in abdication of Stage 1 limit values in Member States. That is why the proposed Directive specifies new ambient standards which removes Stage 2 as these were only indicative and after further experience in the application of Stage 1 is deemed unnecessary. He surmised that the missing footnote to the Irish Regulations is an error.

Dr Porter commented that the Café Directive submitted by Mr McCarthy is an earlier version but he thought it would require transposition into Irish legislation but it would have to be done quickly because the average exposure indicator for PM_{2.5} has to be measured in 2008, 2009 and 2010.

Ms Wheeler asked how well proven is the technologies to measure nanoparticles emissions and how those 1µm can be filtered out and if he had any information on correlations between PM₁₀ and smaller particles like PM_{0.03} and whether you can measure particles less than PM_{2.5} in size.

Response- Dr. Porter said Brian Bahor will deal with how nanoparticles will be filtered out. There are techniques available to measure down to 0.01µm. It is fairly new technology but not sure if it is commercially viable as yet as he is not an expert. He said as part of the study they co-located a second partisol and monitored PM₁₀ and PM_{2.5} and got a correlation between the two. Smaller particles than PM_{2.5} were not looked at. He believed that there are techniques but he had no personal experience in this type of monitoring.

Mr. Bryan asked if the model included provision for the new EU regulations regarding particulate matter and if maximum or abnormal discharges were considered. He asked what would happen if the mercury level was to increase significantly. **Mr. Bryan** and others raised the issue of the proposed development by the Dublin Dockland Development Authority, under a Section 25 scheme, of 100 acres of the Poolbeg peninsula and other proposed developments north of the Liffey. Recently DCC planning guideline is for 20 storey development in this area as set out in their 'draft Plan for Maximising the City's Potential: A strategy for Intensification and Height' and queried the effect of these developments on the results of the modelling.

Response- Dr. Porter said the new EU regulations incorporate all the existing standards, essentially unchanged and also specifies an air quality standard for PM_{2.5} of 25ug/m³ in 2015 and a target value of 20ug/m³. He has assessed PM_{2.5} and it is well in compliance with both the limit value and the target value. He said that for the cumulative assessment, the maximum emissions from the adjoining power plants was assessed but did not assess abnormal operations for these plants. He stated that the AQS

for mercury is $1000\text{ng}/\text{m}^3$ but cadmium, arsenic and nickel have AQS of $6\text{ng}/\text{m}^3$, $5\text{ng}/\text{m}^3$ and $20\text{ng}/\text{m}^3$ as annual average respectively. The emissions of mercury is expected to be equivalent to the cadmium emissions. He considered that the process emission would need to increase by a factor of 500 to exceed the AQS.

Dr. Porter said the modelling assessment considered the U2 tower, Point tower and the South Bank Road proposed development as they are in the planning process. Future developments should take account of the facility if it is in operation at that time. He said they modelled a large structure on South Bank Road (~500m) and the results would likely be similar for a comparable development on the Irish Glass bottle site, which were lower than the worst -case location. The short term limit values could be an issue at those locations. Buildings within 200-300 meters would make a difference but not necessarily higher results. A model would have to be run to know the effect as it cannot be extrapolated.

Mr. Mc Sitigh asked Dr. Porter about the difference between the CALPUFF and AERMOD results.

Response- Dr. Porter said the modelling results (Figure 5.1a and 5.1b) varied depending on averaging period. Very good agreement is observed between CALPUFF and AERMOD on short-term averaging periods. Greater variability is noted for annual averages. This is because of natural variability between the models and CALPUFF can treat shoreline fumigation and calm conditions. The limitation of AERMOD is that it can't deal with shoreline fumigation and has difficulty with calm conditions. The important point is the risk of exceeding air quality standards. The model results demonstrate that maximum process emissions together with background levels do not cause an exceedance.

Thursday 17 April 2008

The oral hearing resumed at 09:30 with questioning of Dr Porter which is incorporated above. During the day there were requests for adjournment by Mr McCarthy to have time to assess the additional data submitted by DCC particularly in relation to Dr Porters presentation and the list of waste codes submitted by DCC.

No. 13 Dublin City Council –Dr Feargal Callaghan (17/04/08 L –T)

Dr Callaghan summarised his submission (Document 23) which outlined his qualifications and experience. The brief for the project was to take the PCDD/F deposition data which was acquired by Dr Porter and predict the potential increase in soil PCDD/F concentrations and subsequent exposure to PCDD/F associated with the proposed WTE facility, for two theoretical individuals, the Maximum At Risk Individual (MARI) and the Typical At Risk Individual (TARI). The MARI spends all their time at the point of maximum deposition and obtains all their vegetables from that area and the TARI whose food is all grown outside the area and is more typical of a resident of the area.

He then explained Table E-1 and Figure E-1 of his document. The baseline PCDD/F for the MARI ($11.7\text{pg}/\text{kg body wt}/\text{wk}$) and TARI ($3.0196\text{pg}/\text{kg body wt}/\text{wk}$) and with the contribution of the WTE plant a 5.1% increase to $12.3\text{pg}/\text{kg body wt}/\text{wk}$ for the MARI and a 0.27% increase to $3.0278\text{pg}/\text{kg body wt}/\text{wk}$ for the TARI is predicted. The study concluded that the predicted PCDD/F exposure were less than EC Tolerable Weekly Intake (TWI) of $14\text{pg}/\text{kg body wt}/\text{wk}$.

He went on to outline how the study provides a very conservative assessment of the risk as it is based on multiple pathway analysis – Table E-2 of his document and also Table E-3 shows that he used the maximum allowable numbers for stack emissions, a non-residential area Sean Moore Park for the

location of the MARI/TARI and the soil concentrations which were higher than a suburban garden. He used the RISC Human Model V.3.2 (May 2005) which was developed by the Dutch National Institute of Public Health and Environmental Protection (RIVM). The maximum deposition rate shown by Dr Porters air dispersion model was taken and applied to the nearest land area - Sean Moore Park. Dr Callaghan went into more detail quoting from sections of the document.

He stated that the PCDD/F values for soil were referenced to NATO/CCMS TEQ but they needed to be converted to a WHO reference for consistency with EU intake values which resulted in the value of 10 ng PCDD/F (NATO TEQ)/kg being converted to 9.5ng (WHO TEQ)/kg. He then explained the need to convert the raw dioxin data to TEQ values using the Toxic Equivalence Factor (TEF) weighting concept which refers to the most toxic of the 17 congeners as set out by WHO or NATO/CCMS. In 2006 the WHO published a new set of figures which are different to those used in the Incineration of Waste Directive (2000/76/EC) with two of the congeners being given a lower weighting and thus lowering the overall toxicity but this has not been done in the current analysis.

In Section 5.4 of the document a theoretical accident scenario, emission of 10ng/m³ dioxin for 48hours, was assessed and the predicted impact was not significant.

Questions:

GP- Ms Wheeler asked if the issues of dioxins in breast milk and children living in the area and eating soil/blackberries were considered.

Response – Dr Callaghan stated that the EU Tolerable Intake (TI) was set with the likely exposure of a breast fed baby being taken into consideration but the RISC model doesn't incorporate the case of a child being breast-fed but that they are outside in the area and have dermal contact with the soil for long period of time. The model does take account of a vegetable garden and that all their food comes from that garden.

Mr Hawkins queried if an accident scenario where a ship containing the residues would sink in the harbour.

Response – Dr Callaghan stated that he had not considered that scenario and couldn't address the issue.

S&MRA- Ms Kelly asked if the use of the background levels from Sandymount Prom, which are higher, were used what the results would be. She queried the run-off of surface water from the WTE facility and if contaminated its possible impact particularly on other species.

Response – Dr Callaghan stated that the baseline would be higher and that would make the overall values higher but they are not calculated. The model looked at the top 7cms of soil and the run-off could be also by percolation. In relation to sediments the UKEA has a limit value for protection of fish and marine species which was presented at the ABP hearing but there was no assessment of the impact on birds from deposition. He stated that there were no models available that dealt with species other than humans.

CRAI – Ms Corr asked if any studies had been done on the shellfish in the area as people were eating them particularly the winkles. She asked if any tests were proposed on the health of the people currently living close to the site or the children playing on the pitches

Response – Dr Callaghan stated that the winkles were not tested but that dioxins were hydrophobic (low partition coefficient) which meant that they did not dissolve in water to any great extent and tend to stay bound to soil/sand particles. He stated that the testing of people wouldn't fit within his remit.

RISEG – Mr Cassidy asked if a global view had been taken of the issues such as accidents and Dr Callaghan's experience particularly in relation to Italy.

Response – Dr Callaghan stated that it did not form part of his brief to deal with process issues and that other experts would present on that.

Mr Bryan queried whether future planning proposals which might have roof gardens or climate change issues had been taken into consideration. He asked about Irish EPA standards and any update of background levels.

Response – Dr Callaghan stated that future planning proposals had not been taken into account and that climate change was not included in the model. The EPA rely on EU data and there has been no update of the background soil data since 2003.

No. 14 Dublin City Council –Mr Joseph Scire (17/04/08 V –Z)

Mr Scire of TRC Environmental Corporation read from his submitted text (Document 25).

Mr Scire assisted Dr Porter in the application of CALPUFF in the modelling of the proposed Dublin waste to energy facility and background sources. He stated that he was the principal author of the CALPUFF model and co-author of the building downwash module, PRIME, used in AERMOD and CALPUFF.

CALPUFF was used to address the potential for coastal fumigation, stagnation and recirculation associated with the land-sea circulation. The assistance provided involved CALPUFF modelling in parallel for the worst case year 2004. A comparison of the final TRC and AWN CALPUFF simulations showed a high level of agreement.

CALPUFF is a non steady state model that allows the spatial variability of the winds to be accounted for in the modelling. It uses meteorological data from many locations to develop a 3D wind field. CALPUFF treats shoreline fumigation, calm wind conditions and plume recirculation.

CALPUFF results were generally higher than AERMOD especially for the annual average concentrations but CALPUFF modelling confirmed the conclusions of AERMOD regarding compliance with the relevant air quality standards.

CALPUFF modelling includes emissions in the fine and ultra-fine particle size range. In modelling PM₁₀ and PM_{2.5}, the simulations were based on a distribution of mass with a geometric mass mean diameter of 0.48µm and a geometric standard deviation of 2µm. CALPUFF takes this information and then resolves the distribution into 9 particle sizes ranging from 0.04µm to 5.64µm. The USEPA recommends using a mass-based PM_{2.5} as an indicator of fine particulate matter and for its PM ambient air quality standard (Federal Register, Vol. 71, No. 200, October 17, 2006, page 61163). In terms of the facility, the CALPUFF model results indicate a minor impact on PM_{2.5} and PM₁₀. The facility impacts (0.41µg/m³) are predicted to be well below the proposed EU PM_{2.5} standard of 25µg/m³. With background PM_{2.5} concentrations considered, the cumulative impact was predicted to be 10.3µg/m³.

Question:

Mr. McCarthy asked Mr Scire to define ultrafine and fine particles, about the study of ultrafine particle with reference to size, number and effect. He asked about CALPUFF operation in relation to statistical techniques, model time steps, sub-hourly events, input data and size distribution considered and the modelling of ultrafine particles. He asked about short term acute episodes and the precision of the model and queried if the models can assess them as they are averaged across an hour.

Response- Mr. Scire said 0.1µm or less is ultrafine and he had studied 9 different size categories - the upper and lower limits were 0.04µm and 5.64µm with two sizes were below 0.1µm; 0.07µm and 0.14µm. Seven of the 9 categories were larger than 0.1µm. The model studies mass not numbers. All of the particle size categories within the PM_{2.5} cut-off are used to develop a total mass based value that is then used to assess compliance with the proposed EU air quality standard. Subsets are not taken as there are no standards for other particle sizes.

Mr. Scire said the use of 98%iles relates to short-term averaging times but in this case, the annual average (0.41µg/m³) includes 100% of predictions. The value is taken from point/receptor of maximum impact. The shortest period of time is 1 hour and although the CALPUFF model is capable of simulating sub-hourly time periods in this particular simulation a time step of 1 hour was used.

The inputs in terms of emission rates and stack parameters were identical to the values Dr. Porter used in AERMOD. The scenarios considered were the limit emission rates and abnormal condition values. Mr. Scire clarified that they used a different size distribution. In CALPUFF the size distribution was based on the USEPA recommendation and AERMOD uses a size distribution of AP42 factors. CALPUFF website contains information on the USEPA default values. The difference primarily is that CALPUFF uses lower size particles than AERMOD. AERMOD uses AP42 source which is a list of emission factors for different types of sources. CALPUFF would model with USEPA defaults, which is more conservative as most particles are smaller and thus the depletion rate is lower.

The distribution by particle size is computed internally by the model and is a calculation based on log normal distribution applied with a geometric mass-mean and geometric standard deviation. The values computed for the different size categories are as follows:

µm	% mass
0.04	0.09
0.07	1.22
0.14	7.8
0.26	23.7
0.48	34.3
0.89	23.7
1.65	7.8
6.05	1.22
5.64	0.09

In relation to deposition, the rate of deposition of very small particles increases due to Browning Motion. There is a minimum of particle deposition, in roughly the 0.1 -1µm range when none of the three mechanisms (gravitational, inertial impaction and Browning Motion) is very efficient.

For this distribution, there is likely to be less deposition than the AERMOD model.

Mr. Scire said the model attributes 1.3% of the mass to ultrafine category. The size distribution is realistic and based on USEPA recommendation as there is no source with 100% of particulate matter

emitted would be in the size range of less than 0.1µm. Mass and number are related and are based on the inverse cube of the diameter. This is the reason that models account for the particle size distribution. CALPUFF can model ultrafine particle only. The modelling undertaken took into account the appropriate portion of the ultrafine.

He agreed that as there are standards for 24 hour and annual it was prudent to use 24-hour averages and annual averages to assess the impact of the incinerator.

Mr. Scire could not recall a case for regulatory applications where they looked at deposition or concentration of less than 1 hour. The model itself can accommodate sub-hourly intervals for certain types of events such as explosion. For stack emissions, the normal time-step is one hour. For regulatory applications, the models are run so that emission rate and the averaging time for the standard are related i.e. average yearly emissions for annual average standard. Where the averaging time for the standard is one hour then it would be appropriate and standard practice to take a 10 minute excursion and average for one hour.

Mr Scire stated that he would supply the CALPUFF modelling information requested and outlined that he could provide the model output files that will contain the average concentrations for each of the receptors with a summary table for the largest overall receptors for only 24 hour and annual averaging times. However the input file to the meteorological piece is in the order of gigabytes as it is 3D, the input file for model options and output file are relatively modest.

Friday 18th April 2008

The session started at 09:30 with presentations by Sinn Fein representatives and was followed by questioning of Mr Twomey. Ms Jennings listed outstanding documents which DCC were to supply and Mr Shipsey stated that an energy and heat balance other than that provide by Mr Norgaard would not be presented and that they felt that it was dealt with the issue.

No. 15 Sinn Fein –Ms Mary Lou McDonald (MEP) – (18/04/08 A –C)

Ms McDonald (MEP) outlined her concerns about the incinerator project for Dublin relating to the environment and human health and felt that the precautionary principle should apply particularly as the incinerator would be sited in close proximity to a densely populated area and that it had not been taken sufficiently seriously by the proposers. Noise pollution and traffic hazards and the right of citizens to enjoy their home has not been sufficiently factored in.

The capacity exceeds requirements and therefore it incentivises the production or the import of waste which goes against waste reduction. In terms of the EU, incineration remains at the lowest level of the waste pyramid and moratoriums have been placed on incinerators and the focus has moved to setting targets for recycling and re-use. By attempting to meet landfill targets Ireland may face fines as we fail to achieve recycling and re-use targets.

A petition was brought by the residents to the EU Parliament and she quoted from the letter read in by Mr Cassidy (Document 6). She feels that the EPA should not have moved to this stage of the process without confirming the compatibility of the project with EU Directives.

Questions:

DCC- Mr Shipsey asked for the name of countries that had a moratorium on incineration and to clarify her understanding that incineration was the lowest level on the waste hierarchy. He queried where in the EIS was there evidence that DCC had not taken the project seriously. He asked if she was aware of an EU parliament decision Monday 14th April 2008 that classified incineration as waste recovery.

Response – Ms McDonald mentioned Canada and certain provinces but was not aware of any EU countries other than that there was a debate around the use of incineration and maintaining it at the lowest level of the waste pyramid which she stated she would provide document on (none were received). She stated that the Environment Committee may have voted but the procedure would require it to come to plenary where it would be voted on.

GP- Ms Wheeler thought that the 'recovery' referred to in the EC decision was energy recovery and that incineration was not to be classified as recycling, reduction or re-use. She asked that the Precautionary Principle be explained.

Response – Ms McDonald said that the Precautionary Principle had legal effect and that policy decisions are required to protect public health over other considerations.

Mr Bryan asked if a full baseline health assessment should be carried out.

Response – Ms McDonald felt that if this was not carried out the proposer did not take it seriously.

Lab- Mr MacSithigh asked what process would be followed in light of the letter from the Petitions Committee.

Response – Ms McDonald stated that it was significant that the letter outlined the doubts of the Committee but the Committee is limited and it falls to the domestic authorities and the Commission to act on the issues raised.

RISEG – Mr Cassidy queried the European process/procedure in terms of further hearings or actions.

Response – Ms McDonald was not aware of what would happen next but felt that there would be further action.

S&MRA- Ms Kelly asked if the Water Framework and Biodiversity Directives should also be taken into account by the Petitions Committee as they had not been taken into account in the EIS.

Response – Ms McDonald stated that these could be taken into account but that the Petitions Committee had identified certain provisions and they would likely deal with additional relevant legislation.

No. 16 Sinn Fein –Cllr Daithí Doolan – (18/04/08 C–F)

Cllr Doolan stated that two documents (Documents 16 & 17) had been submitted in addition to the objection and he would not be reading from them. He outlined that he was not an expert but that he had a mandate from people in the area who don't want an incinerator in the community. He set out his objection:

- Traffic – ABP failed to grant permission in the 1990's to a similar project on that basis and he feels that this is still relevant particularly if there is to be a more densely populated residential area.

- The EIS should be revised to take account of the need for a community liaison committee, environmental education and improvement projects as outlined by a DEHLG policy statement (1998).
- The section in the EIS on noise does not adequately assess the impacts during construction and operation phases.
- The proposal contravenes the Dublin City Development Plan (2005-2011) which zoned the Poolbeg Peninsula as Z7A which relates to employment, heavy industry but excluding incinerator/WTE. Policy U4 of the Plan states that the elected members of DCC oppose the siting of an incinerator on the Poolbeg Peninsula.
- Health Research Board report should be taken into consideration particularly that the skills and resources necessary to undertake health and environmental risk assessments is in place before the incinerator is granted permission.
- He thinks that a number of areas have adopted a Zero Waste strategy, Edmonton, San Francisco and New Zealand and that this should have been attempted in Dublin.

Cllr Doolan then gave a history of the issues related to the adoption of the Dublin Waste Management Strategy. He also outlined that it was not a level playing field with up to €20million spent on this project by DCC with €13million going to one company and the resources that have been given to the community. He stated that if the incinerator is built it will have to burn waste to remain financially viable. He referred to Covanta's operation in the US and quoted press statements related to pollution violations in various US plants. He also outlined that there was a similar contract situation between Covanta and Hillsborough, US and how the costs had escalated during the project.

Questions:

DCC- Mr Shipsey asked what countries had a moratorium on incineration and where the data in relation to Covanta was obtained.

Cllr Doolan stated that he believed France had from something he heard at a meeting he attended. In Edmonton there was a Zero Waste policy and no incinerators would be built. He felt that the decision to build an incinerator in Dublin was a political one, with the Protection of Environment Act amending the power of the elected councillors to allow it to go ahead. He feels it did not relate to scientific facts and it was unviable if high levels of recycling are attained.

The information in relation to Covanta was found on a website (www.renewableworld.com) and he had no further information in relation to the fines or the legal framework in the USA.

S&MRA – Ms Kelly asked some questions around the City Development Plan and compulsory purchase orders (CPO) on the site.

Response- Cllr Doolan agreed that the City Development Plan is a reserved function of the councillors guided by legislation. It is a broad document with many policies and objectives around developing the city in a holistic manner and the incinerator would have a negative impact on the plan. He had no information regarding the CPO status.

RISEG – Mr Cassidy asked questions around waste re-use/recycling and the views of the elected representatives in the area. He referred to maps in the EIS and the proximity of proposed housing. He queried the powers of the DCC councillors.

Response - Cllr Doolan outlined that waste should be looked on as a commodity and not a problem. Waste should be reduced and re-used where possible and the recycling should be then used where

possible and money should be invested in a recycling facility rather than incineration. He stated that there were some concerns that houses built on an old 'dump' site were causing health problems. Cllr Doolan stated that he as far as he was aware all the elected representatives were against the incinerator including Mr McDowell.

The Dublin Docklands Development Authority and the Dublin City Development Plan seeks to develop the area into a residential area and agreed that this was contrary to the maps supplied by DCC. He stated that there were several motions passed against having incineration but that the City Managers appeared to disregard the wishes of the elected representatives.

GP-Ms Wheeler queried the status of MBT in the plans.

Response- Cllr Doolan felt that MBT was within the terms of the DCC Plans and should be explored further.

CRAI- Ms Corr asked what councillors think is pre- treatment of waste as set out in the proposed licence entails.

Response- Cllr Doolan considered that the waste was the residual waste after re-use and recycling and that it was up to the householders as well as the local authority to do this.

