PREFACE

The Environmental Impact Statement (EIS) for the Dublin Waste to Energy facility (the Dublin WtE facility) consists of the following documents:

Non-technical summary

Volume 1	Non-Technical Summary, Main Text and Drawings
Volume 2	Appendices 1-7
Volume 3	Appendices 8-21

ACKNOWLEDGMENTS

The EIS was prepared on behalf of Dublin City Council by Elsam Dublin Waste to Energy Ltd. with Arup Consulting Engineers (Arup) as their main consultant.

Specialist technical contribution was provided in Landscape and Visual Impact assessment by Brady Shipman Martin, David Slattery Conservation Architect and Friis and Moltke Architects; Traffic assessment by RPS Group and ILTP Ltd., Material Assets assessment by RPS Group Ltd.; Air Quality and Climate assessment by AWN Consulting Ltd.; Noise and Vibration Impact assessment by AWN Consulting and Elsam Engineering; Water assessment by Danish Hydraulics Institute and University College Cork; Human Beings assessment by RPS Group Ltd., Prof. Dr. Dr. Dieter Schrenk Universitaet Kaiserslautern and Arup; Terrestrial Ecology assessment by Biosphere Environmental Services; Estuarine Ecology assessment by Ecological Consultancy Services (EcoServe) Limited; and Archaeology, Architectural and Cultural Heritage assessment by Margaret Gowan & Co. Ltd.

The assistance of all organisations and individuals consulted during the preparation of the EIS and the contribution of local residents over the course of the assessment is gratefully acknowledged.

EIS DISPLAY LOCATIONS

Members of the public may inspect and purchase copies of the EIS document, including the Non-Technical Summary, during normal office hours, at the following locations:

Dublin City Council – Civic Offices Wood Quay Reception
Wood Quay
Dublin 8
(A 1 in 500 scale model of the Dublin WtE facility will also be displayed at this location.)

Dun Laoghaire Rathdown County Council
County Hall
Marine Road
Dun Laoghaire
Co. Dublin

Fingal County Council
County Hall,
Swords
Fingal,
Co. Dublin

South Dublin County Council
County Hall,
Tallaght
Dublin 24.

Ringsend Regional Office
Cambridge Road
Ringsend
Dublin 4
(A 1 in 2000 scale model of the Site and surrounds will also be displayed at this location)

Ringsend Library
Fitwilliam Street
Dublin 4.

In addition, the Non-Technical Summary of the EIS will be available on the Dublin Waste to Energy website (**www.dublinwastetoenergy.ie**)

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1. Non-Technical Summary

1.1. Introduction

1.1.1. The following is a Non Technical Summary of the Environmental Impact Statement (EIS) for the proposed Dublin WtE facility. The EIS is a statement of the likely effects of the proposed Facility on the Environment, prepared in accordance with the Planning and Development Regulations, 2001. This EIS will accompany the Planning Application to An Bord Pleanala, the Waste Licence Application to the Environmental Protection Agency (EPA), the appropriate licences to the Commission for Energy Regulation (CER) and to support the Compulsory Purchase Order (CPO) to an Bord Pleanala.

1.1.2. Dublin City Council (the Authority) acting on behalf of the four local authorities for the Dublin Region, i.e. Dublin City Council, Fingal County Council, South Dublin County Council and Dun Laoghaire Rathdown County Council, proposes to establish a waste to energy facility (the Facility) to thermally treat household, commercial and non-hazardous industrial waste. The proposed Dublin WtE facility will have a design capacity to thermally treat up to 600,000 tonnes of waste annually and will be located on the Poolbeg Peninsula in Dublin.

1.1.3. Elsam Dublin Waste to Energy Ltd has been commissioned by Dublin City Council to prepare an Environmental Impact Statement for the proposed development. The project is known as the Dublin Waste to Energy Project (the Dublin WtE project) and is part of the implementation of the integrated waste management strategy for the Dublin Region as detailed within the current Dublin Region Waste Management Plan.

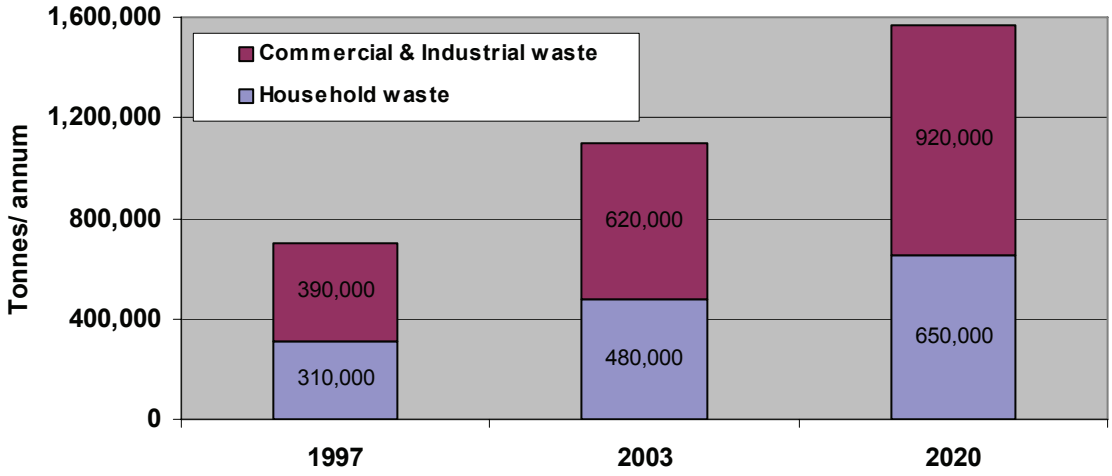
1.2. Waste Management Plan for the Dublin Region

1.2.1. Dublin's waste strategy goals are summarised by the EU waste hierarchy pyramid, see Figure 1.2, which stresses that a new approach to managing waste is required to lead to more sustainable waste management. The strategy is to place emphasis on prevention, minimisation, reuse, recycling and recovery of energy in order to end the over-reliance on landfill disposal.

1.2.2. With the growth in population, employment and economic activity in the Region, the amount of waste generated is on the increase. Waste generation has increased significantly from 1997 as shown in Figure 1.1 below. The current Dublin Waste Management Plan 2005-2010 reports that 1.1 million tonnes of household, commercial and industrial waste were recorded in 2003. By 2020 it is expected that a total of 1.5 million tonnes of household, commercial and industrial waste will be generated in the region.

Figure 1.1 Household, Commercial, & Industrial Waste Trends

(Source: Dublin Waste Plans 1998 & 2005)



1.2.3. The reliance on landfill is still high in the region, with 74% of municipal and similar industrial type waste generated disposed to landfill in 2003. The remainder of the waste, 26% is recycled and recovered through source separated collection systems and additional recycling facilities. The aim is to recycle 59% of the region's waste and to landfill 16% by 2013. The development of key infrastructure such as central biological treatment facilities and a waste to energy plant is essential to achieving this goal.

1.2.4. At present the region is dependent on landfill for residual waste management and in 2006 there are three facilities in operation; Balleally Landfill, Arthurstown Landfill and the privately operated KTK Landfill in Co. Kildare. The majority of these landfills are currently nearing capacity and under current authorisations are due to close within three years. The local authorities are developing a replacement landfill in Fingal to serve the long term disposal requirements of the region.

1.3. Need for the Project

1.3.1. The need for the development of a WtE facility with the capacity to serve the waste management needs of the Dublin Region was identified as far back as 1997 in the Regional Waste Management Strategy.

Figure 1.2 Waste Hierarchy Pyramid

1.3.2. The adoption of the Dublin Waste Management Plan in 1998/2001 formalised the region's policy direction and set out an objective to develop thermal capacity for municipal and non-hazardous industrial waste.

1.3.3. Subsequent feasibility studies were carried out in 1999 to assess various technologies capable of treating this waste stream and examine the best location for the plant. The target date set for the implementation of the Facility in the first regional plan was 2004.

1.3.4. An extensive period of public consultation and community interaction including establishing a community office in Ringsend has been underway since 2001. Baseline environmental monitoring has been carried out since 2003 to facilitate the preparation of this Environmental Impact Statement.

1.3.5. The replacement Waste Management Plan for the Dublin Region was adopted and published in November 2005. The need for development of thermal capacity in the Region was re-confirmed within this plan.

1.3.6. The Waste Management Plan for the Dublin Region 2005-2010 sets out specific targets and objectives for recycling, thermal treatment and residual landfill. The development of key infrastructure such as central biological treatment facilities and a waste to energy plant is essential to achieving these goals and thus meeting regional, national and European targets.

1.3.7. As mentioned above, the Region remains overly reliant on landfill and after recycling, the main tool for reducing landfill reliance will be the proposed Dublin WtE facility, which will divert Approx 600,000 tonnes per annum (tpa) away from landfill.

1.3.8. The WtE will be the preferred residual waste treatment option and waste still requiring landfill at this stage will comprise residual waste in excess of the capacity of the plant, plus other non-combustible residues.

1.4. Alternatives considered

Alternative Strategies

1.4.1. The Dublin Waste Strategy 1997 compared a number of alternative waste management scenarios from the perspective of environmental impact, technical feasibility, and economics. A summary of these scenarios is provided in Table 1.1. A modelling exercise allowed the environmental impacts, costs, and waste management performance to be assessed and compared for each of the alternatives. Following the assessment, the fourth scenario – combining maximum recycling levels with thermal treatment of the remaining waste – although somewhat more expensive than the other alternatives, was found to be the Best Practicable Environmental Option (BPEO) for the Region.

Table 1.1 Alternative Waste Management Scenarios of the Dublin Waste Strategy

Scenario	Recycling	Bulk Waste Reduction/Recovery
1	Mandatory recycling according to national and EU recycling targets plus proposed landfill directive	None
2	Maximum realistic recycling	None
3	Mandatory recycling according to national and EU recycling targets plus proposed landfill directive	Thermal treatment
4	Maximum realistic recycling	Thermal treatment

1.4.2. The preferred scenario and associated targets remain the basis of regional policy in terms of integrated waste management. In terms of international experience (see Section 15.2 of the Plan), the targets set for Dublin are ambitious and a strategy aiming to achieve any higher recycling rates, or a lower landfill rate, would not be realistic.

1.4.3. During the review of the Dublin Waste Management Plan carried out in 2004-2005, an assessment was carried to determine whether any new approaches were available requiring the overall strategy to be modified. In particular, an assessment of the potential for Mechanical Biological Treatment (MBT) to play a role in Dublin was conducted. Section 17.4 of the Plan found that MBT would not offer any significant advantages for the Dublin region, and indeed would prove less sustainable. For this reason the policy of employing thermal treatment for residual waste was not changed.

1.4.4. The do-nothing strategy was also considered in relation to the proposed Facility. By not developing the Facility, there would be a number of negative consequences for the waste management strategy of the region:

- Waste tonnage consigned to landfill would remain at current high levels and likely exceed the EU Landfill Directive targets.
- Given the deficiencies in landfill capacity in the region (set out in Section 12 of the Plan), Dublin's waste would need to be transported to other regions for a sustained period of time. This might extend to exporting waste for treatment abroad which would be contrary to the EU Proximity Principle and the need for Member States to be self sufficient in terms of solid waste infrastructure.

1.4.5. Both of these factors would have negative environmental impacts, and cost implications. The cost implications could in turn impact on the ability of the local authorities to implement the waste prevention, reuse, recycling and biological treatment policies of the Plan.

1.4.6. The "zero waste" option was also examined. While considered a long-term aspiration, it was not seen as a practical prospect in the Dublin Region.

Alternatives Technologies

1.4.7. A Feasibility Study Report for Thermal Treatment of Waste for the Dublin Region was completed in 1999. Phase 1 of the study examined the various thermal treatment technological options, associated environmental impacts, operational issues and costs. The report examined three alternative thermal options:

- Waste-to-Energy (WtE)
- Gasification
- Pyrolysis

1.4.8. The report concluded that WtE was a safe, tried and tested technology with full-scale facilities in operation across Europe. These facilities are capable of meeting stringent EU environmental standards. Gasification and Pyrolysis in comparison were considered to be emerging technologies, which had not been operated at the scale required by the Region. These technologies were also found to be costly to operate relative to WtE.

1.4.9. Following a detailed assessment the study concluded that '… No other thermal technology can compete with waste-to-energy technology on the basis of cost, reliability and ability to deal with untreated municipal waste'. Regarding the alternative technologies, it was recommended that these continue to be monitored to assess their future suitability if required.

1.4.10. During the procurement of the Dublin WtE facility, the process for selecting companies was an open competition advertised in the EU procurement journal. The first stage of

procurement, whereby potential Service Providers are short listed, was carried out so as to enable alternative thermal technologies to be proposed.

1.5. Site Selection

1.5.1. The Poolbeg Site has been identified through a systematic assessment of areas suitable for thermal treatment in the Dublin Region.

1.5.2. A site selection assessment was carried out in 1999 by MC O'Sullivan Consulting Engineers on behalf of the local authorities of the Dublin Region, which identified the Poolbeg site as the preferred site. The other three short listed sites were again visited during the preparation of this EIS. Each of these three sites at Robinhood (Walkinstown), Cherrywood (Loughlinstown) and Newlands (Clondalkin) are still zoned industrial and are currently (June 2006) vacant. However, they are deemed to be no more advantageous than they were in 1999 and indeed less so due to the greatly increased traffic and residential/commercial development encroaching on them. On the other hand the Poolbeg site is now seen to have additional advantages that were not considered in the 1999 Site Selection Report, as detailed in Section 1.5.4 below.

1.5.3. As part of the Environmental Impact Assessment (EIA) process, the Poolbeg site was considered having regard to other published criteria. The Site met these criteria and no major constraints were identified. These confirmed the suitability of the Poolbeg site for the proposed Dublin WtE facility.

1.5.4. The proposed location of the Dublin WtE facility at the Poolbeg site not only provides a strategic location but also provides the following additional synergies with the surrounding existing facilities:

(a) Ringsend Waste Water Treatment Works. In the event that land spreading of sludge will no longer be an option due to environmental constraints, it will be possible to pump the sludge directly to the proposed Dublin WtE facility for thermal treatment.

(b) There is also the opportunity to use the treated effluent from the Ringsend Waste Water Treatment Works within the WtE process thus reducing the quantity of potable water required.

(c) The close proximity to an existing cooling water channel will facilitate the use of seawater for cooling.

(d) The close proximity to grid connection. Power will be exported to the power grid via the existing substations which service the generating stations located in Poolbeg.

(e) When district heating infrastructure is developed in the future, it will be possible to use heat from the proposed Dublin WtE facility for district heating in new residential and commercial developments nearby in accordance with the energy and waste management policy objectives of the Dublin Waste Management Plan, Section 14.3.

(f) The site's location within Dublin Port is convenient for export of any residues and will minimise traffic impacts on the surrounding area.

(g) Some very large prefabricated components for the Facility can be imported through Dublin Port.

(h) The completion in 2006 of the East Wall dual carriageway road development scheme and in 2008 of the Samuel Beckett Memorial Bridge (Guild Street to Macken Street).

1.6. Proposed Scheme

1.6.1. The proposed Dublin WtE facility will be located on the Poolbeg Peninsula in Dublin. Most of the Site is located south of Pigeon House Road and is rectangular in shape measuring

circa 160 m x 340 m and covers an area of approximately 5.5 hectares (13.6 acres). The location of the Site can be seen in Figure 1.3 below.

Figure 1.3 Location of the Site

1.6.2. There will be three buildings on the Site:

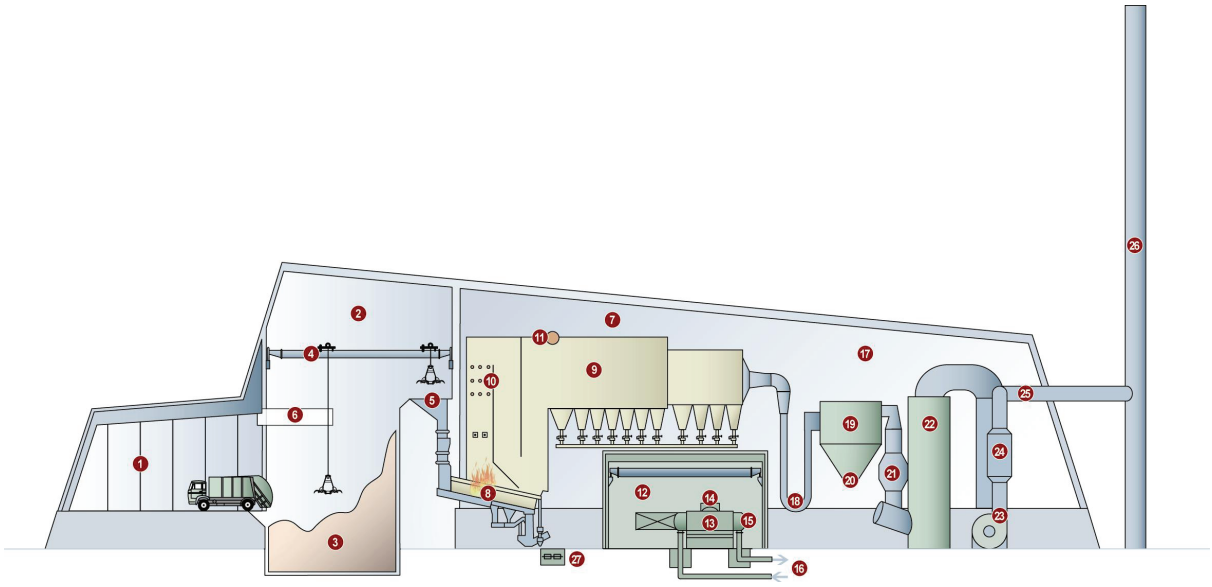
(a) Main process building

(b) Cooling water pump house

(c) Security building

1.6.3. The main building will be approximately 200m long by 130m wide by 52m in height, at the highest point. A schematic of the waste to energy process is shown in Figure 1.4 below.

Figure 1.4 Schematic Diagram of the Waste to Energy Process



1. Waste reception hall
2. Waste bunker compartment
3. Waste bunker
4. Waste crane for feeding the boiler grate
5. Waste hopper
6. Control room
7. Boiler area
8. Grate
9. Boiler, where the heat energy is transferred from the flue gas to the boiler water
10. NO_x reduction by spraying ammonia water into the flue gas
11. Boiler drum, where water and steam are separated
12. Turbine room
13. Steam turbine
14. Generator, producing electricity
15. Condenser, where the remaining heat energy in the steam is cooled
16. Cooling system
17. Flue gas treatment area
18. Activated carbon and lime are added to the flue gas to bind dioxins and other components
19. Fabric filter, where the flue gas treatment residue is removed from the flue gas
20. Extraction point for flue gas treatment residues
21. Flue gas cooler
22. Two-stage wet scrubber for reduction of HCl, SO_2, HF and Hg emissions
23. ID fan
24. Silencer
25. Emission Monitoring
26. Stack
27. Bottom ash for recycling

1: Waste Reception Hall

1.6.4. The waste reception hall will handle up to 50 waste trucks per hour. There will be a series of chutes, ample space for the waste trucks to manoeuvre and an area for inspection of incoming waste. The waste reception hall is kept under constant negative pressure to avoid the leaking of any odours to the surrounding environs.

2 & 3: Waste Bunker Compartment and Waste Bunker

1.6.5. Waste will only be received in the opening hours as specified in the operational licence from EPA. It is intended that waste will be accepted at the Facility between 08.00 and 22.00, six days per week, but incineration will take place 24 hours a day/365 days a year. The waste bunker will be designed to be large enough to ensure that the incinerator can store sufficient waste to allow a continuous feed of fuel outside of waste acceptance hours.

4 & 5: Waste Crane and Hopper

1.6.6. Two waste cranes will mix the waste and feed the waste into the furnace inlet hopper. A third grab will be on stand-by in case of maintenance or breakdown. From the hopper the waste will be pushed into the grate at an appropriate rate.

8: Grate

1.6.7. The Facility will have two parallel independent incineration lines. Each line has a capacity of 35 tonnes/hour, i.e. the capacity of the Facility is 70 tonnes/hour. The actual incineration of the waste takes place on the grates. The waste is continuously moved forward at a controlled speed to ensure optimum burnout. The ashes will be deposited into the bottom ash bunker. The grate is water-cooled and the hot water from this cooling process will be collected and used for pre-heating.

27: Bottom Ash Collection

1.6.8. The bottom ash will be collected and stored on site in a bunker.

9: Boiler

1.6.9. The hot gas from the incineration process will be led through the boiler in four passes – three vertical and one horizontal. The boiler walls will be lined with steel pipes and the heat energy from the gases turn the water in the pipes to steam, which is subsequently fed to the steam turbine.

12, 13, 14, 15 & 16: Steam Turbine and Electricity Generator

1.6.10. The steam turbine drives a generator producing electricity. Approximately 480,000 MWh will be fed to the National Grid in a year. This amount of electricity is equal to the demand from approximately 50,000 homes. The plant will be designed to allow for a future district heating network, and will have the potential for heating future housing and office developments in the area.

10, 17, 18, 19 & 22: Flue Gas Cleaning

1.6.11. After releasing their heat, the flue gases pass through a series of cleaning processes, which will reduce the stack emissions to the level specified by the EPA – in accordance with the Waste Incineration Directive as implemented in Ireland by the European Communities (Incineration of Waste) Regulations 2003. The various processes and systems reduce dust particles, nitrogen oxides (NOx), heavy metals, dioxins & furans, hydrogen chloride (HCl), sulphur-dioxide (SO_2), Carbon Monoxide (CO) and Hydrogen Fluorides (HF), to the levels for which the plant is licensed. Ammonia is sprayed into the boiler to reduce NOx, activated carbon to bind dioxins and furans and mercury, and lime to reduce HCl and SO_2 are injected into the gas stream and are subsequently retained in

bag filters. A final scrubbing with water and Sodium Hydroxide (NaOH) takes out the remaining HCl, HF and SO_2.

25: Emission Monitoring

1.6.12. Emissions monitoring equipment will be provided to monitor the air pollutants. The monitoring system will meet the requirements of the Waste Incineration Directive, Irish implementing regulations and the Waste Licence. All monitoring results will be displayed in the control room.

1.6.13. Emissions monitoring will include the measurement of dioxin emissions from the stack on a fortnightly basis. A monitoring filter will be removed and analysed in an independent laboratory with the subsequent results being representative of dioxin emission concentrations for that period. It should be noted that such monitoring is not a requirement of EU or Irish legislation.

26: Stack

1.6.14. The stacks will be approximately 100m in height. This will be approximately half the height of the existing ESB-Poolbeg Stacks.