No. 17 Dublin City Council- Mr Brian Bahor (18/04/08 O-U, 21/04/08 A-H, K-M, O-V and JJ-RR)

Mr Bahor read his qualifications and experience from his submission (Document 27) which outlined that he is the Vice President, Sustainability in Covanta Energy Corporation, Fairfield, New Jersey. He has been with Covanta since 1987 and has been involved in the design and implementation of programmes for the management of waste and had evaluated proposals and performance guarantees from subcontractors. Prior to that he worked on the design and testing of air pollution control systems including fabric filters. He outlined that Covanta operates 37 WTE facilities (34 in US, 2 China, 1 Italy) and was responsible for the design and construction of 20 of those in the US with the others being acquired.

He referred to the diagram in his submission, Overview of Process, and explained that Covanta would be designing the plant to comply with the diagram and the requirements of the EIS and licence. As an example he dealt with the control of particulate through the maintenance of high temperature in the furnace (Zone 10), the air pollution control systems (APC) (Zone 18 – Spray dryers, Zone 19 – Fabric Filters). He then discussed the diagrams of the bag filters and stated that these were not the chosen systems but they are illustrative of what the Vendors have to offer. The flue gas hits a distribution plate on entering the Bagfilter resulting in a pressure drop and the particulate collected on the outside of the bag and the clean air going through the bag. There are approximately 2000 coated (Gore-Tex or other) felt bags (13-15cm diameter and 6-7m length) but the main filtration is done by the accumulation of particulate on the bags (10-15mm filtercake). The bags are cleaned by compressed air blowing back. The 2-Stage wet scrubbing system (Zone 21 & 22) consists of water dosing (HCl removal) followed by Bubbling Tray system (SO₂ removal). Effluent from Zone 21 is taken back to the furnace and from Zone 22 goes to the dry lime system therefore particulate entrained will be returned back for removal in the bag filters again. Mr Bahor went through the Mass Balance diagram (Document 27a) and explained that he took the numbers from the EIS and rounded them off.

Questions:

Mr Salino asked about the quantity and fate of the filtercake and lifetime of bagfilter. He queried the measurement methods used by Covanta for particulate and the mass Vs count efficiency.

Response: Mr Bahor stated that the filtercake falls into the hopper and is removed from the silo in a tanker and is approximately 24,000 tonnes/annum as shown on the Mass Balance Diagram. There was an error in the numbers but the Delta of 13,380 tonnes was correct. The bags can last 2-4 years with the first 2 years maintaining a steady state. Covanta measure the flue gas emission by weight as required by licences but laboratory tests of the filters measure PM_{2.5} and below and he outlined the method.

GP- Ms Wheeler queried the efficiency of the bag filters and their expected lifetime. She queried if it was proposed to vitrify the fly ash and if the filters on the silos were similar to the bag filters in relation to the safety of transporting the ash. She also asked about the monitoring of the ultrafine particles and the temperature of the flue gas.

Response: Mr Bahor stated that there were two types of filter (woven and felt) and the woven would be similar to a sieve but the felt which is proposed to be used in the WTE facility does not have a constant interstitial space as the fabric is pressed together and then this is coated. He referred to data from laboratory testing of this type of bag filters which states that a 96-97% reduction in 0.03microns particle sizes. He then stated that when the filter was coated with dust in its use it provides better performance. The Gore-Tex is applied to the bag and in his experience they have lasted 4years. Covanta do not measure nanoparticulate in the flue gas but the Total Particulate measurement has shown values of about 10% of the EU limit over 4 years on one of their sites.

The silo filters are equipped with HEPA filters and the ash is put into dedicated containers but the ash is not proposed to be vitrified. He stated that there may be laboratory equipment that can analyse for particle size but that in the off-gases from an incinerator he did not believe there was such equipment. He stated that there was a requirement in the proposed decision to measure PM_{2.5} but the test method had not been decided as yet. The flue gas temperature is approximately 80°C from the stack but there is no scope for further condensation of the gases at that temperature as it has achieved its adiabatic saturation point.

Mr Rountree asked questions related to the burning of food waste, ammonia formation and its impact on calorific output.

Response: Mr Bahor stated that he was not aware of whether ammonia was produced from burning food waste but that ammonia was introduced to reduce NO_x in the flue gas. The injection of water would result in a reduction in calorific output but he was unsure of the impact of the injection of ammonia but felt it would be insignificant.

S&MRA – Ms Kelly asked about maintenance and changing of the filterbags. She queried the number for water in the Mass Balance document. She asked what a 'Tip fee' was as stated in Document 34.

Response: Mr Bahor stated that each line has its own bagfilter and that the replacement of the bags would take place over two days as part of a managed schedule to minimise the downtime. The bags are pulsed to clean them, removed and put into a plastic bag to be removed for disposal. The bags are readily available in Europe. In relation to knowing when to change the bags he clarified that the stack monitor or a monitor within the modules of the bag filter would give an indication of a problem and the required bags could be removed. Covanta have not yet agreed the monitoring systems that will be used but the systems stated in the EIS and in the licence will be used including the monitoring of differential

pressure across the bag filter system, however this does not give a good indication of bag failure and looking at specific modules is more accurate. The level of flue gas residue in the hopper is to be monitored to ensure that the hopper is evacuated prior to the cleaning of the bags as an indicative measure to identify blockages in the system.

The value of 26,500kg is the mass of water leaving the facility in the ash process and there is the possibility of using the grey water from the sewage plant if there was a lack of clean water available. Mr Bahor did not know what a 'Tip fee' was.

Mr Bryan asked questions about the water emitted and the handling of the fly ash. He asked what his job as Vice President Sustainability entailed, how Covanta interact with the USEPA, and the customer of the plants in the US. He queried issues around the location and design of the Poolbeg plant in relation to other plants that Covanta operate and how the interface with a sensitive area is managed. He queried the storage, testing, treatment, movement and regulatory requirements related to bottom ash. He asked if there would be a HS&E person on-site, who would appoint them, their responsibilities, training issues and safety record of Covanta. He continued with questions regarding health of the community, the provision of operational data to the public and validation and quality assurance of the plant including issues related to plant sourced in the US. He then asked about recent projects in the US and Asia and biomass plants.

He returned to the issue of the safety of the transport of ash and stated that what Mr Bahor was saying was different from the EIS which referred to putting the ash directly into the ship and was now a significant safety issue as the containers now need to be lifted onto the ship.

Mr Bryan queried issues from a Covanta brochure including interaction with the public and the specifications of each piece of plant as he felt this was critical to performance.

He asked about the objections made by DCC – experience of the facility manager and waste rejection policy. He queried the efficiencies of various Covanta plants from a Brochure in comparison to the Dublin plant in relation to waste input and electricity output.

Response: Mr Bahor outlined that water was included in the flue gas. Cleaning of the bag filters is a job that needs to be well managed with the Operatives suited. Looking at the diagram of the bagfilter shows that the bag is below the cage and the worker removes the cage and the bag is then put directly into a plastic bag with the dust falling off into the hopper.

Mr Bahor outlined that his job was to look at sustainability issues including the environmental implications of the WTE facilities and how waste is managed. He is familiar with the operation of the Covanta plants. The USEPA as the Federal Authority sets out the legal minimum operating requirements for the plant, the State then sets out the Implementation Plan which it gets approved by the USEPA and then they become the delegated Authority for the Plan with the USEPA retaining the right to review decisions. Plant inspections are generally carried out by the State Agencies although the USEPA have visited infrequently. The customers of the plants in the US are generally Municipal Authorities- not the State who have a regulatory role independent of the customer. In relation to Asian plants, the plants are designed on the same principles as Europe as they are using the same emission standards.

Mr Bahor stated that Covanta are responsible for the design of the plant, that they had other plants in the US in a similar marine environment and that he was not aware of the use of aluminium cladding in other plants and could not deal with possible corrosion issues related to the location. In relation to plants in sensitive areas he referred to the facility in Honolulu where the similar issues were dealt with in relation to sensitive species etc at the planning stage. Several of the Covanta plants have achieved the

USEPA Performance Track Programme similar to the ISO14001 EMS standard and there is a community outreach requirement.

He stated that ash bunkers were on the US sites but he was unaware of the size of them in relation to the 10,000 tonnes proposed in Poolbeg. Bottom ash has a slightly positive pH but is not highly alkaline and it is proposed to be recovered by a sub-contractor in accordance with the regulatory requirements. He was unaware of the requirement for storage of waste for 30 days following testing as per the TFS regulations but that testing would be carried out at the initial phase of the project with one line operating. Approximately 20% of the daily output is ash and there did not appear to be a problem elsewhere with the movement of ash with the Italian plant deals with its own ash. Covanta will be responsible for loading the trucks and transporting to a designated area followed by loading the ash onto the ship.

Mr Bahor stated that, consistent with the USEPA Performance Track Programme and ISO14001, everyone employed on-site was responsible for compliance but there will also be a designated Point person appointed by the Covanta Facility Manager. Responsibility for plant shut-down in the event of an incident would be with the Facility Manager. Covanta will design and implement the employee and contractor training programmes but he was not aware of the penalties for breaching HS&E rules as he was not involved in the construction and operational phase of the project. Although the corporate name has changed from Ogden to Covanta the personnel involved in HS&E remained the same and he is not aware of any change in the safety record.

The company will have a H&S programme for the workers but they will not be involved with the health of those outside the facility. Emission data is provided on-line for the public and one plant is Haverhill in Massachusetts as that State requires it but he is unsure as to what the proposals are for this facility.

Covanta is responsible for all steps of the design operation and compliance with the licence and there is a management programme that deals with ensuring quality during all steps of the process but they do not have a separate validation section. He agreed that the detailed design of the plant has not yet commenced but the duty specifications have issued to suppliers and he is unaware as to where it will be sourced or the closing date for tenders. Covanta have a licence with a German manufacturer (Martin GmBH) for 20 years and there has been no problems with the interface between American and metric units. The main external factor regarding the timeframe for commencement would be that the plant will not be put into operation before it can comply with the licence.

The Montgomery County WTE facility was the last Greenfield project in the US but they have been involved in expansions on other plants which involve the same issues. WTE in Asia is a growing market and there is one WTE facility in Italy but Dublin is an important European project for the company. Covanta operate woodwaste burning plants but are not involved with MBT facilities.

In relation to ash, Mr Bahor stated that in the US the fly, boiler and bottom ash is combined and taken to landfill. He had no details on the trucks or the containers used to transport the waste but they were not going on the public road and he was not aware if the bagfilters would be included.

He outlined that the EIS has a requirement for an environmental outreach programme, the Community Gain Fund and other areas where the company will interact with the local community. The specifications are not yet finalised for each component of the plant.

Dealing with Objections: An experienced operator of other plants such as power or cement plants would know that something unusual was happening in a baghouse and they would not need to have 10 years incinerator experience. In relation to lowering the waste rejection rates of loads the Hauliers will be made aware of the process and the type of waste that will be accepted and of the system for spot checking of the waste.

Mr Bahor felt that the differences in the relative efficiencies of plants might relate to the fact that they were older plants.

CRAI-Ms Corr asked about the type of incinerators in the US and the safety record of Covanta. She queried the conveyor system that might be used for the removal of ash, spillage of ash on the quays and the future plans for the relocation of the dock.

Response: Mr Bahor stated that Covanta operated Mass Burn and RDF facilities in the US and that the inspection of MSW wastes helps to make the plants safer. There was a fire at the RDF SEMASS facility in 2007 which seems to have been caused by the shredding of a propane tank in the presence of a combustible liquid causing a spark/explosion. There was another incident at the facility in 2002 but that is a different type of facility to that proposed in Dublin.

The ash would be placed in a truck to take it across the street where it would then be conveyed into the ship. He stated that companies were interested in taking the ash and they would arrange to have ships to take it. The handling of the ash would be carried out in a manner that it would not cause an environmental problem.

Mr McCarthy asked questions relating to Mr Bahor's role in the project and his previous design experience. He queried the proposed air pollution control systems, the fabric filter and scrubbers system particularly in relation to nanoparticulate removal. He submitted Document 35 in relation to the fact that the European Environment Agency considered no safe level of PM had been identified. He asked several questions regarding Document 27a- The Facility Mass Balance, Document 14 page 20 Capacity Diagram, Document 37- Flue gas calculation, the effect of the use of sludge on the energy balance of the facility and requested that the combustion calculations should be made available including a heat balance. He referred to documents related to the Biffa Ward project and queried several aspects of the design process in relation to the proposed use of sewage sludge.

He queried statements in Document 34 which is a press release related to Covanta announcing the Dublin WTE project but Mr Bahor was not in a position to answer. Mr Lee confirmed that the ownership of Dublin Waste to Energy Limited was 51% Covanta and 49% Dong Energy.

Mr McCarthy stated that the electrical efficiency claimed in the Covanta UK plant is 25% which is significantly less than that claimed for Dublin and queried other aspects of the operation but Mr Bahor was not in a position to answer. He asked questions related to the design of the boiler, fourth pass and the flue gas temperature as it relates to DeNovo synthesis of dioxins and the economics of waste incineration. He queried who would be responsible for compliance with the licence conditions, spot checking of waste loads

Mr McCarthy asked why DCC wished to add the reference to WID in C2.1 and C3.19 and changes to Conditions 2.1.1, C.7 – C.8.2.3(a), C9.4.1 or 'process line' removed and the timeframe increased to 7 days and experience. Mr McCarthy queried the process for the characterisation of the ash prior to shipment and the ability to trace a particle back to its source as stated by Dr Montanari.

Response: Mr Bahor stated that he although he is now Vice Present of Sustainability he was previously responsible for air pollution- design, control and environmental compliance and he works for Covanta Energy Corporation, US not the Irish subsidiaries. The Project Manager for this project is based in New Jersey but another one is to be located in Ireland. He stated that he was involved in the design of various air pollution systems for at least a dozen projects with Covanta and that his preference would be bag filters over wet ESP but he was not involved in the design of the furnace, turbine or ash handling systems. He outlined that fabric filters are not designed for meeting specific stack concentrations

whereas ESP operates differently and removal efficiencies are relevant. The patent on Gore-Tex expired and there are other types and finishes available such as PTFE. The bag filters are cleaned by pulsing air through and in the US this could be as frequently as every 15 seconds depending on the thickness of the filtercake but the proposal for Dublin is for a European system which is 'gentler' with lower pressure and less frequent pulsing.

Mr Bahor did not believe that a second bag filter system was appropriate because the system proposed has two sections the semi-dry scrubber baghouse and the wet scrubber and he considers that this is adequate to meet EU Directive levels and fabric filter is the best available for all size particles including nanoparticles. He explained that there is no technology available to measure nanoparticulate at the inlet and outlet of the filter systems and thus it is not possible to give efficiencies. The example he had given of the Gore-Tex fabric filter was carried out in a laboratory (Document 53 was supplied on 23 April).

The two-stage wet scrubber could consist of a Venturi type scrubber followed by a Bubbling Tray or Packed Bed scrubber. He agreed that the USEPA Guidelines on Air Pollution Technology may have found that the removal efficiencies using scrubbers for micro- and sub-microparticulate was less than 50% which is why the bagfilter system is the primary particulate removal device and the furnace also has a role in the reduction of particulate matter.

Mr Bahor stated that he had prepared the Facility Mass Balance from the data in the EIS (Appendix 8 page 8.11) but it appears its not in the EIS. He agreed that there was an error in Document 27a but due to the different values that would pertain to different waste inputs, and combustion conditions it was difficult to come up with definitive numbers.

In relation to the use of sludge he stated that the diagrams pertained to MSW being burned in the WTE facility but that he felt further studies and approvals would have to be sought from ABP and the Agency under Condition 1.10 of the licence. He agreed that the facility would have to determine how the use of sludge from the Ringsend waste water treatment plant would be managed in terms of the maintaining the energy output and that combustion calculations would need to be carried out. The facility has been designed for MSW with sludge being a possible additional waste stream in the future but Covanta has assumed conservative inlet conditions to the air pollution system and the use of sludge would not significantly alter these parameters. He understood that there were two types of sludge 25% and 90% dry solid content and he stated that the sludge would be piped into the WTE facility but it was not decided where in the furnace it would be injected as these plans had not been finalised. Covanta and Dong Energy have experience in burning dry and wet sludges at facilities in the US and Europe.

Mr Bahor considered that the Development Phase of the project with reference to Document 34 was open to interpretation. He stated that there will be a person, located in New Jersey, with a team responsible for the preparation of the combustion calculations. The plant is being designed to burn 600,000 tonnes which is a large plant.

Mr Bahor outlined that the exit temperature of the flue gas from the boiler will be circa 180°C and he considered that the dioxin denovo synthesis temperature was in the upper end of the range of 200-450°C. He stated that modern incinerator design did not incorporate a quench due to a need to achieve better energy output but that the licensed emission limits are still met through the use of the abatement systems. He felt that District Heating didn't affect the emissions from the plant and was an upside in terms of use of energy.

Mr Bahor considered that issues related to particulate matter were not new and had been dealt with by the USEPA and the EU by introducing lower limits for PM, PM₁₀ and PM_{2.5} over the years.

The reason for the requested changes in the Objection was to ensure there was no uncertainty but that WID should be used for interpretation but if the definition is the same for 'abnormal operation' then it does not need to be changed. Mr Shipsey stated that they wished to retain the objection as they wanted the Agency to consider allowing them to operate as allowed by Article 13 of WID by allowing the definition of Abnormal to be as per WID.

In relation to Condition 7 there are no plans to recover waste on the facility and the facility is an incinerator facility.

In relation to the Condition 9 requested amendment each process line is independent and therefore it has no impact on the other line so they both should not need to be shut-down if there was a problem. In the case of a complete shut-down he considers that 7 days would be more reasonable for the removal of waste from the bunker. Mr Shipsey clarified that they wished to retain the need for 7 days in line with the storage available but that he needed to come back in relation to the assessment of the impact- e.g. odours etc.

Mr Bahor considered that in Covanta's experience power plant managers could do the job with training provided by Covanta. Mr Bahor stated that Document 37 was an example of a flue gas calculation at one point of the combustion diagram which he received from Mr Norgaard but that it did not relate directly to the values in the Mass Balance document other than that the Air input came from the actual air demand (6.87kg/kg fuel) multiplied by annual tonnage (600,000t) and the gas output was approximately derived from actual flue gas production (7.65kg/kg fuel) multiplied by annual tonnage. He stated that he had no similar mass or heat balance for the burning of sludge.

Mr Bahor did not know why the steam output of the boiler had changed from 400°C in the EIS to 410°C in Mr Norgaard's presentation- Document 15 page 3 but that he had to defer to a corrosion expert in relation to the statement in the EIS which referred to the possibility of corrosion at temperatures over 400°C.

Compliance with licence.

Mr Bahor stated that the facility manager and the environmental manager was responsible for compliance with the licence. He described that the spot checking would be done on the Reception Hall floor but the Quarantine Area is at a separate location within the Hall but that the details will be finalised, the areas will be set out and operators trained in their operation. He agreed that the waste practices might result in unacceptable waste being received and if the spot checking identified this the truck may have to be sent back even if it was a DCC vehicle. If a radiation monitor is necessary it will be installed.

Mr Bahor was not aware of any need to 'cure' the ash prior to testing it for characterisation prior to shipment. After the ash is unloaded from the trucks off-site Covanta are considering the use of conveyors to bring the ash into the ships but that the ash will be damp and thus there will not be significant dust generated.

In relation to the formation of secondary particulates in the atmosphere, Mr Bahor outlined that they would be minimising the emissions of the precursors NO_x and SO_x using the SNCR and scrubbers. Mr Bahor was aware of the concept of tracing back a substance to its source but understood that for dioxins this had not been achieved. He felt that the evidence presented by Dr Montanari was surprising as it didn't show a correlation between a sampling strategy, statistical analysis for natural variation. He didn't know how a sample could be traced back to a plant.

RISEG- Mr Cassidy queried what is on an incinerator facility and how the waste would be inspected to ensure that unacceptable items were removed. He then asked questions related to the air quality in the vicinity of the proposed site, the 3 days storage in the bunker, the 'operator' and responsibility for

monitoring. He asked if the design of the plant was complete, what the 'fail safe' systems were proposed and if local groups would be allowed to visit the site to inspect or monitor.

Response: Mr Bahor stated that on an incinerator site there are trucks delivering MSW and the waste is composed of many things which could include a car battery. To try to ensure that these do not get into the incinerator the waste is inspected by trained operatives. He stated that the proposed decision identifies the parameters that will be emitted from the stack and that he had clarified with DCC regarding the objections submitted. He clarified that Covanta were responsible for the design, construction, operation, maintenance and environmental compliance of the project and that all employees were responsible for HS&E. The continuous monitoring will be carried out as required in the proposed licence. The design of the plant is on-going but it will include the necessary measures to ensure that the requirements of the legislation are met. He stated that there would be Community Programmes which have yet to be worked out which may allow for these visits.

No. 18 Dr Stefano Montanari (18/04/08 V –GG)

Dr Montanari delivered a powerpoint presentation (Document 28). He stated that he has been involved in the area of medical research and cardiac and cardiovascular surgery for 36 years. In 1997 in association with his wife, Dr Antonietta Gatti, at the University of Modena, Italy, he discovered nanopathologies i.e. the diseases caused by micro- and nanoparticles. In 2002, the EC awarded them a Framework Project where they headed research with other universities and a more recent project was awarded where they head a group of 10 universities and institutes to study the mechanism by which the particles enter the cell nucleus which will end in 2009.

Particle Size

He then described the size of the particles being dealt with in that they are only an order of magnitude larger than the diameter of an atom of hydrogen. The particles he refers to are solid and inorganic and come from nature (volcano, rock erosion, sand (60µm) and fires) and humans (quarries, landfills, traffic, aeroplanes, industrial fumes, cement plants, incinerators etc). Acts of terrorism such as the attack on the Twin Towers produces nanoparticles and articles written by him and his wife predicted pathologies and since 2004 he has been a consultant to a group called FASE to advise on the issues.

PM production

All combustion gases produce particulate matter and also secondary sources can generate particulates from NO_x, SO₂ and organic compounds using free radicals such as ozone. He showed pictures of nanoparticles and outlined that fragile particles can fracture giving many more smaller particles. He outlined that NO_x and SO₂ associate with water and lower the pH and are responsible for acid rain, ozone and eutrophication which has an impact on soil and that ammonia (NH₃) and non-methane volatile compounds (NMVOC) were responsible for ozone and particulate matter (PM) production as well as the former problems which all impact on health and ecosystems.

PM in food

He stated that nanoparticulates stay in the air for up to many years but when they come to earth they are incorporated into the folds of vegetables such as cauliflower and broccoli and it is impossible to remove them by washing. His recent work on starchy food in different countries is published in an American Journal showed pollution in it from particulates. He showed that many types of food contained nanoparticles.

Health impacts

Dr Montanari referred to the European Environment Agency Report No. 2/2007 page 9 which states that no safe level of PM has been identified. These particulates enter the body in the air as they behave like a gas and are inhaled into the lungs with the smaller particles entering the alveoli and the bloodstream. They also get into the blood stream by ingestion. The bodies organs have no mechanism to eliminate the particulates so it covers them in a granulome (inflammatory tissue) which can turn to a cancer. He showed slides of particulates within the red cells of the blood. He outlined that 10% of the population has a tendency to hyper-coagulation which he says is attributed to particles affecting the change of fibrogen to fibrin. These clots lead to a venous thrombous if in the veins, a myocardial infarction if it occurs in artery and other diseases such as various cancers.

He outlined that his research has shown the composition and source of the nanoparticles can be determined. New research by his group under an EC Framework Project has shown that translocation can occur i.e. pieces of DNA are moved causing problems with the cells which ultimately leads to cancers. He also dealt with particles entering the seminal fluid leading to sterility and other diseases which can also affect his partner. Foetal malformation can occur where the particles pass through the mothers bloodstream to the foetus.

He made reference to problems associated with depleted uranium. He stated that all the micro and nanoparticles detected in pathological tissue are non-biodegradable and non-biocompatible and so are pathogenic with the smaller the particle the more aggressive they are and he stated the factors influencing their pathogenicity such as size, shape, surface area, intake speed, chemical and biological conditions etc.

Mass Vs Number

Dr Montanari outlined the importance of the difference between mass of these particulates and the number of particulates when defining the efficiency of the filtration system.

Waste disposal

He stated the principle of conservation of mass and thus matter cannot be created or destroyed but it can be re-arranged so although we do not see anything coming out of a chimney it is our eyes that are at fault. He then quoted a Greenpeace document outlining the fate of one ton of waste burnt in an incinerator, 1ton fumes, 280/300kg toxic ash, 30kg fly ash, 25kg calcium sulphate and 650kg water. He showed an analysis of particles of dust from an incinerator found 25km away on a seaside resort where he also found a deformed organism which had the same ash as that from the incinerator inside it. He does not agree with defining the ash as inert. He concluded that from a scientific point of view incineration is not a way to eliminate waste because it doubles the mass and transforms it into more toxic material.

Epidemology

He referred to a slide (in italian) which showed a list of studies from the Italian Department of Health of the effects of incinerators by epidemiologists which agreed that around incinerators there was an increase in cancers and malformations. A federation of French doctors issued a document about 2 months ago requesting the government to have a moratorium on building incinerators. The International Society of Doctors for the Environment (ISDE) also issued a document against incineration. He then outlined that in his own town there is a proposal to double the incinerator to 240,000 tonnes/annum and the authorities proposing the project issued a document stating that there will be increases in diseases and malformation.

He referred to the Precautionary Principle and stated that those giving permission for the project must be aware that they are responsible for it.

He clarified for the Chair, with the assistance of Mr Salino, that the papers and studies referred to above may have been cited in the documents submitted as part of the submission and objection of that group but the original Italian versions were not submitted. The Framework project funded by the EC will run out in November 2009 and reports will not be available until then and they relate to the biochemical mechanism that the particle enters the cell. The previous study, which concluded in June 2005, showed the pathology of the particles i.e. that they were harmful. That report is the property of the EU and not yet publicly available but the presentation gives the outcomes of the study and it is also published in a book called Nanopathology.

Questions:

Mr Salino asked if the pathology caused by a particle could be traced back to its source and if this has been proven in court. He asked if there was a safe distance from an incinerator and the merits of an epidemiological study

Response: Dr Montanari stated that it can be done relatively easy by isolating samples from a few sources and seeing if there is a correspondence with the emissions. For incinerators the composition of the particles includes many different elements which is not the case with steel plants or traffic which emit particles with a more homogenous composition. He referred to a case in March 2006 where they demonstrated to an Italian court that the particles from a power station were responsible for the destruction of flora and agriculture and the second step of the trial has started as they now see the same particles in 24 cases of cancer. He also outlined a case in Forle where a child (8yr) has prostate cancer and his lab has found a correlation between the samples from the cancer and particulate from two incinerators in the locality. He is also involved with another case in Terne where the court has sequestered the incinerator due to demonstrated pollution in the area.

Dr Montanari outlined that the heaviest particles are 2-3km from the incinerators but the smaller particles are distributed further. He referred to the EEA Report of Aug 2007 which found that PM₁₀ is found mainly in large cities but the smaller particles (PM_{2.5} and below) are distributed evenly in urban and rural areas.

He stated that you need to carry out a baseline study involving many diseases as you cannot show that the incinerator is responsible at a later stage.

DCC- Mr Shipsey queried the qualifications and experience of Dr Montanari and his familiarity with waste legislation and the proposed project. He asked Dr Montanari to explain how he proved that the infarction came from an incinerator and any controversy there may be within scientific circles about his work. He asked questions relating to the quantity of nanoparticulate emitted by a WTE facility, the flue gas treatment systems used on incinerators that he has sampled and the toxicity of ash.

He then asked questions regarding the DEFRA Review of Environmental and health effects of waste management and stated that he felt that Dr Montanari was incorrect in his views on new incinerators. He asked for the methods for counting particles on an incinerator stack.

Mr Bahor clarified that laboratory studies of the efficiency in terms of particle counts of size down to 0.03 microns was 97.7% and that in practice a different measurement technique would be used. It is also conservative as the filtercake would improve the efficiency in practice. He queried the formation of the secondary particles in the manner outlined.

Response: Dr Montanari stated that he had a degree and PhD from the University of Modena, Italy in pharmacy and microchemistry and worked until 2000 in cardiac research and started working on nanopathologies in 1997. Independent research is carried out in his laboratory on the ash in the vicinity

of incinerators or other facilities and then check the particles in the biopsy or autopsy. He works with the criminal courts. He has worked on up to 1000 samples from 6 or 7 incinerators collected by himself or others.

He stated he has no knowledge of the WID and has no familiarity with the proposed project as he deals with health issues only. He outlined that his lab recently received a heart from an autopsy of a man who had died from a myocardial infarction and a sample showed that there were particles present from a factory that caused a disease. He stated that it was easy to trace back the particles as they were like fingerprints.

Dr Montanari felt there was no controversy regarding his work and that was well known in medical circles that foreign bodies can cause cancer. Their discovery was that it is impossible to eliminate the particles.

He stated that he did not have any information as to how much nanoparticulate would be emitted by an incinerator and that no-one knows and that the formation of secondary particles must be taken into account. For secondary particles, filters are not effective as they form away from the incinerator by condensation of gases that pass through the filters. The efficiency of bag filters should be calculated in terms of numbers in reverse of size rather than mass.

Dr Montanari outlined that due to the composition of particles that he has analysed they cannot come from any source other than incinerators and these incinerators are equipped with bagfilters. He then stated that the residues if captured were still disposed of and re-entered the environment. He re-iterated that secondary particles are not captured by the scrubber system because they are not formed until later in the atmosphere.

He used the numbers from Greenpeace for the mass balance and he classified the ash as toxic with the water being classified as dirty since the increased temperature and biocides are not good for the environment.

Dr Montanari stated that his presentation deals with inorganic particles and that dioxins and furans referred to in the DEFRA report are organic. He stated that he felt that 'older' incinerators emitted larger particles whereas newer incinerators emit smaller particles that are more harmful.

He stated that in atmospheric air it is possible to count the particles but that is not his area of expertise.

Mr Bryan asked if the engineering aspects of the incinerators had been considered and how the analysis was carried out on the samples. He queried if there were other epidemiological studies carried out in cities with incinerators.

Response: Dr Montanari stated that he was not concerned with the engineering aspects of the plant but with the emissions. He agreed that he takes the samples and gets an EDM spectrum which is a unique spectrogram for that incinerator. He stated that you would need about 15 years to carry out a proper epidemiological study. He stated that Vienna is one of the most polluted cities in Europe and that all the food producers in the region lost their quality mark but not a lot is known about the incinerator.

Mr Rountree asked about particles having chemicals attached to the surface.

Response: Dr Montanari stated that one of the factors influencing toxicity is surface area and the other is that chemicals such as dioxins can be adsorbed to the surface of the particles and travel long distances.

GP- Ms Wheeler asked if there were registers of diseases in other countries. She asked for clarification as to the methods for counting nanoparticles.

Response: Dr Montanari stated there are registers in most countries but that those people are dead and the samples have not been studied. Not many epidemiological studies have not been carried out as it was not thought that incinerators would cause such problems.

He stated that a sample is taken and the particles counted and the result extrapolated to the gas flowrate.

Mr McCarthy asked if he had any numbers as to the amount of nanoparticles or secondary particles produced by a tonne of waste.

Response: Dr Montanari stated that the count of nanoparticles was technically very difficult and expensive to determine but he had no data. Literature reports that there are 6-8 times more secondary particles by mass as primary particles.

No. 19 Labour - Deputy Ruairi Quinn – (18/04/08 HH –JJ)

Deputy Quinn stated that his objections were lodged with the Agency and he outlined that he was the local TD and lived on Strand Road across from the proposed location of the incineration facility and he was aware of the concerns of the local people. He particularly wished to address the health concerns regarding the uncertainty of the project. If it is accepted that the onus of proof of the safety of the project from an environmental point of view rests with the proponents of the project then it should be demonstrated. He has looked at the unscientific manner in which the waste would be inspected (by dumping it on the floor) and he feels that unless it is known what is being burnt then the outcomes through the incineration process cannot be controlled. The Chair and the Agency should be satisfied by the guarantees given by the proponents the facility that it will not have an impact on the health of people living in the area.

Questions:

GP- Ms Wheeler queried why the HSE were not present since the documentation related to health impact had been referred to them and should DCC concern themselves with health issues.

Response- Deputy Quinn outlined that this was an EPA oral hearing and couldn't concern itself with planning issues. He didn't expect that the HSE could deal with this kind of issue but that a properly managed and staffed HSE could possibly provide that service therefore the EPA are the ones to deal with that issue in this hearing.

Mr Salino asked if the responsibility for proof that there would be no health impacts from nanoparticles should be on the community or DCC taking account of the Precautionary Principle.

Response- Deputy Quinn felt that the onus is on the proponents of the projects and that the Agency would satisfy itself that the concerns expressed were properly addressed and additional information was provided by the proponents if necessary.

No. 20 Labour – Cllr Dermot Lacey (18/04/08 JJ-KK)

Cllr Lacey stated that he had been a member of DCC since 1993 and he wanted to refer to the 1998 DCC Waste Management Plan referred to by Mr Twomey. He feels that there is no authority given in that document for an incinerator facility but that it included a provision for the examination of incineration. He outlined that the law officer of DCC endorsed this view when a motion proposed by Mr

Ryan of the Green Party asking that the provision of an incinerator be suspended was ruled out of order as no decision had been taken therefore the decision could not be suspended. He feels that no decision was made and that any claim otherwise is false and bogus.

Under the Local Government Act, policy is set and determined by the elected members of DCC and the legally stated policy of the elected members does not favour incineration and specifically not at Poolbeg. Given the proposals for 20,000 residence in the area and with the current and resulting traffic the provision of the incinerator is not environmentally sustainable. The EPA should refuse the grant of this licence as it is the wrong location and not sustainable.

Questions:

GP-Ms Wheeler asked if the provision of MBT was in keeping with the 1998 DCC plan. She asked what he had thought he had voted for in dealing with the plan and what assurances Mr Twomey and other DCC staff had given.

Response- Cllr Lacey feels that the plan allowed for the investigation of all options and that is his function. He was given assurances by DCC that they were voting to investigate incineration particularly as they had recently dealt with the Bioburn plant controversy.

No. 21 Labour – Cllr. Kevin Humpfries (18/04/08 KK-LL)

Cllr Humpfries outlined that he would address the fact that the studies that have taken place deal with the current state of the location and not the proposed plans that DCC and the DDDA have for the area. It is important to look at how the environs have developed since 1999 including the IFSC, Spenser Dock, Point Depot village and the IGB site and that in June 2007 a Section 25 Planning Scheme was sanctioned for the area so now there is a potential for a new urban village with greater than 20,000 residents and an eco-park. He feels that the incinerator would undermine that plan. He queried if the current studies had addressed the impact on these residents and office areas.

Questions:

Mr Bryan asked several questions around the location of the 100 acres that fall under the Section 25.

Response -Cllr Humpfries stated that the legislation was circulated (Document 31) which outlines the areas but he has no map. He thinks it includes the spine road and would be providing residential areas within close proximity to the incinerator.

S&MRA-Ms Kelly queried whether a plan for a civic amenity area was included.

Response -Cllr Humpfries stated that he does think an eco-park linking to the strand would be desirable. An eco-park would allow for citizens to enjoy the bay.

Monday 21 April 2008

The oral hearing resumed at 09:30 with questions to Mr Bahor followed by Dr Staines.

No. 22 Dr Anthony Staines (21/04/08 W-BB)

Dr Staines read from his submission (Document 36) where he outlined his background and qualifications in medicine and environmental epidemiology. He then proceeded with his critique of the health assessment in the EIS.

Content of the EIS

Dr Staines stated that the process to prepare **Chapter 13 Impact on human beings** is unclear and there is no justification or rationale given and no indication of a scoping exercise having been carried out. He states that what it contains is a brief description of the local environment, a socio-economic profile from 2002 CSO data, a list of community facilities and a brief description of land-use and planning objectives. In the section on **Human health issues** he outlines that it contains documents, one of which he authored, his report on the existing health of the local community, a review of dioxins in the Irish environment and a summary literature review by Prof. Schenk. Other chapters of the EIS also contain some reference to health impacts. He feels that there is no serious consideration of the actual impacts of the estimated emissions on people in the local community or on human health.

Health Impact Assessment (HIA)

Dr Staines outlined that he considered a HIA should be 'a combination of methods and tools by which a policy programme or project may be judged as to its potential effect on the health of the population and the distribution of those effects within the population'. He stated that it should be used to ensure that the health consequences of decisions are not overlooked, to identify new opportunities to protect and improve health across policy areas and to understand the interactions between health and other policy areas. He stated that it can be used at any stage of the project and it would comprise Screening, Scoping and Assessment.

The Screening report should describe, in general terms, the possible impacts of a proposed development on human health and conclude if a HIA is warranted. It is a desk study and should take 1-2 weeks. The Scoping report should develop the scale and scope of the assessment with shareholders such as planners, developers and members of the community and can take from a few days to weeks. Finally the Assessment report can, for small projects, be a desk study however for complex projects field work with the affected community is required.

Critique of the EIS

Dr Staines considers that the human health assessment is inadequate as a formal HIA process has not been done and obvious impacts ignored (odour, exhaust from trucks, sleep disturbance) and that the section on cumulative impacts is 'almost derisory' with the general approach of Chapter 13 failing to grasp the issues of this particular project and location. He feels that his finding that the community is vulnerable to any adverse effects of plant operation is not acknowledged in the EIS.

He disagrees with the conclusions of Prof. Schrenk and feels that his review contains 'some questionable interpretations of the existing literature' and a 'misunderstanding of the principles and limitations of epidemiology'.

Capacity

Dr Staines quotes from the HRB report (2002) and notes that there is insufficient capacity to assess, monitor and enforce human health protection and that although some progress has been made the current situation is that neither the EPA or the local authorities have the capacity and that this is notionally the role of the Department of Health. The limited resources of the department of Health are indicated by Ireland's failure to produce an EU mandated National Environmental Health Action plan. He also notes that the division of the roles of the planning authority and EPA has not helped the development of the capacity required to monitor and police human health.

In conclusion he states that the proposed development requires a HIA and that the EIS falls short of what is required.

Questions

DCC- Mr Shipsey asked some questions in relation to a review of the need for a HIA that Mr Buroni had carried out and presented at the ABP hearing or the report of Dr Murphy for ABP which forms part of the documentation submitted by DCC. He then asked questions around the requirement to carry out a HIA.

Response- Dr Staines did not assess any reports prepared by Mr Buroni or Dr Murphy which he considers are not part of the EIS. He reiterated that he considered that the documentation submitted did not provide a basis for a reasonable judgement as to the presence or absence of health impacts from the proposed development. He feels that a reading of the EPA guidelines and the EU directives requires a formal method of assessment of the health impacts to be carried out but that might not necessarily be a formal HIA.

Mr Bryan queried the statement in the EIS regarding a potential health gain for the community and the responsibility of the Operator for health beyond the boundary. He queried the health effects of fly ash and nanoparticles and possible development of adjacent lands as residential.

Response: Dr Staines felt that to make such a statement would require quantification of the gains and losses and this is not done in the document. He states that there is no serious consideration of the health of the community and that would reflect the statement by the Operator regarding responsibility. He stated that fly ash is a toxic material and a spillage would require evacuation of the contaminated area with substantial clean-up costs. He outlined that particulate matter has a significant impact on human health and that the smallest particles are most hazardous, with the hazard increasing as the respiratory rate increases.

Dr Staines considered that residential development should not take place adjacent to an incinerator and that would require a large scale HIA and health monitoring. If the project goes ahead the health monitoring systems are not in place to determine if there are adverse impacts.

S&MRA- Ms Kelly referred to Document 38 submitted by DCC (from UK Health Protection Agency) and asked if the background levels are high what would the impact of added pollutants

Response: Dr Staines outlined that the evidence for harm associated with particulate inhalation is growing and that the document predates the CAFÉ directive which most countries will have difficulty meeting. Anything that raises the levels of particulate has a health impact and it needs to be estimated for this project. Document 38 may be referring to only the gaseous emissions.

GP-Ms Wheeler queried whether there was a cumulative impact if the health of the area was low prior to the development.

Response: Dr Staines stated his study showed that the population of Ringsend was poorer and had worse health than the rest of the population of Dublin at the time and could be more vulnerable to the adverse effects of air pollution but a more detailed assessment of the area would need to be carried out.

Mr McCarthy asked if he had made recommendations regarding what should be studied and its effect on the EIS

Response: Dr Staines stated that at a meeting with MCOS/RPS the initial proposal was for a formal HIA which would have involved both the analysis of routine data and a substantial amount of fieldwork within the community as was outlined in his presentation regarding a HIA. The review was carried out but the other part was rejected on cost and he advised the consultants that he did not consider that the report was a substitute for a proper assessment of the health impact of the development. He considered

that an epidemiologist should have been engaged to carry out the assessment. He felt that the EIS was flawed as a result of not providing the relevant information on health impacts.

No. 23 Dublin City Council -Ms Ria Lyden (21/04/08 BB-GG)

Ms Lyden read from her submission (Document 32). She outlined her education and experience in the area of EIS. Arup Consulting Engineers were the main consultants to the the project for the preparation of the EIS and the waste licence application. The EIS was prepared by a team of specialists having regard to the various EPA and EU guidelines available. Chapter 20 of the EIS on Cumulative Impacts and Interactions was prepared by Arup and she outlined that the rest of the document concentrates on that chapter.

Schedule 6 of the Planning and Development Regulations 2001 specifies the information that is to be included in an EIS. She stated that there are no generally agreed and accepted definitions for indirect or secondary impacts, cumulative impacts or inter-action of impacts. The EPA and EU guidelines are not identical in their definitions and there is also an over-lap of definitions within the legislation.

Methodology used in the EIS

The potential for significant cumulative and indirect impacts and interactions was examined at the screening stage of the process and where necessary baseline and impact assessment studies were identified. Table 20.1 of the EIS shows the matrix of potential interactions.

Cumulative impacts and interactions

A summary of the impacts and interactions which are elaborated on in the EIS is given under the following headings:

- Landscape and visual impact – EIS Chapter 6. The project is expected to have a positive cumulative impact on the Poolbeg peninsula and be a catalyst for further development.
- Traffic – EIS Chapter 7- specific mitigation measures were identified and the residual impact is expected to be imperceptible.
- Air quality – EIS Chapter 8 –The background levels were determined and added to the expected ground levels concentrations for various substances emitted from the facility. The emissions from other installations in the vicinity were factored in as well as an allowance for future changes in air quality. The assessment concluded that the cumulative ground level concentration would be below the relevant air quality standards and guidelines.
- Climate – EIS Chapter 8 – The impact of the emissions from the WTE facility was examined in the context of Irelands obligations under the Kyoto protocol and the assessment indicated that it would have a positive impact.
- Noise & vibration – EIS Chapter 9 – baseline noise levels were measured and the noise emissions from the operation and construction phases modelled. Although there will be a noise impact during the construction phase it is expected that noise and vibration would to be imperceptible during the operational phase.
- Residues and consumables – EIS Chapter 10 deals with the solid waste residues generated from the process including the flue gas treatment systems and these will be re-used or disposed of at licensed facilities without significant environmental impact.
- Soils, geology and groundwater – EIS Chapter 11 outlines the studies that were undertaken and the potential impacts on water quality, estuarine ecology and soil quality of the operation of the facility were addressed with no significant residual negative impact predicted.