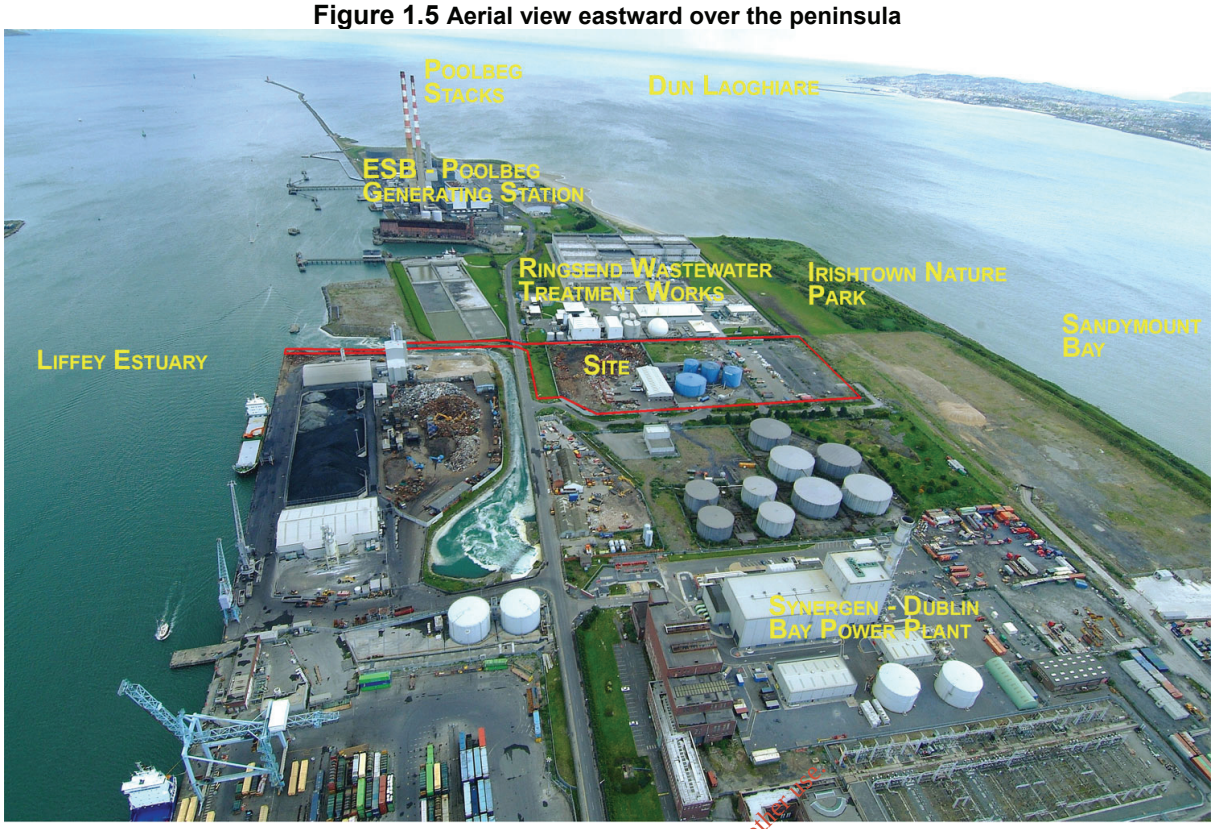
1.7. Landscape and Visual impact

1.7.1. The landscape and visual assessment involved reviewing aerial photography, plans, sections and elevations of the proposed scheme, various publications and reports, together with visits to the site and environs of the proposed development. In addition a series of Photomontages were prepared from viewpoints in surrounding areas.

1.7.2. Poolbeg peninsula has a central and pivotal setting within the arc of Dublin Bay. Despite its overwhelmingly industrial character it is a significant landscape and visual feature dominated by the tall stacks of Poolbeg ESB Generating Station.

1.7.3. The site by contrast is visually indistinct and its character is consistent with the core industrial nature of its surrounds. The site has a visually degraded industrial appearance and is of low landscape sensitivity. The site has no specific landscape or visual-related designation. However areas of the peninsula are important as an amenity and recreational resource, particularly in terms of its association with Dublin Bay, *e.g.* coastal walks, views to and from the area, Shellybanks Beach and also because of Irishtown Nature Park located directly southeast of the site.

Figure 1.5 Aerial view eastward over the peninsula



Characteristics of the Proposed Development

1.7.4. The main building occupies a central position on the site and presents a strong architectural spiralling form. The overall height of the building is 52m and it has a strong, contemporary architectural design see Figure 1.6. The northern elevation facing Pigeon House Road includes a large area of glazing through which it will be possible to view internal technical aspects of the Dublin WtE facility.

1.7.5. Twin stacks to be located alongside the northern elevation of the proposed building. The stacks are slender and rise to 100m in height – approximately half of the height of the two existing ESB stacks at Poolbeg Generating Station.

Impact of the proposed development

1.7.6. The proposed development is of visual significance and will be visible from a wide range of areas around and across the arc of Dublin Bay. However, the landscape and visual impact will be strongly influenced by the existing industrial setting and the nature of existing views to and from this prominent coastal setting.

1.7.7. The proposed development will also be viewed as a major change in architectural approach to development on the peninsula. Existing development constitutes a visual collection of container stacks, silos, warehouses, *etc*. The proposed development will enclose the entire waste to energy process within a single structure.

Figure 1.6 Aerial view from South East (as represented on physical model)

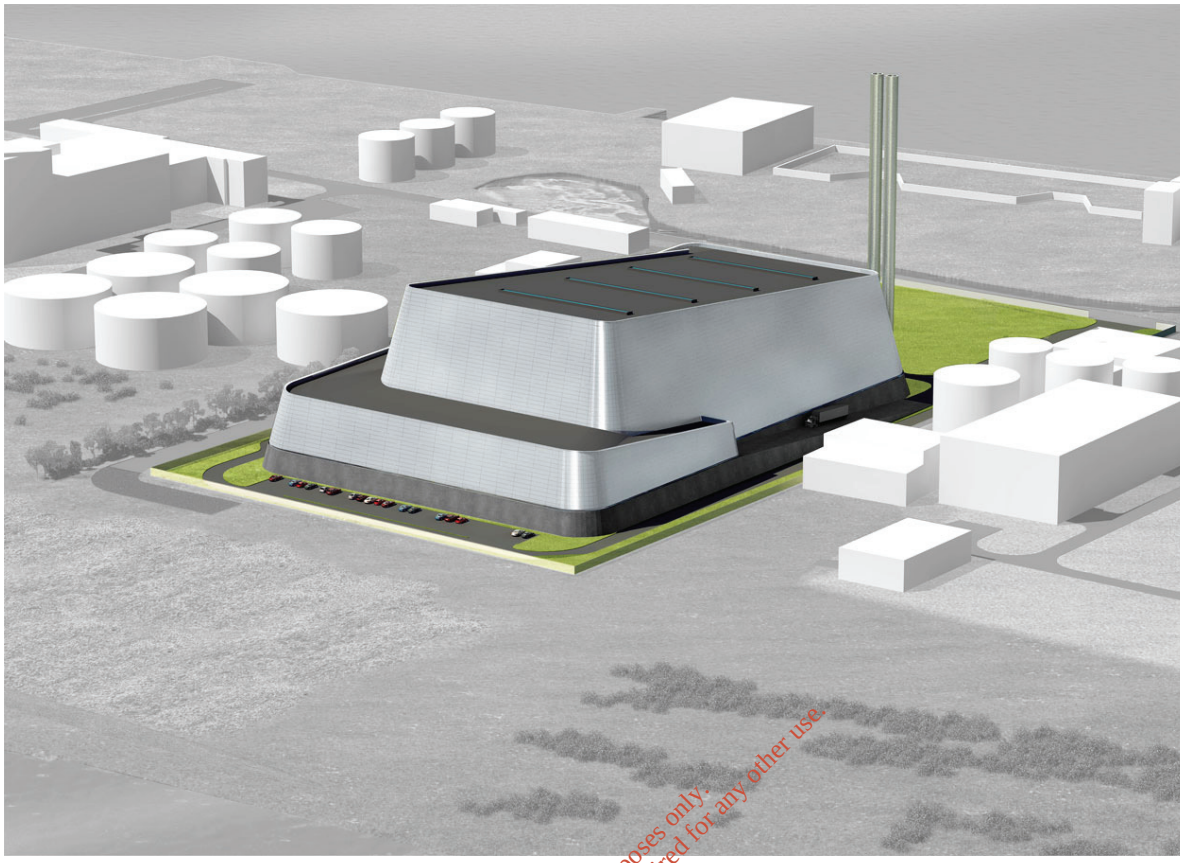


Figure 1.7 Aerial view of proposed Dublin WtE facility from the North

Impact on Landscape, Cityscape and Seascape

1.7.8. While the proposed development is significant it will not adversely alter the existing unique character of the Poolbeg peninsula within Dublin Bay. The peninsula will remain unaffected as a central and pivotal feature within the arc or sweep of the bay. Furthermore, the existing Poolbeg Stacks will retain their predominant landmark influence on the character of the peninsula and the bay.

1.7.9. Overall, the proposed development will not have a significant impact in terms of the contribution of Poolbeg peninsula to the landscape, cityscape or seascape character of Dublin Bay. However, the proposed Facility will have a significant influencing presence on the immediate character of the peninsula, and particularly on the south shore areas. However, this is not considered to be of a negative nature. On the contrary, the proposed Facility has been designed to be a landmark structure, defining a new approach for architectural treatment of industrial development.

Visual Impact

1.7.10. The development will have a strong visual presence from locations on Poolbeg peninsula and from areas off the peninsula particularly where viewed from directly north within Dublin Port or at Clontarf, see Figure 1.8, and from the southwest and south at Irishtown and Sandymount, see Figure 1.9.

1.7.11. The visual impact will remain significant for the coastal promenade, strand and bay at Sandymount. However, as the viewer moves away from the coast or further along the coast, the impact will quickly reduce as the development becomes an increasingly smaller part of the wider developed context.

1.7.12. In operation, a water vapour plume will also be visible from the stacks. Such plumes are already a feature associated with the many existing stacks on Poolbeg peninsula.

1.7.13. The Poolbeg peninsula is already an area of high lighting set within the backdrop of the city. As such the lighting associated with the proposed development will not give rise to any additional adverse impact.

Figure 1.8 (Photomontage Viewpoint 7 of EIS) – an open view south from Clontarf with the twin ESB – Power Generating Station stacks dominating the horizon and standing as a clear landmark on the Poolbeg Peninsula

1.7.14. The proposed development comprises a major building of visual prominence which given its scale and site context, cannot be visually screened. Therefore, a building of significant architectural and visual merit has been designed for the site. The building in conjunction with the provisions of the Poolbeg Masterplan has the potential to set the trend for the rejuvenation of the architectural quality of the industrial elements on the peninsula.

1.7.15. In terms of landscape restoration, it is proposed to establish a strong visual evergreen screen along the eastern, southern and western boundaries of the site. Four spiralling berms will provide for definition and framing of views towards the glazed northern elevation. In this way the landscaping seeks to visually anchor the development, screening the low-level traffic movements, whilst setting-off the architectural treatment of the building.

1.7.16. The proposed development will remain as a prominent building of visual significance on the peninsula. Therefore the development will continue to have a particular visual influence and impact. The development also has the potential to be viewed as a positive landmark building and as part of the envisaged framework for Poolbeg has the potential to act as a catalyst for the positive architectural treatment of industrial development on the peninsula.

Figure 1.9 (Photomontage Viewpoint 17 of EIS) – a clear view north toward the Poolbeg Peninsula from the promenade at Sandymount

1.8. Traffic

1.8.1. The Facility is proposed to operate 24 hours, 7 days a week and it is proposed that it will accept deliveries between 8:00 AM and 10:00 PM Monday through Saturday, 312 days per year. It is also proposed that waste be delivered directly to the Facility from within a defined catchment area around the Dublin WtE facility and the remainder will primarily come from three licensed transfer stations located at Ballyogan, Ballymount and Kilshane Cross. Direct deliveries will arrive by refuse collection vehicles (RCVs) and transfer station deliveries will arrive by bulk transfer vehicles.

1.8.2. The most relevant land use and transport plans for the area, namely the Dublin City Development Plan, The Dublin Docklands Development Area Master Plan and the Poolbeg Framework Plan were examined, which set the context for the future transport and development of the area.

1.8.3. The current and future transport receiving environment was established in terms of the road conditions, traffic flows, future roads and improvements, public transport, and pedestrian and cyclists' services and facilities.

1.8.4. A classified turning movement count survey was undertaken at the site in April 2006. From the results, existing site traffic generation was determined and heavy goods vehicle (HGV) movement patterns were established.

1.8.5. Trip generation was estimated for the proposed Facility, which included trip generation caused by waste deliveries, residue removal, employees, and visitors, construction and of occasional operations such as service overhauls.

1.8.6. Waste residues will be removed off site by truck to a dockside location, therefore their impact on the local road network, except immediately within the vicinity of the Site, will be minimal.

1.8.7. The Facility is anticipated to employ approximately 64 staff members. This will include a number of shift workers, therefore the traffic generation of employees is relatively low.

1.8.8. The traffic impact analysis showed the proposed development will not generate significant traffic on either the local or strategic road network and adequate capacity was available on the road network to accommodate the development.

1.8.9. Overall in transport terms the site is well located and will not create any undue traffic impact on the local community or the road network provided proposed traffic management measures and the associated mitigation measures are implemented.

1.9. Air Quality and Climate

1.9.1. Air quality refers to the presence or absence of airborne pollutants, and the impact of these materials on the atmospheric environment. In order to reduce the risk to human health and the environment from poor air quality, National and European statutory bodies have set objective limit values for a range of air pollutants.

1.9.2. An air quality assessment was undertaken for the construction and operation of the proposed Facility. This involved an assessment of the existing air quality and the prediction and assessment of future air quality. Mitigation measures are proposed where appropriate to reduce, remedy or avoid significant adverse impacts.

Air Quality

1.9.3. Air dispersion modelling results indicate that the background ground level concentrations of air pollutants, with the Facility in operation, comply with the relevant air quality standards or guidelines for the protection of human health and vegetation.

1.9.4. The stack height was confirmed by air dispersion modelling to ensure adequate dispersion.

Climate

1.9.5. An assessment was undertaken of the impact of the Facility on climate, in particular the greenhouse gas emissions from the Facility were quantified and compared with the alternative of landfilling the same amount of waste. The Facility was found to have marginally less greenhouse gas emissions than the landfilling alternative.

1.10. Noise and Vibration

1.10.1. The impact on the environment of noise and vibration from the Dublin WtE facility at Poolbeg was examined.

1.10.2. The existing noise and vibration levels were measured at the site boundary and at the nearest noise sensitive locations.

1.10.3. The noise and vibration assessment shows that during operation, the Facility will comply with the relevant guidelines.

1.10.4. During construction, noise and vibration will be generated from construction activities. Construction noise and vibration were considered in the assessment and also found to comply with the relevant guidelines, with mitigation in place.

1.10.5. Such mitigation measures will include the following; the Facility has been designed with an enclosed waste reception hall to prevent unnecessary noise to the environment, trucks will be properly maintained, on site speed restrictions will be enforced, the driving routes on site will be as short as possible and all activities related to the operation, e.g. collection of bottom ash, will take place inside the building.

1.11. Residues and Consumables

Ashes and Residues

1.11.1. Ash and residues will be generated during the WtE process. There will be three main solid residues:

a) Bottom ash

b) Boiler ash

c) Flue gas treatment residues

1.11.2. The types and approximate quantities of ash and residues from treating 600,000 tonnes of waste are detailed in Table 1.2 below.

Table 1.2 Estimated Ash and Residues by Type and Quantity

Ash Type	Tonnes/annum
Bottom Ash	120,000
Boiler Ash	3,000
Flue Gas Treatment Residues	24,000
Total	**147,000**

1.11.3. Bottom ash is what remains at the end of the grate after the burnout of the waste. Bottom ash is classified as non-hazardous. Bottom ash will be stored onsite in the bottom ash bunker. Until the framework for re-use of bottom ash develops in Ireland, the bottom ash will be exported by ship for recycling and reuse in the UK or Continental Europe.

1.11.4. Boiler ash is contained in the flue gases from the combustion process and accumulates in the boiler. Depending on its content, the boiler ash will either be stored with the bottom ash (if non-hazardous) or with the flue gas treatment residues (if hazardous), prior to removal offsite for either re-use or disposal overseas.

1.11.5. Flue gas treatment residues are the residues removed from the flue gases in the treatment processes. Flue gas treatment residues will be collected and stored in an enclosed system. The flue gas treatment residue, due to its composition, will be classified as hazardous for transportation and disposal. The residue will be transported offsite in sealed containers and will be shipped to Mainland Europe.

1.11.6. There will be no emissions from the ash and residue handling operations during normal conditions. The residues handling, storage and loading areas will be enclosed to prevent the potential for windblown ash.

1.11.7. No treatment of any ash or residue will take place onsite.

Material Usage

1.11.8. A number of materials will be used in the WtE process. Most will be used for flue gas treatment, including activated carbon and lime, ammonia solution, sodium hydroxide and water. Diesel and liquefied petroleum gas (LPG) will be used for the auxiliary burner system, the emergency generator and for any vehicles permanently used on site. Activated carbon and lime will be stored onsite in silos. Ammonia solution, sodium hydroxide and diesel will be stored in bunded tanks. LPG will be stored in small quantities on site. Due to quantities of relevant materials stored onsite, the Dublin WtE facility will be regulated by the Health and Safety Authority under rules that control major accident hazards involving dangerous substances (COMAH).

1.12. Soils, Geology and Groundwater

1.12.1. An assessment of the impact of construction and operation of the proposed Dublin WtE facility on soils, geology, and groundwater was undertaken.

1.12.2. The Site is located on the Poolbeg Peninsula, on a reclaimed area that was formerly the foreshore. This area was predominantly reclaimed in the early 1970s and as such fill covers all remnants of the natural ground on site.

1.12.3. The assessment looked at the bedrock and soils underlying the site. A layer of fill that includes gravels, sands, silts and clays, including rubble, bricks, concrete, glass, timber and cinders, covers the natural ground. Some hydrocarbon contamination, generally below levels of concern, was recorded in the fill.

1.12.4. Soil will be excavated during construction. A risk assessment will be undertaken of the soil to determine its suitability for reuse in landscaping onsite. Unsuitable soil will be removed from site for disposal.

Groundwater

1.12.5. The groundwater beneath the site was found to be slightly contaminated with hydrocarbons, and salty due to the close proximity to the sea.

1.12.6. During construction, dewatering will be required to construct parts of the Facility. The groundwater abstracted during construction will be discharged to sewer.

1.12.7. Mitigation measures will be put in place to ensure the construction and operation of the Facility will not have a significant impact on geology, soils and groundwater.

Water

1.12.8. Cooling water will be abstracted for use in the Dublin WtE facility. Water will flow from the intake point in the port, through the condensers where it will be used to cool the steam after the turbine, and will return to the port through the outfall channel. The discharge temperature will be a higher temperature than the intake temperature. Because the water is heated it will become lighter than the main body of water in the port and will stay on the surface and form a so-called 'buoyant thermal plume' that will spread over the water in front of the outfall channel. The excess temperature of the thermal plume will gradually decrease after discharge due to loss of heat to the atmosphere and mixing with the background water.

1.12.9. Modelling was undertaken of the mixing of the discharged heated water. The modelling took into account the flows in the River Liffey, and the movement of water due to the rise and fall of the tides in the River Liffey and Dublin Bay. The water inflows from the rivers Tolka and Dodder and the cooling water discharges from Synergen and Poolbeg Power Plants were also included in the model.

1.12.10. The model was calibrated to reproduce the present conditions with respect to water levels, currents, temperature and salinity (salt content). The Dublin WtE facility was built into the model and simulations were made to determine the extent and magnitude of the thermal plume.

1.12.11. The simulations showed that the average excess surface temperature due to the WtE discharge is about 1-2° C for a confined area close to the outfall location. Locally near the outfall, for a short period of time at each tide, the excess temperature can be higher and up to 10° C.

1.12.12. In order to control fouling in the cooling water system, it is proposed to add biocides (substances that control marine growth) to the system. Ten different types of biocide were considered in order to determine the best product. Following research, two specific types emerged as potentially suitable. The effects on the marine environment for these two specific biocides - chlorine dioxide and hypochlorite - were modelled.

1.12.13. The modelling analysis indicated that hypochlorite would only have an impact very locally to the proposed cooling water outfall where as the chlorine dioxide would have a much greater impact on the Liffey Estuary. Consequently the hypochlorite was identified as the preferred biocide.

1.12.14. Temperature and quantity of cooling waters will be continuously monitored to ensure the optimal running of the Dublin WtE facility and compliance with the conditions of the Waste Licence.

1.12.15. The addition of biocides will be monitored and optimised according to the requirements of the intake water to ensure that excess biocides are not used.

1.13. Human Beings

1.13.1. The impacts on human beings were assessed by considering the community issues and the health impacts from a Dublin WtE facility.

1.13.2. The socio economic and community infrastructure for the Ringsend, Irishtown and Sandymount areas were examined.

1.13.3. Community facilities in the area include community halls, schools, healthcare centres and a range of sports and recreational facilities such as Irishtown Stadium, ESB Sportsco and a number of public parks. The local area has a high proportion of long-time residents and this is reflected in the low level of population change within the study area.

1.13.4. It is predicted that construction of the Dublin WtE facility will have a positive effect on employment in the local area both directly in terms of employment of construction workers, and also indirectly for other local businesses / service providers such as retail outlets, restaurants, pubs and accommodation.

1.13.5. No negative impact on industry or community facilities in the local area is expected to arise from the Dublin WtE facility. Two existing industrial facilities (Clearway Disposal and the Hibernian Molasses Company), which currently operate at the Dublin WtE Site will be re-located. The proposed development will not detract from the level of community facilities currently available.

1.13.6. The principal of community gain was first introduced in the policy statement Changing Our Ways (1998) (Section 9.2 Public Support and participation).

"Local authorities, working closely with local communities, should utilise a proportion of income from waste charges and gate fees to mitigate the impact of ….. facilities on these communities through appropriate environmental improvement projects".

1.13.7. Dublin City Council is proposing to implement the following Community Gain initiatives, if granted planning approval.

- A Community Gain Fund that will be used to finance facilities/services for the benefit of the local community
- District Heating to be generated by the Dublin WtE facility
- The refurbishment / redevelopment of the Pigeon House Power station and Hotel for appropriate uses, in partnership with the local community

1.13.8. Due to quantities of relevant materials stored onsite, the WtE facility will be regulated by the Health and Safety Authority under rules that control major accident hazards involving dangerous substances (COMAH). A preliminary risk assessment has identified a small number of possible major-accident scenarios. The risk assessment concluded that the effects of any of these major-accidents outside the site would be minimal. The residual risk to humans and the environment from the Dublin WtE facility would be extremely low.

1.13.9. A comprehensive safety management system will be established for the Dublin WtE facility. This system will include training of staff, regular auditing and inspection and on-site emergency plans.

1.14. Terrestrial Ecology

1.14.1. A terrestrial ecological assessment was undertaken for the construction and operation of the proposed Dublin WtE facility. Terrestrial ecology includes both the land flora (vegetation) and fauna (animals) and their associated habitat.

1.14.2. All of the habitats present are classified in the broad categories of built land and disturbed ground and none are of conservation value. There are no known flora species of conservation value in the area.

1.14.3. The mammal species associated with the site are common to developed and disturbed habitats and none are of conservation value. The presence of skylarks on waste ground to the south of the site is of some note as skylark is listed as a species of moderate conservation concern. The presence in winter of Brent geese on the grasslands associated with the adjoining sewage treatment works is of note as these are part of the Dublin Bay internationally important population.

1.14.4. The Irishtown Nature Park, whilst rich in plant species derived from various sources, is not of significant conservation importance. From the terrestrial perspective, the closest designated sites are Booterstown Marsh proposed Natural Heritage Area (situated almost 3 km south of the site) and the Grand Canal proposed Natural Heritage Area (situated approximately 2 km east of the site).

1.14.5. The impact of site clearance is not considered of significance as the existing habitats are not of conservation importance. Overall, the replacement of existing habitats with further, highly modified habitats is rated as a Neutral impact. The construction activities could have a disturbance effect on the Brent geese, which feed during winter on the grassland to the south-east of the site. However, the geese in Dublin Bay are well used to high levels of disturbance and are unlikely to be much affected by construction activities. Even if disturbed, which would be temporarily, they have many other sites in the Dublin Bay area to retreat to. The construction activities would not be expected to have any adverse impacts on the flora and fauna of the Irishtown Nature Park. Once operational, the plant would not be expected to have any impacts on the terrestrial ecological interests of the immediate area. The proposed development would not have any impacts, direct or indirect, on the ecological interests of the Booterstown Marsh or Grand Canal proposed Natural Heritage Areas.

1.14.6. Owing to the low ecological significance of this site, and considering that there are no significant adverse impacts, specific mitigation measures are not considered necessary.

1.15. Marine and Estuarine Ecology

1.15.1. Dublin Bay is an area of high conservation importance and is legally protected under both the EU Habitats Directive and the EU Birds Directive. Specific sites of conservation importance include the Liffey and Tolka Estuaries, and Sandymount Strand, all immediately adjacent to the proposed development. Baseline surveys of the area showed that all the species and habitats recorded are typical of the east coast of Ireland

1.15.2. Salmon, an important fish species, uses the River Liffey. There are well-established seal colonies in Dublin Bay but seals do not generally enter the Liffey near the proposed development. Dolphins and whales have been observed in the Bay but generally do not occur near the proposed development.

1.15.3. The operation of the proposed Dublin WtE facility has the potential to impact the marine and estuarine environment in a number of ways. These include impacts from water abstraction, heat pollution and biocides.

1.15.4. Water is to be taken from the Liffey Estuary immediately upstream of the proposed development and used as cooling water within the process. Salmon and other fish may be drawn into the system with cooling water. The use of grates in front of the intake should reduce levels of fish deaths. The rates of mortality will also be monitored and if found to be unacceptable, further deterrents will be installed.

1.15.5. Cooling water is to be released back into the Liffey at a higher temperature than it was taken out. Fish are particularly sensitive to temperature. If the heated water stretches across the width and depth of the Liffey for extended periods it could impact on salmon migrating upstream to spawn. Models indicate that heated water will not fill the river

channel during normal operation. Once in operation, the extent of the heated water will be monitored to ensure that this is the case.

1.15.6. The proposed development will take into account other discharges and ensure that the combined effect does not have a significant adverse impact on the marine and estuarine flora and fauna of the area.

1.16. Architectural Heritage, Archaeological and Cultural Heritage

1.16.1. An assessment of the existing Archaeological, Cultural Heritage and Architectural Heritage was undertaken based on a desk study of available information on the archaeological, cultural heritage and architectural heritage of the study area and a field survey of the Site.

1.16.2. The proposed Dublin WtE facility will be located along Pigeon House Road to the north of which is the recorded monument of the sea wall (DU019:029-01). Historical and cartographic sources point to an earlier sea wall (DU019:029-02) being located along the line of the current sea wall and Pigeon House Road. The sea walls were initially constructed to prevent the build up of deposits within the main navigational route of the River Liffey. This was followed in the seventeenth and eighteenth century by reclamation of the lands to the south of the wall between Ringsend and Poolbeg lighthouse. The proposed site remained undeveloped in the eighteenth and nineteenth century. In the twentieth century a portion of the site was reclaimed.

1.16.3. There are no recorded features of an architectural heritage or cultural heritage merit within the proposed site, and therefore the proposed Dublin WtE facility will have no physical impact on the receiving architectural heritage or cultural heritage environment and no mitigation measures are required.

1.16.4. Although there are no recorded archaeological monuments within the proposed site the northern section of the site is within the constraint area of the sea walls (DU019:029-01/02). However the proposed design will avoid the line of these walls as noted in historic maps, with the intention for the associated cooling water pipelines to bridge the monument. A sheet pile structure and pump house will be constructed within the estuary area. The proposed development will therefore not directly impact on the recorded monument (DU019:029-01/02), but may have a potential slight impact on maritime archaeology.

1.16.5. It is recommended that archaeological monitoring of all groundbreaking and earthmoving activities within the proposed Facility take place under licence to the Department of the Environment Heritage and Local Government. It is also recommended that the Underwater Unit of the National Monument Section be consulted once a construction programme has been finalised to assess the suitability of conducting an Inter-tidal Survey in the area of the cooling water channel and the Liffey estuary.

1.17. Material Assets

1.17.1. The impacts of the Facility on material assets in the vicinity were assessed, including land use issues, utilities, natural resources and transport network.

1.17.2. To facilitate the proposed Dublin WtE facility, it will be necessary to relocate two commercial enterprises (Hibernian Molasses and Clearway Disposal) to alternative sites. The remainder of the site required for the cooling water system, north of Pigeon House Road, can be facilitated without the need to relocate any commercial interests. There will be no residential properties, community facilities or agricultural land acquired to facilitate this project.

1.17.3. It is not expected that local property values will be negatively impacted as a result of locating the Dublin WtE facility on the Poolbeg Peninsula. The areas surrounding the Peninsula are well-established residential areas where demand is expected to remain

strong. There may be a temporary impact on the house market in local residential neighbourhoods once construction of the Facility begins, however research shows this would likely be a very short term effect.

1.17.4. Two 110kV cables and one 220kV cable cross the southern end of the Site and may have to be relocated. The existing Hibernian Molasses pipeline, currently crossing Pigeon House Road, will be removed during preparation of the Site.

1.17.5. It is proposed to connect the Facility to the power grid, subject to agreement with ESB Networks, which will be made in due course.

1.17.6. The Dublin WtE facility will treat 600,000 tonnes of household, commercial and non-hazardous industrial waste, which is currently landfilled.

1.17.7. Approximately 60MW of electricity will be exported to the national grid. This will replace the power being generated from fossil fuels, thus reducing the consumption of these fuels. The design of the Facility will allow for production of district heating to a district heating network comprising new residential and commercial developments.

1.17.8. A comprehensive traffic management plan will be developed as part of the proposal to ensure that negative impacts to the local traffic are minimised.

1.17.9. The principal residual impacts from the Dublin WtE facility are the reduction in the volume of municipal, industrial and commercial waste to be landfilled in the Dublin region and the supply of 60MW of electricity to the national grid. When district heating is developed, heating will be supplied to selected residential and commercial properties in the area. No other residual impacts are anticipated.

1.18. Construction and Decommissioning

1.18.1. It is expected that construction work at the Dublin WtE facility will commence in 2008 and that construction and commissioning of the Facility will take approximately 36 months.

Construction Employment, and Facilities

1.18.2. Throughout the construction phase there will be some variation in the numbers working on site. The construction workforce will average 275 with a maximum of approximately 500.

1.18.3. Temporary office accommodation and welfare facilities will be provided in the western part of the site. A minimum number of parking spaces will be provided on-site, for site construction management and visitors. To ensure that construction workers do not create additional demand for parking in the vicinity of the proposed development, or cause obstruction on the adjacent road network, the workforce will either be encouraged to use public transport, or the contractors will be required to provide transport to the site for their workforce.

1.18.4. It is proposed that work will take place 24 hours per day during the construction phase. The construction programme will be planned in such a way that noisy construction activities outside normal hours will be limited, where possible, and will be strictly monitored.

Construction Impacts and Mitigation

1.18.5. Normal construction techniques will be employed. Every reasonable effort will be made to ensure that any environmental impacts will be minimised during the construction phases of this project. The construction planning will be geared towards keeping disruption and nuisance to a minimum.

1.18.6. The earthworks will require excavation of some areas and the filling of others, with the levelling of the site. Some soil will have to be excavated from the bed of the new cooling water channel. This work may be done by dredger, with the spoil being disposed of at sea in accordance with the necessary permit.

1.18.7. A dust minimisation plan will be put in place to lower the potential for dust generation from site activities. Appropriate measures will be taken to ensure that the site and the surroundings are maintained to a high standard of cleanliness.

1.18.8. Storm water run-off will be controlled and discharged via a silt trap.

1.18.9. Due to the nature of construction activities, there will be diesel-powered plant and machinery operating at the site for the duration of the construction phase. All fuels will be stored in bunded areas.

1.18.10. A construction waste management plan will be implemented to control and minimise the generation of construction waste and where possible, the waste arising will be reused or recycled in preference to disposal.

1.18.11. It is anticipated that with the proper construction management, there will not be any significant negative residual impacts arising from the construction of this development.

1.19. Sustainability

1.19.1. Sustainability is an important objective for all activities undertaken by Dublin City Council.

1.19.2. The widely accepted definition of sustainable development, on which this section of the EIS is based, is that outlined in the World Commission on Environment and Development report “Our Common Future” (1987), and states that “humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs”.

1.19.3. Sustainable development is not a fixed state of harmony, but rather a “process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are made consistent with future as well as present needs” (ibid).

1.19.4. Sustainability is about three main issues: environment, economy and community. The Dublin WtE project has been reviewed in the context of these recognised sustainability criteria. The conclusion is that the Dublin WtE project is in accordance with sustainable development objectives.

1.20. Cumulative Impacts and Interactions

1.20.1. The cumulative impacts and interactions of the proposed Dublin WtE facility are addressed in relevant chapters of the EIS.

1.20.2. The Effect Matrix below, Table 1.3, examines whether a topic in the left hand column has an impact during construction and/or operation on each of the topics listed along the top row. The effect table should be read from left to right.

1.21. Conclusion

1.21.1. It is concluded that the proposed Dublin WtE facility if designed, constructed and operated in accordance with this EIS will not have a significant impact on the environment.

Table 1.3 Inter-relationship and Interaction of Effects matrix (C = Construction, O = Operational)

	Landscape and visual impact	Traffic	Air Quality and Climate	Noise and Vibration	Soils, geology and groundwater	Water	Human beings	Terrestrial Ecology	Estuarine Ecology	Architectural Heritage, archaeology and cultural heritage	Material Assets
Landscape and visual impact	-	-	-	-	CO	-	CO	CO	-	CO	CO
Traffic	CO	-	CO	CO	C	-	CO	-	-	CO	CO
Air Quality and Climate	O	CO	-	-	C	O	CO	CO	O	O	O
Noise and Vibration	-	-	-	-	C	-	CO	CO	-	-	-
Soils, geology and groundwater	C	C	C	C	-	CO	CO	CO	CO	C	C
Water	CO	-	-	-	C	-	CO	-	CO	-	C
Human beings	-	-	CO	-	-	-	-	-	-	-	CO
Terrestrial Ecology	CO	-	CO	-	-	-	CO	-	CO	-	-
Estuarine Ecology	-	-	-	-	-	CO	CO	CO	-	-	-
Architectural Heritage, archaeology and cultural heritage	C	-	-	-	-	-	CO	-	-	-	CO
Material assets	CO	CO	-	-	C	C	CO	-	-	-	-

Note: C = Construction Phase Interaction; and, O = Operational Phase Interaction

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2. Preamble

2.1. Introduction

2.1.1. Dublin City Council (the Authority) acting on behalf of the four local authorities for the Dublin Region, i.e. Dublin City Council, Fingal County Council, South Dublin County Council and Dun Laoghaire Rathdown County Council proposes to establish a waste to energy (WtE) Facility to thermally treat household, commercial and non-hazardous industrial waste. Elsam Dublin Waste to Energy Ltd has been commissioned by Dublin City Council to prepare an Environmental Impact Statement for the proposed development.

2.1.2. The project is known as the Dublin Waste to Energy Project (the WtE Project) and is part of the implementation of the integrated waste management strategy for the Dublin Region as detailed within the current Dublin Waste Management Plan 2005-2010.

2.1.3. This chapter outlines the description of the proposed Facility together with a description of the procurement of the project and Elsam's environmental and safety profile. The need for an Environmental Impact Statement (EIS), regulatory framework, scoping and public consultation process are also described. This section also includes the names of the specialists involved in the preparation of the EIS and confirms that no particular difficulties were encountered in the preparation of the EIS.

2.2. Outline of the project

2.2.1. The proposed Dublin WtE Facility will have a design capacity to thermally treat up to 600,000 tonnes of waste annually and is proposed to be located on the Poolbeg Peninsula in Dublin. The principal part of the Site located south of Pigeon House Road is rectangular in shape measuring circa 160 m x 340 m and covers an area of approximately 5.5 hectares (13.6 acres) in area. The location of the Site can be seen in Fig 2.1 below.

Figure 2.1 Location of the Site

2.2.2. There will be three main buildings on the Site:

(a) Main process building

(b) Cooling water pump house

(c) Security building

2.2.3. The main building will be approximately 200m long by 130m wide by 55m in height, at the highest point.

2.2.4. The waste to energy process will consist of the following main process elements:

(d) Waste acceptance

(e) Waste intake and storage

(f) Combustion process

(g) Energy recovery process, and

(h) Flue gas cleaning

2.2.5. The Facility will generate power that will be supplied to the national grid. The Facility will also have the capability to supply heat to any future district heating networks serving future developments in the vicinity. Construction and operation of the district-heating network is being separately procured and is thus not an integrated part of the Dublin Waste to Energy project as such.

2.2.6. A detailed description of the proposed Facility is provided in Chapter 5 - 'Proposed Development'.

2.3. The Public Private Partnership of Dublin City Council and Elsam Dublin Waste to Energy (WtE)

2.3.1. The proposed Dublin WtE Facility is being procured and developed as a public private partnership. Under the public private partnership arrangement it is proposed that the private company (the PPP Co) will be responsible for the design, construction and financing of the new WtE Facility as well as the ongoing operation of the Facility for a period of at least twenty-five years. The PPP Co will generate income by charging a gate fee for each tonne of waste delivered to the Facility and through the sale of electricity.

2.3.2. The tender competition for the design, build, finance and operation of the facility required certain minimum standards. In this context, it might be noted that the current intended operator is from the Elsam Group in Denmark although in this EIS, we have used the term "operator" generally rather than refer to any specific person.

2.4. Elsam's Environmental and Safety Policy

2.4.1. Elsam's environmental and safety policy states their environmental aspirations and values. Specifically it states:

"*Further to our business platform and values, we will*

- *Work to continuously strengthen our efforts to reduce the adverse impact of our power plants on the environment, our employees and the surrounding community.*

- *Involve, motivate and educate our employees in the daily effort on behalf of the occupational environment and the general environment.*
- *Incorporate sustainability into our research, development, planning and investment in new activities.*
- *Comply with and take a lead in the promotion of environmental and occupational health and safety laws and local environmental regulations.*
- *Encourage suppliers to incorporate environmental and occupational issues into their production and products.*
- *Communicate openly with customers, authorities and the public about our work on sustainability, including environmental issues and occupational health and safety."*

2.5. EIS Methodology

Need for an EIS

2.5.1. The purpose of the Environmental Impact Statement (EIS) is to provide information on the possible environmental impacts of the proposed Dublin WTE Facility and highlight the proposed mitigation measures to reduce the residual impact of the Facility on the environment.

2.5.2. It is required that the EIS address all likely significant impacts, both direct and indirect, of a development. This EIS includes all information relevant to the potential significant environmental effects of the proposed Facility and highlights the proposed mitigation measures, as required by S.I. No. 600 of 2001 Council Directive 97/11/EC Amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment as implemented in Ireland by the Planning and Development Regulations 2001-2005.

2.5.3. The EIS will accompany the application to An Bord Pleanála for planning consent under sections 175 and 226 of the Planning and Development Acts, 2000 to 2004. Schedule 5 of the Planning and Development Regulations, 2001-2005 (S.I. No. 600 of 2001)[1], specifies development for which an EIS is required. The proposed Dublin Waste to Energy Facility falls into Category No. 10 of Part 1 of Schedule 5.

2.5.4. *"Waste disposal installations for the incineration or chemical treatment as defined in Annex IIA to Directive 75/442/EEC under heading D9, of non-hazardous waste with a capacity exceeding 100 tonnes per day."*

2.5.5. Furthermore the EIS will accompany the application to the Environmental Protection Agency for a waste licence under the "Waste Management Acts, 1996 to 2003", the application to the Minister for Communications, Marine and Natural Resources for the appropriate consent under the "Foreshore Acts, 1933 to 1988" (if required) and the application to the Commission for Energy Regulation for the appropriate consents under the "Electricity Regulation Acts, 1999 to 2002".

EIS Methodology

2.5.6. Environmental Impact Assessment (EIA) is the process of examining the environmental effects of a development at both construction and operational stage. This process includes the consideration of environmental aspects, impact and mitigation measures at

[1] The Government of Ireland (2001). Planning and Development Regulations, 2001 (S.I. No. 600 of 2001). The Stationary Office, Dublin.

design stage, the preparation of an EIS, the evaluation of the EIS by a competent authority and the subsequent decision as to whether or not the development should proceed.

2.5.7. The Planning and Development Regulations 2001-2005 specify the information to be contained in an EIS and include the following:

(a) A description of the proposed development comprising information on the Site, design and size of the proposed development
(b) A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects
(c) The data required to identify and assess the main effects which the proposed development is likely to have on the environment
(d) An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice, taking into account the effects on the environment

2.5.8. Information is also required on the following matters:

(a) a description of the physical characteristics of the whole proposed development and the land-use requirements during the construction and operational phases;
(b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used
(c) an estimate, by type and quantity, of expected residues and emissions (including water, air and soil pollution, noise, vibration, light, heat and radiation) resulting from the operation of the proposed development
(d) aspects of the environment likely to be significantly affected by the proposed development are also to be described, including in particular:
    i human beings, fauna and flora,
    ii soil, water, air, climatic factors and the landscape,
    iii material assets, including the architectural and archaeological heritage, and the cultural heritage
    iv the inter-relationship between the above factors;
(e) a description is required of the likely significant effects (including direct, indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative) of the proposed development on the environment resulting from:
    i the existence of the proposed development,
    ii the use of natural resources,
    iii the emission of pollutants, the creation of nuisances and the elimination of waste,
    iv and a description of the forecasting methods used to assess the effects on the environment;
(f) an indication of any difficulties (technical deficiencies or lack of know-how) encountered by the developer in compiling the required information

2.5.9. A summary in non-technical language of this information is also to be included.

2.5.10. This EIS has been prepared with regard to the above requirements on the basis of all available information at this time.

EPA Guidelines

2.5.11. This EIS has also been prepared with due regard to the guidelines on environmental impact statements published by the Environmental Protection Agency (EPA). These are

outlined in Advice Notes on Current Practice2 (in the preparation of Environmental Impact Statements), published in 2003 and also Guidelines on the Information to be contained in Environmental Impact Statements3 published in 2002.

2.5.12. European Commission Guidance on EIS Scoping4 was also consulted in the preparation of the Environmental Impact Statement.

2.5.13. The EIS has been prepared in grouped format structure as described in EPA Guidelines. This format examines each topic as a separate section referring to the existing environment, the proposed development, impacts and mitigation measures.

2.6. Regulatory framework for the Waste to Energy Facility

2.6.1. The Dublin Waste to Energy Facility will require:

(a) an approval from An Bord Pleanála under sections 175 and 226 of the Planning and Development Acts, 2000 to 2004
(b) a waste licence from the Environmental Protection Agency under the Waste Management Acts, 1996 to 2003
(c) an authorisation to construct and licences to generate and supply from the Commission for Energy Regulation under the Electricity Regulation Acts, 1999 to 2005
(d) a foreshore consent from the Minister for Communications, Marine and Natural Resources under the Foreshore Acts, 1933 to 1988, (if required)
(e) a licence to discharge trade effluent, if applicable
(f) an approval of grid connection from ESB Network
(g) an approval of supply connection
(h) appropriate certification under the Building Control Act 1990
(i) a permit under the Dumping at Sea Act 1996 (if required)

2.7. Public Involvement

Introduction

2.7.1. In early 2000 Dublin City Council indicated in reports to the Elected Members and in correspondence and at meetings with local residents / community groups, that it was proposing to engage a clients representative to advise the Council in relation to the development of a thermal treatment plant. This would include the management of the appropriate procurement processes to appoint a service provider, overseeing the completion and submission of the statutory processes as well as representing the public interest.

2.7.2. The public involvement and information campaign began on the Dublin Waste to Energy Project in February 2000, shortly after a Site on the Poolbeg Peninsula was identified as the preferred location for the development of a thermal treatment plant to treat 25% of Dublin's waste.

2.7.3. The team based in Cambridge House, Cambridge Road, Ringsend, began work in October 2000.

[2] Environmental Protection Agency (2003). Advise Notes on Current Practice in the Preparation of Environmental Impact Statements. Environmental Protection Agency, Wexford.
[3] Environmental Protection Agency (2002). Guidelines on the Information to be contained in Environmental Impact Statements. Environmental Protection Agency, Wexford
[4] European Commission (June 2001). Guidance on EIA Scoping. Office for official publications of the European communities, Luxembourg.

2.7.4. Public involvement on the project is being managed in parallel with the development of the project as follows:

Table 2.1 Public involvement on the project parallel with project development

Public Involvement		Project Development
Phase 1	Introduction to Project/ Community Interest Group Process	Development of Procurement Process
Phase 2	Information Sessions	Development of Procurement Process
Phase 3	EIS Scoping	Preparation of EIS
Phase 4	Statutory Consultation	Statutory Phase
Phase 5	Post Statutory Phase	Post Statutory Phase

2.7.5. In drawing up the Public Involvement Strategy, the project team drew on the experience of two international experts, Pat Delbridge and Judith Petts. Both have extensive experience of developing a range of consultation strategies for communicating complicated messages to local communities.

Summary

2.7.6. The following is a brief summary of the public involvement and awareness activities undertaken as part of the development of the Dublin Waste to Energy Project (See Figure 2.2 for time line and related activities).

Information service opened

2.7.7. An information service was officially opened in the Ringsend Regional Office in December 2000. The office has a full-time compliment of staff including a senior official from Dublin City Council and a number of environmental scientists from RPS. The information service is available to all members of the community and all are welcome to drop into the office at any time to discuss any aspect of the project. In addition to a full time staff available to the public, the Ringsend Office produces a regular Newsletter *'Wastewise'* for distribution to the community; provides a project website; library and research service; liaises with local community representatives and groups and undertakes any media contact necessary. The Information Service will continue throughout the development of the Dublin Waste to Energy Project.