- Water- EIS Chapter 12 and 15 -Cross-media effects with respect to the cooling options were addressed in the EIS with three methods being considered. A detailed study of the existing hydrography of Dublin Bay and the Liffey Estuary was carried out and the impact of a once-through seawater cooling examined. It was assessed that there would be a potential impact on the estuary but that it will reduce noise and visual impact and improve energy efficiency of the plant. An indirect impact on water arises from the potential re-use in the WTE plant of treated 'grey' water from the Ringsend WWTP.
- Human beings - Impacts and interactions of impacts on human beings with respect to landscape and visual aspects traffic, noise and air quality are detailed in the respective chapters with other impacts addressed in Chapter 13. These included the potential for complex indirect, cumulative and interactive impacts between soils, emissions to air and human health. The general conclusion was that a properly equipped and operated incinerator does not pose a threat to human health. Positive effects in terms of the employment generated and community Gain Fund were addressed.
- Terrestrial ecology –EIS Chapter 14 outlined that indirect impacts on terrestrial flora and fauna species within and around the site particularly in the designated SAC and SPA in Dublin Bay were addressed.
- Estuarine ecology- EIS Chapter 15 dealt with the existing marine flora and fauna in the vicinity of the site and indirect and cumulative impacts including an increase in suspended solids (construction phase), noise pollution (marine mammals), the discharge of heated and biocide treated water in the cooling water, the extraction of water, the potential entrainment of fish and other species at the intake and impact on any commercial fishing in the vicinity. The impact is expected not to be significant.
- Material assets- EIS Chapter 17 deals with the impact in relation to property values as was the impact in reducing the demand on landfill capacity.

The cumulative impact was summarised as follows:

- If the WTE is designed constructed and operated it will not have a significant impact on the environment
- There will be a reduction in the volumes of waste to be landfilled and a supply of 60MW electricity to the National Grid
- If DH is developed it will supply selected residential and commercial properties.

Appendix 1 of the document is essentially an index of the EIS to facilitate finding information referred to in the submission.

Questions:

GP-Ms Wheeler queried the site selection process, the location of the centre of waste production, the expertise of Arup in health and the DH proposals.

Response: Ms Lyden stated that Arup were not involved in the site selection process, they had no expertise in health and she could not comment on the use of other sources as a heat source for DH.

Mr Bryan stated that he felt that the indirect impacts particularly on fauna were not addressed fully in the EIS and he indicated that the comments in relation to the architectural merit were subjective. He queried the impact of traffic and the studies carried out, the movement of bottom ash and adjacent

construction projects, the impact of the cooling water discharges and the overall impact and the probable efficacy of the mitigation measures and if a DH system was mentioned in the EIS.

Response: Ms Lyden disagreed in relation to the fauna and outlined that it was the opinion of the architect. She stated that she has no data since the traffic impact study was completed, bottom ash movement to ship was taken into consideration and presented to ABP in 2007 but any increase in traffic would decrease the impact of the facility in percentage terms. Noise from adjacent projects was taken into consideration as much as possible. The water depth information was validated in relation to Dublin Bay and the modelling of impacts of biocide showed the effect was localised.

Ms Lyden outlined that the application foresaw the opportunity to develop DH and so is a possible positive effect.

S&MRA- Ms Kelly queried the assertion that the facility would have a positive impact on climate. She also queried if there was cross-checking in the ecology sections.

Response: Ms Lyden stated that the difference was marginal and that Dr Porter would deal with that issue. Arup did not cross-check the work of the other experts.

Mr McCarthy asked several questions around the authors of the EIS and the responsibility for the proof reading and quality of the document. He queried the absence of calculations in the EIS, the control of the flow of data and the impact of any changes of data that may have been presented at the hearings.

Response: Ms Lyden stated that the EIS and non-technical summary had several authors/specialists but that she was the main reviewer/editor of the document. The quality assurance process is to select the specialists on the basis of their experience and previous high quality work but the sums were not cross-checked by Arup. Engineering calculations are not normally included in an EIS. Mr Norgaard would have supplied the combustion data to Dr Porter for his climate study in Feb/March 2006 and specific detail would not come through Arup. The EIS was prepared between Feb and June 2006. Although there is a change in the data Ms Lyden did not consider it a significant change in the conclusions of the EIS. Dr Porter has been taking the latest information on Climate change from the IPCC and presenting them to the hearings.

Tuesday 22nd April 2008

The oral hearing resumed at 09:30 with submissions by the Green Party.

No. 24 Green Party–Cllr. Bronwen Maher (22/04/08 A-B)

Cllr. Maher read from her submission (Document 41) which dealt with Air Quality. She quoted from the ABP Inspectors report in relation to the existing air quality, the impact of the proposed development and the role of the EPA in licensing the facility. She considers from that report that the air quality in the area is compromised, that the operation of the facility will result in further exceedances and that the EPA should carry out a more detailed assessment of the air quality issue in its consideration of the licence application.

She states that there is no evidence that the Agency carried out such a detailed assessment and that limits on the emissions was considered sufficient without assessing the capacity or likelihood of the applicant to meet them. She states that the Inspector understates the legal obligation of the Board in

relation to compliance with air pollution standards as she considers that if a development would be likely to breach air pollution standards the EPA is legally obliged to refuse permission.

Cllr. Maher refers to difficulties raised by the EC in relation to Ireland and the split system for EIA between the planning authorities and the EPA and that this project represents a serious failure of the Agency to carry out an integrated assessment.

She then raised the following specific issues:

- EIS Paragraph 4.2.43 –The EC cites areas to avoid locating an incinerator as enclosed air basins and areas where the air quality is already poor. Cllr Maher contends that Dublin City is such an air basin and that the air quality is poor in Ringsend and Irishtown.
- EIS Paragraph 8.2.5 shows that at the time the EIS was written pollution levels were reaching or exceeding the limit values.
- Nanoparticles – This concerns her in relation to the impact of any financial redress being sought from DCC.
- Land value- Dublin Port Company and the residents are concerned and it is not possible to assess the impact without a reliable assessment of the air pollution impact.

She considers that the requirements of the EIA Directive (85/337 as amended) for an integrated assessment of the impacts has not been carried out by ABP.

Cllr. Maher outlined that the ABP Inspector had recommended a limit be placed on the total intake of waste so as to limit emissions and ABP decided that this was a matter for the EPA. She stated that the EPA has an obligation to make the EIA process effective and that failure to carry out a proper assessment would make the decision 'procedurally illegal'. She outlined that the EPA must assess the indirect and cumulative impacts of the development which she considers includes the emissions from the incinerator, the traffic and the existing pollutant load and in addition the impact on human health.

She states that the EPA must have regard to the Precautionary Principle and quotes S.40 of the Waste Management Act 1996 and outlines that the burden of proof must rest with the applicants to show that there is no impact and not with the residents.

In relation to monitoring she feels that continuous monitoring of PM₁₀, PM_{2.5} and PM_{0.1} should be required based on a health based approach at locations where humans are at most risk of exposure. She refers to papers submitted by DCC from Zurcher et al which detail the efficiency of flue gas treatment systems but she contends that if a waste licence is to be granted it must contain the following:

- Emission limits for fine particulate across the size spectrum in line with those identified in the Zurcher literature submitted.
- The flue gas treatment systems outlined must be assessed against BAT
- Monitoring should be carried out as in the Zurcher et al. papers.

She considers that anything less is not consistent with S.40 of the Waste Management Act.

Questions:

DCC- Mr Shipsey asked questions around the background and predicted PM₁₀ levels as presented by Dr Porter.

Response: Cllr. Maher stated that she had not been present for Dr Porter's presentation and that she was not aware that background levels of particulate were falling in the vicinity but that her information was based on research carried out for her by Green Party staff. The basis of her information was also the EIS and she was concerned that there was no proper on-going monitoring systems proposed if the

licence was granted. She agreed that if the levels were decreasing it would be good news but that these needed to be monitored and the emissions data available for members of the community.

CRAI- Ms Corr queried the traffic levels in relation to the pollution in the area.

Response: Cllr Maher felt that the potential increase in traffic due to the movement of trucks to and from the incinerator would increase pollution. She had no information on the traffic counts across the East Link Bridge but these can be obtained from DCC.

S&MRA – Ms Kelly queried the change in the proportional impact of the emissions if the air quality improved.

Response: Cllr Maher feels that the incinerator and traffic will add to the pollution levels.

No. 25 Green Party–Ms Claire Wheeler (22/04/08 C-E)

Ms Wheeler read from her submission (Document 40) and she outlined her qualifications and her experience on Dublin Corporation and DCC as a Councillor. In relation to human health issues she reiterated the views of Dr Staines that a HIA must be carried out before a decision can be taken on the licence application. She referred to his study and related this to the information supplied by Mr Hawkins, a study of the Pearse St area entitled 'Senior Citizens- their future and their past 2003' and to other anecdotal evidence that the general health in the area is poor.

EIS, air emissions and particulate matter

She refers to the EIS where it states in Chapters 8.2.4 and 8.2.5 that the levels of PM₁₀ exceed the ambient limit while those of NO₂ and PM_{2.5} approach permitted levels and feels that no further emissions should be allowed. She considers that the assessment of the risk of abnormal operation and accidents is unrealistic and further statistic should be provided.

She is concerned by the possible emissions of nanoparticles and referred to Mr Bahors submission that the bag filters could stop 97% by weight of particulate greater than 0.03microns under laboratory conditions. However, this raised problems for her in relation to what the actual field data would be, how the bag filters would vary with time, that 3% of larger than 0.03microns from such a large facility is still a lot of particulate and the emission of nanoparticles less that 0.03microns. She stated that there was no safe level of nanoparticulate. Although Covanta do not appear to be aware of monitoring systems for such particles, laser based equipment exists and she queried who would pay for and operate such a system. She then referred to Professor Montanari's submission, the longevity of the particulates and their impact on health.

Food quality and Fauna

Ms Wheeler stated that in the EIS Chapter 8.4 shows that the incinerator is upwind of the area where Dublin's fruit and vegetables are grown and that with current trends in oil prices people will be reverting to local production for such foods and even individuals keeping their own market gardens.

She stated that the windrose data showed that the majority of the nanoparticles could end up in the sea and referred to Professor Montanari and the effects that this could have on sea organisms, fish and geese and outlined that it would be tragic if the salmon stocks in the River Liffey were eliminated either by dioxins, nanoparticles or the lack of a clear pass through the thermal plume of the cooling water. She feels that Dr Shrenks assessment in the EIS –Appendix 13.3 was limited and that the EIS lacked evidence of the likely effects of the incinerator emissions on flora and people in its environmental

footprint. She stated that an association of French doctors have called on a moratorium on incinerators and that a HIA would include investigations into other developments in Europe.

Local factors

Ms Wheeler makes the following points:

- The site is in the centre of a nature reserve with SAC, SPA and NHA designations
- District heating could be provided from existing heat sources, Ireland has a mild climate and thus would not require DH for 50% of the time and a location elsewhere would allow for the waste heat to be utilised as process heat by industry.
- No quantitative analysis appears to have been made of the statement that this is the 'centre of gravity' for waste.
- Difficulty in discerning where the 600,000 tonnes/annum of waste will arise.

Experience on Dublin City Council

Ms Wheeler stated that she was on the Council when the votes on the Waste Strategy 1998 and the Waste Plan 1999 were taken and that she understood that what was proposed was incineration but that other Councillors received verbal reassurances from management that it was feasibility studies that were being proposed. No cost benefit analysis was carried out at that time on MBT and she feels that Mr Twomey was incorrect in claiming that MBT would be less effective when used in conjunction with source segregation. She feels that there should be enforcement of source segregation to raise awareness and improve recycling rates.

She attended, with DCC, a trip to several waste management facilities in the Netherlands, including three incinerators and she noted that they were run by private operators but wholly owned by the municipal authorities so that they did not have a profit motive and safety standards were paramount.

She feels that in the proposed system for Dublin the operator appears to be responsible for monitoring and has a financial incentive to minimise safety standards with DCC effectively licensing itself. She states that she is alarmed by the management of the project to date and the fragmented nature of the design and operation aspects. She is not aware of Covanta as a company and is concerned as to the interests of Dublin householders and ratepayers if one of the parties goes bankrupt and the contractual arrangements are not secure. She feels that minimum specifications for certain equipment should be available and that it is unfortunate that MCOS would have business interests with incinerator companies.

Ms Wheeler referred to Cllr Maher's presentation in relation to the adequacy of the EIS. In relation to sustainability she outlined that in light of current global issues Ireland should adhere to the EU's 6th Environmental Framework – Waste Management Hierarchy with materials recovery preferable to energy recovery. She feels that this proposal is oversized and would reduce potential improvements in source segregation and an energy balance of various options including MBT should have been undertaken in the EIS.

She asks that the licence is refused or at least that a HIA be required and that if it is to proceed that the tonnage is reduced to 100,000 tonnes/annum.

No. 26 Green Party–Mr Ciaran Cuffe (22/04/08 E-K)

Deputy Cuffe read from his submission (Document 42) and outlined that he was an architect and planner and from 1991-2003 was a Councillor in DCC and for the last six years has been a TD for Dun Laoghaire Rathdown. He outlined the reasons that the Green Party are opposed to the application:

Principles of Waste Management

He stated that if the EPA approve the plant they will underpin waste management practices in Ireland and encourage waste generation and disposal options instead of a resource recovery approach

In addition he outlined that although there is an energy recovery component to incineration, the ECJ EU determined it was not waste recovery but disposal. He referred to the UK Waste Not Want Not Strategy (2002) and quoted that local authorities should not get locked into long term tonnage contracts, should develop contracts for the incineration of residual waste and should consider other options such as MBT for managing residual waste.

Proposal is premature

Deputy Cuffe stated that the proposal for the incinerator is premature as the facts around the exact quantity of available residual waste is not known. In addition, National waste policy is under review as the Minister for the Environment has issued a tender to that effect which is due to be completed in 2009 and which will inform a new National policy.

Capacity, waste projections and waste management policy

He outlined that although it is agreed that Ireland does not have sufficient infrastructural capacity to deal with the current levels of waste, the proposed plants combined with improved recycling will reduce the quantity of residual waste to be disposed of in the country. He referred to both a response to a Dail question and he read a letter from Minister Gormley, dated 18 April 2008, to illustrate that the projected residual waste in Ireland for 2016, following the increases in recycling rates and the development of an MBT infrastructure, would be 408,896 tonnes/annum. The letter also outlines the derivation of the numbers which are included in Table 1 of Document 42. The letter also provided further details of the review of the waste management policy, which allows for interim reports, and it also states that there can be other policy measures including an increase in the landfill levy.

EPA Advisory Role to Local Authorities and Government

Deputy Cuffe stated that since 1996 the EPA has gathered data on Irish wastes arising and has recently commissioned work and called for research in areas relevant to the hearing and therefore the EPA is aware of the characterisation of wastes in 'grey' bins and the amount/types that can be removed by MBT. He outlines that the Agency has a statutory responsibility under S.52 of the EPA Act to advise local authorities of the data available on waste characterisation and the latest waste management options available and the Green Party feel that the granting of a licence would be incompatible with this responsibility and that this proposal is premature until the outcome of the studies and reviews are completed.

Economics of the plant

Deputy Cuffe considers that the capacity of the plant was not addressed by the EPA in the proposed decision, albeit that ABP considered it should, particularly in the context of air quality. He states that the decision on capacity will have an effect on not only the environs of the plant but also other local authorities currently in the process of waste management planning. He states that the capacity is integral to the economics of the project and the 'Put or Pay' clause in the contract require DCC to provide a minimum of 300,000 tonnes/annum waste or they will be penalised. He expresses grave concern on behalf of the Green Party as this conflicts with the principles of reducing waste and promoting recycling and cannot be justified on the basis of the new waste projections. He highlights the responsibility of DCC to protect its finances and ensure value for money on all contracts.

Scale – Health, amenity and environmental quality

He outlines that the decision on the scale of the plant will have direct and long-lasting implications for the health, environmental and urban amenity quality of the residents in the locality which is of serious concern to the Green Party.

Notwithstanding that he is requesting that the licence be refused he then asks for a complete revision of several licence conditions as there are concerns principally around access to information and notification of public agencies, departments and the public of incidents and in light of a commitment in the Programme for Government 'to establish community monitoring arrangements of major waste facilities'. The concerns regarding the specific conditions are outlined below:

- Condition 1.5 and Schedule A Note 2 – ability of the EPA to amend wastes on a case-by-case basis
- Condition 1.8- licence can be amended at any time limiting public participation
- Conditions 2.3, 11.2 and 2.3.2.8 – Environmental Management System only required after licence is granted and not required to be included in the Public Awareness Programme.
- Condition 2.3.2.8 – limited real-time data to be made available
- Condition 7.1 – CHP proposals only required after the licence is granted
- Condition 11.1 – Notification of incidents is inadequate and should require other Departments and Authorities
- Condition 11.11 – Waste Recovery report is required after licence granted and it is not specified under Condition 2.3.2.8
- Waste profiling records are not included under Condition 11.2 or 2.3.2.8
- Clarification of Condition 11.11.1 in relation to references to 'imported waste'.

Questions:

DCC-Mr Shipsey asked several questions around the issue of current Government Policy and the documents prepared by DCC for the hearing and referred to specific documents referenced in Document 1. He queried aspects of the letter from Mr Gormley, the status of the review and the background to the numbers.

Response: Deputy Cuffe stated that he had read many documents produced by Mr Twomey, DCC but not all the documents for the hearing. He has staff that produce summaries on this issue. He indicated that he was aware of the policy documents referred to by Mr Shipsey which do favour thermal treatment including the Dublin Waste Management Plan. However he felt that there are more recent strategies and policies which give a different view. In addition although he agrees that the Waste Management Plan makes provision for a WTE facility this was a concern in relation to the way the plan was presented to the Councillors.

Deputy Cuffe agreed that Minister Gormley had commenced a review of Waste Management Policy. His opinion was that policy was determined by policy documents, guidelines, circular letters, programme for government, and other publicly available documentation. He had no further details in relation to the derivation of the details of waste projections but feels that the Minister is well placed to produce the facts.

Mr Bryan queried policy in relation to light bulbs and how this would impact on the input wastes particularly insofar as CFL's have mercury in them.

Response: Deputy Cuffe outlined that the aspiration was to move to electrical fittings that use less energy and which would be disposed of at a lesser frequency. He outlined that on a visit to Switzerland he was taken aback by the type of waste he saw being incinerated and he thinks that their move to incineration was motivated by a need to dispose of industrial wastes.

GP- Ms Wheeler asked questions related to recovery levels and MBT

Response: Deputy Cuffe believes that the Ministers intention is to increase recycling and recovery levels by using MBT and also that these figures are conservative in terms of the diversion that can occur.

CRAI- Ms Corr asked about the 'Put and Pay' clause that may be in the contract

Response: Deputy Cuffe stated that he believed the Minister was concerned about 'Put and Pay' clauses and that if he was a Councillor on DCC he would be concerned in relation to money being spent wisely. He would consider tabling a Dail Question to try to ascertain if there was such a clause but he was aware that there was commercial sensitivity around the contracts which keeps this information out of the public domain.

S&MRA – Ms Kelly asked questions around the Waste Management Plans and the contract and whether the emissions to air from the facility would affect the whole Dublin region.

Response: Deputy Cuffe understands that the plan is for the four Regional Authorities but would defer to Mr Twomey, DCC as to the responsibilities of the other three local authorities within the contract. He thinks that depending on the prevailing winds it could be possible that other areas were affected.

No. 27 Dublin City Council- Dr Edward Porter- Climate (22/04/08 S-U and EE-KK)

Dr Porter read from his submission (Document 8) and outlined his qualifications, experience and recent projects. He stated that the climatic impact of the proposed WTE was assessed by means of quantifying the release of fossil fuel derived greenhouse gases (GHG's) and comparing these releases to those derived from the alternative waste treatment options such as landfill and landfill with anaerobic digestion.

Assessment Approach

He carried out a detailed consideration of available published guidance and directives including those produced by the Intergovernmental Panel on Climate Change (IPCC), UK Environment Agency (EA) and Irish Government Departments and Agencies. The IPCC guidelines on compiling National Greenhouse Gas Inventories was used in the assessment. According to the IPCC methodology the main GHG emission from solid waste disposal sites, including landfill, is methane (CH₄) and carbon dioxide (CO₂) is not treated as a net emission from waste.

Dr Porter outlined that the emissions from the WTE facility with climate change potential are CO₂, CH₄ and nitrous oxide (N₂O) and the assumptions were based on the treatment of 600,000 tonnes MSW per annum for 30 years in the incinerator and the export of 59MW_e as against the landfill of this waste. It was also assumed that a landfill gas capture rate of 75% would be achieved, with subsequent power generation and that the power displaced (after 2018) was that derived from CCGT rather than coal or peat. He stated that the calculations show that for WTE the total anthropogenic GHG contribution would be 0.14% of the total GHG emission in Ireland in 2010 but that in the absence of the WTE plant the landfill of the waste would generate GHG of 0.25% of the total GHG emissions. He concluded that this indicates a saving of 0.11% of national emissions or equivalent to removing over 27,000 average cars from the road network.

Dr Porter stated that other alternatives were investigated including the diversion of all residual waste to anaerobic digestion (AD) and that the incineration route was shown to be more favourable in climatic

terms. The addition of district heating (DH) to the assessment would increase the savings of GHG emissions to 0.30% of total national emissions in 2010.

Replies to Third Party Objections

He stated that the waste mix is residual waste and the expected characterisation of that waste was determined using available reports, such as the National Waste Report 2005, and the Waste Management Plan for the Dublin Region 2005-2010 with fraction adjusted to take account of biological treatment of 165,000 tonnes of waste and projected variations in the ratio of household to commercial waste.