Table 2.2 List of Publications

Newsletter	Topic Covered
Volume 1 Issue 1: November 2001	Update on CIG meetings
Volume 1 Issue 2: April 2002	Update on expert speakers at CIG meetings
Volume 1 Issue 3: October 2002	
Volume 1 Issue 4: December 2002	Update on recycling in Dublin and the Ringsend area
Volume 2 Issue 1: February 2003	Promotion of the waste awareness day
Volume 2 Issue 2: September 2003	Promotion of Information Session 1 on air quality

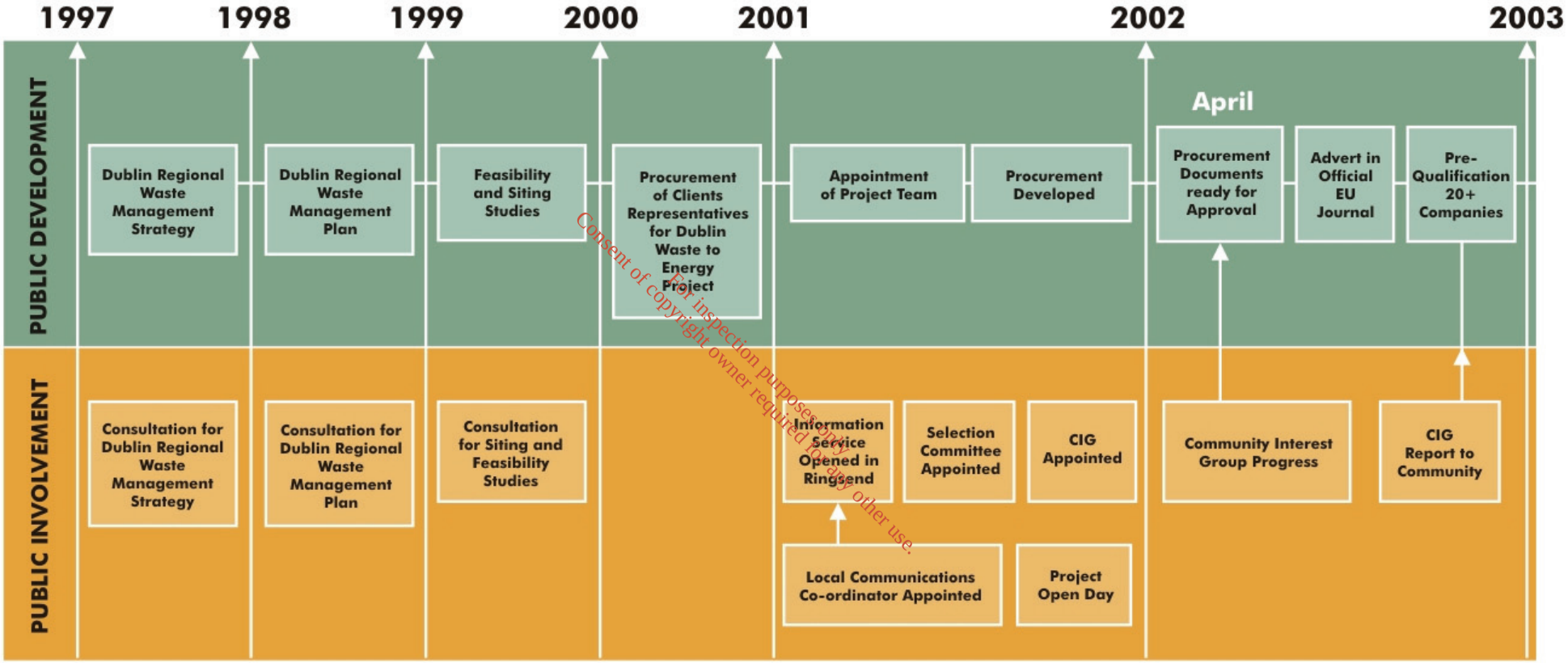
Volume 2 Issue 3: October 2003	Promotion of Information Session 2 and report on Information Session 1
Volume 3 Issue 1: January 2004	Promotion of Information Session 3 on health and report on Information Session 2
Volume 3 Issue 2: February 2004	Project Update, project development and public involvement
Volume 3 Issue 3: March 2004	Promotion of Information Session 4 on traffic and report on Information Session 3
Volume 3:Issue 4: Special Report June 2004	Report on Information Session 4 and launch of Dublin City Council waste management report
Volume 3 Issue 5: October 2004	Promotion of Information Session 6 on incineration technologies and report on Information session 5
May 2005	Report on Information Session 6 and on the draft Dublin Waste Management Plan
Waste to Energy Update 2005	Announcement of the service provider
Background March 2006	Summary of the process so far, details of what exactly is being proposed and the incineration process

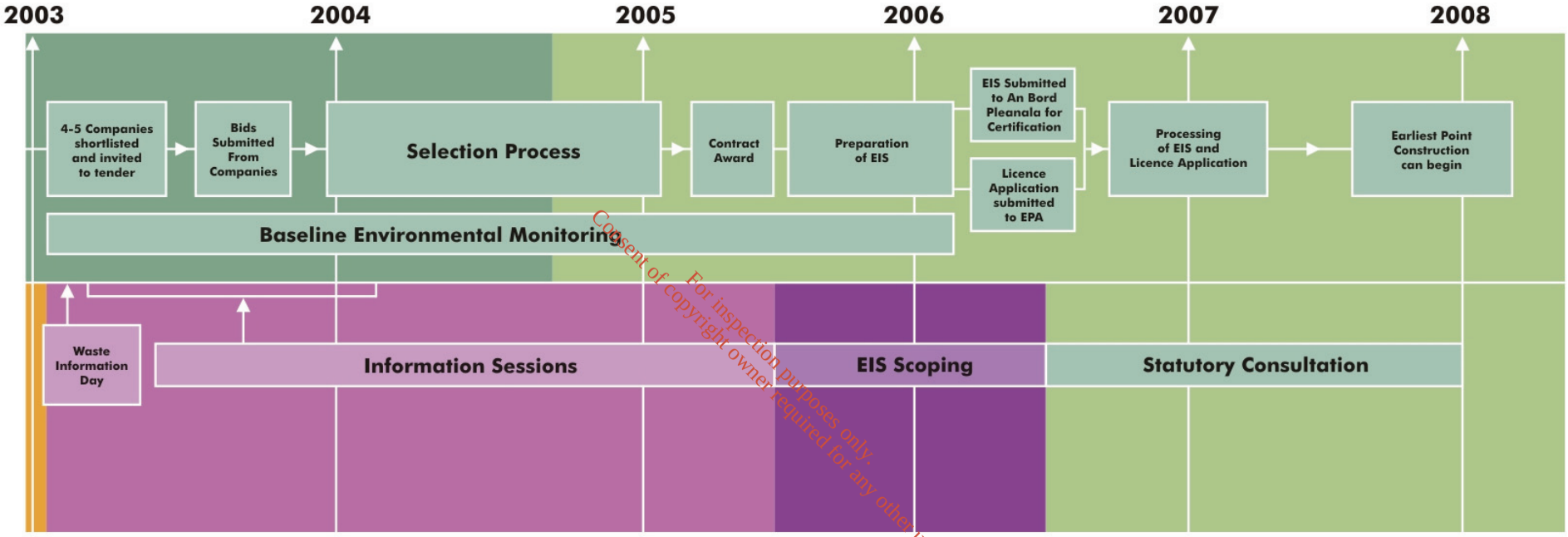
2.7.8. Publications are available in Appendix 2.1.

Project Open day

2.7.9. The first project Open Day (Summer 2001) was held to introduce the community to the project team and to encourage members of the community to apply to be members of the CIG process.

Figure 2.2 Timeline of consultation activities on the Dublin Waste to Energy Project





CIG Process

2.7.10. The CIG process was established to provide the community with:

- Access to the information they required about the development of a thermal treatment plant in their area;
- The opportunity to raise their issues, questions and concerns so that they could be inputted into the scoping process for the EIS.

2.7.11. The CIG process began in Autumn 2001 and a wide range of promotional activities were undertaken to encourage members of the community to be involved in the process.

- All applicants to join the CIG were reviewed by an Independent Selection Committee and 20 people were selected to be part of the process because they reflected rather than represented the community.
- The role of the CIG was clearly defined from the outset and agreed with the members of the group in advance of the official meeting process.

2.7.12. The brief to the group was as follows:

- Identify issues of concern regarding the proposal to build a Waste to Energy Facility on the Poolbeg Peninsula;
- Assess the work that has been carried out by Dublin City Council to determine the need for such a facility and the action that has been taken to identify an appropriate site for such a facility;
- Discuss (with the help of experts who support or oppose the use of energy from waste as part of an integrated waste management strategy) the impact of similar facilities on local communities and on health and safety of humans and the environment.
- Indicate the questions that would need to be addressed in the Environmental Impact Statement to respond to areas of community concern;
- Prepare a report on the CIG process for dissemination to the community and interested stakeholders.

2.7.13. Providing the CIG and therefore members of the Community with up-to-date accurate information from independent sources was central to the success of the CIG Process. This was highlighted at a very early stage as being one of the major advantages of participating in the process.

2.7.14. The CIG met officially seven times but also had 21 unofficial meetings funded by Dublin City Council. Members of the group selected experts who were on both sides of the thermal treatment debate to address their meetings.

2.7.15. In total seventeen experts addressed the CIG at official meetings with the Independent Legal Team addressing the group at unofficial meetings. One member of the group went to see a thermal treatment plant in London and the CIG appointed and briefed their own legal team to assess the project on their behalf.

Table 2.3 List of experts involved in CIG meetings

	Name	Organisation/Position	Topic Covered
Meeting 1	Jean Clarke	RPS-MCOS	Baseline environmental monitoring
	Gunnar Kjaer	COWI	Incineration technologies
	John Singleton	Dublin City Council	Waste management in Dublin City

Meeting 2	John Fitzgerald	City Manager	Development in Dublin City
	Matt Twomey	Assistant City Manager	Waste management in Dublin City
Meeting 3	Dr Jim Wilson	Trinity College Dublin	Baseline monitoring
	Karin Dubsky	Coastwatch Ireland	Issues for scoping
	Matt Twomey	Assistant City Manager	Waste management in Dublin City
Meeting 4	Professor Yvonne Scannell	Trinity College	Environmental law
	Martin Hederman-Robinson	EU Comission	Safety issues and EU policy
	Frank McDonald	Irish Times	The need for enforcement of waste legislation
	Dr Conor Skehan	CAAS Environmental Services	EIS scoping and the statutory process
	Hendrick Van der Kamp	Head of Planning and Development (DIT)	Siting study and the planning process
	Matt Twomey	Assistant City Manager	Waste management in Dublin City
Meeting 5	Prof. Dr Dieter Schrenk	Consultant with World Health Organisation	Health impacts of waste management
	Dr Andrew Farmer	Institute for European Environmental Policy	Air quality/health
	Dr Paul Johnston	Greenpeace	Health/environmental issues
	Eoghan Madden	Dublin City Council Traffic	Traffic in Dublin City
	Donal Mathews	Dublin City Council Traffic	Traffic in Dublin City
	Matt Twomey	Assistant City Manager	Waste management in Dublin City
Meeting 6	Matt Twomey	Assistant City Manager	Waste management in Dublin City
Meeting 7	Denis Fitzgerald	Met Eireann	Local weather conditions
	Matt Twomey	Assistant City Manager	Waste management in Dublin City

2.7.16. The question of whether or not Dublin City Council acted appropriately during the evolution of the Dublin Waste to Energy Project was one that remained a constant theme throughout the CIG process. Having regard to the concerns expressed by the CIG, the Assistant City Manager sanctioned the CIG to select, appoint and brief their own legal team. The purpose of the team was to review the decisions taken by Dublin City Council to date, and report back to the CIG. Following a complete review of all the documentation the legal team found that Dublin City Council were in compliance with their statutory obligations with regard to the development of the thermal treatment plant.

2.7.17. The CIG meetings raised almost 200 separate concerns that the community has about the Dublin Waste to Energy Project and the group produced their own report.

The main issues raised by the CIG concerned:

- Health
- Planning and siting
- Traffic
- Operational issues
- Climate
- Air Quality
- Environment/Eco Systems
- Energy Creation
- Waste Residues

A full copy of the report can be viewed in Appendix 2.2. The report of the legal team can be found in Appendix 2.3.

Although the CIG did not formally input into the scoping process, all issues raised by the group were considered during the baseline monitoring programme and in this EIS, so that the concerns of the community are reflected in the Environmental Impact Assessment.

Waste Information Day

2.7.18. In February 2003, a Waste Information Day was held to provide information on all aspects of the Dublin Regional Waste Management Plan to members of the community all over Dublin.

Information Sessions

2.7.19. In response to the questions, issues and concerns that members of the public have raised about the Dublin Waste to Energy Project in earlier involvement processes, Dublin City Council began a series of Information Sessions. These sessions were designed to provide an update on:

- Development on the Dublin Waste to Energy Project;
- Progress in relation to Baseline Monitoring;
- Statutory Processes relevant to the project.

2.7.20. The events were widely publicised and usually involved:

- Notice to Elected Members
- Newsletter distribution to homes in Ringsend, Irishtown and Sandymount
- Letters of invitation to all on Database (over 400)
- Letters of invitation to all groups in the greater Dublin area
- Advert in News-Four (local community newspaper)
- Newsletter issued to all libraries in the Dublin Area
- Parish Notice
- Follow-up calls to all those invited.

2.7.21. The sessions were facilitated and focused on a different specific aspect each time.

Information Sessions

- Information Session 1 – Air Quality (24th Sept 03)
- Information Session 2 – Ecology (12th Nov 03)
- Information Session 3 – Health (21st Feb 04)
- Information Session 4 – Traffic (3rd April 04)
- Information Session 5 – Statutory Processes (25th Sept 04)
- Information Session 6 – Incineration Technologies (13th Nov 04)
- Information Session 7 – Overview of Waste Management in Dublin (15th Oct 05)

EIS Scoping Sessions

- Scoping Session 1 – Community Gain (26th Nov 05)
- Scoping Session 2 – Project Update, Transport Studies & Community Gain Update (28th Feb 06)
- Scoping Session 3 – Meet the EIS Team (8th April 06)
- Scoping Session 4 – Final Scoping Session (27th May 06)

2.7.22. The issues, questions and concerns raised by the community during the public involvement process were summarised and are provided in Appendix 2.4.

2.8. Statutory Scoping and Consultation

2.8.1. Scoping is the time in a project when the broader issues are identified and examined in great detail as the EIA process progresses. The aim of scoping is to identify the main issues that are likely to be important during the EIA. A scoping exercise was carried out to

ensure that the questions, issues and concerns that statutory consultees had in relation to this project were identified and considered during the Impact Assessment Process.

2.8.2. A letter requesting a formal opinion on the contents of the EIS was sent to An Bord Pleanála in 23 February 2006.

2.8.3. Letters and brochures were also sent to the following non-governmental and governmental bodies as part of the non-statutory consultation process.

Table 2.4 List of Non Statutory Governmental Consultees and Non Statutory Public Consultees.

Non Statutory Governmental Consultees	Non Statutory Public Consultees
Department of Arts, Sports & Tourism	Eircom Group plc
Department of Tanaiste, Enterprise, Trade & Employment	Sustainable Energy Ireland
Department of Communications, Marine & Natural Resources	Friends of the Earth Ireland
Department of Agriculture and Food	Irish Planning Institute
Department of Community, Rural and Gaeltacht Affairs	Royal Town Planning Institute
Department of Transport	Voice of Irish Concern for the Environment
Department of Justice, Equality and Law Reform	Coastwatch Europe
Office of Public Works	Dublin Bat Group
Railway Procurement Agency	Birdwatch Ireland
The Heritage Council	Dublin Naturalists Field Club
Commission for Electricity Regulation	Royal Irish Academy
Department of Defence	Royal Institute of Architects of Ireland
Fingal County Council	Engineers Ireland
South Dublin County Council	Irish Federation of Sea Anglers
Dún Laoghaire-Rathdown County Council,	Irish Underwater Council
Dublin City Enterprise Board	ENFO
Bord Gáis Headquarters	Irish Wind and Energy Association
ESB	Irish Landscape Institute
Dublin Bus	Landscape Alliance Ireland
Iarnrod Eireann	Dublin Chamber of Commerce
FÁS - Training and Employment Authority (Ireland)	IBEC
Enterprise Ireland	Poolbeg Yacht Boat Club & Marina
Radiological Protection Institute of Ireland (RPII)	Irish Wildlife Trust
Met Éireann Headquarters	Dublin Port Company
Industrial Development Agency	Celtic Anglian Water
Dublin Docklands Development Authority	
Central Fisheries Board	
Eastern Regional Fisheries Board	
Arklow Harbour Commissioners	
Irish Maritime Development Office - Irish Marine Institute	
Bord Iascaigh Mhara (Irish Sea Fisheries Board)	
Dublin Transportation Office	
National Building Agency	
RTE	
Fáilte Ireland	

The National Parks & Wildlife Service (NPWS),	
Health Service Executive Eastern Region	

2.9. Contributors to the EIS

2.9.1. The EIS has been prepared by Elsam Dublin Waste to Energy Ltd. with Arup Consulting Engineers (Arup) as their main consultant. Specific sections were prepared by the following specialists:

Table 2.5 List of specialist area of study and consultants

Specialist Area of Study	Consultant
Landscape and Visual impact	Brady Shipman Martin / David Slattery Conservation Architect / Architects Friis and Moltke A/S
Traffic	RPS Group Ltd. / ILTP Ltd.
Air Quality and Climate	AWN Consulting Ltd.
Noise and Vibration Impact	AWN Consulting/ Elsam Engineering
Water	DHI Water & Environment / University College Cork
Human beings	RPS Group Ltd./ Prof. Dr. Dieter Schrenk Universitaet Kaiserslautern / Arup
Terrestrial Ecology	Biosphere Environmental Services
Estuarine ecology	Ecological Consultancy Services (EcoServe) Limited.
Archaeology, architectural and cultural heritage	Margaret Gowen & Co. Ltd.
Material Assets	RPS Group Ltd.

2.10. Technical Difficulties Encountered

2.10.1. No particular difficulties were encountered during the preparation of the EIS for this development.

Table of contents

3. Need for the Project

3.1. Introduction

3.1.1. This chapter sets out the policy context for the project with respect to EU, National and Regional policies. It also summarises the requirement for energy recovery capacity for residual Household, Commercial and Non-Hazardous Industrial Waste in the Dublin Region.

3.2. Overview of Project Development

3.2.1. The need for the development of Waste to Energy capacity to serve the waste management needs of the Dublin Region was identified as far back as 1997 in the Dublin Waste Management Strategy[1]. This document highlighted the need for the Region to develop integrated waste infrastructure to improve recycling rates and residual waste management. The adoption of the Dublin Waste Management Plan[2] in 1998 formalised the region's policy direction and set out an objective to develop thermal capacity for Household, Commercial and Non-Hazardous Industrial Waste.

3.2.2. Subsequent feasibility studies were carried out in 1999, which assessed various technologies capable of treating this waste stream and examined the best location for the Facility. The target date set for the implementation of the Facility in the first regional plan was 2004.

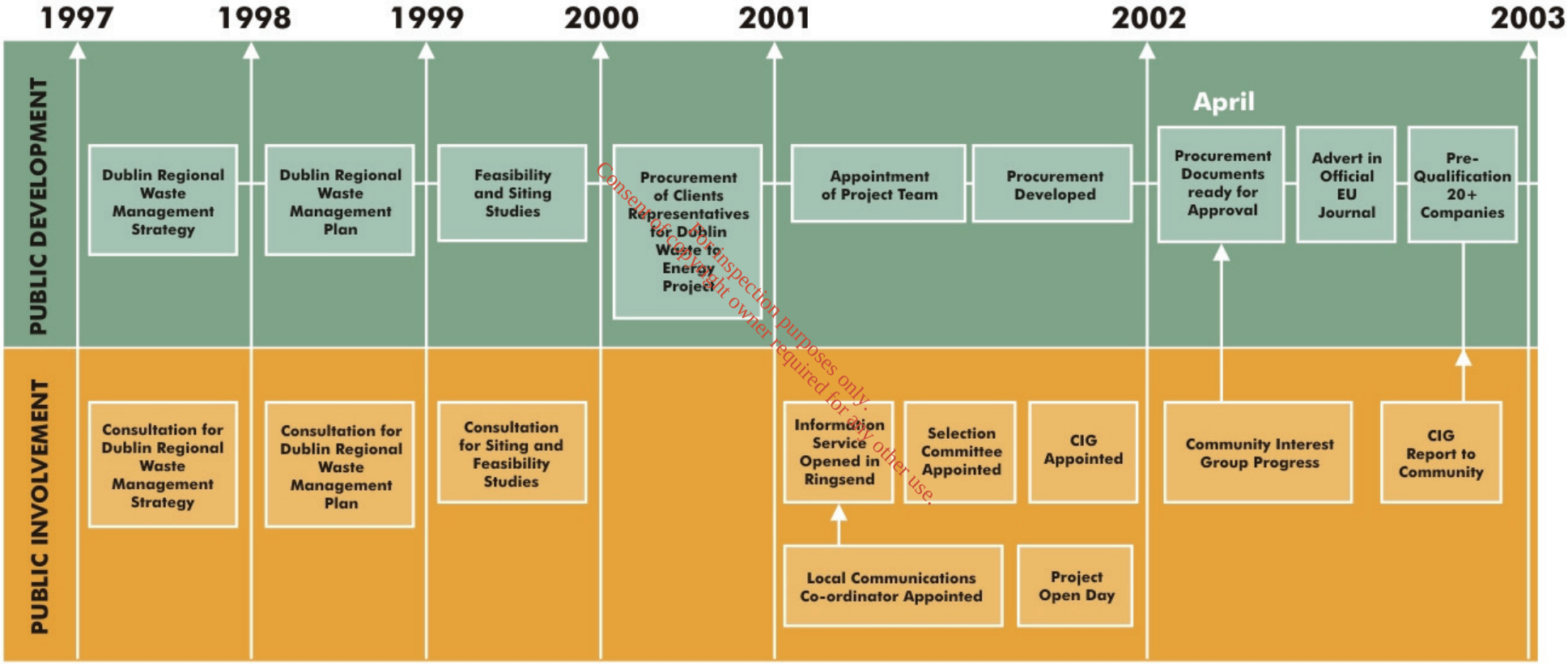
3.2.3. An extensive period of public consultation and community interaction, including establishing a community office in Ringsend, has been underway since 2001. Baseline environmental monitoring has been carried out since 2003 to facilitate the preparation of the Environmental Impact Statement.

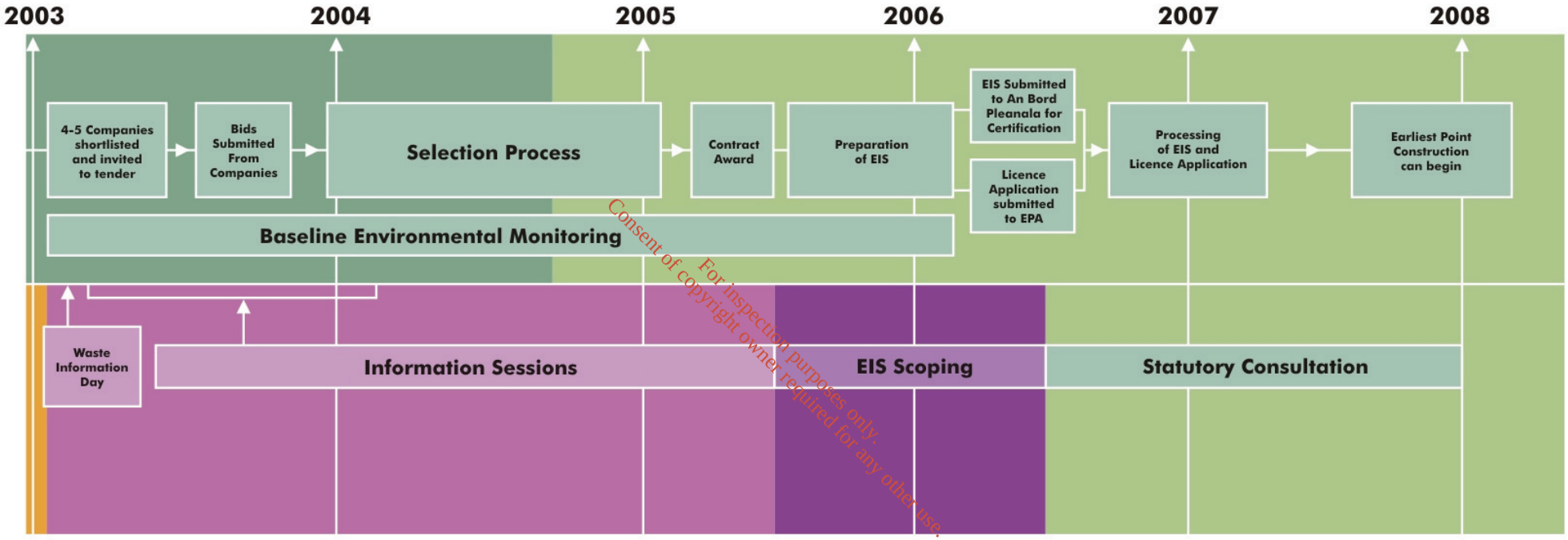
3.2.4. The need for the development of thermal treatment capacity in the Region was confirmed in the policy of the replacement Waste Management Plan for the Dublin Region published in November 2005[3]. In October of that year a service provider was selected following a three-year process of public tendering, tender assessment and contract negotiations.

3.2.5. A timeline summarising the key dates of the development process to date and the future critical milestones is outlined in Figure 3.1.

[1] Dublin Local Authorities, Waste Management Strategy For The Dublin Region, Strategy Report, 1997
[2] Dublin Local Authorities, Waste Management Plan for the Dublin Region, 1998
[3] Dublin Local Authorities, Waste Management Plan for the Dublin Region, 2005-2010

Figure 3.1 Summary of Dublin Waste to Energy Development





3.3. European Waste Policy

EU 6TH Environmental Action Programme (2002)

3.3.1. The EU Decision (1600/2002/EC) set out the scope of works and objectives for the Sixth Community Environmental Action Programme. The Programme sets out a framework for the Community's environmental policy with the aim of ensuring a high level of environmental protection and of achieving a decoupling between environmental pressures and economic growth. The Programme covers a period of 10 years and identifies four key priority areas including 'natural resources and waste'. Key priorities and objectives for waste include the preference for recycling and recovery options (including energy recovery) and need to significantly reduce the quantity of waste going to landfill.

3.3.2. Thematic Strategies have since been prepared for seven key areas, setting out strategic frameworks of improvement. A Thematic Strategy on the Prevention and Recycling of Waste has been prepared and was adopted in December 2005.

A Thematic Strategy on the Prevention and Recycling of Waste (2005)[4]

3.3.3. This strategy assesses EU waste policy with a view to setting the strategic framework for the future. It sets out objectives and outlines the means by which the EU can move towards improved waste management. The Strategy provides clear policy direction in relation to landfill disposal and the preference for better treatment options. It states the "*aim of moving towards a recycling and recovery society means moving up the hierarchy, away from landfill and more and more to recycling and recovery".* The long-term aim of the strategy to move waste flows away from landfill have the potential to significantly improve environmental performance and cost effectiveness.

3.3.4. The strategy states that "*further diversion of municipal waste from landfill to composting, recycling and energy recovery could produce additional reductions in greenhouse gas emissions ranging from 40 to over 100 Mt CO_2 equivalent per year*". The social and environmental benefits of alternative treatment options such as WTE for Member States are clearly identified and preferred to landfill in the Strategy.

EU Landfill Directive

3.3.5. The EU Landfill Directive (1999/31/EC) sets out procedures and standards for the operation, monitoring, closure and aftercare of landfill facilities to ensure safe environmental management. The Directive also requires that each Member State prepares a national strategy for the reduction of biodegradable waste going to landfill. Specific reduction targets are to be achieved. The aim is to significantly reduce the landfilling of biodegradable waste and, as a consequence, greenhouse gas emissions. The strategy clearly favours the treatment of biodegradable waste by composting, biogas production or energy recovery. The Irish government policies have responded to the EU Landfill Directive as set out in Section 3.4 below.

EU Waste Incineration Directive (WID)

3.3.6. The EU Waste Incineration Directive (WID) (2000/76/EC) aims to protect the environment and human health by limiting emissions into air, soil and water, resulting from the incineration of waste. The Directive sets out stringent operational conditions, technical

[4] Commission of the European Communities, Brussels, 27.5.2003, COM(2003) 301 final "Towards a thematic strategy on the prevention and recycling of waste"

requirements and emission limit values to achieve this aim. The adopted waste management strategies in Europe are based on the integrated waste hierarchy of solutions and are endorsed by the Directive. The Directive recognizes that Incineration/WtE has a role to play alongside prevention, recycling and landfill with priority given to the higher options, causing least environmental impact. Any WtE facilities operating in the EU must meet the technical standards of the Directive. In Ireland effect is given to the Directive by the EPA Waste Licence under which WtE facilities must operate.

3.4. National Waste Policy

Changing Our Ways (1998)

Figure 3.2 Waste hierarchy Pyramid

3.4.1. Changing our Ways', the waste policy statement produced by the government in 1998 set the foundation for modernising waste management in Ireland by developing integrated waste management infrastructure. The statement was based on the internationally recognised hierarchy of waste treatment options as shown in Figure 3.2, and set national targets for recycling.

3.4.2. The statement strongly endorses the development of 'waste recovery facilities employing environmentally beneficial technologies as an alternative to landfill'. In the medium to long-term the statement summarises that Ireland, to improve environmental performance, needs to move treatment up the hierarchy whilst significantly reducing reliance on landfill. Targets include the diversion of 50% of household waste from landfill and recycling of 35% of Household, Commercial and Non-Hazardous Industrial Waste by 2013.

3.4.3. With regard to WTE the statement provides clear direction. It states "*WTE plays a major part in Household, Commercial and Non-Hazardous Industrial Waste management in many other EU countries*" and the developments of such facilities are fully "*compatible in an integrated approach to waste management*". In environmental terms the policy states that "WTE has a considerably lower environmental impact than landfill" and the "development of WTE capacity is consistent with, and could make a significant contribution to the implementation of, the Government's renewable energy policy".

Delivering Change – Preventing and Recycling Waste (2002)

3.4.4. This policy statement continued to progress the idea of integrated and sustainable waste management with particular emphasis on higher treatment solutions such as prevention, producer responsibility, recycling, and recovery. The statement re-iterates that wastes should only be landfilled when "*all other options have been exhausted*" which includes waste to energy. Resource recovery is also addressed as follows:

"*much unavoidable waste is a resource, which, if re-used or properly exploited for its materials and energy content, can reduce the use of natural resources and minimise the environmental impacts of waste disposal".*

Taking Stock and Moving Forward (2004)

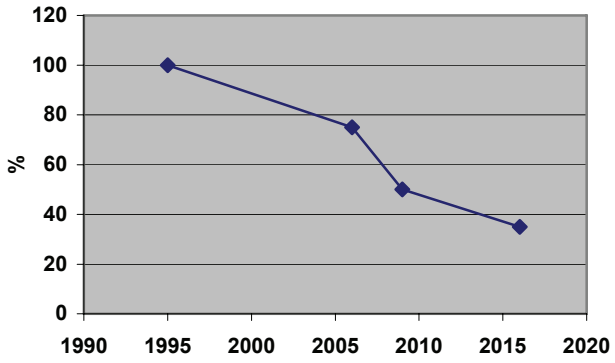
3.4.5. The most recent government policy document "Taking Stock and Moving Forward, 2004)" states that "*thermal treatment with energy recovery has a role to play as one element in the integrated approach to waste management*". This clear policy direction endorses the

integrated approach to waste management and identifies the need for waste to energy facilities. The proposed Facility for Dublin will meet this requirement and will provide a solution for waste management along with other recovery and disposal infrastructure.

National Strategy for Biodegradable Waste (2006)

3.4.6. In response to the phased restriction imposed by the EU Landfill Directive (99/31/EC) on the future landfilling of biodegradable waste, the DOEHLG published a National Strategy for Biodegradable Waste in April 2006. This document sets out the actions required to meet the mandatory targets for organic waste diversion from landfill, see Figure 3.3.

Figure 3.3 Landfill Directive - Required % Reduction in Landfill of BMW



3.4.7. The current practice of landfilling organic waste, biodegradable municipal waste (BMW), results in the release of landfill gas, a contributor to global warming and the greenhouse effect, and the generation of leachate that must be managed properly. The strategy states "*the scale of the challenge to meet the Landfill Directive targets is great and requires urgent and concerted efforts*". The strategy looks at a range of solutions to meet this challenge including waste to energy and states "*options that will be pursued to divert BMW from landfill include thermal treatment*". Thermal treatment provides a landfill diversion option and "enables the energy content of the residual waste to be captured and used".

National Hazardous Waste Management Plan

3.4.8. The Waste Management Acts 1996-2003 require the EPA to draw up a National Plan for Hazardous Waste Management in Ireland. The first Plan[5] was published in 2001. The Plan includes measures to prevent hazardous waste being generated, improve collection systems, and develop more self-sufficiency in terms of recovery capacity including thermal treatment of hazardous waste. In relation to hazardous waste generation the Plan draws a distinction between 'process' waste and 'product' waste.

3.4.9. The Plan recognises that the development of thermal treatment capacity for Household, Commercial and Non-Hazardous Industrial Waste will occur and will result in the production of fly ash, which will be classified as a hazardous waste. The fly ash will be a 'process' waste, as defined in the Plan. The fly ash (FGT residues) from the Dublin WtE Facility will represent approximately 4% of the weight of the waste inputted into the Facility.

3.4.10. The Plan recommends the development of engineered hazardous waste disposal cells in at least two locations in Ireland to deal with hazardous waste requiring disposal, including waste generated by thermal treatment of Household, Commercial and Non-Hazardous Industrial Waste. The suggested locations for such cells include the Dublin area, and it is recommended that the residues from thermal treatment plants be taken into account in selecting the location and capacity of disposal cells.

3.4.11. To date there has been limited implementation of these recommendations, although the current Dublin Waste Management Plan (2005-2010) has set an objective[6] to examine the feasibility of developing a hazardous waste disposal cell. The Plan is currently under

[5] Environmental Protection Agency, National Hazardous Waste Management Plan, 2001
[6] Policy 19.9

review by the EPA, and a revised Plan is expected to be released for consultation towards the end of 2006.

National Climate Change Strategy

3.4.12. The National Climate Change Strategy was published by the government in 2000 and sets out measures and targets for the reduction of greenhouse gas emissions in Ireland. Those sectors responsible for the production of the highest level of emissions were targeted and this included the energy, transport, agricultural and waste sectors. The implementation of the waste objectives and targets requires the sector to move away from the reliance on landfill for residual waste management towards preferred recycling and recovery (including energy recovery) options. For the waste sector the strategy endorses the policy objectives set out in 'Changing our Ways' and sets an emissions reduction target of 0.85 Mt equivalent of CO2. It is understood that the Strategy will be updated during 2006.

Sustainable Development – A Strategy for Ireland

3.4.13. 'Sustainable Development – A Strategy for Ireland' was published by the government in 1997 and sets out in detail the need to integrate economic development and environmental protection. It stresses that Irish waste policy should be in line with the "*EU approved hierarchy of waste management options*". The Strategy's sustainable energy policy aims to minimise greenhouse gas emissions and sets out short to medium term targets for the generation of electricity from waste to energy facilities.

3.4.14. The document "Making Ireland's Development Sustainable", published in 2002, reviewed the progress on Ireland's sustainable strategy and set out specific steps for the continued improvement in the quality of life. In waste terms the document calls for the implementation of the policy identified in the national statements 'Changing our Ways' and 'Delivering Change'.

3.5. Regional Waste Policy

3.5.1. The Dublin Waste Management Strategy (1997) prepared jointly by the Dublin Local Authorities formed the basis for an integrated approach to waste management in the Region. The Strategy informed the policy of the first statutory Waste Management Plan for the Dublin Region, adopted in 1998. A statutory review of the first plan culminated in the preparation of a replacement Waste Management Plan for the Dublin Region (2005 – 2010). This document was adopted and published in November 2005 and updates the policy and objectives from the first Plan.

3.5.2. The policy for the Dublin Region is to pursue maximum recycling levels, followed by thermal treatment of residual waste. The following targets were adopted for the region and are to be implemented by 2013:

Table 3.1 Targets Adopted in the Dublin Waste Management Plan (2005-2010)

Source	Recycling	Thermal	Landfill
Households	60%	39%	1%
Commerce/Industry	41%	37%	22%
Construction/Demolition	82%	0%	18%
Total	**59%**	**25%**	**16%**

3.5.3. Under the Waste Management Plan 2005-2010, the Dublin local authorities are committed to providing a separate collection infrastructure for recycling of both dry-recyclables (paper, plastic, glass etc.) and also organic waste to meet the 59% recycling target. This process is already well underway, with an average 26% recycling rate being achieved in 2003. It is intended to deliver the 'residual waste' to the WTE Facility – i.e. waste not collected through the recycling collection system. The development of other elements of the integrated waste treatment infrastructure is also underway, as outlined in Figure 3.5.

3.5.4. The Plan provides specific policy direction on Waste to Energy and the role it has to play in developing integrated waste management infrastructure for the Region and meeting the targets. The provision of such a facility is a critical element of the Plan particularly in meeting statutory obligations under the EU Landfill Directive, the National Biodegradable Waste Strategy and the long-term targets of the Plan. To meet this challenge the Plan states (Policy Objective 18.8) that the Dublin Local Authorities will:

> ***"Develop a Waste to Energy (Incineration) plant at the preferred location on Poolbeg Peninsula, Dublin 4. This will have capacity of approximately 400,000 to 600,000 tonnes/annum, and will treat non-hazardous municipal or similar waste."***

3.5.5. The scale of the Facility was selected so as to meet the requirements for residual waste for the region, without being counter-productive to the efforts to improve waste prevention/ minimisation and increase recycling to 59% of the overall waste stream.

3.5.6. In terms of self-reliance the Region has adopted a policy to become self-reliant (Policy Objective 18.10) aiming to manage in Dublin waste generated in Dublin, as far as possible, in order to reduce the need for unsustainable waste transport and reliance on other regions. The bulk of residual waste is currently landfilled either in Dublin or neighbouring counties. Unless the region has put into place the necessary infrastructure including WTE, the policy of self-reliance will be extremely difficult to meet.

3.5.7. Waste to Energy as a residual treatment technology will provide the region with a long-term sustainable solution for residual waste, fits into the integrated approach adopted, and improves further the self-sufficiency of the Region.

3.5.8. It is a specific policy objective (Policy Objective 18.8) of the Regional Waste Management Plan to "develop a Waste to Energy plant at the preferred location in Poolberg Peninsula Dublin 4. This will have a capacity of approx 400.000 to 600.000 tonnes/annum and will treat non-hazardous municipal or similar waste".

3.6. Planning Policies

National Spatial Strategy

3.6.1. The National Spatial Strategy 2002 – 2020 (NSS)[7] identified the overall strategic spatial development direction for Ireland. This strategy seeks a greater regional balance in Ireland's future growth selecting a number of Gateways around which inward investment and infrastructural development will focus. For the Dublin Region, the NSS underlines the need for the region to perform as a competitive gateway that… "continues to perform at the international level as a driver of national development". Policies that support a physical consolidation of the Greater Dublin Area (GDA) are set out, including the use of existing industrial areas for the development of new economic activity. The NSS envisages the population of the GDA reaching between 1.9 and 2.2 million by 2020.

[7] Department of Environment and Local Government, National Spatial Strategy for Ireland – People, Places and Potential,

3.6.2. Discussing the requirements for infrastructure in Ireland, the NSS recognises that other economic infrastructure, such as water services and waste, are also needed to support balanced regional development. The NSS states that "Efficient, effective and cost competitive waste management facilities are essential if industrial and enterprise activity is to thrive and develop in a balanced way across Ireland."

Regional Planning Guidelines

3.6.3. The co-ordination of development at the regional level is set down in a series of Regional Planning Guidelines prepared during 2003 – 2004 by regional authorities. These Guidelines inform and guide regional development to ensure access to adequate infrastructure including waste management facilities. The Dublin Region (the four local authorities Dublin City Council, Dun Laoghaire Rathdown, Fingal and South Dublin County Councils) form part of the GDA along with counties Meath, Kildare and Wicklow.

3.6.4. The Regional Planning Guidelines for the GDA were published in 2004. In terms of waste management the Guidelines make a number of recommendations namely:

"A Regional approach to waste management should be adopted in the GDA which will:

- *Promote the development of new integrated waste management facilities in the GDA in the short term;*
- *Permit inter-regional transfer of waste to give appropriate economies of scale to new waste management facilities;*
- *Provide for growth in capacity to mitigate the escalating costs of waste disposal;*
- *Develop biological treatment facilities for organic waste, further recycling and waste to energy Facilities to serve the needs of the GDA."*

3.6.5. In the revised Waste Management Plan for the Dublin Region (2005 – 2010), these recommendations have been adopted in the development of waste policies. Integrated waste management facilities are proposed and interregional movements of waste are permitted in appropriate circumstances. The proposed WTE Facility for Dublin serves to fulfil these recommendations by providing a long-term management solution for household, commercial and industrial residual waste arising in the region. The proposed Facility is appropriately sized to give an economy of scale and sufficient capacity to serve the region. Along with future biological and recycling infrastructure, the WTE Facility will help ensure regional targets are met by 2013.

Dublin City Development Plan

3.6.6. The Dublin City Development Plan 2005 – 2011 came into effect in March 2005 and sets out a sustainable framework for the future development of a vibrant city.

3.6.7. Chapter 12 of the Plan is entitled 'Infrastructure' and contains specific policies on the future development required for the City including waste infrastructure. In relation to waste, Dublin City Council sets out a list of priority policies including the following, which makes reference to WTE:

"To encourage and support the recycling and recovery of waste including green, organic and construction and demolition waste and the recovery of energy from waste".

3.6.8. Within the Development Plan, the following policy sets out the opposition of the Elected Members of the City Council to the siting of a Facility on the Poolbeg peninsula:

Policy U4
"It is the policy of Dublin City Council, in conjunction and co-operation with the adjoining local authorities in the Dublin Region, to implement the Waste Management Plan for the Dublin Region. It is the policy of the elected members of Dublin City Council to oppose the siting of an incinerator on the Poolbeg peninsula".

3.6.9. The land-use zoning map for the proposed Facility is zoned as category (Z 7A) and although suitable for heavy industry, waste to energy and incineration is expressly excluded from the list of suitable activities. By contrast, the surrounding industrial lands have an industrial zoning Z 7, which does not exclude waste to energy or incineration. The characteristics of a WTE Facility, which is for all intents and purposes an industrial Facility, are consistent with an industrial zoning in terms of land use and activity. This is recognised in Section 14.4.7 of the City Development Plan, which states:

Land Use Zoning Objective Z7:
"To provide for the protection and creation of industrial uses, and facilitate opportunities for employment creation."

"The primary uses in these areas are those which result in a standard of amenity which would not be acceptable in other areas. They can unavoidably cause 'bad neighbour' problems due to the generation of disamenities such as noise, smells, heavy goods traffic etc.. Activities include industry, other than light industry, manufacturing repairs, open storage, waste material treatment, transport operating services."

Uses Permitted includes: Incinerator/ Waste to Energy Facility

3.6.10. The distinction made in Zoning Z7A was an artificial differentiation introduced due to opposition of Elected Members to the siting of an incinerator, as with Policy U4 above. It should be noted that when the Site was selected, the land was zoned Z7 (Refer to Chapter 4 of this EIS).

3.6.11. However, section 22(10A) of the Waste Management Acts, 1996 to 2003 (as inserted by section 26 of the Protection of the Environment Act, 2003) provides clarity on the priority of conflicting objectives contained in the Waste Management Plan and the Development Plan. Specifically, it provides that:

"The development plan for the time being in force in relation to the functional area of a local authority shall be deemed to include the objectives for the time being contained in the waste management plan in force in relation to that area."

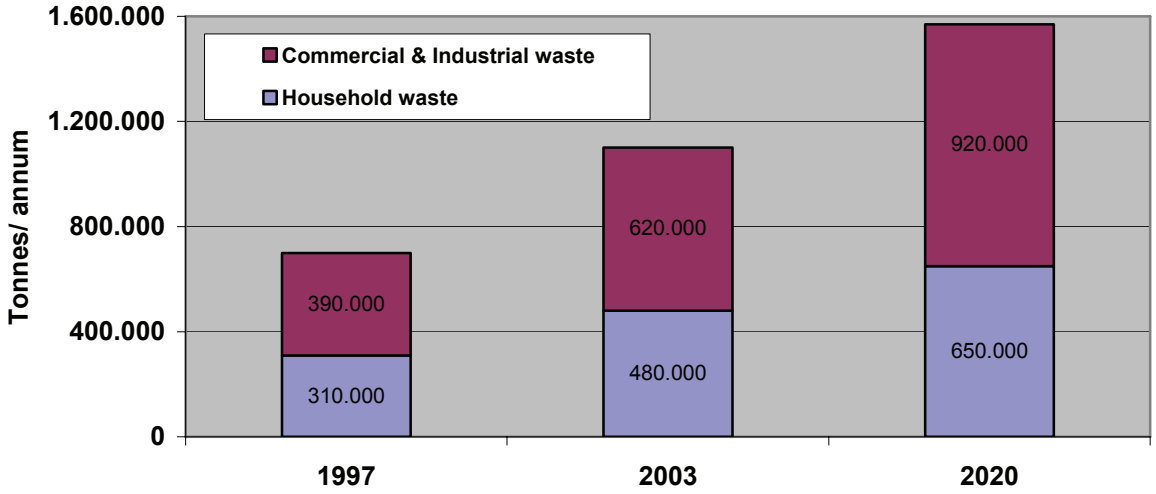
3.6.12. This means that the City Development Plan is deemed to include Policy Objective 18.8 of the Dublin Region Waste Management Plan 2005, which provides for the development of the WtE Facility at Poolbeg. To the extent that there is conflict between objectives and the other provisions of the City Development Plan, section 22(10A) makes clear that in the event of their being a conflict between the Waste Plan objective and any other Development Plan objective the Waste Plan objective *"shall override"* the Development Plan objective. It is clear that Policy Objective 18.8 of the Dublin Region Waste Management Plan 2005 must take priority and override any conflicting objectives in the Development Plan. This express statutory provision contained within the Waste Management Acts 1996 – 2003 was designed for the precise situation that arises in this case.