Waste fractions and composition

He explained that there had been some confusion in relation to the carbon fraction and the fossil fuel fraction of individual waste streams and in particular the definition of 'Plastics' and 'Others'. He stated that he had gotten clarification from the EPA in relation to the change in the definition of 'Others' in the various National Waste Reports 1998 – 2004 and that Table A4 represents the breakdown used. In relation to the carbon and fossil fuel fraction of 'Others' he stated that although there would be some regional variation in waste streams it was considered that the UK and EU waste profile would be broadly similar to Ireland and an average of the data was used to derive the anthropogenic CO₂ emissions from the proposed WTE facility which he states is in line with IPCC methodology that country specific information should be used where possible.

Power generation and Fuel displacement

Dr Porter stated that the gross power output is approximately 65.7MW_e with internal power consumption estimated at 6.6MW_e in line with BAT 63 in the BREF on Waste Incineration. The proposed facility will export 59.2MW_e to the national grid and a key question is what fuel will be displaced.

He referred to various reports from the Government, SEI, CER and A&L Goodbody and stated that the studies indicate that wind power will essentially be accepted onto the national grid with 'priority access'. Further reports by SEI have indicated that oil will be phased out by 2012 and replaced by CCGT installations using natural gas.

Incineration Vs Landfill

Dr Porter dealt with three scenarios of incineration versus landfill of 600,000 tonnes of waste using the combined margin approach for displaced power and the results over the lifetime of the plant are summarised as follows:

- Landfill (assuming 75% gas capture) – incineration is more favourable by 0.11% of the Kyoto target
- AD of all residual organic waste (144,031 tonnes) with landfill of remaining (75% gas capture rate) – incineration is more favourable by 0.02% of the Kyoto target
- AD of all residual organic waste (144,031 tonnes) with landfill of remaining (50% gas capture rate) – incineration is more favourable by 0.22% of the Kyoto target
- AD of all residual organic waste (144,031 tonnes) with landfill of remaining (50% gas capture rate) versus incineration with District Heating - incineration is more favourable by 0.30% of the Kyoto target.

Sequestration/biogenic fraction of waste

He explained that focus of UNFCCC and the IPCC as set out in guidance from the IPCC on the compilation of National Greenhouse Gas Inventories are the anthropogenic emissions i.e. those directly from human activity or as a result of natural processes which were affected by human activity. Carbon from biogenic sources such as paper and food waste are not considered to contribute to the GHG emissions total and CO₂ emissions from landfill are also not included as emissions from waste. Similarly

the CO₂ from the incineration of paper and food waste is not considered but that from plastics and fossil fuel based fractions is.

Since GHG's have different efficiencies in retaining solar energy and different lifetimes in the atmosphere the emissions are calculated using their Global Warming Potential (GWP) over a 100 year period so that they can be compared. The GWP100 for CO₂ is 1 whereas CH₄ is 21 and N₂O is 310 so the issues raised by objectors in relation to the lifetime of gases in the atmosphere has been factored into the calculations. Dr Porter stated that in line with IPCC methodology all GHG fluxes are treated as if they are emitted simultaneously even though in the case of landfill it occurs over decades. He quotes from a UK DEFRA report (2005) which implies that the social cost of methane emissions will increase much faster than CO₂ emissions and given the choice of emitting now or in 60years time we should opt for doing it now on the basis that it will have gone from the atmosphere before the severe impact of climate change occurs.

He summarised by outlining that incineration of mixed MSW was a more favourable option from a climate perspective, under IPCC rules, than either landfill alone or landfill with AD.

He clarified that the 75% gas capture rate referred to an instantaneous rate of 85% so then a capture rate of 50% could be an operational rate of 60% and data from IPCC and EU shows that the rate of capture is in the range 50-60%. He stated that even with the best designed systems it is clear that the capture rate falls well below the default rate of 75%. He has assumed in all the calculations that the captured gas is used in power plant.

Questions

GP- Ms Wheeler asked if he should have compared it to a greater level of recycling in line with the Landfill Directive and if the energy taken in the manufacture of the plastics should be taken into account in terms of a saving if the material was recycled. She asked if it should be compared with MBT so that further recycling could be assessed and the energy involved in recycling paper. She queried if he had considered that in the future there would be levelling out of demand and thus not as concerned with peak demand.

Response: Dr Porter said that the starting point of the calculations assumes that the WTE facility will only take residual waste which has had the recyclable fraction removed and it also allows for the diversion of biogenic material for anaerobic digestion. In relation to the plastics, the assessment is not a lifecycle analysis and only deals with the process emissions and displaced power. He stated that issues such as the energy requirements for the recycling of metals such as aluminium has not been included either therefore it is erring on the conservative side. He stated that the scenario in section 5.4 deals with a case where almost all the biogenic material is recycled in the AD with only inert going to landfill and this is realistic. He stated that although he did not have the figures to hand related to the energy usage the EU and UK documents referred to on page 4 of his presentation has good information on the issue. He felt that if wind power was able to supply a constant base load it would not affect the calculations as it gained priority onto the grid.

S&MRA- Ms Kelly asked for a further explanation for the use of the 75% and the 50% landfill capture rates and why there is a jump in the line in the graphs in 2018-2019 and the new information submitted in the document. She queried if tidal power would affect the calculations

Response: Dr Porter explained that they were trying to show the full range of possibilities and that the true answer was somewhere within these. He stated that this was due to the issue of displaced power i.e. CCGT will be displaced from 2018 which favours the use of alternatives. He felt that the information

in his presentation was a response to the issues raised by objectors and was by way of further explanation as to how the assumptions were arrived at.

He outlined that pages 10-12 dealt with the acceptance of renewables onto the grid and that they will have priority over incineration derived energy and he doesn't see that it will have an impact on his calculations as the power being displaced will be fossil fuel based.

Mr Bryan asked if the footprint of the export of bottom ash was modelled. He asked questions regarding wind power and base load.

Response: Dr Porter restated that he only looked at process emissions and that transport emissions are generally only a small fraction of the emissions. He agreed that there were cost implications for the ESB in relation to the priority given to renewables as they will have to retain capacity to deal with times when the wind power is not producing electricity etc.

Mr McCarthy asked if the presentation was based on a new climate model, if the input waste mix had changed, if three sources of data were used, the fraction called 'others', and communications with EPA report lead author. He asked if there were new calculations done on the carbon and fossil fuel fraction, if these were used in the model, the displaced fuel figure and the difference between what is in the EIS and the current document. He asked questions related to the use of sludge, number used for total CO₂ emissions and the Kyoto target used. He referred to his submission (Document 50) and asked if it reflected the changes in his different models. He queried if the number of scenarios had changed from 8 in Poolbeg 2, 5 in Poolbeg 3 and 4 in Poolbeg 4

Response: Dr Porter stated that he had used the same approach and methodology but there had been small changes in relation to the inputs and outputs that were used in the previous models to take account of further detail available such as the displaced power issue. He stated that the input waste mix had changed as previously he had looked at it on a national basis but he has updated it to reflect the Dublin ratio of household to commercial waste. He used three sources as stated in Section 5.1 as there is more detail in certain areas in these reports. Dr Porter outlined that in response to Mr McCarthy's submission that 'Others' was 100% fossil fuel derived he did further research and clarified that there were two definition of 'others' one of which applies to Recovery and the other to Landfill. In terms of 'residual waste' the accepted international definition that applies is 'composites, fine elements such as ash, unclassified incombustibles and unclassified combustibles including wood waste'. He stated that this is the definition that was used in the EIS. He had sought the advice of the Lead Author of the EPA report in his research as outlined in his presentation.

He stated that he had looked in detail at the fossil fuel and carbon content of waste in EU, UK and IPCC publications (Tables A5, A6 and A7 of Document 8) which show variations and determined that he would calculate the emissions based on the UK and the EU data and then average the result to take on-board the submissions made by the Third parties. He used the average numbers in the model but these are more conservative than the previously used UK numbers.

It had been outlined in a submission that incineration might displace wind power so he further researched the issue and found the SEI has set out an approach which he has now followed. Dr Porter stated that there has been an evolution of the data as the planning and licensing process has been gone through.

Dr Porter stated that sludge has not been dealt with in this version of the model though he has looked at the issue and it was it was included in a previous version but it is not reported in this presentation. The biogenic carbon is provided (Table 5.5) and the total CO₂ is the sum of the biogenic and fossil derived

CO₂ but this was not supplied in the report. He used the Kyoto target from the period 2008-2012 (~63 million tonnes) but the lower target from 2012 onwards was not used but if it was then it would make incineration more favourable than landfill.

Dr Porter stated that the main difference between Poolbeg 3 and 4 was the electricity correction which gave a more conservative result but he did not agree that there a substantial change. The number of scenarios in the models has changed as it has become evident that some of the scenarios were not relevant. He outlined that he had studied the sludge scenario and it was showing more favourable to incineration as although less power was exported due to the use of sludge there was a saving of 13.3% saving CO₂ emitted with 80,000 tonnes less of MSW but the detail has not been presented at the hearing.

No. 28 Dr Vyvyan Howard (22/04/08 V-DD)

Dr Howard stated that he was medically qualified and a pathologist that specialised in the toxicology of things that affect the foetus and infants. He currently holds two EU grants for investigating the adverse effects of nanoparticles (Framework 6 project called Nano-interact and Framework 7 project -Neuro-nano). His submission was in the form of a powerpoint presentation (Document 43(a), 43(b) and 43(c)) which contains the references to the books and papers that he mentions in his submission. He outlined that he would deal with two topics; Particulates and Persistent Organic Pollutants.

Health effects of particulates

The health effects of particulate are well known such as silicosis, asbestosis but the spotlight has changed to smaller particles as set out in a paper by Pope & Dockery (Journal of Air & Waste Management Association 56:709-742) where they conclude that they cannot detect a safe level of exposure to these particles and that there is little knowledge of the relative toxicity of particulate from different sources. His interest in the subject of ultrafine particles started in 1986 and he referenced work by Dr Jefferson of the University of Cambridge who outlined that when a substance such as gold, which is relatively inert in bulk, forms in small particles of ca 100 atoms they take on a crystalloid shape and isolated atoms get electrically charged and thus chemically reactive. Dr Howard then made reference to the proceedings of conferences on particulate matter from 1998, 2000 and 2004.

Exposure routes

He defines nanoparticulate as being in the particles with a diameter in the range $10^{-7} - 10^{-9}$ m which can be seen only by a electron or scanning probe microscopy. A Toxicologist looks at how substances get into the body, how they are distributed, where do they get to within the body, how are they got rid of and their toxic effects.

With aerial pollution the main exposure route is inhalation and when material enters the body it gets a coating of biological material which effects its toxicity. We have always been exposed to nanoparticles such as suspended sea salt, viruses and the body has defence mechanisms such as impaction in the nose, muco-ciliary action in the trachea and bronchi and alveolar macrophages in the lungs.

He outlined that muliti-cellular organisms rely on the ability of cells to engulf particles by two mechanisms called phago- and endocytosis and it is thought that this is how nanoparticles get around the body.

Analysis of nanoparticles and their distribution in the body

In 1976 the US National Academy of Sciences and a recent paper by Wichmann and Peters (2000) pointed out that a gravimetric method of analysis was not useful since when looking at particle size distribution the majority of the particles have a small diameter and weigh the least.

There is currently a lot of research being undertaken on where the inhaled particles end up in the body as the pharmaceutical industry are looking at it as a drug delivery system. This shows that at the 1-100nm level they are mainly deposited in the alveoli and can be adsorbed across the membrane or engulfed by phagocytes and taken into the body. Inflammation and fibrosis can occur.

Chronic effects of long term exposure

Donaldson and others on rats have found that the longer the exposure the greater the inflammatory effects and it didn't seem to matter what the composition was but of more importance was the particle size. There are relatively few epidemiological studies on the effects of air pollution but he shows data related to a study by Wiechmann & Peters on the incidents of respiratory illness and mortality in Erfurt, Germany (1995-1998) following a period of air pollution. After 1 day it showed a significant increase in mortality when measured against PM_{2.5} and ultrafine particles but after 4-5 days a second peak of incidents from cardiovascular causes. Over a period of 10 years the mass of particulates in the air in Erfurt has significantly decreased however the smallest particles are increasing as a proportion of the total indicating how difficult it is to suppress and capture them.

Different studies attribute 3-6% of all deaths to particle inhalation which is thus a major public health issue.

Toxic effects of particle

Particles may act on protein molecules, DNA, RNA and phospholipids leading to problems associated with aerobic respiration and protein synthesis in the cells and the integrity of the genetic material. He then outlined the mechanisms of nanoparticle cytotoxicity:

- Catalysis
- Membrane perturbation
- Chaperone effects on proteins and
- Physical damage

He was most concerned with these effects and how they might relate to Alzheimer's and Parkinson's diseases and he quoted some studies related to these effects.

Movement of ultrafine particles

In the UK the Government has some High Volume air samplers which run continuously and information obtained under the Freedom of Information legislation showed that the level of uranium in the atmosphere spiked during the start and the 'shock and awe' phases of the Gulf war (2003) which can be attributed to unusual meteorological during that time. It indicated to him that ultrafine particles can undergo long range transport effects.

Persistent Organic Pollutants (POP's)

Dr Howard stated that POP's are subject to long-range transport and are sequestered in the colder areas of the planet in a process called Global Distillation. POP's accumulate in the body as there is no efficient mechanism for their metabolism or removal. There are 12 POP's targeted by the UN for control and many of them are pesticides and have been phased but dioxins and furans are formed as by-products so cannot be phased out.

He stated that over the past century there has been an increasing 'toxification' of waste with organochlorines which are not part of natural biochemistry. He referred to a study by Iwata et al. in 1993 that shows that PCB residues are distributed widely throughout the globe.

POP's bioaccumulate in the body with an estimated half life for dioxins of 7-10 years therefore the older people will have higher levels than younger. He is particularly interested in their occurrence in breast milk and that they can cross the placenta. A process called biomagnification brings them back into the

food chain which means that if the nominal concentration in the water is 1 then the level in fish would be 2.8 million and in birds would be 25 million.

There has been estimates that up to 80% of dioxin contamination of land is due to incineration of chlorine containing wastes. He outlined that the current average body burden in the US is 10ng I-TEQ/kg body weight but that 1% of the population have 30-40ng I-TEQ/kg body weight. He is concerned that the estimates for dioxins in the EIS relate only to the chlorinated dioxins and furans and the coplanar PCB's. However he feels that there are many other compounds that have dioxin-like activity such as hexachlorobenzene (HCB) and brominated compounds.

He showed the results of studies carried out in Canada and Greenland which showed that there were higher levels of PCB's and DDE in umbilical cord blood the further north they went which reinforced the Global Distillation theory.

Another study showed that after six months of breast feeding, the mother's dioxin body burden is halved and that the baby would take in about 16% of its lifetime exposure to dioxins.

There is an on-going study of children following their progress since before birth (about 15 years now) which relates the body burden to development and they have found problems associated with development.

Brominated compounds

He referred to the dioxin-like properties the brominated compounds that result from the combustion of polybrominated fire retardants.

Total Dioxin Emissions

He felt that in general, the EIS only really dealt with gaseous emissions but that the levels in the bottom and fly ash should be taken into account. He states that per tonnes of waste

- ~500ng TEQ – air
- ~300kg bottom ash would contain 30 times more dioxin than to air
- ~30kg fly ash would contain ~100 times more dioxin than to air

Therefore wherever it goes it is semi-volatile and will eventually get back into the environment.

He then detailed some papers that show what happens when incinerators do not operator correctly. Tegima et al. (2007) and Wang (2007) dealt with start-up situations.

Questions:

DCC- Mr Shipsey asked how many presentations had been made previously on this subject, the views of the Health Protection Agency (HPA) and DEFRA in the UK and the availability of monitoring systems.

Mr Lee queried the presence of hexachlorobenzenes (HCB's) in the intake and emissions from the proposed WTE facility and papers quoted by Dr Howard in his presentation. **Mr Bahor** asked questions on Dr Howards understanding of the abatement systems proposed at the facility for removal of dioxins. He stated that ESP was worse as an abatement technique due to its inability to maintain a charge and the smaller the particulate the worse the performance of the ESP. He also queried if Dr Howard was aware of a USEPA study (~1988) on start-up and shut-down of incineration plants and fabric bag filters.

Dr Howard stated that he had presented to hearings in the UK and Ireland (approx. 8 in total). He was of the view that the HPA in the UK believed that incineration was an acceptable technology. He had attended meetings in regard to the DEFRA report on the health effects of incineration and some of his earlier papers may have been reviewed as part of the process. He agreed that there was a difference in the abatement used on the newer incinerators but that there was a difficulty in the suppression of the small particles as they behaved like a gas. He reiterated that there was a difficulty with the monitoring

techniques used as they were based on mass and that count of particles should be done. He outlined that there was commercially available technology for monitoring by counting the particles for approximately £5,000 which could be adapted to work on an incinerator but he wasn't aware of any facility operating one.

Dr Howard outlined that HCB's were dioxin-like compounds as were similar brominated compounds and that if there was chlorine or bromine in the system they would be produced particularly as it was impossible to know exactly what was in municipal waste. He explained De-Novo synthesis. In relation to the Wang and Tegima papers, he stated that although they referred to hazardous wastes the emissions would be similar but perhaps the dioxin-like compounds would be less concentrated especially if the waste was segregated.

Dr Howard indicated that his understanding was that the peak dioxin deNovo synthesis temperature was 200-400°C and that the rapid quench was used to get through that phase. He agreed that at 180-200°C it was possible that the majority of the dioxins would be on the surface of particles. He agreed that the majority of the dioxins would be removed in the flue gas residues as shown in his presentation. He felt that an ESP system would be better and was aware of Kevlar bag filters but could not recall the USEPA study.

Ms Wheeler clarified that the segregation of waste meant householders doing it and queried if MBT can form the dioxin-like compounds and what temperature this occurs at. She asked if nanoparticles biomagnify in a way similar to dioxins.

Dr Howard agreed that segregation of waste was to be encouraged but that education on what happened the 'black' bag was necessary. As oil prices escalate the amount of 'use once' packaging etc will decrease on a cost basis and with increased recycling but if this incinerator is built and tied into a 25 year contract it will be difficult to take advantage of new recycling technologies.

He outlined that combustion formed dioxin-like compounds at optimal temperatures of 200-400°C which is why a rapid quench is used on the flue gases and that MBT would be a less hazardous approach. Dr Howard stated that nanoparticles do not biomagnify like dioxins but that they get into the body and possibly can get across the blood brain barrier. There has been little studies taken on intake by ingestion but inhalation is the major route of concern.

Ms Kelly asked about hospital waste and the possibility that this type of waste would be in MSW and burnt in the incinerator.

Dr Howard stated that he was on the Board of an NGO called Healthcare without Harm which aims to reduce the amount of hospital waste being incinerated. Clinical waste (cytotoxic) would contribute PVC to the waste if used in the incinerator.

No. 29 Ms Anita Curtis (22/04/08 DD)

Ms Curtis interrupted the session to make a statement against the granting of a licence for the incinerator. She stated that she suffered from myalgic encephalopathy (chronic fatigue syndrome). She felt that her life and that of other vulnerable people was crippled by pollution and she wanted her name registered.

Evening Session submissions

The evening session commenced at 18:30 on Tuesday 22 April 2008 and the Chair gave a brief overview of the licensing process and the purpose of the Oral Hearing. She outlined that the purpose of the session was to facilitate people in making submissions which they may be questioned on by other parties. These submissions would be included in the record of the oral hearing and taken into account.

No. 30 Ms Mary Carvill (22/04/08 LL)

Ms Carvill outlined that she had not been in a position to attend the other days and she read her submission (Document 44). She stated that the ESB engineers in the 1960's had determined that they needed a chimney 600 feet tall to deal with the inversion effects during anticyclonic weather in winter months and she queried how the emissions from incinerator stack can be safe at half that height. She quoted the 'Precautionary Principle' and the requirement that the proponents of the project must establish that there are no health effects and it is the role of the EPA to protect the residents. Ms Carvill outlined that DCC had assured the residents that the sewage works would be 'State of the Art' and there would be no odours but that there has been odours (even this week) therefore she queries why the residents or the EPA should believe the assurances given in relation to the incinerator. She stated that her daughter had visited the sewage plant as a student engineer and that she felt the operators considered the submissions made by the residents were a 'nuisance' and she was worried that the operators of the incinerator would have the same attitude to the residents.

Ms Carvill asked if the Environment Directorate of the EC was asked for an opinion in relation to the location of the facility close to Special Areas of Interest.

In particular she asks what comeback the residents will have if health issues emerge, the measures in place to deal with fires, explosions and accidents including immediate notification of residents, the provisions for the closure of the plant where it doesn't meet the necessary standards, the exposure of the taxpayer to fines if the facility doesn't comply with EU standards and whether the plant will be required to retrofit to meet the standards. She asked if there was to be independent monitoring of the emissions and felt that was very important to reassure the community.

She stated that she was disappointed that she would not get answers at this stage of the oral hearing.

No. 31 Poolbeg Quay Residents- Ms Sharon McCormack (22/04/08 MM)

Ms McCormack read from her submission (Document 45) and outlined that she had submitted an objection on behalf of Poolbeg Quay residents and asked the EPA to refuse the licence on the grounds of the health and safety of the residents, the already high levels of pollution in the area and the traffic congestion. She stated that she was not a technical person but that the EPA would be neglecting their responsibility if they grant a licence.