3.7. Waste Quantities and Current Disposal Arrangements

3.7.1. The growth in population, employment and economic activity in the region over the last decade has been mirrored by significant increase in waste growth. Waste generation has increased significantly from 1997 as shown in Figure 3.4. This upward trend is expected to continue with average annual increases of 1-2 % forecast, which is approximately 50% of waste growth in recent years (3-4% per annum) according to Section 16.1 of the current Dublin Regional Waste Plan. The Plan targets waste prevention and minimisation (Section 18.1) as a priority, yet acknowledges the inherent "*challenge to society*" And lists a number of specific initiatives to achieve waste prevention and reduction. Notwithstanding this by 2020 it is expected that a total of 1.6 million tonnes approximately of Household, Commercial and Non-Hazardous Industrial waste will be generated in the region.

Figure 3.4 Households, Commercial, & Industrial Waste Trends

(Source: Dublin Waste Plans 1998 & 2005)



3.7.2. The reliance on landfill is still high in the region, with 74% of municipal and similar industrial type waste generated disposed of to landfill in 2003. The remainder of the waste, 26%, is recycled and recovered through source separated collection systems, recycling facilities and two composting sites in operation in the region. The aim is to recycle 59% of the region's waste and to landfill only 16% by 2013. The development of key infrastructure such as central biological treatment facilities and a waste to energy Facility is central to achieving this goal. The proposed capacity of 600,000 tonnes is sized to manage the residual waste arisings after recyclables (dry recyclables and organics) are removed from the waste stream. As can be seen from Figure 3.4, the household, commercial and industrial waste stream in 2020 is expected to reach almost 1.6 million tonnes/annum. The WTE Facility will be treating just a subset of this and will not counteract the pursuit of ambitious recycling policies.

3.7.3. At present the region is dependent on landfill for residual waste management and in 2006 there remain three facilities in operation; Balleally Landfill, Arthurstown landfill and the privately operated KTK landfill in County Kildare. The majority of these landfills are currently nearing capacity and are due to close within three years under current authorisations. The local authorities propose the development of a replacement landfill in Fingal to serve the long-term disposal requirements of the region.

3.8. Future Capacity Developments

Overview

3.8.1. The Dublin Region has adopted an integrated waste management scenario and has set out specific targets for the recycling, thermal treatment and landfilling of waste by 2013 as set out in Section 3.5 above. The region requires the necessary infrastructure and treatment capacity to be in place to achieve regional, national and European targets. As outlined in Section 3.5 above, the Region remains overly reliant on landfill and the development of adequate biological and thermal capacity is critical to implementing policy and delivering on the promised targets.

Prevention/ Minimisation and Reuse

3.8.2. The Dublin Waste Plan has at its core prevention, minimisation and reuse policies aimed at curbing the growth in waste arisings. The prevention and minimisation activities of the Local Authorities will be directed to three target audiences – community, schools and business - with goals and targets for each. Three officers will implement these tasks in each Local Authority:

- The Environmental Awareness Officer
- The Green Schools Officer, and
- The Green Business Officer.

3.8.3. The latter role will include implementing environmental management systems and green purchasing within the Local Authorities as well as supporting small and medium enterprises to reduce waste. Greater co-ordination of the waste prevention message will be achieved across the region. The Local Authorities will encourage and support further community and voluntary sector initiatives throughout the region.

3.8.4. The policy of applying "*use related charges*" is a policy instrument aimed at waste prevention, minimisation and recycling in the Dublin Region. Allied to this the Dublin Local Authorities will seek to increase recycling through waste collection byelaws. Waste reuse will be encouraged through the new "Free Trade" module in the Dublin Waste Website (www.dublinwaste.ie).

Recycling/Recovery

3.8.5. The expansion of the recycling and recovery infrastructure is essential to achieve the regional target of 59%. Policies within the Dublin Waste Plan highlight the need to expand segregated collection services and develop the necessary biological treatment and materials recovery capacities. A programme of implementation is outlined in the Plan for the development of waste capacities and a number of these are summarised as follows:

- Biowaste Facilities with a combined treatment capacity of up to 200,000 tonnes to be operational by 2009.
- Source separated organic waste collection services to be phased in from 2007.
- Additional materials recovery facility capacity to be increased and provided as required to treat recyclable waste generated in the Region.

Future Residual Waste Treatment Capacities

WTE

3.8.6. After recycling, the main tool for reducing landfill reliance will be the proposed Dublin WTE Facility, the policies for which are set out in Section 3.5 above.

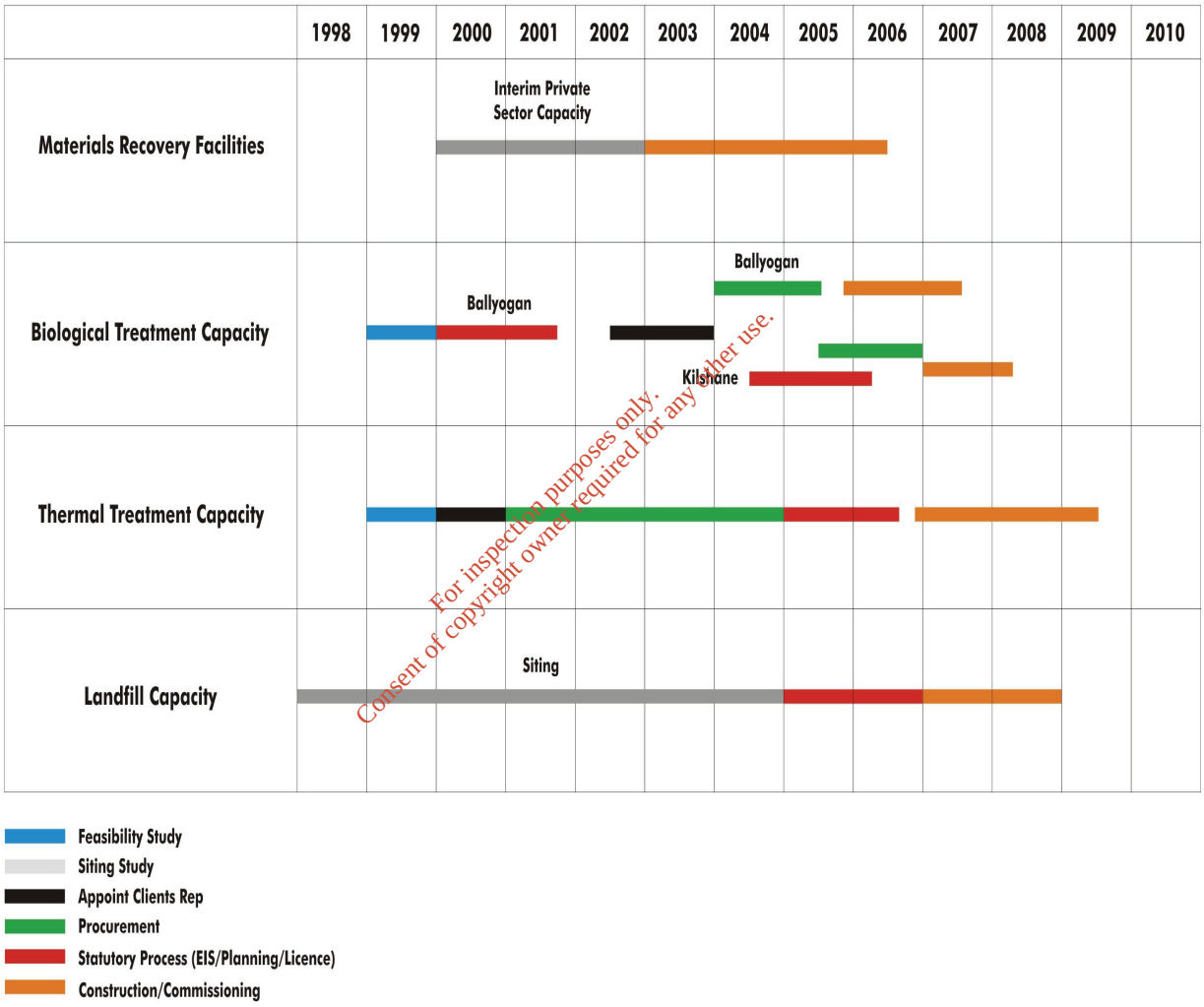
Landfill

3.8.7. The current municipal and industrial landfill requirement in the Region is approximately 800,000 tonnes per annum, fulfilled by the facilities at Arthurstown, Balleally, and KTK landfills. It is anticipated that this level of residual landfilling will remain in the Region from 2005 – 2007.

3.8.8. With increased recovery of dry-recyclables and organic waste, the percentage waste landfilled in the region will fall over the coming years. However the amount of Household,

Commercial and Non-Hazardous Industrial Waste generated is expected to rise due to increases in population, numbers of households and economic growth, which will off-set some of the gains from recycling. Based on this scenario the Dublin Waste Plan has predicted that the residual disposal requirement should fall to between 650,000 – 750,000 tpa between 2009 and 2010. The proposed Fingal Landfill Facility will provide void capacity for up to 500,000 tonnes per annum of residual waste to be landfilled. Once WTE capacity is in place, waste still requiring landfill will comprise residual waste in excess of the capacity of the WTE Facility, plus other non-combustible residues.

Figure 3.5 Development of Integrated Facilities for Management of Household, Commercial and Non-Hazardous Industrial Waste in Dublin



Source: Dublin Local Authorities, Waste Management Plan for the Dublin Region, 2005 - 2010

3.9. Alternatives Considered

3.9.1. This section addresses the policy alternatives that have been considered in the various waste plans to the proposed WTE Facility. These include alternative strategies, technologies and pre-treatment solutions.

Alternative Strategies

3.9.2. The Dublin Waste Strategy 1997 compared a series of alternative waste management scenarios from the perspective of environmental impact, technical feasibility, and economics. A summary of these scenarios are outlined in Table 3.2. A modelling exercise allowed the environmental impacts, costs, and waste management performance to be assessed and compared for each of the alternatives. Following the assessment, the fourth scenario – combining maximum recycling levels with thermal treatment of the remaining waste – although more expensive than the alternatives, was found to be the Best Practicable Environmental Option for the Region.

Table 3.2 Alternative Waste Management Scenarios of the Dublin Waste Strategy 1997

Scenario	Recycling	Bulk Waste Reduction/Recovery
1	Mandatory recycling according to national and EU recycling targets plus proposed landfill directive	None
2	Maximum realistic recycling	None
3	Mandatory recycling according to national and EU recycling targets plus proposed landfill directive	Thermal treatment
4	Maximum realistic recycling	Thermal treatment

3.9.3. The preferred scenario and associated targets remain the basis of regional policy and integrated waste management in the region. In terms of international experience, as explained in Section 15.2 of the Plan, the targets set for Dublin are ambitious and a strategy aiming to achieve any higher recycling rates, or a lower landfill rate, would not be realistic. This was the finding of the 1997 Dublin Waste Strategy, which determined the 'maximum realistic recycling' levels that can be achieved and was confirmed by the recently adopted 2005 Plan.

3.9.4. During the review of the Dublin Waste Management Plan carried out in 2004-2005, an assessment was carried out to determine whether any new approaches were available requiring the overall strategy to be modified. In particular, an assessment of the potential for Mechanical Biological Treatment (MBT) to play a role in Dublin was conducted. The Plan (Section 17.4) found that MBT would not offer any significant advantages for the Dublin region, and indeed could prove less sustainable. For this reason the policy of employing thermal treatment for residual waste was not changed.

3.9.5. The do-nothing strategy can also be considered in relation to the proposed Facility. By not developing the Facility, there would be a number of negative consequences for the waste management strategy of the region:

- Waste tonnage consigned to landfill would remain at current high levels and biodegradable waste input would exceed the EU Landfill Directive targets.
- Given the deficiencies in landfill capacity in the Dublin region (set out in Section 12 of the Plan), Dublin's waste would need to be transported to other regions for a sustained period of time. This might extend to exporting waste for recovery in other countries if adequate capacity was not available in Ireland. This would contradict the Dublin Waste Management Region's stated aim, as set out in the

Dublin Waste Management Plan, of becoming more self reliant in terms of waste management.

3.9.6. Both of these factors would have negative environmental impacts, and cost implications. The cost implications could in turn impact on the ability of the local authorities to implement the waste prevention, reuse, recycling and biological treatment policies of the Plan.

Alternatives Technologies

3.9.7. A Feasibility Study for Thermal Treatment of Waste for the Dublin Region was completed and a report was published in February 1999. Phase 1 of the study examined the various thermal treatment technological options, associated environmental impacts, operational issues and costs. The report examined three alternative thermal options:

- Waste-to-Energy (WTE)
- Gasification
- Pyrolysis

3.9.8. The report concluded that WTE was a safe, tried and tested technology with full-scale facilities in operation across Europe. These facilities are capable of meeting stringent EU environmental standards. Gasification and Pyrolysis in comparison were considered to be emerging technologies, which had not been operated commercially at the scale required by the Region. These technologies were also found to be costly to operate relative to WTE.

3.9.9. Following a detailed assessment the study concluded that *"… No other thermal technology can compete with waste-to-energy on the basis of cost, reliability and ability to deal with untreated municipal waste."* Regarding the alternative technologies, it was recommended that these continue to be monitored to assess their future suitability if required.

3.9.10. During the procurement of the Dublin Waste to Energy Facility, the process for selecting companies was an open competition advertised in the EU procurement journals. The first stage of procurement, whereby potential Service Providers are short listed, was carried out so as to enable alternative thermal technologies to be proposed. The procurement of the Facility was an open competition under EU procurement rules and did not specify any technology type. Following this, expressions of interest were obtained from a number of companies including some providers of non-incineration technologies. Following an evaluation of the expressions of interest, the four companies considered to best meet the requirements of the project were invited to tender for the project.

3.9.11. Further information is presented in Chapter 5 of this EIS in relation to alternative technologies considered for the development of the Facility.

3.10. Policy Conclusion

3.10.1. The proposal to develop a waste to energy Facility to treat the residual Household, Commercial and Non-hazardous Industrial waste of the Dublin Region is fully in keeping with European, Irish and regional environmental and planning policy.

3.10.2. The Dublin Waste Management Plan sets out to achieve an integrated waste management system including waste prevention, reuse, recycling, energy recovery and minimum reliance on landfill disposal, in accordance with the EU waste hierarchy. The waste to energy facility is one important aspect of the overall strategy.

3.10.3. The Facility will treat the residual waste remaining once recycling and composting have been separated. As such it will not be counterproductive to reaching the 59% recycling target for the region.

3.10.4. Waste arisings in the region are expected to grow over the coming years due to population and economic growth. The proposed Facility would provide a robust waste management solution at an appropriate scale, in keeping with the regional development policies of the Greater Dublin Area.

3.10.5. The do-nothing alternative would result in greater overall environmental impacts and higher costs by virtue of greater reliance on landfill and increased transportation distances, both of which would have negative consequences for the region.

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4. Site Selection

4.1. Introduction

4.1.1. This chapter describes the site selection process and alternatives considered for the location of the proposed Dublin WtE Facility. The selected site has also been reviewed using published alternative criteria. An assessment of the synergies of the selected site is also provided.

4.2. Siting Study

Introduction

4.2.1. The following is a description of the site selection process, which was undertaken for the proposed Dublin WtE Facility.

4.2.2. The identification of areas suitable for the development of the proposed waste management facility involved the consideration of technical, environmental, social and economic criteria.

4.2.3. The site selection process used in this assessment involved the following four stages:

(a) Stage 1 - Feasibility Study for Thermal Treatment of Waste for the Dublin Region, February 1999
(b) Stage 2 - Report on Siting and Environmental Issues - Feasibility Study for Thermal Treatment of Waste for the Dublin Region, November 1999
(c) Stage 3 - Review of the Selected Site using published alternative criteria.
(d) Stage 4 – On-Site Review of Short Listed Alternative Sites

Stage 1: Feasibility Study for Thermal Treatment of Waste for the Dublin Region, February 1999

4.2.4. This report examined alternative technologies, the possible number and size of plants, end market use and procurement issues. This report was launched publicly at a press conference in the Gresham Hotel on 14 September 1999 and placed in public libraries.

4.2.5. In early 1999 MC O'Sullivan Consulting Engineers, on behalf of the local authorities of the Dublin Region, commenced the process of selecting a suitable site for the Dublin WtE.

4.2.6. The first stage in the process was to develop a procedure for the selection process and to establish robust selection criteria. A multi-step procedure was developed as follows:

- Define the study area,
- Define selection and exclusionary criteria,
- Identify areas for potential sites by application of the selection and exclusionary criteria,
- Sieve and screen the potential areas to identify possible sites,
- Compare the short listed sites using the defined criteria.

4.2.7. The procedure was implemented in the assessment described below.

Stage 2: Report on Siting and Environmental Issues - Feasibility Study for Thermal Treatment of Waste for the Dublin Region, November 1999

4.2.8. A detailed site selection assessment was prepared by MC O'Sullivan Consulting Engineers on behalf of the local authorities of the Dublin Region. The site selection assessment was contained in Chapter 5 and 6 of the report entitled 'Feasibility Study for Thermal Treatment of Waste for the Dublin Region - Report on Siting and Environmental Issues' which was published in November 1999. Chapters 5 and 6 and related appendices of the Feasibility Study are included in Appendix 4.1.

4.2.9. This assessment concluded by identifying a preferred site for the development of the proposed Dublin WtE Facility.

4.2.10. The identification of areas suitable for thermal treatment plants was undertaken according to a systematic selection process having regard to technical, environmental, social and economic criteria.

Site Selection Methodology

4.2.11. The general procedure for the study commenced with a sieving process whereby exclusionary factors were first examined. These are factors that would preclude the siting of a Thermal Treatment plant and include the following:

(a) Zonings or conditions of City and County Development Plans
(b) Proposed Natural Heritage Areas
(c) Airport Exclusionary Areas
(d) Areas of High Amenity or Archaeological Interest

4.2.12. Having taken account of the above exclusionary factors, ten areas were identified as potential sites. These sites were visited and a preliminary assessment was carried out of their suitability for development as a thermal treatment facility. The sites are listed by local authority below.

4.2.13. Dublin Corporation (Now Dublin City Council):

(a) The Poolbeg Peninsula
(b) The former Semperit factory at Killeen Road, Ballyfermot

4.2.14. Dun Laoghaire-Rathdown:

(a) The Cherrywood area of Loughlinstown
(b) Agriculturally zoned area of Glenamuck
(c) The Tibradden section of Rockbrook

4.2.15. Fingal:

(a) Industrial area west of Baibriggan
(b) The Belcamp Area west of the Malahide Road
(c) Agriculturally zoned land in Deanestown

4.2.16. South Dublin:

(a) Vacant sites in the Robinhood Industrial Park

(b) Vacant industrial site in Newlands

4.2.17. The sites were then subject to an assessment on the following criteria:

- End-Market Use
- General Planning and Environmental Considerations
- Proximity to Residential Areas
- Road Access
- Site Size and Current Land Use
- Traffic

4.2.18. A table of the ten potential sites was created in order to perform a qualitative evaluation of the individual site suitability. Table 4.1 provides a summary of the assessment criteria on the sites, more detail of each individual site is located in Appendix 4.1.

Table 4.1 Summary Description of 10 Shortlisted Sites

Site	Description	Relative Suitability
Site A **Poolbeg**	Located in Dublin Corporation, thermal treatment is considered a permissible use in the Development Plan[1] zoning. The proximity to waste centre is very good and although currently just satisfactory, road access is set to improve in line with timescale for development of thermal plant. Traffic in the area is heavy at times, however industrial nature of the area is suitable for trucks coming to/going from facility. There are many options for end market use in the vicinity of the Site and there are no residential dwellings within 1km.	More Suitable
Site B **Killeen Road**	Located in Dublin Corporation, thermal treatment is considered a permissible use in the Development Plan[1] zoning. The proximity to waste centre is good and there is opportunity for end market use in the area. The local road network linking the Site to the N7 is not sufficient for use by industrial vehicles. The Site is a large factory adjacent to the rail line and located within 250m of the south-western portion of Ballyfermot which is primarily residential.	Less Suitable
Site C **Cherrywood**	Located in Dun Laoghaire-Rathdown., Industry-Special is considered permitted in principle in the Development Plan[2] Zoning. The proximity to waste centre at the Site is fair in relation to other assessed locations. There is excellent possibility for end-market use as a science and technology park is currently under development adjacent to the Site. The proposed extension of the M50 adjacent to the Site will provide good road access. Currently the Site is vacant and there are no residential dwellings within 500 metress of the Site.	More Suitable
Site D **Glenamuck**	Located in Dun Laoghaire-Rathdown[2]. Industry – Special is considered open for consideration under the agriculture zoning of this Site. The proximity to waste centre of gravity is poor as the Site is located at the southern end of the region close to the Dublin Mountains. The Site provides easy access to the M50 however vehicles must pass through residential village en route. There are no possible end users located in the vicinity of the Site. Currently the Site is a rolling field in an agricultural area with moderately dispersed residential dwellings.	Less Suitable
Site E **Tibradden**	Located in Dun Laoghaire-Rathdown[2]. Industry – Special is considered open for consideration under the agricultural zoning. The proximity to waste centre of gravity is poor as the Site is located beyond the urban fringe of the county. The Site provides easy access to the M50 however vehicles must pass through residential neighbourhood en route. There are no likely end users located in the vicinity of the Site.	Less Suitable

Site	Description	Relative Suitability
	Located in a predominately agricultural area with moderately dispersed residential dwellings	
Site F **Balbriggan**	Located in Fingal[3], thermal treatment is considered Open for Consideration under the Development Plan zoning for the Site. The proximity to waste centre of gravity is poor as the Site is located in the northern section of Fingal, far removed from the urban areas in the southern portion of County Dublin. Although road access to the Site is good, vehicle traffic would have a long distance to travel which is not optimal for waste transportation. Located in a high-tech business park there are potential end users for energy. The Site lies within 250m of a major residential area.	Less Suitable
Site G **Belcamp**	Located in Fingal[3], thermal treatment is considered Open for Consideration under the Development Plan zoning for the Site. Proximity to waste centre and road access are good however, trucks would have to travel across city centre, which is not optimal. The land is currently open space and there is a possibility for end market use. The Site is in very close proximity to residential areas of Clare Hall and Darndale.	Less Suitable
Site H **Deanestown**	Located in Fingal[3], thermal treatment is considered Open for Consideration under the Development Plan zoning for the Site. Located in fair proximity to the waste centre of gravity there are several potential end users located in business/commercial estates near the Site. Although the M50 is located close to the Site, travel through Blanchardstown village occurs en route. Although there are no major residential areas within 250m of the Site there is a hospital located to the south of the area.	Less Suitable
Site I **Robinhood**	Located in South Dublin[4], Industry – Special is considered 'permitted in principle' under the Development Plan zoning for the Site. The Site is in good proximity to the waste centre of gravity and provides easy access to the M50. Located within an industrial estate, there are several potential end users in proximity of the Site. Traffic in the area is a mix of industrial/commuter and is not extremely heavy. Currently there are three potential sites which are all open fields within the Industrial Estate. Although there are moderately dispersed residential dwellings throughout the Estate the area is mostly removed from residential dwellings.	More Suitable
Site J **Newlands**	Located in South Dublin[4], Industry – Special is considered 'permitted in principle' under the Development Plan zoning for the Site. Located along the N7 in close proximity to the M50, the Site provides good road access. Traffic in the area is often heavy with a mix of Industrial and commercial vehicles. There may be potential for end market use. However there is none adjacent to the Site. The Site is an industrial zoned area surrounded by residential development.	More Suitable
Note: [1] Dublin City Development Plan 1999		

Site	Description	Relative Suitability
[2] Dun Laoghaire-Rathdown County Development Plan 1998 [3] Fingal County Development Plan 1999 [4] South Dublin County Development Plan 1998		

4.2.19. Through this process the following 4 most suitable sites for development of a thermal treatment facility were obtained.