No. 32 CRAI -Ms Maria Parodi (22/04/08 MM)

Ms Parodi read from her submission (Document 46). She outlined that the incinerator was not in the interests of the population or the environment and represented an outdated and inefficient approach to waste management. She referred to the priorities of the EPA to protect the environment and sustainable development and considers that granting a licence to the incinerator is contradictory to the EPA's approach to waste management and the Programme for Government. She considered that the Zero

Waste model focussing on composting, recycling and waste prevention was more appropriate leading to job creation and wealth for the economy.

Ms Parodi stated that the proponents of the facility have not demonstrated that there will be no adverse effects from the incinerator and she stressed the need to establish relevant baseline health data, preparation of a comprehensive health impact assessment and an on-going health surveillance programme. She states that the EPA should not grant the licence on these points and the considerations in the submissions made during the hearing such as the climate impact, the effects of the nano-particles and the DDDA plan for residential developments in the area.

No. 33 CRAI- Mr Rory Hearne (22/04/08 NN)

Mr Hearne mainly read from his submission (Document 47) and stated that he was a member of CRAI and as a member of People Against Profit Alliance had campaigned against the incinerator in the recent election. He feels that it is the wrong technology in the wrong place and that it will affect the people of Dublin in terms of the dioxins released, the increased waste charges and the increased traffic.

He is currently completing a PhD on Public Private Partnership (PPP) projects and feels that lessons should be learnt from previous projects such as schools and the Ringsend Sewage plant. He stated that as the private sector want to maximise their profit there are corners cut in terms of materials of construction etc leading to problems later in the project life. In relation to the odours from the sewage plant he stated that there have been rows as to who will pay for the problem to be addressed with both partners refusing responsibility and he queries that if this happens with the incinerator the public will be unaware of the health impacts in the same way as with the UWWTP. He considers that there is no trust in DCC or the private partners to operate the incinerator in a manner to protect the health of the community and that the lack of details due to commercial sensitivity leads to a lack of confidence. He asks that the EPA should investigate the record of Covanta in its US operations.

He was disappointed that the Minister for the Environment had not expanded and clarified his statements on incineration and Government Policy. He outlined that current data indicates that the waste would not be available for treatment in the incinerator and that it would result in a major setback to recycling and reduction strategies and is contrary to a sustainable waste management policy for Dublin.

Mr Hearne stated that the USEPA had cited incineration as a major source of dioxins and stated that the American Public Health Association had expressed serious concern over the health effects of incinerator and that Dr Staines had stated that no HIA had been carried out. He queried the ability of the EPA to safeguard the environment and health of the community if the transport and management of the fly ash is not considered within the remit of the licence.

He referred to the 3000 letters of objection submitted to ABP in 2006 from CRAI and requests that the people are listened to at this hearing.

No. 34 Mr Christy Cullen (22/04/08 OO, PP-QQ)

Mr Cullen stated that he lived on Bremer Road, Dublin and he stated that the incinerator should not be located in Poolbeg as there was already significant traffic in the area emitting fumes and 800 trucks per day to the incinerator, the Landsdowne Road and other developments will cause an increase in the traffic and affect the health of the community. He asked that the EPA should protect the health and environment in the area and referred to increased asthma in Dublin which could result in significant financial implications in years to come.

No. 35 Ms Patsy Doolin (22/04/08 OO)

Ms Doolin stated that she lived on Bremen Road, Ringsend and lived there all her life. She stated that there were health problems in the area with a significant number of cancer deaths -Bremen Road (20 out of the 55 houses) and on Kyleclare road (8 out of 20 houses) with several other people undergoing treatment. She feels that the health of the community is not been taken into consideration by DCC. In relation to the traffic she outlined that the Sean Moore Road was like a carpark.

No. 36 Ms Frances Healy (22/04/08 OO)

Ms Healy stated that she agreed with Ms Doolin and restated the health problems in the area and that the area was polluted. She asked that a Health check be carried out in the area.

No. 37 Ms Elisabeth Buckley (22/04/08 OO)

Ms Buckley stated that she also lived on Bremen Road. She outlined that the people and the councillors voted against the proposed incinerator but it was being forced on them by the DCC manager. She was disappointed with the Minister for Environment. She stated that they had fought against the illegal incinerator in the 1990's and also the other proposal for an incinerator and after that time they were told there would not be an incinerator due to the traffic problems which has now gotten much worse. She was concerned about the health effects of nanoparticles and that this was not the correct location for this facility. She outlined that its difficult for CRAI to fight DCC, and that her faith now lies with the EPA to protect the area which she considers beautiful with its open spaces.

No. 38 Ms Frances Cassidy-McLaughlin (22/04/08 PP)

Ms Cassidy-McLaughlin stated that she was 26 yrs old with a young daughter and that the hearing was unfair in that they could not afford to get experts which meant that they had to base their objection on what was available through the internet. She referred to the health effects of incinerators and that it was unfair that the location appeared to be picked because it was handy and contained other industry such as the sewage plant. She wanted reassurance that her family would be fine and that there was nothing to worry about as there was a person that would take responsibility for any problems that might occur.

No. 39 Mr Owen Dunne (22/04/08 PP)

Mr Dunne stated that he was from Pembroke Cottage, Ringsend. He queried the safety implications for the location of the facility in a Cul de Sac with limited access by the Emergency Services. He referred to the flooding of the area in 2000/2001 and outlined how the Emergency Services could not gain access to the area for several hours as the only access was Ringsend Bridge as the other roads were closed off. He referred to a visit by a Norwegian person who told a community meeting that there would be a fire at least once a year at the facility in Norway. He stated that many of his friends and relatives had died of cancer and were suffering from chest infections and indicated that the local doctors should be present to give details. He felt that the area was getting a raw deal with the sewage plant and incinerator and that they would continue to object even if a licence was granted.

The session adjourned at 19:30.

Wed 23 April 2008

The oral hearing resumed at 09:30 with Mr McCarthy requesting an adjournment. There were further requests for an adjournment later in the day

No. 40 Mr James Rountree (23/04/08 C-G)

Mr Rountree read from his submission which came in three parts and he started with Document 48(C) which is a letter to the EPA dated 18th January 2008. The letter supports the objection of Marco Salino and others and wishes to add further information in relation to particulate matter (PM₁₀). He refers to the work of a J.S.Owens in the 1920's in relation to smog in London. He requests that the Agency provide funds to coroners (for cellular level examinations), toxicology and veterinary sentinel post mortem and talks to the HSE regarding public health monitoring arrangements.

He then read from the Veterinary Ireland Public Health Committee statement dated 08 July 2003 which related to the use of landfill and thermal facilities for the disposal of waste. The statement calls for the biochemical, microbiological and toxicological monitoring of water, air, soil, vegetation, effective bio-security and site management and surveillance of animals in the vicinity. It states that the potential for bioaccumulation of chemicals/toxins in human and animal tissues and the latency period between exposure and side effects should be considered. The Committee contends that the use of animal surveillance systems to establish baseline data is useful to both the authorities and the public and the benefits of the 1991 –2001 study of dioxins in milk from Co. Cork was noted.

Mr Rountree read his objection and additional information which outlined that he was a dairy farmer in Co. Meath and that he had concerns regarding the environmental responsibility of the State and the applicant to the farming community particularly in relation to air quality (particulate matter), monitoring of chromium and cadmium, sentinel monitoring of birds and animals for dioxins/furans and filtration failure. He outlined that there is a 'grey' area as to who is responsible for losses to the farming community in the event of a serious toxic release and the resulting restriction on their products.

Particulate Monitoring

He stated that he was told that there was no method for monitoring for particulate matter below PM₁₀ but he found that in a book published in 1925 it had been done. He then queried the surface area of particle and their carrying capacity for other chemicals and was told it was not known however he found, in the same book, that a method called the Owens System Jet Dust Collector and counting could do this and he provides further detail in Document 48(A). He feels that the use of a gravimetric system for quantifying dust emissions is irrelevant and that technology should allow for a method for particulate monitoring by counting particles.

He indicates that there are dust removal systems in the electronics industry and other areas that should be considered for the continuous monitoring of dust, such as an oil bath air filter. He states that the public would prefer continuous monitoring rather than spot checks. He then describes a method for estimating particle surface area which is illustrated in his submission.

He also reads a proposal for an 'Air borne sediment collecting device' (Document 48(B)) which involves an oil filtration system.

Climate Change Impact

He refers to Dr Porters submission to the ABP oral hearing and states that he is unaware as to how the EIS was amended in light of the different figures proposed. He suggests that a less complicated manner of presenting the data should be provided. He also stated that he is involved with a proposal regarding

the conversion of meat and bonemeal to charcoal and is concerned that the methods used for carbon accounting in the incineration project will not allow for a proper comparison.

Monitoring of agricultural areas

He stated that if a dioxin problem arises, e.g. from a burst pipe in an incinerator, it will lead to restrictions on farmers with their produce having to be dumped and he feels that the State and the incinerator operator will deny responsibility.

In relation to chromium monitoring he asks for regular monitoring and includes a test method (Document 48(A)) and some questions for Dr Porter. On cadmium he states that there is an accumulation of cadmium along major roadways and there should be a baseline study and veterinary sentinel monitoring carried out for agricultural purposes. He feels that chromium (VI) was not fully considered in the EIS and in particular the derivatives of chromium trioxide and other chromates produced in the incineration process and their subsequent environmental decomposition.

He considers that food waste should not be burnt in an incinerator and outlined that the burning of protein in an incinerator (re: his question to Mr Bahor) results in reduced heat energy than waste of a similar CHO content due to the energy required in the production of NO_x.

Questions:

Mr Bryan asked questions concerning pathological effects of particulate, dioxins and furans in animals and humans.

Response: Mr Rountree outlined that dioxins tend to accumulate in animal fat including milk and particulate matter can carry dioxins.

No. 41 CRAI- Ms Frances Corr (23/04/08 N-T)

Ms Corr read from her submission (Document 49). She stated that she was Secretary of the Combined Residents Against Incineration (CRAI) group and a former member of the Dublin Docklands Development Authority. She outlined the grounds on which the members of CRAI from Ringsend, Irishtown and Sandymount object to the granting of a licence for the facility.

Waste Management Policy

She stated that there was a conflict between the statement of ABP that the proposed incinerator was in line with government policy and the statements of Minister Gormley which indicates that incineration is not a cornerstone of waste management policy and that it is disposal and not recovery. She states that a licence should not be granted until the waste management review is completed and the findings available to the public as it appears that the facility is oversized on the basis of the most recent data from the DEHLG. She referred to a conference in September 2007 where Dr Dominic Hogg, in relation to a report he has produced on Irish waste management, indicated that there is a need to develop an alternative to incinerators such as MBT.

Ms Corr outlined that the proposal is not consistent with the EU Waste pyramid as there is inadequate facilities available to householders for recycling to ensure proper segregation of waste. She feels that it is the intention of DCC to direct 'grey' bin waste from the inner city to the incinerator and to bale waste from other other areas and send it unsegregated to the incinerator in light of the traffic movement data proposed in the planning application. She asks if there would be a need for the 600,000 tonne/annum incinerator if adequate recycling facilities were in place.

Traffic and Air Quality

Ms Corr dealt with traffic issues such as the current congestion, the previous refusal of an incinerator on the basis of a lack of infrastructure, the lack of plans for the Eastern By-pass and proposed residential and commercial development that will further increase the traffic. She outlined that severe air and noise pollution is being caused by the traffic and that there has been a 15% increase in the number of vehicles that crossed the East Link Bridge and Sean Moore roundabout which leads to air quality exceeding the EU legislation. She outlined that the ban on five axle trucks in the city didn't make much difference to traffic in the area. She also stated that there was still some doubt as to whether certain waste trucks can be transported in the Port tunnel due to it being classified as hazardous or dangerous.

Consultation

Ms Corr referred to the requirements of Article 12 of Directive 2000/76/EC (WID) and Article 15 of Directive 1996/61/EC (IPPC) and stated that there has been a lack of community involvement, real consultation or relevant information available on the project and that this was evident in the report, commissioned by DCC, of Mr Trutz Hasse (*The Community Gain Study*). She feels that after 10 years the groups have only engaged twice in discussion namely the ABP and the EPA oral hearings.

Health Assessment and baseline data

She stated that CRAI have huge concerns around community health issues and they feel that these issues have not been addressed. She referred to the HRB report 'Health and Environmental effects of landfilling and incineration of waste- a literature review' (2002) which she stated concluded that Ireland had insufficient resources to carry out risk assessment for proposed waste management facilities. She stated that the report outlined a deficit in personnel and dedicated resources to carry out risk assessments, data gaps in relation to the assessment of the technologies, a lack of baseline health related information and that the Irish health system could not support routine monitoring in the vicinity of waste facilities.

She referred to statements by Dr Andrew Buroni who gave a submission to ABP on behalf of DCC and who had assessed the potential environmental effects against national and international guidelines set to protect health. Ms Corr stated that, there was a lack of baseline studies in Ireland, there was no documented evidence to show that socio-economic health improvements followed regeneration. In relation to his contention that the Community Gain Fund could be used to address existing social and health issues she outlined that the area had suffered from early school leaving and that when the traditional port related industries ceased these people became unemployed. She feels that the health issues relate, in part, to the industries (coal unloading, glass manufacture, coal burning power plants etc) and the dumping of unsegregated waste on the Poolbeg Peninsula prior to the 1980's. She stated that the health effects of living in this area has not been investigated.

She stated that there was concern in relation to the health effects and monitoring of ultrafine particles and that the concerns was not adequately dealt with.

Health & Safety

She stated that although they are being told that modern incinerators are safe she referred to incidents at the Kirklees incinerator in UK (September 2006) and two incidents at the Semass recovery facility in the US owned by Covanta (2002 and April 2007). In addition she referred to alleged breaches of USEPA emission standards by Covanta and stated that this did not inspire confidence within the community particularly as they will design build and operate the plant but have not applied for the licence.

Concerns regarding responsibility for and operation of the facility

CRAI have concerns about who will have overall responsibility for the plant, for dealing with the waste if the plant breaks down given that there has been 3 changes of agent or contractor in the last year and DCC have not made public the Contract with Covanta. She made reference to the Municipal sewage

plant and the odours emanating from it insofar as CRAI believes that DCC are incapable of operating it within the stipulated limits despite the statements in that EIS. In addition, the current application to increase it to 2.2 million people with increased sludge truck movement was not addressed in the cumulative impact assessment of the incinerator.

Natural heritage

Ms Corr outlined that Dublin Bay is an area of high conservation importance protected by both the EU Habitats and Birds Directives with other special sites of conservation being the Rivers Liffey and Tolka estuaries. The incinerator will infringe on the Nature Park and the habitat of the Brent Geese and the community are concerned that this was not adequately addressed in the EIS as they consider that the maps provided were not to scale since ABP requested further information on them.

BAT

CRAI consider that their previous experience with DCC on the sewage plant indicated that 'reasonable cost' was more important than BAT and she stated that it has been shown that there is a vast difference between providing a similar incinerator in Ireland than in Europe.

Ash disposal

Ms Corr outlined that the proposal for waste ash disposal was very vague and that further details should be required by the EPA. The responsibility for, storage and transport of the ash, how it will be transported to the ships, how it will be shipped and what will happen to rejected ash consignments are not adequately dealt with in the EIS.

Proposed Decision

She referred to several areas of the PD that should be removed/amended/inserted:

- Fourth Classes 3,4, 8 and Third Schedule Class 12 – There was no proposals for carrying out all these activities submitted by DCC and this would be a considerable expansion of the project.
- There should be control of the construction phase as this is to extend to 3 years duration.
- Delivery hours for waste should be revised as they impinge on the health and enjoyment of the community.
- Condition 3 – Is there a need for a windsock if the Agency is convinced there will not be an incident or accident.
- No licence should be granted until proper enforcement mechanisms are in place particularly as DCC will also be enforcing this licence on Covanta.
- A CCTV system should be in operation to monitor the ash transportation system including dust control systems for ship loading on the open quayside. It was not dealt with in the EIS, by ABP and so far by the Agency and it poses a significant environmental hazard. Also as this method of waste disposal will not be available for the planned life of the project the viability of the proposed facility should be queried.
- Condition 12- Financial charges – CRAI contends that the Condition is founded on the assumption that financial compensation is adequate remedy for loss of life, amenity, health or damage to property or other interest but that it is the duty of the Agency to prevent such hazards and that significant risks that cannot be removed at design stage should prevent the commissioning of the facility.
- A Condition requiring a full health impact assessment of the community with 5km of the site should be included to establish a baseline of health data.

- A Trust with a fund of at least €25 million from the operator should be established to allow for the investigation of death or illness in the community after the facility has commenced and to pay for such pathology tests as necessary.
- Funds should be made available to compensate persons or their families if their lives have been affected by the incinerator through illness or loss of life.

Background Air Quality

Ms Corr outlined in detail that a wide range of issues were raised during the ABP oral hearing and she referred to the report of Dr Broderick. She outlined areas of particular concern:

- Current 24-hour PM₁₀ levels exceed the EU legislation in the vicinity of the proposed plant and was not discussed in the Non Technical Summary or elsewhere in the EIS.
- The background concentration (mean measured) used to predict PM₁₀ levels for 2012 leads to an underestimation of the predicted 2012 background level.
- The assessment of background NO_x may not address local impacts as it is based on an average of sites rather than those observed for Sandymount Strand and Sean Moore Park and thus the impact of the facility and related traffic may be more significant than presented. She referred to guidance from the National Society for Clean Air and states that using that guidance the impact of the operation of the facility would be '*slight to moderate adverse*'
- The Necten background calculator was devised for local authorities in the UK and assumes that air quality will improve as vehicle and industrial emissions improve. However these assumptions may not be relevant to the Poolbeg area particularly as the high PM₁₀ concentrations may not be due to traffic. This is highlighted as background levels are not falling in a uniform manner in the period 2000-2007.

She stated the ABP concluded that the EPA had responsibility for the control of pollution through the licence and Ms Corr asked that the EPA should consider all the information presented at the planning hearing.

Site Selection

Ms Corr states that the poor air quality and carrying capacity of the site indicates that it is not suitable for the development of further industrial activity unless significant improvements are made elsewhere. This should have eliminated the site during the site selection process.

In summary Ms Corr stated that CRAI had examined the proposed licence and they feel that it has serious defects some of which arise due to discrepancies between the findings of ABP and the EPA and the conditions appear to relate to a proposed incinerator but not the type of plant or operation portrayed at the ABP hearing. In addition the development proposals for the Poolbeg area and other external factors such as climate change and traffic management should require the licensing process is halted until these projects/proposals are finalised.

No. 42 Mr Maurice Bryan (23/04/08 U-HH)

Mr Bryan stated that he had made a submission and an objection on the application for a waste licence by DCC and that he now wished to deal with issues that have not previously been raised.

He stated he was a Chartered Engineer and outlined his qualification, experience and expertise over the last 60 years working in various industries including the Communications, civil service (P&T), control systems engineering, project management and other works in many sectors (food, glass sector (IGB), electricity, diamonds etc) and since retirement have advised on planning and wildlife conservation issues and Chairman of Irish Birdlife Conversancy.

He feels that the main shortfall in the discussion on the processes so far has been on the human interfaces and he gave the example that the Chernobyl incident was a result of the safety devices being disabled to carry out an experiment.

He has been involved with the project for 11 years and wants to empathise that there has been virtually no consultation with the community by DCC. He outlined that the inequality of resource allocation in this project is unprecedented with in excess of €20million being spent by DCC but nothing being made available to the Community. This was most evident at the ABP oral hearing when they put forward detailed submissions on the EIS (which he feels is a confused document) and were overwhelmed with 29 expert witnesses that they had to question however in the end the report shows that their evidence was barely considered. He feels that the result of the hearing was pre-determined and he quoted the view held by Simon Coveney TD that the way ABP is set up makes it difficult for objectors to be successful.

Health Impact

He quoted Dr Staines in stating that no baseline Health Survey was undertaken for financial reasons but he also feels that the health of the community in the vicinity is not suitable for the emissions from this proposed plant. He referred to their being no appeal mechanism other than a court case and that the outcome would be difficult to predict.

Agency Constraints

Mr Bryan found that when he worked on a Community Forum with Dun Laoghaire Co.Co. that there was a lack of communication within the council with duplication, gaps and no co-ordination and he feels that this is evident in the application (referring to the Air Emissions Assessment and the fact that future developments were not taken into account). He referred to Document 51- A discussion document on a Vision for Dublin Bay which outlines plans for the North side for the next 40 years to include tidal barrages and the use of tide and wave to generate energy. In the south of the city he states that there are 20 storey buildings proposed which would be level with the incinerator building and that these have not been factored into the assessment of air emissions.

Site location

He wonders why DCC are proceeding with the project as he feels that the site was pre-selected on the basis of the detail he read in the draft Dublin Waste Management Plan 1997 although other sites were mentioned. He feels that it was never logically evaluated but that it is politically driven and is being justified in retrospect by consultants. In particular, he referred to the fact that in the original documents the site was justified on the basis that the Eastern By-pass was going to provide a direct connection to the motorway. He considers that the By-pass will not be built but now the idea being proposed is to truck the waste around Dublin and through the Port Tunnel to get to Poolbeg. He feels that there is no co-ordination between the Dublin Dockland Development Authority and DCC's planning departments. Mr Bryan then indicated that he felt that the Developer of the IGB site and the DDDA should be concerned that areas of their site lay within the exclusion zone of a Seveso site but there has not been representation from them.

Co-ordination between EPA and ABP

Mr Bryan outlined that in dealing with ABP they stated that the detail of the plant and equipment would be dealt with by the EPA and that so far he feels that the EPA are also not dealing with technology. He considers that in the event of an incident both authorities will say they looked after their issues but that the environment and the people will not have been protected as is the remit of the EPA. He feels that potential problems should be addressed and that if the Precautionary Principle is used a licence cannot be granted to the proposed plant.