- Cherrywood
- Newlands
- Poolbeg
- Robinhood

Figure 4.1 Dublin Thermal Treatment Final Shortlist of Sites

4.2.20. These sites were then subject to a more detailed assessment of the above stated criteria as well as general planning and environmental issues surrounding the Site. The main

advantages/disadvantages of siting a thermal treatment facility at the above locations are summarised in Table 4.2.

Table 4.2 Summary of Advantages and Disadvantages of Four Shortlisted Locations (1999)

Location	Advantages	Disadvantages
Cherrywood	Zoned industrial	Development contingent on completion of South Eastern Motorway
	Adjacent to South Eastern Motorway	Plant would be intrusive on visual quality of current landscape
	Strong potential for end user	Within 500m of residential neighbourhood
	Advantages	**Disadvantages**
Poolbeg	Zoned industrial	Traffic
	Central in terms of proximity to waste production centre of gravity	Possibility of negative perception by local residents related to increase in existing industrial infrastructure
	Road access will be good upon completion of several current projects	
	No houses within 1km of Site	
	Would fit well with existing chimneyscape in industrial setting	
	Prevailing south-westerly wind	
	Advantages	**Disadvantages**
Newlands	Zoned industrial	Relatively weak end-market potential
	Good road access	Traffic
	Good proximity to waste centre of gravity	Site is adjacent to major residential area
	Advantages	**Disadvantages**
Robinhood	Zoned industrial	Traffic
	Strong end market potential	Moderately dispersed residential dwellings throughout industrial estate
	Road access	
	No major residential neighbourhoods within 1km	

4.2.21. This assessment resulted in the following preferential ranking of the four sites:

(1) Poolbeg
(2) Robinhood
(3) Cherrywood
(4) Newlands

Selected Site description

4.2.22. On the basis of the above evaluation the Poolbeg Site was selected as the preferred Site for the development. The following reasons for selecting the Poolbeg Site for the proposed Dublin WtE Facility where provided in the Report on Siting and Environmental Issues, November 1999.

- *This Site is located in the Poolbeg Peninsula area of the Dublin Docklands, which falls under the Dublin Corporation City Development Plan. Under this Plan, all of the Docklands area is zoned under Objective Z7: to provide for the protection and creation of industrial uses, and facilitate opportunities for employment creation. An incineration plant is listed as a permissible use under this zoning objective.*

- *The Docklands Development Authority has created a Docklands Area Master Plan, which sets specific objectives for the Docklands area. Poolbeg Peninsula is*

sectioned off into three different zoning objectives under the Dockland Development Authority's Master Plan. The majority of the area is zoned under objective E2, which considers Industry – Light as normally permissible but does not allow for Industry – General which a thermal treatment plant would most likely fall under. The southern docklands is divided into two zoning objectives. A strip along the southern coast is zoned under objective K, which does not permit Industry – Light or Industry – General. The section between these two zones falls under objective E1, which considers Industry – Light and General as normally permissible.

- *This Site is central in terms of proximity to the waste centre of gravity. Traffic in the Docklands area is considerable due to the large amount of industrial/ commercial activity as well as commuter traffic over the toll bridge. Road access at present is satisfactory. There are major roads projects planned that will increase access to this Site significantly. The North Port Tunnel will connect the North Port section of the Docks to the M50 in Santry. The tunnel was planned to be completed in late 2003, which would allow for access previous to the completion of development for the thermal treatment plant. In addition an upgrading of East Wall Road from the outlet of the tunnel to East Link Bridge was planned together with a new Macken Street Bridge. The Dublin City Development Plan calls for the creation of an Eastern by-Pass Route, which will link the North Port to the N11 in Merrion. There is no precise time frame for the creation of this route as the planning is subject to an EIS; however it can be expected within the timeframe for the City Development Plan (1999-2004). It should be noted though that there is no southern interchange at Ringsted in the Eastern Relief Route it is of no major benefit to the project. The improvements at East Wall Road and Macken Street Bridge are however of positive benefit.*

- *The current landscape of Poolbeg Peninsula is predominately industrial with several high heat users and potential end users for energy produced by the plant. There are also a number of existing chimneys especially the twin stacks of Poolbeg Power Station, which are 210m in height. Due to the existing industrial landscape in the area, the siting of a thermal treatment facility would be subject to the current landuse and have minimal visual impacts*

- *A major advantage of the Poolbeg Site is the relatively large distance between the land and residential areas. The closest major residential neighbourhoods are all located greater than 1km from the Site.*

- *Adjacent to the eastern border of the Site is the Irishtown Park, which is classed under the Docklands Area Master Plan as a Natural Habitat Area. This is a classification of terrestrial ecological importance. The Site is bordered on the south by Sandymount Strand, which is a proposed Natural Heritage Area. Development of the Site would have to be in the context of the ecological and amenity importance of the area. There is no known archaeology on the Site.*

Selected Site and Siting Conclusion

4.2.23. The Poolbeg Site has been identified as the preferred Site through a systematic assessment of areas suitable for thermal treatment development in the Dublin Region. The Site offers potential for end market use, is not in close proximity to residential areas, and new road developments will make the area quite accessible. The Poolbeg Peninsula currently contains a large amount of existing power industry with chimney stacks so the facility should not be visually intrusive on the landscape. It's location within the waste production centre of gravity for the region supports the proximity principle.

Stage 3: Review of the selected Site using published alternative criteria (2006)

4.2.24. Stage 2 concluded that the available Site at Poolbeg is suitably located. As part of the EIA process it was decided to examine and benchmark this Site having regard to the siting criteria for WtE Facilities in the following documents:

(a) World Health Organisation Working Group on Site selection for new Hazardous Waste Management Facilities, 1990.
(b) Basel Convention Series/SBC No. 97/005. Technical guidelines on incineration on Land, 1997.
(c) European Commission's advice reference on Site Selection and Incineration - environmental impacts and mitigation measures[1]
(d) Draft Guidelines on Best Available Techniques and Provisional Guidance on Best Environmental Practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants

World Health Organisation Working Group on Site selection for new hazardous waste management facilities, 1990

4.2.25. It is important to remember that the WHO criteria have been developed for Hazardous Waste Facilities, particularly landfills. The proposed Dublin WtE Facility is for the management of non-hazardous waste and accordingly many of the WHO criteria do not apply. The approach in the WHO guidelines has been examined as a conservative bench marking tool.

4.2.26. The proposed Site at Poolbeg was considered in relation to the four stages of this model and the key points emerging from the appraisal of the subject Site are set out below.

4.2.27. Step 1 is to eliminate generally unsatisfactory areas for hazardous waste sites. See Table 4.3 below.

[1] http://europa.eu.int/comm/development/body/theme/environment/env_integ/env_integration/envman-1066.html http://europa.eu.int/comm/development/body/theme/environment/env_integ/env_integration/envman-1068.html#pgfId-609122

Table 4.3 Selected Site assessed according to WHO Selection Criteria – Step 1 Eliminate Unsatisfactory Areas.

Step 1 - Eliminate unsatisfactory Areas	Applicability of Criteria	Sensitivity of Site	Comment
Coastal Areas Subject to Floods	Yes	Low	Criteria relevant. Site not prone to flooding (See Chapter 12)
Coastal wetlands	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Areas with limestone deposits	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Areas with subsurface mining	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Areas critical for Aquifer recharge	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Lands designated for preservation	Yes	N/A	Criteria relevant Site not designated
Areas of high well yield	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Areas of reservoir watersheds	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site

4.2.28. The Site at Poolbeg is not an "unsatisfactory" area under Step 1.

4.2.29. Step 2 is to highlight promising areas, such as industrial areas, the sites of existing waste management facilities, etc. See Table 4.4 below. These factors are related primarily to community development.

Table 4.4 Selected Site assessed according to WHO Selection Criteria – Step 2 Highlight Promising Areas

Step 2 - Highlight Promising Areas	Applicability of Criteria	Ranking of Site	Comment
Industrial areas	Yes	High	Criteria applicable. Site located in industrially zoned area
Sites of existing Waste Management Facilities	Yes	High	Criteria applicable Selected Site is adjacent to Ringsend Waste Water Treatment Works and to scrap metal business.
Compatible public lands	No	N/A	Criteria not applicable
Abandoned properties	No	N/A	Criteria not applicable
Lands with major highway access	Yes	Medium	Criteria applicable. HGV Management plan to direct all HGV traffic through Dublin Port Tunnel
Lands near waste generators	Yes	High	Criteria applicable. Site located within Greater Dublin Area.

4.2.30. Step 2 shows that the Poolbeg Site is a promising area as this site ranks highly in three of the four relevant categories, namely industrial areas, sites of existing waste management facilities and location close to waste generators The Site ranks medium against the criterion of roads/highway access. The current status of the road network and future roads plans is presented in Section 7 Traffic of this EIS.

4.2.31. Step 3 is to assess promising sites in detail. The use of the kinds of areas listed below normally poses risks to health and the environment, i.e. riverine areas subject to floods, freshwater wetlands, etc.

Table 4.5 Selected Site Assessed according to WHO Selection Criteria – Step 3 Assess Promising Areas in Detail (environmental and human impacts)

Step3 - Assess Promising Areas in Detail (environmental and human impacts)	Applicability of Criteria	Sensitivity of Site	Comments
Riverine areas subject to floods	Yes	Low	Criteria applicable Site not prone to flooding
Freshwater wetlands	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Areas with flood hazards relating to a dam	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Coastal areas for shellfish and Fishing	Yes	Medium	Criteria applicable Site located adjacent to coastal areas.
Areas upstream of water supply Intakes	No	N/A	Criteria not applicable
Areas of special significance	Yes	Medium	Criteria applicable. Site located adjacent to Irishtown Nature Park and Dublin Bay SPA and SAC
Visual corridors of scenic rivers	Yes	Low	Criteria applicable Site located in highly industrialised location
Existing developed areas	Yes	High	Criteria applicable. Site located in established built up area of Dublin
Areas for which non industrial development is planned	Yes	Medium	Criteria applicable. Site located close to possible proposed zones of future mixed use development
Agricultural districts	No	N/A	Criteria not applicable

4.2.32. In Step 3, The Poolbeg Site has a low sensitivity in three of the six relevant categories. It is of medium sensitivity in relation to areas of special significance and areas for which non industrial development is planned. It should be noted that it is medium in this category due to a planning permission subject to appeal to An Bord Pleanala. The Site is of high sensitivity due to existing developed areas as it is within the Greater Dublin Area. However, the existing closest residential area is located at approximately 1km from the Site.

4.2.33. Step 4 is to evaluate and rank sites. This involves the factors affecting health and the environment, such as population density, groundwater and soil characteristics, etc.

Table 4.6 Select Table 4.5 Selected Site Assessed according to WHO Selection Criteria – Step 3 Table 4.6 - Step 4 Evaluate and Rank Sites

Step 4 Evaluate and Rank Sites	Applicability of Criteria	Ranking of Site	Comments
Population Density	Yes	High	Criteria applicable. Site located within Greater Dublin Area
Response time of emergency services	Yes	High	Criteria applicable Site located within established industrial area
Critical habitats or potential mineral developments	Yes	Medium	Criteria applicable No mineral potential. Close to Sandymount Strand which is a Special Protection Area (SPA), Special Area of Conservation (SAC) and proposed Natural Heritage Area (pNHA) and Dolphins Dublin Docks pNHA which protects nesting of Terns.
Groundwater and soil characteristics	Yes	Medium	Criteria applicable Site located on mainly reclaimed made ground
Slope	No	N/A	These criteria are mainly applicable to landfill sites Not relevant to this site
Access to sewers	Yes	High	Adjacent to Ringsend Waste Water Treatment Works
Transport restrictions	Yes	Medium	Criteria applicable Waste acceptance hours to minimise traffic impact (See Chapter 7).
Structures along transport Corridors	Yes	High	Criteria applicable No structures which restrict HGV weight or height
Whether the area contains historic sites	Yes	High	Criteria applicable The proposed development will not impact on any known historic sites.
Feasibility of acquisition	Yes	High	Criteria applicable The site can be acquired.

4.2.34. In the Step 4 criteria, the subject site ranks highly in relation to five out of eight categories relevant to the project. It ranks medium in the three other categories.

4.2.35. Accordingly, the Poolbeg Site enjoys a favourable rating based upon the WHO Selection Criteria.

Basel Convention Series/SBC No. 97/005. Technical Guidelines on incineration on Land, 1997

4.2.36. As with the WHO guidelines, the Basel Convention Technical Guidelines have been developed for Hazardous Waste Facilities. The proposed Dublin WtE Facility is for the management of non-hazardous waste and accordingly many of the Basel Convention Technical Guidelines do not apply. The approach in the Basel Convention Technical Guidelines has been adopted as a conservative bench marking tool.

4.2.37. The Basel Convention Technical Guidelines recommend the examination of each potential location on the basis of protecting human life, health and property from contaminants as well as protecting the natural environment.

4.2.38. These Guidelines also recommend the consideration of the following issues on the suitable candidate Site selected:

- Site Hydrology
- Geology of the site
- Hydrogeology of the site
- Presence of sensitive habitat
- Urbanization of surrounding areas
- Socio-economic aspects (including impacts of transportation)
- Streams in and around the Site, stream flow rates, and public use of stream water.
- Location of markets for any recovered materials and proximity of potential energy users, availability and cost of land.
- Cost of Site development.
- Ambient air quality conditions, dispersion characteristics and wind direction,
- Economic viability (including transport costs).

4.2.39. The above issues were considered for the proposed Site and addressed in the following documents:

(a) Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI
(b) Dublin Waste to Energy Project: Baseline Monitoring, January 2005. RPS MCOS
(c) Dublin Waste to Energy Project: Soil and Groundwater Investigation at the Proposed Dublin Waste to Energy Site in Ringsend (Dublin), May 2005. RPS Group

4.2.40. The table presented below makes specific references to the above issues:

Table 4.7 Reference to Basel Convention Guidelines Parameters

Parameter	Reference
Site Hydrology	Dublin Waste to Energy Project: Soil and Groundwater Investigation at the Proposed Dublin Waste to Energy site in Ringsend (Dublin), May 2005. RPS Group.

	The Hydrology of the Site is addressed in more detail in Chapter 11 Soils, geology and groundwater of this EIS.
Geology of the Site	Dublin Waste to Energy Project: Soil and Groundwater Investigation at the Proposed Dublin Waste to Energy Site in Ringsend (Dublin), May 2005. RPS Group. The Geology of the Site is addressed in more detail in Chapter 11 Soils, geology and groundwater of this EIS.
Hydrogeology of the Site	Dublin Waste to Energy Project: Soil and Groundwater Investigation at the Proposed Dublin Waste to Energy Site in Ringsend (Dublin), May 2005. RPS Group. The Hydrogeology of the Site is addressed in more detail in Chapter 11 Soils, geology and groundwater of this EIS.
Presence of sensitive habitat	Chapter 5 development of siting criteria of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI Chapter 2 Terrestrial Ecology, Chapter 3 Estuarine Ecology and associated appendices A to D of Dublin Waste to Energy Project: Baseline Monitoring, January 2005. RPS MCOS
Urbanisation of surrounding areas	Chapter 6 development of siting criteria of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI
Socio-economic aspects (including impacts of transportation)	Chapter 2 Environmental Impacts and Chapter 6 Shortlisting of sites of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI Chapter 6 Transportation and traffic of Dublin Waste to Energy Project: Baseline Monitoring, January 2005. RPS MCOS The socio-economic aspects are also addressed in 13 and 17 of this EIS. The traffic impacts are addressed in Chapter 7.
Streams in and around the Site, stream flow rates, and public use of stream water.	Chapter 2 Environmental Impacts of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI Chapter 3 Estuarine Ecology and associated appendices B to D of Dublin Waste to Energy Project: Baseline Monitoring, January 2005. RPS MCOS The Water impacts are addressed in Chapter 12 Water of this EIS.
Location of markets for any recovered materials and proximity of potential energy users, availability and cost of land.	Chapter 6 development of siting criteria of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and

	Environmental Issues, 1999. MCOS & COWI
Cost of Site development.	Chapter 7 Procurement and planning procedures of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI
Ambient air quality conditions, dispersion characteristics and wind direction,	Chapter 2 Environmental Impacts and Chapter 6 development of siting criteria of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI Chapter 4 Air quality of Dublin Waste to Energy Project: Baseline Monitoring, January 2005. RPS MCOS
Economic viability (including transport costs).	Not a distinguishing feature for Site selection.

European Commission's advice reference on site selection and Incineration - environmental impacts and mitigation measures

4.2.41. This guidance lists the major factors to be considered during Site selection. The purpose of this guide is to help understand the key environmental issues associated with the incineration sector. It also provides guidance on how key environmental issues can be addressed.

4.2.42. The major factors to be considered during Site selection are:

- The characteristics of the proposed design, needing particular care where hazardous wastes are to be treated;
- Air quality status or the locality, including the impacts of other air polluters in the area;
- Proximity to local communities (for example, loss of amenity and decreases in land values);
- Proximity to sensitive areas (for example, agricultural areas where emissions risk reaching the food chain);
- Impacts on existing and potential economic activities such as tourism;
- Availability of facilities for ash disposal or re-use;
- Adequacy of transport links;
- Site-specific conditions (for example, prevailing weather conditions, particularly wind direction);
- vailability of appropriate materials, technology and skilled labour for construction and management.

4.2.43. The European Commission highlight as important to avoid locating an incinerator upwind of residential areas, in enclosed air basins or in areas where the air quality is already poor.

4.2.44. The European Commission also recommends paying attention to potential impacts on human health, which can be long-lived.

4.2.45. All the factors mentioned above were taken into account in the original Site selection process as described in paragraphs above.

Draft Guidelines on best available techniques and provisional guidance on best environmental practices relevant to Article 5 and Annex C of the Stockholm Convention on Persistent Organic Pollutants

4.2.46. These guidelines provide a list of factors that are considered important in deciding whether it is feasible to construct a WtE Facility. These factors are presented in the table below together with a reference where they have been addressed.

Table 4.8 Stockholm Convention Factors and references

Factor	Reference
Accurate prediction of the nature and volume of municipal solid waste generation in the area to be served. Including waste minimisation, recycling and recovery programmes and supply for continuous operation of the waste to energy facility.	Dublin Waste to Energy Project: Report on Waste Quantities, 2001. MCOS & COWI.
Transportation infrastructure to support collection and hauling	Chapter 2 Environmental Impacts and Chapter 6 Shortlisting of sites of Feasibility

and hauling	Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS. Chapter 6 Transportation and traffic of Dublin Waste to Energy Project: Baseline Monitoring, January 2005. RPS MCOS.
Intra- or inter-State restrictions on waste transportation	The proposed Dublin WtE Facility is designed to treat municipal waste arising from the Dublin Region and there are no restrictions on waste transportation within this area. They are no relevant restrictions for preventing the transportation or exportation of residual waste for reuse/disposal . Residual waste is dealt in Chapter 10 of this EIS
Available markets for on-site separated materials	Chapter 6 Development of Siting Criteria of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI.
Available markets for excess steam or electricity generated on site	Chapter 6 Development of Siting Criteria of Feasibility Study for Thermal Treatment of Waste for the Dublin Region-Report on Siting and Environmental Issues, 1999. MCOS & COWI.
Environmentally sound options for the disposal of residues	Chapter 5 Dublin WtE Project: Report on Residues from Thermal Treatment, 2001. MCOS & COWI. Chapter 10 Residues and Consumables of this EIS.

4.2.47. Accordingly, all the above factors have been considered and addressed.

4.3. Planning Review

4.3.1. The Dublin Regional Waste Management Strategy, 1997 and the Dublin City Development Plan 1999 have been updated since the Site selection was undertaken and the Report on Siting and Environmental Issues was prepared. In the Site selection process reliance was placed on the land use zoning in the plans current at that time. A review of the new plans where they relate to Poolbeg Site is presented in Section 3.6 of this EIS.

Stage 4 – On-Site Review of Short Listed Alternative Sites

4.3.2. The three alternative site locations to the Poolbeg Site – Robinhood, Cherrywood and Newlands – were revisited by RPS Consulting Engineers as part of this EIS. In addition planning and ownership searches were carried out on the all three sites.

4.3.3. Each of the three sites where currently found to be vacant and still posses a suitable industrial zoning under the respective County Development Plans. In the case of Cherrywood and Newlands there has been intensification of residential and commercial

activity in the vicinity of the sites. Cherrywood now lies adjacent to the M50 motorway with likely access via the adjacent Tullyvale/Gleann Ri housing area. Newlands has a new hotel under construction on its southern side and suburban housing on the western side. The area around Robinhood has intensified in terms of commercial and industrial use and traffic movements have increased in the area due to increased economic activity. On all three sites there is clear evidence of much more human activity in terms of residential, commercial or industrial life than currently exists, or is likely to exist, in the vicinity of the Poolbeg Site. On the other hand the Poolbeg Site has several additional advantages not taken into account in the 1999 Siting Study. These are detailed in Section 4.5 below.