Mr Bryan said that he asked DCC, in 2005, to see the heads of agreement for the contract and that six months later what he received was not sensible.

Bottom Ash

He stated that in the initial stages of the project they were told that bottom ash was going to be used for road building but before the EIS was finalised this was changed and the ash was to be disposed off-site. ABP and EPA did not consider the treatment of the bottom ash and he does not understand how this is outside the scope of the permitting processes. He tried to find any reference to a 10,000 tonne bunker for bottom ash but cannot and feels that an enclosed conveyor belt is the most suitable method for transporting the ash to the quayside. However this is a more expensive option and DCC have pointed out that there is a financial cap on the project which he feels accounts for some of the changes proposed in technology.

Use of Standards/Legislation & Accidents

Mr Bryan felt that the use of standards to justify emissions and concentrating on normal operations and not accidents was inappropriate. He outlined that the smell of the sewage plant is not confined to Ringsend and it can be smelt in Rathfarnham which would indicate that in certain weather conditions the emissions from the incinerator would affect all of Dublin. He stated that no-one plans to build a plant that will have a serious accident but a lack of information can inadvertently lead to one.

Letter from petitions Committee

He stated that the letter from the EU Petitions Committee is asking the authorities to think about the project again and Dr Staines is seeking a Health Survey. He queried the implications of the financial aspects of the project on H&S and states that BAT is not being employed. He used examples of the selection of the bag filters where the removal of nanoparticulate competes with the increase in power consumption required, and that air cooling could be employed to mitigate against impacts on the estuary however the efficiency of the plant would be compromised.

Covanta

Mr Bryan read sections from the Financial Report of Covanta (Document 51a) which outlines how they emerged from Chapter 11 proceedings and restructured their company. In relation to their WTE projects the report states that the projects are capable of providing services and generating electricity or steam 'if properly operated and maintained'. Covanta receive revenue from two sources, fees for operating or processing the waste and payments for electricity and steam and the term 'Tip Fee' is used where there is a per tonne fee for processing the waste and they retain 100% of the energy revenues. He also read from another paragraph dealing with the liabilities of Covanta in relation to damages.

Health & Safety

He outlined that in private companies the bottom line is profit and that this is not desirable for this project and he gave examples of this including the operation of an incinerator at a temperature below optimum which a farmer was awarded costs for damages. He outlined that safety was a state of mind and gave an example of how a Standard Operating Procedure was rewritten to circumvent a problem rather than heed the safety implications. He feels that the complex Contract Agreements between DCC and Covanta will lead to difficulties. He dealt with the Debenture that was taken out to protect Covanta's interest in the project which seems to indicate that they own the site, the Shellybanks site and the Ancillary site. He outlined that the value of the project has been 'mortgaged' such that if anything goes wrong with the project the community has no comeback and there will be significant legal consequences and therefore performance guarantees are of little value.

Enforcement of licence

Mr Bryan outlined how DCC did not deal with complaints related to waste dumping on the Fabrizio site and that the complainants referred the case to ABP who directed DCC to carry out works but nothing happened until Directorate XI were contacted and then 43,000 tonnes of waste were removed from the site. He feels that there would be little hope that DCC would enforce conditions in the licence and that the arrangements which DCC outlined to contact the EPA etc were inadequate. He stated that the EPA must have an official on each shift on the site to ensure that they were aware and could effect decisions if anything abnormal occurs.

Site Selection

He outlined that the other two sites were never going to be suitable for such a project and that this site was pre-selected. He stated that the traffic study was 4 years old and that it was now gridlock in the area, the waste centre of gravity has shifted because development has occurred in the Adamstown and South Meath area. Referring again to Document 51 he states that an incinerator could not be considered within these plans. The proposed flood barriers will make the port unviable as the lack of tide would result in silting up and then there will be no ash disposal route as planned in the application. Mr Bryan stated that due to lack of available space on the site the bottom ash could not be treated on-site. He referred to N7 waste who have proposed to build an incinerator with a capacity of 300,000 tonnes/annum in Rathcoole, in a quarry, with segregation of waste and air cooled condensers. He stated that South Dublin CC are also a supporter of the company and if this project and the Meath project go ahead there is sufficient capacity to deal with all the MSW arising.

In relation to the designated sites (NHA, SPA, SAC) he outlined that the effect of a development such as this has not been investigated anywhere but that the methodology that he outlined to ABP should be used.

In relation to the National Parks and Wildlife Service and NGO's and their contribution to the oral hearing, he felt that they have not commented sufficiently on this project and he attributes this to the need for funding from government. He outlined that the North side of Dublin Bay was a UNESCO Biosphere area and that experts from overseas should be employed to give a view on the project.

The definition of the project was based on population projections which look unlikely to be achieved and he outlined influences such as those from businesses reluctant to reduce waste which are pushing the project onwards. He then referred to the BREF Document on Economic and Cross media effects (July 2006) and a methodology for evaluating the project in terms of BAT and costings.

Directives and Economics

Mr Bryan outlined that Ireland signs and ratifies directives but is not good at implementing them and he used the Nitrates Directive as an example as it relates to the sludge from the UWWTP and the inability to source the necessary land for landspreading it. He stated that there is case law that states that anything built near a protected area has to be considered and assessed as if it is within the protected area and he feels that the EIS is out of date and thus the licence cannot be granted on that basis.

He stated that incinerators are being closed down in the US due to them being uneconomical and the project agreement has led to municipalities going bankrupt. The cost estimates prepared by DCC are unreliable particularly as the oil prices are escalating and transport is a significant impact.

He discussed the Community Gain figures which can be used to give an estimate of approximately €200 per tonne as a gate fee but not sure if this includes the cost of shipping bottom ash.

Safety Issues

He feels that paring down of safety precautions will occur if the financial situation gets tight and he referred to a web search which found a significant number of accidents/incidents related to incinerator operations. He feels that there is no proper inspection routine to remove material such as propane

cylinders from the waste stream and serious incidents could result. He stated that in the US several incinerators have been shut-down due to popular pressure when sensors etc were found to be not working and he wants systems in place to ensure this cannot happen in Dublin.

Amendments to PD

He outlined items that should be included in a licence

- Full Health Impact study – he states that Dr Howard and Dr Montanari outlined that there is a mechanism for damage from incinerator emissions and therefore the first precaution would be to have an adequate baseline study. He said that although Dr Shrenk had told them that there was no difference between particles he felt that Dr Montanari had shown otherwise.
- Monitoring of raw flue gas and an increase in the monitoring instruments in licence – He outlined that Mr Norgaard stated that it would be useful to have monitoring of flue gas.
- Control system (SCADA) should have hot back-up as it will take too long to repair and replace items of equipment and he also referred to the type of thermocouples to be used. The Agency should inspect the instrumentation proposed and at least be as good as other European plants.
- Double Bag Filters as a minimum
- Air cooled condensers to protect the estuary from pollution
- More frequent and better monitoring e.g. bi-annual dioxin monitoring is not acceptable and it should be done by independent companies.
- DCC objections should be rejected as the definition that they wish to adopt for waste is too broad, requirement for 10years experience on incinerator plant should be retained as the division of responsibility between DCC and operator is worrying, maintain constraint on transport of bottom ash – require use of a conveyor.

Mr Bryan clarified on 24/04/08 that his comments on Condition 3.2.2.2 referred to the requirement of the company to carry out the plans required in the condition by the Waste legislation but that he has no objection to it being included in the licence.

Questions:

GP-Ms Wheeler queried if an increase in the level of bin charges would result in more dumping of waste, if its good practice to have a level of redundancy, and if residual waste following MBT would be more acceptable for use in the incinerator.

Response: Mr Bryan said that there appeared to be a strong correlation between high charges and fly tipping and that Dun Laoghaire CC may be able to assist further. He stated that there should be a higher level of sensor redundancy and calibration required by the licence to better protect the plant. He agrees that MBT would result in a more homogeneous waste input.

DCC- Mr Lee asked for clarification as to the document which referred to the Shellybanks sites

Response: Mr Bryan clarified that it was part of his submission Document 51a and that it was an extract from the Covanta Debenture document taken from the website.

RISEG-Mr Cassidy asked to see evidence of the title for the site and he outlined that there were significant concerns in the community related to the issue of responsibility and who the operator was. He outlined that there was a difficulty with the UWWTP plant in determining who was responsible for its operation.

The **chairperson** clarified that it was not necessary for a licensee to own the site and Mr Lee stated that the issue was raised at the Planning hearing. Ms Kelly stated that there was a difference between a licence and a lease as a lease gives greater interest in the property and in terms of the Landlord and Tenant Acts there are issues related to ownership of the property after long periods of lease. **Mr Lee** outlined that DCC own it in Freehold and therefore its neither licensed or leased.

Mr McCarthy asked questions related to the submission on objections (dated 25th January 2008) on the Contractual Arrangements, Fit and Proper Person, Environmental Management System (EMS), and the USEPA's Performance Track (PT) programme and the Covanta Financial information (page 8). He further asked questions on Appendix 1 of that document in relation to items 1,2,4,10,12,16,18,19,27 and 28 and suggested that clarification should be given by DCC in writing to the hearing. **Ms Jennings** stated that there was an expectation that Elsam and then Dong would have been applying for the licence but that since DCC had applied for it there was now confusion as to who would check on compliance with the licence. Mr McCarthy referred to Documents 50a and started with No. 3 which was a CRO document and Document No 1 is his summary of the corporate structure and explained their significance in that they stated that the ownership of the PPP Co were entirely owned by Covanta and Dong had no part of the operating company.

DCC- Mr Lee stated that the issues in square bracket on page 2 of the submission on objections (dated 25th January 2008) was a note for themselves but the brackets on page 3 related to issues that were required as part of the procurement process. He agreed that the Agreement included power to police the activity, approval rights in relation to the Holding Company and the right to collateral warranty with sub-contractors some of which may be executed already, and there are two parent company guarantees with Covanta (Pre-termination and post termination).

In relation to Fit and Proper Persons there is one contract with Dublin Waste to Energy Limited but they may enter into other sub contractors for design or operation. He stated that neither of the companies had convictions under the WMA. He considered that the requirement for an EMS came from the licence and also from the Project Agreement. Mr Lee stated that the USEPA PT programme was an onerous accreditation and that few of the incinerators in the US attained it. **Mr Bahore** updated the numbers on page 6 stating that 23 of the facilities are now in the programme. Mr Lee stated that for the Dublin facility there were financial commitments from Covanta and Dong above what is available in other PPP projects.

Mr Lee confirmed that the parent company guarantees were with Covanta in the US which is the main asset backed corporation and the Agreement allows for a minimum asset base for the company of €4 billion he thought. Originally it was considered that PPP Co would apply for the consents but then DCC decided to apply for them. He felt that the waste was the property of PPP Co when it entered the bunker but it was a matter of law as to who owned the waste before that. He outlined that this was an agreement between DCC and the PPP Co so it only dealt with DCC waste removal but that it was likely that the contracts with other hauliers would have a similar clause.

He considered that DCC would have access to the site at all times and that the Clauses 10 and 16 referred to access to other sites that were not part of the waste licence application. In relation to Clause 18 Mr Lee stated that DCC had remedies for breaches of the Agreement by PPP Co and those subsidiary bodies with which it had collateral warrantees.

He clarified that Appendix 1 was just a summary of what was contained within the Agreement. He outlined that the Debenture document was a Covanta document and that he was not familiar with all its

detail. However he did clarify that it was consistent that the PPP Co. would enter into agreements with other companies such as the O&M Contractor and there would be collateral warrantees in place.

Mr Lee felt that legally Mr McCarthy was incorrect in his assumptions related to Document 50a No 1.

Mr Lee dealt with Document 54 and stated that for the purposes of WID the 'operator' was DCC who would retain control over the plant. He feels that the terms 'employ' does not necessarily mean 'employee' and he gave an example that he was employed by DCC for the purposes of the hearing but he was not an employee of DCC. He suggested that if the wording was 'shall appoint' it may be more accurate. There will be an Authorised Representative of DCC (unlikely to be an employee) on-site who will be enabled to carry out the powers of DCC.

The Project Agreement is treated as a commercially sensitive document and has 30 different schedules which are inter-related. There is an abstract of the Agreement in the Additional information submitted by DCC.

GP -Ms Wheeler asked who the person that made a decision to close the plant would be employed by stated that they would have a responsibility to the company that paid their wages.

Mr Lee stated that they would be an employee of the PPP Co or the operating company that the PPP Co engage and DCC would also have a contract with the employer of the person and they have a responsibility to comply with the requirements of the licence.

At the end of the session procedural issues were dealt with regarding the requests for adjournment, the availability of NO₂ readings on DCC website, submissions by Ms Kelly, Mr Cassidy and Mr McCarthy.

The session closed at 18:20.

Thursday 24 April 2008

The session commenced at 10:00.

Mr Lee clarified that the PPP Co has a licence over the site therefore they are given non exclusive access to the site to fulfill their functions but they cannot mortgage it. The Project Agreement allows for DCC to have unrestricted access to the site at all reasonable times to perform their functions and this would be seen as allowing the PPP Co to make decisions to restrict access on H&S grounds e.g. to the grate if it was operating. He also stated that the use of the 'co-ordinate' was one word in a clause with 10 paragraphs but the main obligation was that PPP Co shall procure that all aspects of the project are subject to the Quality and Environmental aspects.

No. 43 Sandymount and Merrion Residents -Ms Lorna Kelly (24/04/08 C-N)

Ms Kelly read from her submission (Document 55). She referred to Condition 2 and outlined that the Licensee, DCC, had entered into an agreement with Dublin WTE Ltd but that the public had not been made aware of the contract and whether there was a 'put or pay' clause in it. In relation to Condition 2.1 DCC want to amend the experience of the manager and she states that this is unacceptable in view of the size and location of the facility. She stated that power plants are different from incinerators which would require skilled operators to deal with the mixed waste composition, waste storage, dust control

and possible hazardous material in the waste. She states that Condition 2.3.2.5 (Corrective Action) raises issues in view of the fact that DCC has a dual role as public partner and licensee.

She finds it difficult to appreciate that the contract is commercially sensitive since other incinerator companies give detailed accounts of income sources in their annual reports. She stated that it would be better to have legal and financial advice in drawing up the contracts and she referred to 'geared property bonds' and the need for financial advice.

Residual waste

Ms Kelly outlined that the definition of residual waste should be more precise and that the wide categories of wastes in the PD and submitted to the hearing would still allow for sludge from septic tanks to be burnt. She is also concerned about the proposed monitoring of the incoming waste which is likely to contain clinical type waste from households.

Sludge

She refers to the ABP Inspectors report and that there was confusion as to whether the sewage sludge would be incinerated but that the planning approval does not allow for the burning of sludge.

District Heating Scheme and resource use

Ms Kelly referred to the ABP report and the PD in relation to a district heating scheme and stated that these were a means of influencing and pre-empting future land use zoning and planning applications. She stated that conditions in the planning permissions and PD give the impression that no detailed proposals or EIS for such a scheme exist but it now appears that feasibility studies have taken place and agreement signed with developers but there are no other details in the public arena and there has been no public consultation. She states that the potential for CHP can be applied to an incinerator no matter where it is sited and it does not have to be in Poolbeg.

Her association has reservations as to whether it is the duty of the licensing or planning bodies to assist in promoting the DH scheme particularly as Ms Lyden agreed that on balance a DH scheme would have very little impact in reducing the GHG impact associated with the plant.

Air Emissions

She stated that the main consideration should be the cumulative effect of the emissions of all developments in the area rather than whether the new development would significantly increase the existing environment. Quoting again from the ABP report she outlined that there were issues with the background air quality and that limits may be exceeded at present. She then referred to the EPA website in relation to a definition of ozone and NO₂ and its health effects and she referred to her attached photograph (Document 55b) of Irishtown Nature Park dated 07 December 2004 taken by Ms Cavendish. She stated that there is significant airbourne dust levels currently in the area as stated by Mr Hawkins.

Location of incinerator

Ms Kelly feels that the EPA is obliged to have regard to the EC advice on site selection, the air quality status in the area and all directives including the Water Framework Directive before it considers issuing a licence. Referring to the ABP report she agrees with the statement that the air quality status was not adequately taken into consideration in the site selection process outlined in the EIS. She stated that the heavy industrialised nature of the Peninsula was due to planning decisions which has resulted in environmental destruction and poor air quality. She stated that ABP decided that an EIS was required for the UWWTP expansion on the basis of its visual impact and queries if it should be part of a licence. The industrial zoning of the area derives from its part use by the Port Company but it had been an area of High Amenity prior to the public beach being used as a waste dump. She states that it is premature to

grant the licence as if all the issues are taken into account the Poolbeg Peninsula does not have the assimilative capacity to take this development.

Construction related impacts

She notes that it is not proposed to consider the environmental aspects of the construction of the seabed insertion and the use of a temporary construction area for a period of years as they are outside the main site. She states that since this was not dealt with by either the Planning Authority or the EPA then she considers that no permission for it exists particularly the construction of a trench and pumphouse on a foreshore at some distance from the facility.

Ms Kelly referred to a letter from the Coastal Zone Administration Division, Dept of Marine to the Dublin Port Company in 1998 regarding the reclamation of 21 hectares but which she feels also relates to the construction and operation of the cooling water discharge. It outlines the impact on the River Liffey (water quality and fish migration) of that proposed development.

Ecological Impacts

She referred to the submission by Mr Price (Document 19a) which provided information on the impacts of discharges on salmonid species and the ABP Inspectors report which she states underlines the lack of survey data and the significant potential for the development to impact on aquatic ecology and that the mitigation measures proposed do not address the fundamental issues such as the requirements of the Water Framework Directive.

Ms Kelly pointed to submissions by Dr Montanari, Ms Mayes and Ms Corr in relation to possible impacts of the bio-accumulation of inorganic microparticles and other substances.

Birds

In referring to Ms Mayes submission she stated that all birds are protected under the EU Directive and that Pale-bellied Brent geese are not the only species of wintering and summer birds using the lands in the vicinity of the proposed site. Her personal observations are that birds were affected by the construction of the UWWTP, the temporary habitat provided Poolbeg ESB was not used by the birds and there were dead and starving birds found in the area. She outlines that the current and proposed monitoring will not give a complete picture because the baseline data is incomplete and only wintering birds were counted in one particular area. She has included photographs in her submission – Document 55b).

DCC Biodiversity Action plan 2008-2012

Ms Kelly outlined the sections of the plan that relates to the legislation and the species that are to be protected which the Agency must consider (London Rocket, waterfowl, bees, butterflies, sea mammals and fish).

Climate Change

Ms Kelly referred to studies undertaken by J.Sweeney et al. in Maynooth which predict heavier winter rainfall and dryer summers and considers that in drought conditions the incinerator would need to take water from the mains supply and that the contention that grey water from the UWWTP would be used is not applicable in drought conditions. She also referred to the fact that there would be less dilution of the outfall available in the River Liffey.

Monitoring

She considers that the monitoring of the ambient environment required by the licence appears to be after the commissioning of the facility and would not be satisfactory for dealing with or preventing a negative impact on species. She stated that the inadequacies of the waste and residue inspection and testing were discussed and they have found nothing in the application, proposed licence conditions or the hearing to allay their fears.

Enforcement and proposed development on the Peninsula

The S&M RA feel that there is an on-going problem with the enforcement of legislation on the Poolbeg Peninsula which they try to tackle at their own expense. She outlined that the Association had raised the issue of seven unauthorised discharge points into the cooling water channel of the ESB with DCC, Dept Environment and the EPA but that the responses were inadequate and slow (issue raised in February 2001 and problem dealt with in November 2001). She then referred to another activity related to the import of cement that she feels are storing cement in areas that are not authorised such as that of the proposed incinerator. She feels that there is a significant lack of enforcement and feels that this will also be the case of the licence which undermines any confidence that DCC will comply or be required to comply with it.

She referred to the proposal to build a 'Flood Barrier' and the possible requirement to relocate the outfalls in the future.

She then referred to the lack of consultation with the community regarding this proposal or the Section 25 Order regarding the DDDA Master Plan as the greater part of the Poolbeg Peninsula lies on Sandymount Strand and thus the plans affect the community.

Questions:

Mr Bryan asked questions related to research/studies on fate of contaminants in the food chain, the effect of the UWWTP construction on the geese, wildfowl counts, biodiversity plan, terrestrial/insect survey, enforcement of the Wildlife Act, proposals for 'flood barrier'.

Response: Ms Kelly responded that she was not aware of studies in relation to the aquatic invertebrates but that some post mortems of seal species found in the Dublin Bay had shown high levels of dioxin contamination. She considered that there was a theoretical pathway for the inorganic microparticles to come through the water to the invertebrates and to humans in the same manner as disease organisms do but there is little research on the subject. Ms Kelly outlined that during the UWWTP construction phase there was no area for the geese to forage and they starved trying to feed off the rocks and they could possibly be dehydrated also. The i-Web scans of waterfowl are taken monthly to count the bird populations. She agreed that the population of Brent Geese may have increased over recent years which will result in competition for food. She agreed that the Biodiversity Plan was a good one but it was unclear how it will develop. She responded that the terrestrial and insect surveys appeared to be carried out over short periods (two days) and that this was not an adequate ecology survey as species would vary over different times of the year, times of the day and weather conditions. She agreed that rare species should be surveyed in Irishtown Park and that the species on the proposed site could not be extrapolated to the Nature Park and the EIS is inadequate.

Ms Kelly commented that there were certain amenity activities that cause disturbance to the birds such as uncontrolled dogs on the beach/Park and quad bikes and that the use of prohibited areas are not enforced. She agreed that the 'Flood Barrier' was a draft plan and it is in the DCC 'Vision for Dublin'.

GP- Ms Wheeler queried if an EIS should be prepared for the district heating system. She also asked Ms Kelly questions on the Dr Montanari presentation, why the birds are reliant on freshwater in that area and who protects them.

Response: Ms Kelly outlined that the immune system of species has evolved and gave some detail on the response that the cells give to 'invaders' and she agreed that Dr Montanari had explained it in his presentation. Ms Kelly stated that the habitat of the birds should be protected under the Birds Directive

and that Brent geese need a long flight path which makes using the Dodder or other freshwater area difficult as the trees would impact on their flight path.

DCC – Mr Lee confirmed for Ms Kelly that in relation to the financial concerns she raised that Price Waterhouse Cooper have been involved as part of the Client Representative since the beginning of the project. He also referred to some systems in place for the reduction of healthcare waste in MSW including legislation and that the WTE plant would require a small quantity of the grey water from the UWWTP. He asked Ms Kelly about her qualification.

Response: Ms Kelly stated that she had completed part of a degree course in Chemistry and Biology but due to financial reasons had worked in a laboratory testing freshwater and then qualified as a nurse and worked for many years in Dublin hospitals.

No. 44 Sandymount and Merrion Residents -Ms Catherine Cavendish (24/04/08 -O)

Ms Cavendish referred to her submission (Document 55a) and to the map which was supplied to her by DCC which shows the flow of the River Liffey to the estuary. She stated that since the UWWTP was built the condition of Sandymount Strand has improved. She referred to a Community Interest Group (CIG) meeting where Dr Jim Wilson (TCD) outlined concerns of heavy metals causing pollution from the incinerator. She referred to the issue regarding the lack of enforcement and that DCC had entered the Nature Park and planted mature conifer trees using tractors which went through an area of the park which had protected species of orchid.

In relation to Chapter 12 of the EIS and the salmonid classification of the River Liffey she states that in the EIS for the Landsdowne Road Stadium that the Dodder is an important river for salmon and trout and that the salmon can only get to the Dodder via the river Liffey. She referred to her letter to the Sunday Times which she includes in her e-mail. This outlines that research on the effects of sealice on salmon has been carried out on the West Coast of Ireland but very little has been done on the effects of the thermal and biocide discharges into the Liffey Estuary and the effect this would have on salmon migration. She refers to the EIS Chapter 12 and quotes levels of 267-798kg/annum trihalomethane which may be present or formed in the discharges from the utilities plants. She also refers to the extent of the thermal plume and the need for the corridor (horizontal and longitudinal) to be maintained to allow the fish to pass unhindered. She also refers to the fact that the EU funded 'Three Rivers Project' only commences above these plants at Island Bridge and that in the not too distant past there was salmon caught in the River Liffey for sale in restaurants but that only two salmon were caught last year. She asks that the EPA not grant the licence.

Questions:

GP -Ms Wheeler asked why the river could not be restocked with salmon and the status of the river.

Response: Ms Cavendish stated that they were the North Atlantic salmon and in the Red Book for protection. She outlined that you couldn't be sure that restocking would work given that the pollutants would still be in the river. She stated that the River Liffey had lost its designation in recent years (1990's) but that the area around the toll road was where the fisheries were located. **Ms Corr** interjected to state that drift net salmon fishing had recently been banned in an attempt to improve the salmon stocks in the river.

Thursday 01 May 2008

The session commenced at 09:30. Dr Porter stated that he had reviewed data and documents and found errors. He submitted Document 61 (a revised Document 12) and dealt with the issues around the errors. This is dealt with above under Dr Porters section on Air.

No. 45 Mr Joe McCarthy (01/05/08 XX-GG)

Mr McCarthy on behalf of Ms Jennings and himself made a submission based on a powerpoint presentation (Document 62) and he outlined the topics he would address which were (a) elaboration of the conclusions of air quality, (b) in relation to climate as there was no opportunity to analyse the Poolbeg 4 model he has analysed sludge and has a small presentation to make on electricity.

He produced his own climate models for Poolbeg 3, 2 and 1 and these are on record. They believe that reverse engineering has been used throughout to support the site selected. The poor air quality in Poolbeg has been ignored. Traffic has been avoided by shipping the ash out. They contend that waste ash will be cured in Nevitt dump (Fingal Council) prior to recycling and the traffic associated with this activity should have been considered. They believe the salient reason for siting the plant in Poolbeg is because it is beside the sewage plant. The 1997 Business case has never been revised in detail, which justified incineration over other processes. There are six or more errors, all in the applicants favour. The ABP have handed the air quality issues to the EPA. He stated that Ms Lyden had told the hearing that there was no checking of figures and he wants to know who is going to be the counterbalancing expert for the EPA.

With reference to Dr Porter and his air quality and the Entire Baseline 2007 (Document 62), Mr McCarthy highlighted that standards are currently breached and will be breached in 2010 (Stage 2) and that measured exceedances have not been analysed. They have shown that the LAQM and empirical formula do not apply upon checking. In relation to CALPUFF, the model needs a peer review as they were unable to analyse fully the model having not asked for the NO_x data.

On Climate models, he considered that Dr Porter didn't analyse sludge in the latest models but it was considered in the EIS. One scenario considered in the EIS related to sludge with 10% dry solids. The energy lost from boiling off the water reduces efficiency of the process. If they had the time they would show that the Poolbeg 4 model is detrimental to the climate but it is illustrated in graph (Document 50). On foot of errors in calculations in earlier models highlighted by Mr McCarthy and Ms Jennings, Dr Porters later models corrected carbon dioxide yield. The Electricity Credit claim should be much lower because less electricity is produced and the displaced electricity analysis (build margin over operating margin) is flawed. This is a quick analysis as there was no opportunity to build a full rebuttal.

Referring to the slides on 'Value from Waste' (see Document 64), Mr McCarthy's view is that the efficiency claim for Dublin (32%) cannot be achieved with current plant design when the Amsterdam plant proposes to achieve an efficiency of over 30% with patented technology, using additional superheaters and economisers, higher pressure and temperature regimes and waste heat for the sewage treatment plant. The latter is not proposed for Dublin as there are different operators.

Referring to the fourth slide on 'Value from Waste' (Document 64), Mr McCarthy noted that an ash handling plant is very big and that was one of the reasons that ash handling was not being proposed as it wont fit on the site.

The climate analysis now consists of 4 Poolbeg models and there has been substantial changes on climate policy in recent times.

Mr McCarthy proceeded to summarise his critiques of Poolbeg 1, 2, and 3 which were submitted to the EPA previously. In the first 3 models the climate methodology is reasonable good. He highlighted the errors and corrections in the models. He has had no opportunity to study the input of Ms Odile le Bolloch (EPA) for Poolbeg 4. Dr Porter studied sludge in the first scenario but he did not do it subsequently as it is not good for the model. Poolbeg 3 has variations on the waste mix. The efficiency of the plant is debatable 32% versus the 29% first published and various steam temperatures reported. There has been agreement on the hours of electricity produced, which is about 8000. These criticisms have lead to 4 different models. The sources have varied which effects the carbon content. There was no conclusion on the electricity avoidance factor. Dr Porters models were not peer reviewed. A full critiques on the substantial material submitted to the hearing in relating to the operating margin and the build margin cannot be provided. He hasn't had the opportunity to put, what they considered, the legitimate reduced electricity credit into Poolbeg 4 model, which would show that incineration is more harmful than landfill. Soon CO₂ will have to be paid for fossil fraction and maybe biogenic fraction. The quantum of carbon dioxide from an incinerator in 25 years should be refused because we don't need it. The policy drivers are familiar, the Stern report and IPPC reports and the targets have been adopted. By not having an incinerator, 2% of the Irish Kyoto target can be met.

In conclusion, the air quality is already compromised in Poolbeg. A statistician should take issue with Dr Porter on his exceedances. The EPA should take Climate change policy into account and require DCC not only to produce a correct climate model but to withdraw the EIS as it has been amended 4 times. With a substantial change in ownership from Elsam to Dong to Covanta he considered the basic plan is so bereft of solid foundations that it should be withdrawn and the public allowed to submit objections.

Question:

DCC-Mr Shipsey asks if it were better for the applicant to take on board the criticisms raised rather than ignore them. He asks questions on various topics such as CALPUFF, the private operator of the waste water treatment plant, the climate models, the cost of the Amsterdam plant (€400,000,000) and the burning of sludge at 80-90% dried and 20% and the relevance of sludge drying.

Response – Mr McCarthy said that would be prudent to for DCC to present new data as it became available however it should have been presented in advance as it is difficult to analyse in a short period of time and without experts. He was concerned about shoreline fumigation but the CALPUFF model did not provide comfort as the model was run by the applicant, it wasn't peer reviewed and wasn't made available until the hearing. He examined one input file and one output file relating to PM₁₀ but the third parties are not experts. Ms Lyden stated that the models were not peer reviewed or quality assured. He had found further mistakes in the Climate models but does not have the skill to analyse whether CALPUFF was done right or wrong. He is very concerned by the use of averages to bury difficult issues. Mr McCarthy said his focus at the time of the ABP hearing was climate but since then he has found serious flaws with the air quality.

In relation to the operation of the Ringsend WWTP he said he called them once a week to complain about odour and is answered by Celtic Anglican Water. He is not privy to project agreements with regard to incentives to co-operate for profit.

Regarding the cost of the Amsterdam plant he stated that he does not know anything about the costsbreakdown but evident differences in design are the expensive superheaters as they are lined with inconel.

Mr McCarthy said he is a scientist and will take facts as he finds them and as such sludge would have a higher calorific value. He agreed that by definition that these sludges would have higher calorific values than that modelled (10%DS). He is not familiar with the economics of the waste water treatment works and considers that the electric dryers are the cause of odours.

RISEG -Mr Cassidy asked about failsafe systems, odour from the WWTP, new model, EC and Irish law and UK guidance, baseline monitoring, health surveys, Poolbeg poor air quality, bottom ash, Dr Broderick and Dr Shanahans reports, site selection and changes.

Response – Mr McCarthy said he didn't see anything other than what's in the EIS and that there was no satisfactory answer as to who presses the red button. There is normally a failsafe system in any such design, build and operate contract. The automatic control system proposed hasn't been specified yet. He has the same process engineering concerns with regard to the incinerator as he has with the WWTP. Mr McCarthy and Ms Jennings had to focus their efforts on finance and climate due to the pressures of time. They have been constantly catching up with the applicants information. He made the point that Irish Regulations are what are applicable and not EC Directives, which are transposed into Irish law. He is concerned that baseline monitoring is interpreted in light of UK guidelines when it should be interpreted in light of the reality at the plant at Poolbeg. Background readings taken across Dublin are not directly relevant to the bad air quality of Poolbeg. As residents they haven't been involved in any health surveys.

Mr McCarthy said ultrafines should have been part of his submission. Having requested the applicant to study ultrafines in 2004, they have not been studied, WHO and others agree they are very dangerous and it is a egregious omission on behalf of applicant.

The current readings show significant exceedance by a factor of about 50% of the air quality standards. This is a very severe exceedance of current standards and even more dramatic exceedance of the Irish standards which will apply in 2 years. The facility will add one exceedance. The site does not have the capacity to contain the ash handling system and there is no spare space. Dr Brodericks report was very balanced and he hadn't studied Dr Shanahan's report. The division of responsibilities between ABP, HSA and EPA means the question cannot be fully addressed. Dr Porter knew that the air quality wasn't good but wasn't asked for his input into site selection. The justification for the site was reverse engineered i.e. site selected first. He is very concerned about the changes to the application.

S&MRA- Ms Kelly asked if he is aware of the land costs of the facility.

Response – Mr McCarthy said he believed the land costs are free and are giving it to the operator. He is not aware how much DCC paid for the land.

CRAI-Ms Corr asked about the methane tank at the WWTP.

Response – Mr McCarthy said the methane is used to generate electricity and the efficiencies of the WWTP are a separate issue.

Ms Wheeler asked Mr McCarthy whether he took into account the embedded energy, energy to make the materials, for instance its more efficient to make paper from recycled paper and would his calculations be conservative, give an overview of the Climate calculations on the environment and how long would biogenic materials emerge from landfills as carbon dioxide or methane and how significant is it in relation to Koyoto targets. She also asked about Dr Porters presentation of data and calculations.

Response – Mr McCarthy said there has been no life cycle assessment, which embedded energy directly effects. It hasn't been included in models and is a significant loss to the economy to burn it. The plant will put two thirds of a million tonnes of CO₂ into the atmosphere and that's a significant on the impact on climate issue. The biogenic portion is not included in the climate models. Policy may change to effect a stop to carbon dioxide emissions.

He considered that a good deal of carbon dioxide is sequestered in landfill. Incineration is six times worse in the first 25 years for the release of carbon dioxide. After 25 years, the model gets more complex. There is no way the incinerator will be turned off after 25 years.

In relation to Dr Porters presentation he said only occasional references are made to the errors in the baseline measurement, he hasn't seen any reference to errors in the calculations. The presumption throughout the EIS is that all figures are correct and they know there not. He received no flue gas calculations, no energy calculations, no mass balance calculation and the electrical claims are derisory. So he considers that it hasn't a scientific basis and the level of accuracy and use of precision in producing the plan is very weak.

CLOSING STATEMENTS

Mr Bryan on behalf of the Community (01/05/08 HH)

Mr Bryan read from Document 66 and stated that the oral hearing demonstrated that the proposed incinerator cannot be built safely in Poolbeg. He outlined points that they felt must precede the grant of a licence:

1. new site selection process
2. full baseline health assessment
3. submission and public examination of process flow sheets including exact determination of all significant inputs and outputs for every feedstock scenario proposed
4. complete update of the EIS
5. independent air quality assessment including the effects of ash transport
6. dismissal of DCC objections to draft licence
7. mandatory introduction of double bag filters as BAT
8. vesting of ultimate control of the facility in an independent authority with full power to terminate operations
9. establishment of an adequate and comprehensive fund for the assessment of community health issues and a separate trust or insurance fund
10. stipulation of additional measuring and control including measurement of raw flue gas parameters as done in Amsterdam
11. 'always on' back-up for essential systems
12. more frequent independent monitoring of critical variables
13. more stringent controls on categories (if any) of sludges

He also outlined a further three conditions that the community felt were necessary

1. Air cooled condensers should be used to eliminate pollution of the River Liffey
2. A scientific assessment of the potential for disturbance of protected wildlife should be conducted by an independent expert of international standing prior to the commencement of development

3. An investigation of the possible effects of all existing plans and/or visions for future development of the Poolbeg Peninsula.

Mr McCarthy and Ms Jennings (01/05/08 JJ)

Mr McCarthy delivered his closing statement orally. He considered that the EPA must satisfy itself, by obtaining appropriate, independent opinion and analysis, that the air quality, climate impact, electricity and heat models are accurate. In particular, the EPA needs an independent analysis of the baseline air quality in the context where the ABP inspector referred these matters to the EPA. These matters have been raised here at the oral hearing but have not been adequately addressed with new information being presented during this EPA oral hearing. As ABP have determined that the EPA is the better Agency to do this, it is their submission that an independent analysis of this material must be conducted by the EPA.

Dublin City Council- Mr Shipsey (01/05/08 KK-RR)

Mr Shipsey read from his closing statement (Document 65). He outlined the background and relevant legislative provisions governing the oral hearing and the assessment of a waste licence application and EIS, referring to the Waste Management (Licensing) Regulations 2004, the Planning and Development Regulations 2001 and the Waste Management Acts 1996 to 2007. He stated that An Bord Pleanála had granted approval for the facility and had indicated its view that the information in the EIS was adequate to allow it to form the view that the facility would not have a significant adverse environmental effect. He considered that the information submitted to the Agency including the additional information submitted during the oral hearing for the Agency's purposes and referred to a distinction between an EIS and the EIA process.

In relation to the PD he stated that DCC were, on the whole, satisfied with it and he clarified that they wished to accept 600,000 tonnes of non-hazardous waste (including 80,000 sludge from Ringsend WWTP). He stated that concerns in relation to the energy efficiency of the facility were misplaced and that Mr Bahor had reiterated that the facility would be designed to comply with the requirements of the waste licence.

Mr Shipsey went through each of the conditions of the PD that DCC wished to have amended outlining their reasoning. He clarified that the waste bunker had a capacity for 7 days and that if both units are off fans will continue to extract air from the area and discharge it via the main stack and that further mitigation measures such as spraying with odour suppressing solutions and a lime layer would be utilised.

He outlined that the PPP Co is a joint venture company (51% Covanta, 49% DONG), that a significant amount of detail on the contractual arrangements that have been entered into for the purposes of the design, construction, operation and finance of the proposed facility were supplied to the Agency on 25th January 2008 and he elaborated on these. He outlined that DCC were to be the 'operator', that they are delegating responsibility for the day-to-day running to the PPP Co, the Facility Manager would not be an employee of DCC (for employment law purposes) and he quotes section 39 of the WMA on the general obligations in relation to responsibility for waste handling.

Mr Shipsey dealt with the issue of the policy and plans which the Agency must have regard to and referred to the Dublin Region Waste Management Plan (2005), the Dublin City Development Plan (2005) and the National Strategy on Biodegradable Waste (2006). He outlined that the Programme for

Government 2007 is an indication of the legislation and policies that the political parties have agreed to pursue but that it does not constitute waste policy to which the Agency must have regard particularly as a review of national waste policy is underway and will not be finalised until 2009. He states that DCC considers the figures relating to future waste arising presented by Mr Cuffe TD as based on dubious assumptions and not credible and outlines that (a) predictions are that waste arising will increase not decrease, (b) a 49% national recycling rate is unrealistic, (c) MBT is not equivalent to thermal treatment in terms of the Landfill Directive, (d) a target of 10% waste to landfill is impossible to meet and (e) the introduction of MBT will not be available on time to meet the Landfill Directive targets.

Mr Shipsey stated that there is no requirement to deal with the 'need' for the facility, siting, traffic, future developments in the area and other issues related to land use and sustainability in the waste licence application process and that it was dealt with by the planning process.

He stated that the facility would operate at 29-30% net energy efficiency but would have higher efficiency if generating electricity and district heating (up to 90%). The design of the facility will be undertaken by Covanta and DONG and will be done so as to ensure compliance with the waste licence. He outlined that the air impact assessment included the use of AERMOD, SCREEN3 and CALPUFF which indicate that ambient air quality standards will not be exceeded and included an assessment of areas where proposed high rise could be located.

Mr Lee dealt with S.I. No. 271 of 2002 and the Stage 2 limits which Mr McCarthy and Dr Porter had discussed in relation to the Directive (1999/30/EC). He outlined that the meaning in the Directive should be more correctly applied and that the Stage 2 limits were not applicable or mandatory particularly as the CAFÉ Directive has removed the 2010 Stage 2 limits. He stated that the facility would only contribute less than 1% to the PM₁₀ levels it would not breach the ambient standards on its own. He considered that the Agency can put in place a condition to ensure that the facility does not breach the standards. He referred to the Carranstown incinerator and issues related to PM₁₀ emissions insofar as the monitoring of the emission is similar to that in the PD.

Mr Shipsey referred to Dr Porter's assessment of the climate impact and reiterated that the facility would produce a net benefit of between 0.02 – 0.22% of the total greenhouse gas emissions in 2010 and it would rise with the implementation of district heating. He outlined that Chapter 10 of the EIS deals with residues, there was potential outlets in Europe for the treatment of bottom ash by removing the ferrous and non ferrous materials and processing remainder to produce an aggregate, the ash would be tested in accordance with the law on transfrontier shipment of waste and the bottom would be taken from the site in trucks. Fly ash would be transported in dedicated sealed containers and transported via Dublin Port for treatment and placement in disused quarries or depleted salt mines in Europe.

He outlined that no significant adverse impacts were predicted in relation to terrestrial, aquatic or estuarine ecology. Specifically in relation to the River Liffey, he stated that although not designated as 'salmonid water', salmon do pass through the estuary as part of their migration and it was assessed with that in mind and it has been demonstrated that the biocides and thermal plume will have no significant impact on aquatic life.

Mr Shipsey outlined that although there was considerable discussion around the impact of the proposed facility on human health it was based on 'unsubstantiated and largely unscientific speculation' and he referred to the EEA report 'Air Pollution in Europe 1990-2004' which he stated indicates low levels of PM_{2.5} in Ireland and that waste processing was a small contributor to overall PM_{2.5} emissions. He reiterated that Dr Porter predicted a fall in these levels in future years.

He outlined that Dr Howard focused on general pollutants and did not relate specifically to the proposed facility and that he failed to take account of the regulatory controls on emissions from waste incineration and also that the environmental fate of pollutants such as dioxins was undertaken and demonstrated to be below the EU tolerable weekly intake levels. Mr Shipsey stated that the papers presented by Dr Howard referred to facilities in Taiwan which had inferior design to the proposed facility and they would not meet the requirements of the PD or BAT including by-pass of the bag-house during start-up and shut-down.

Mr Shipsey referred to the in-depth literature review that is in the EIS, the statement by the UK Health Protection Agency (2005) on the health effects of MSW incineration where it concludes that provided the emissions comply with modern regulatory requirements the incinerators will have little effect on health. He stated that although a Health Impact Assessment was requested ABP had concluded that one was not necessary and there was no legal requirement for one or any requirement in the EIA process as stated in the EPA Guidance on EIS. He stated that the cumulative impacts of the proposed development had been considered.

Mr Shipsey then dealt with the Precautionary Principle and concluded by stating that the waste licence should be issued taking into account the amendments and clarifications sought by DCC.

The Chair acknowledged the assistance and the patience of Ms Ann Marie Donlon, the administration team, Digitake (particularly Jordan) and hotel staff during the oral hearing and outlined that a report would issue following consideration by the Board of the Agency.

The Oral Hearing was closed at 18:00 on Thurs 01st May 2008

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