4.4. Local Synergies with the Poolbeg Site

4.4.1. The proposed location of the Dublin WtE Facility at the Poolbeg Site not only provides a strategic location but also provides the following synergies with the surrounding existing facilities:

(a) Ringsend Wastewater Treatment Works. In the event that land spreading of sludge will no longer be an option due to environmental constraints, it will be possible to pump the sludge directly to the proposed WtE Facility for thermal treatment.

(b) There is also the opportunity to use the treated effluent from the Ringsend Wastewater Treatment Works within the WtE process thus reducing the quantity of potable water required.

(c) The close proximity to an existing cooling water channel to facilitate the use of sea water for cooling.

(d) Close proximity to grid connection. Power will be exported to the power grid via the existing substations which service the generating stations located in Poolbeg.

(e) When district heating infrastructure is developed in the future, it will be possible to use heat from the proposed Dublin WtE Facility for district heating in new residential and commercial developments nearby.

(f) The Site's location within Dublin Port will minimise transportation journey times for any residues that is exported for reuse or disposal.

(g) Some very large prefabricated components for the Facility can be imported through Dublin Port.

4.5. Summary

4.5.1. The 1999 Site Selection process identified the Poolbeg Site as the preferred Site. The evaluation of the Site relative to published criteria demonstrated that the Poolbeg Site met these criteria and there were no major constraints identified. This further confirms the suitability of the Poolbeg Site for the proposed Dublin WtE Facility. Furthermore additional project synergies have been identified which also enhance the suitability of the Poolbeg Site.

Table of contents

5. Proposed Development

5.1. Introduction

5.1.1. The proposed Facility is described in this chapter. The design objectives, and the principal technology and infrastructure alternatives considered in the design phase, are outlined. Site constraints and their impact on the design of the proposed Facility are also addressed. The buildings and infrastructure of the proposed Facility, the site management and operations, and safety systems and procedures are described.

5.2. Principal Design Objectives

5.2.1. The principal design objectives for the Dublin WtE Facility are to:

- Comply with or exceed all statutory requirements
- Maximise energy recovery as electrical power production
- Provide two identical WtE lines, each with capacity of 35 tonnes per hour at a lower calorific value of 10.5 GJ/tonne, equivalent to an annual capacity of 600,000 tonnes per annum of household, commercial and non-hazardous industrial waste
- Provide one turbine and generator set
- Minimise the environmental impacts by incorporating Best Available Techniques
- Optimise efficiency and cost effectiveness
- Provide a landmark facility of high architectural merit
- Facilitate the future supply of district heating
- Optimise the synergies with adjacent facilities.

5.3. Design Constraints

5.3.1. The close proximity to Irishtown Nature Park has imposed a design constraint in order to minimise noise emissions from the Site towards Irishtown Nature Park.

5.3.2. The location of sub-surface utilities under Pigeon House Road and the proximity of the archaeological feature of the Great South Wall has constrained the routing of cooling water pipes.

5.4. Site Location and Neighbouring Land Uses

5.4.1. The Site for the proposed Dublin WtE Facility is located on the Poolbeg Peninsula, on the southern side of Pigeon House Road. Figure 5.1 indicates the Site location.

Figure 5.1 Location of the Site

5.4.2. The principal part of the Site located south of Pigeon House Road is rectangular in shape measuring circa 160 m x 340 m and covers an area of approximately 5.5 hectares (13.6 acres) in area. This part of the Site has a very gentle slope of 1.5m from north to south with the highest area to the north at approximately 5m OD.

5.4.3. Currently the principal part of the Site located to the south of Pigeon House Road is occupied by Clearway Disposal, a scrap metal business and Hibernian Molasses. As part of Hibernian Molasses, there is molasses storage on the Site. The remainder of the principal part of the Site remains undeveloped and is utilised for car parking. The remaining part of the Site is located to the north of Pigeon House Road and comprises a narrow strip of land extending from the Road to the quay wall. See Figure 5.1. The overall site is bounded by Dublin Harbour to the north, Shellybanks Road to the west, the main Ringsend Wastewater Treatment Works to the east. A public footpath and the shoreline of Dublin Bay lie to the south.[0]

5.4.4. The Synergen Dublin Bay Power Plant lies to the west of the Site, across Shellybanks Road. To the north are further industrial activities and Dublin Port quays. Irishtown Nature Park is located to the southeast of the Site. The established residential areas of Irishtown and Ringsend lie approximately 1km to the west of the Site. The established residential area of Sandymount lies approximately 1km to the south of the Site. The main facilities of Dublin port are located across Dublin harbour, to the north of the Site.

5.5. Main Features of the Facility

Site layout

5.5.1. The entrance to the principal Site will be from Pigeon House Road at the north eastern boundary. The main building will be located in the southern part of the Site, with a green landscaped area between it and Pigeon House Road. A service road will be provided around the perimeter of the main building. The weighbridges and ramp to the waste reception hall will be located due south of the entrance. A service yard will be provided on the western side of the main building for the trucks supplying process materials and removing ash and residues. Staff car parking will also be located in the southern part of the Site.

5.5.2. The part of the Site located south of Pigeon House Road will be re-graded to give a relatively level site with a general level of circa 4.7m OD.

Buildings

General

5.5.3. There will be three buildings on the overall Site, main process building, the cooling water pump house, and a security building.

Main process building

5.5.4. The waste reception area, waste bunker, furnaces, boilers and flue gas treatment lines, turbine hall, and residue storage and handling areas will be accommodated in the main process building. The service areas including the control room, offices, staff facilities, administration area, workshop and stores will also be located in the main process building. The storage areas for residues and process materials will be located on the western side of the main building within the building shell.

5.5.5. The main building will be approximately 200m long by 130m wide by 55m in height, at the highest point. The maximum height of the building is determined by the height of the process equipment, specifically the boiler and the architectural treatment of the building. The ground floor level will be circa 5m OD. The reception hall will have a floor level of circa 12m OD. The waste bunker floor level will be circa 0m OD and the hopper deck level will be circa 30m OD. The process areas will generally be single storey.

5.5.6. The shape of the main building has been inspired by the shape of a marine shell. On all facades the walls will incline inwards with increasing height and the corners will be rounded. A lower outer zone will wrap around the high central core. Around the perimeter, at ground level will be a “heavy” base, consisting of pre-cast concrete panels. The upper parts of the external envelope will be formed in high quality architectural cladding panels and will incorporate large glazed panels. The flue gas treatment equipment will be visible through this glazed panel. See Chapter 6 of this EIS, for further details on the architectural treatment of the building.

5.5.7. Two stacks will be located at the north-eastern corner of the main building. The stacks will be side by side and each will be circa 3m in diameter and circa 100m in height above ground level.

Cooling Water Pump House

5.5.8. The cooling water pump house will be a two storey building and will contain a filter system, the main cooling water pumps and the biocide dosing system. It will be located north of Pigeon House Road as shown on drawing UZT /BE003 in Appendix 5.2.

Security Building

5.5.9. A security building will be located at the main access point. The ground floor levels of the building will also be circa 5m OD.

Site infrastructure and utilities

Cooling water system

5.5.10. The Facility will utilise water from the River Liffey for cooling. The temperature for cooling water outlet will be circa 9 °C above the intake water temperature subject to licence conditions.

5.5.11. It is proposed that the cooling water intake point will be located at the Dublin Harbour quay, north of the proposed Facility. From the inlet, the cooling water will pass through an open channel to a pumping station. From this point the cooling water will be pumped through an above ground pipeline, which will have a diameter of 1200mm. The pipeline will cross the existing cooling water outfall channel and then will cross Pigeon House Road above the road, before entering the Site. The pipeline will continue underground to the main building.

5.5.12. The pipeline for outgoing cooling water, also with a diameter of 1200mm, will run parallel to the incoming cooling water pipeline as an underground pipeline within the Site boundary. The pipeline will cross Pigeon House Road above the road. North of Pigeon House Road the outlet pipe will run below ground until its point of discharge into the existing cooling water channel.

5.5.13. The pumping and screening equipment for the cooling water intake will be housed in a pump house at the quay. The pump house will be approximately 8m in length by approximately 7m in width by approximately 5m in height.

Security

5.5.14. The principal part of the Site will be enclosed by security fencing. The main gate will be open during waste acceptance and normal working hours. Vehicle access will be controlled by barriers, which will be supervised by security personnel. The Site will be equipped with CCTV system.

Weighbridges

5.5.15. Four weighbridges will be provided, two for incoming vehicles and two for outgoing vehicles. The weighbridges will each have a capacity for circa 60 vehicles per hour. This is well in excess of the number of waste vehicles per hour expected at the Facility and should ensure that vehicles will not have to queue on Pigeon House Road prior to entering the Facility. In addition, a right hand turning lane shall be incorporated into the Pigeon House Road at the entrance to the Facility.

Lighting

5.5.16. The Site will have external lighting at night on standard lighting poles, providing safe and sufficient lighting of the Site area. The lighting system will be designed to minimise light spill and light pollution. The stacks will be provided with obstacle warning lights, in compliance with the requirements of the Irish Aviation Authority.

Car parking

5.5.17. Car parking will be provided on Site for staff and visitors as shown on drawing UZT/BE005.

Drainage and Wastewater

5.5.18. The Facility will be connected to the Ringsend Wastewater Treatment Works via a new main combined sewer connection to an existing manhole in the 1800mm diameter Storm Water and Foul Sewer, which runs along the northern Site boundary in the public road, Pigeon House Road.

5.5.19. Separate drainage systems will be provided in the facility for sanitary drainage and for storm water drainage from roofs, roads and parking areas.

5.5.20. Sanitary effluent from the Facility will be generated from the sanitary installations in the kitchens, toilets, floor drains and showers in the administration area and will be discharged to the existing main Storm Water and Foul Sewer in Pigeon House Road.

5.5.21. There will be no discharge of process waste water from the Facility. All process waste waters from the WtE Facility, such as boiler blow down, boiler water treatment reject water and scrubber water will be collected for recycling in the Flue Gas Treatment System or used for humidification/cooling of the bottom ash outlet. Wash water will be discharged to the floor drains in the boiler house, etc. will also be collected and used in the process water system.

5.5.22. A flow meter will be arranged on the potable water system in order to measure the sanitary effluent water, which is discharged to the new main combined sewer pipeline.

5.5.23. A volume of 5000m³ per year of wastewater consisting of sewage and surplus storm water is expected to be discharged to the main Storm Water and Foul Sewer in Pigeon House Road.

5.5.24. All the surface water run-off from the roofs of the buildings and from the roads, parking areas and capped landscape areas will be collected and stored in the rainwater storage tank in order to enable use of the collected rainwater in the facility process.

5.5.25. The construction of the new main combined sewer connection will include construction of an underground rainwater tank or reservoir with a volume at approximately 750m³. Runoff from roof areas will discharge directly to the underground rainwater tank. The runoff from paved areas will be discharged via a silt trap or grit trap and an oil separator, in order to separate oil, silt and other debris from the water, to the reservoir.

5.5.26. The design of the surface water drainage network for the Facility is based on a rainfall return period of more than 2 year with a maximum rainfall intensity of 7.8 mm/10min.

5.5.27. The design of the rainwater reservoir for the Facility is based on a rainfall return period of 1 year with a maximum rainfall intensity of 28.1 mm/12hr.

5.5.28. The rainwater tank will be provided with an overflow connection to the main combined sewer pipeline.

5.5.29. The reservoir surface water tank will be provided with a monitoring arrangement for measurement of continues pH-values for the restored water in the tank, in order to prevent discharge of overflow from the reservoir surface water tank with pH-values exceeding the permission.

5.5.30. There will be no emission to the ground or direct discharge to groundwater of rain water, sewage or process waste water from the Facility. Nevertheless, it is proposed to monitor the quality of groundwater under the Site annually.

5.5.31. Development of the Facility will involve major earthworks and the construction of substantial retaining walls. This work will alter the ground water regime under the Site. Ground water wells will be installed, at locations to be agreed with the Environmental Protection Agency (EPA), when the major Site works have been completed and the new ground water flow has become established. Monitoring wells will be installed upstream and down stream of the location of the main process activities on Site. Due to the present Site location, it is expected that four monitoring wells will be required.

5.5.32. References are made to drawing no. GD/MQ001, Water Flow Diagram and drawing no. UZT/BE040, Drainage and Sewage.

Process water flow

5.5.33. The process water system is shown in drawing GD/MQ001.

5.5.34. Water will be consumed in the process at the rate of approximately 32 m³ per hour in the flue gas treatment system, bottom ash humidification and cooling, and boiler makeup water. Approximately 0.55 m³ per hour will be required for non-process use. Effluent from the process will be reused and rainwater from roofs, roads and parking areas will be collected to minimize the consumption of main water.

5.5.35. The 30-year (1961-1990) average annual rainfall at Dublin City was 710 mm. Rainfall will be collected from roofs, roads and parking areas with an area of approximately 34,500 m². It is estimated that there will be approximately 22,000 m³ rainwater available per annum, which will leave a deficit of approximately 253,500 m³ per annum of water required from the water mains supply (based on 365 days per year of operation on Site).

'Grey' Water

5.5.36. It is proposed to establish a 'grey' water connection from the Ringsend Wastewater Treatment Works so that treated effluent which alternatively would have been discharged to Dublin Bay can be used in the process instead of potable water.

Grid connection

5.5.37. It is proposed to connect the Facility to the 110 kV switchyard located approx. 500 m due west of the Site, subject however to the grid connection offer from ESB Networks. It is proposed that the underground cable will follow the extension of South Bank Road running east west immediate south of the Synergen plant. The 110 kV connection will be the main facility connection for the supply of electricity to the grid. The connection will also be used for a power supply to the Facility.

5.5.38. A 10 kV service line is proposed from the existing power cable in either Pigeon House Road or Shellybanks Road. This is subject to determination from ESB Networks. The 10 kV line will be established for the construction phase to supply power to the construction Site. The service line is expected to be maintained throughout the operational period of the Facility to ensure continuous power supply in the event of maintanence to the 110 kV equipment.

Sludge Pipeline

5.5.39. In the event that land spreading of sludge will no longer be an option due to environmental constraints, it will be possible to pump the sludge directly to the proposed WtE Facility for thermal treatment. It is intended to provide a sludge pipeline from the Ringsend Wastewater Treatment Works. The sludge would be pumped from the Ringsend Wastewater Treatment Works and injected into the waste feed hoppers.

Capacity and types of waste

5.5.40. The Dublin waste to energy facility will have two furnace lines with a total waste capacity of 35 tonnes per hour at a lower calorific value of 10.5 GJ/tonne, equivalent to an approximate annual capacity of 600,000 tonnes per annum. Household, commercial and non-hazardous industrial waste will be thermally treated at the Facility.

Hours of operation

5.5.41. The furnace and flue gas treatment lines and the electrical generator in the Dublin WtE Facility will operate for 24 hours per day, seven days per week. The maintenance intervals are intended to be 18 months. Each line will thus potentially be in operation for 8760 hours per year. Typically, for maintenance one line at a time will be shut down while the other line continues to operate. Due to the buffer capacity of the waste bunker, normal waste deliveries will continue while one line is shut down.

5.5.42. It is intended that waste will be accepted at the facility between 08.00 and 22.00, six days per week. Waste acceptance times will be subject to the conditions of the EPA waste licence.

Staffing levels

5.5.43. It is intended that the Facility will have a total staff of circa 64. There will be 3 shifts per day: 07.00 – 15.15, 15.00 to 23.15 and 23.00 to 07.15. The non-shift workers will work from 08.00 to 17.00.

Project lifespan

5.5.44. The Facility will have a design life of 30 years, which could be extended by equipment upgrades and replacement.

Project Schedule

5.5.45. Assuming a maximum two year time frame for obtaining all statutory approvals, if ultimately awarded, construction of the Facility could start in late 2008. Allowing a 3 year construction period and a further period for commissioning, operations would commence in early 2012.

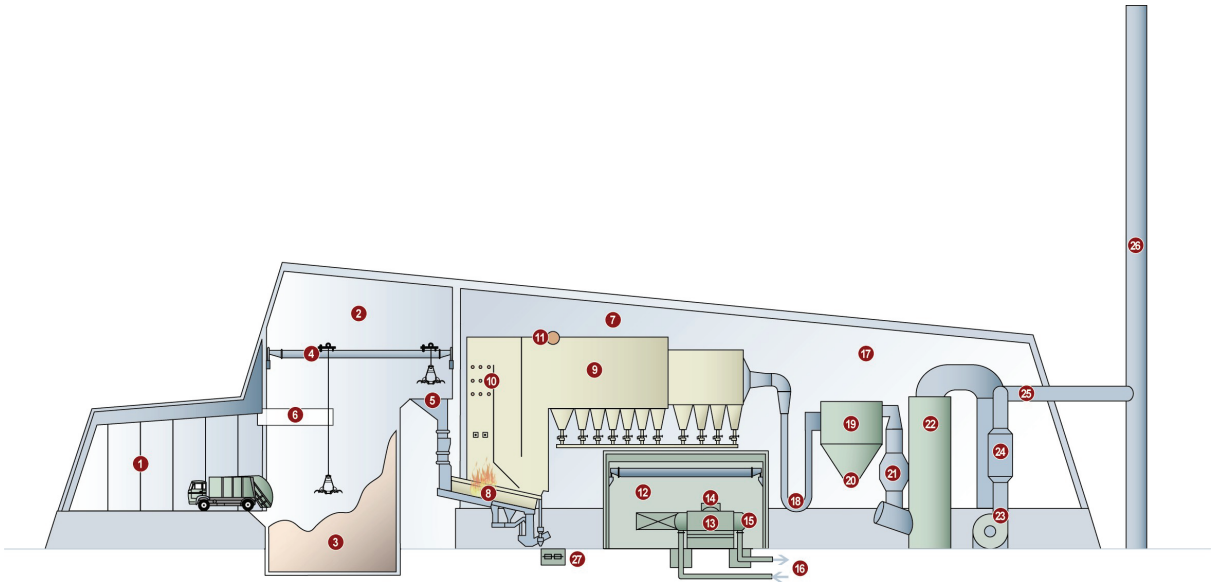
5.6. Description of Processes

General

5.6.1. The waste to energy process will consist of the following main elements:

- Waste acceptance
- Waste intake and storage
- Combustion process
- Energy recovery process
- Flue gas cleaning.

Figure 5.2 Schematic diagram of the WtE process



1. Waste reception hall
2. Waste bunker compartment
3. Waste bunker
4. Waste crane for feeding the boiler grate
5. Waste hopper
6. Control room
7. Boiler area
8. Grate
9. Boiler, where the heat energy is transferred from the flue gas to the boiler water
10. NO_x reduction by spraying ammonia water into the flue gas
11. Boiler drum, where water and steam are separated
12. Turbine room
13. Steam turbine
14. Generator, producing electricity
15. Condenser, where the remaining heat energy in the steam is cooled
16. Cooling system
17. Flue gas treatment area
18. Activated carbon and lime are added to the flue gas to bind dioxins and other components
19. Fabric filter, where the flue gas treatment residue is removed from the flue gas
20. Extraction point for flue gas treatment residues
21. Flue gas cooler
22. Two-stage wet scrubber for reduction of HCl, SO2, HF and Hg emissions
23. ID fan
24. Silencer
25. Emission Monitoring
26. Stack
27. Bottom ash for recycling

Waste acceptance

5.6.2. The Facility will be designed and equipped to handle at least 50 waste vehicles per hour. However, the average hourly number of waste vehicles arriving at the Facility is expected to be much lower. For details on waste deliveries to the Facility, see chapter 7 “Traffic”.

5.6.3. When a waste vehicle arrives at the Facility it will be weighed and catalogued electronically at the weighbridge, either by the driver swiping a magnetic card or by automatic recognition of an electronic chip. If the consignment has no chip or magnetic card, the driver will be required to report to the operations personnel and provide details such as the waste type and source and the waste permit number. Only pre-approved types of waste, in compliance with the EWC codes of the waste licence, from pre-approved sources, transported by appropriately permitted contractors will be accepted at the Facility.

5.6.4. Each outgoing waste vehicle will be weighed and catalogued electronically before it leaves the Facility.

Waste handling and storage

Reception hall

5.6.5. After weighing is complete the incoming waste vehicle will climb the ramp to the waste reception hall. This is indicated as item 1 in Figure 5.2. One wall of the reception hall will have a series of chutes through which the waste will be tipped into the waste bunker. See Figure 5.2.

5.6.6. The empty waste vehicle will then leave the reception hall and travel down the ramp to exit the Site. The typical turnaround time for a waste vehicle will be less than 15 minutes.

5.6.7. The reception hall will have a concrete floor and will be fully enclosed. The reception hall will be maintained under negative air pressure. This means that air will be sucked into the building through any openings rather than escaping out. This will ensure that odour or dust will not be emitted to the outside during the waste unloading operations.

5.6.8. In accordance with waste acceptance procedures, at regular intervals a waste load will be tipped onto a designated part of the reception hall floor and inspected to ensure that the waste load complies with the agreed specification.

5.6.9. Activities in the reception hall will be monitored by operators in the control room, either directly or by CCTV cameras. The control room, indicated as item 6 in Figure 5.2, will be positioned to give an overview of the waste reception hall and bunker.

Bunker

5.6.10. The incoming waste will be stored in the waste bunker. The bunker is indicated as item 3 in Figure 5.2. The bunker will be made of reinforced concrete and will have sealed surfaces. The bunker will be fully enclosed by walls and a roof. The bunker will be maintained under negative air pressure to ensure that odour or dust will not be emitted to the outside from the stored waste. No drainage system will be provided in the waste bunker, as any liquids will be absorbed by the waste in the bunker. When the waste is incinerated, the water will be released as water vapour in the boiler. Any contamination of the water will thus be caught in the flue gas treatment system.

5.6.11. The bunker will have sufficient capacity to store one week’s normal throughput of waste. In the event of a shut down, waste deliveries will be controlled so that no wastes for incineration will be delivered to the plant if it cannot be placed in the bunker. This will be managed by communicating with waste suppliers, etc to control deliveries.

5.6.12. Two grab cranes will be installed above the bunker. These are indicated as item 4 in Figure 5.2. Each crane will have sufficient capacity to handle the waste in the bunker and to feed both WtE lines. A third, spare grab, will be provided. An important function of the cranes will be to mix the wastes in the bunker creating a more homogenous fuel, which is important for optimum combustion process. The bunker will have sufficient capacity to enable the proper mixing of the waste using the cranes. The cranes can be operated automatically or manually, by an operator located in the control room. The control room, indicated as item 6 in Figure 5.2, will be located above the bunker and will have an unrestricted view into the bunker.

5.6.13. Occasionally very large items of waste such as furniture or mattresses will be delivered to the Facility. A shredder will be located in a corner of the bunker to shred or crush bulky wastes, which will be picked up and fed to the shredder by one of the cranes.

5.6.14. During normal maintenance only one of the two combustion lines will be shut down, leaving the other line fully operational to prevent any dust and odour emission by creating the sufficient negative pressure in the reception hall and waste bunker.

Furnaces

5.6.15. The two furnaces, boilers and flue gas treatment lines will be identical and will not be interconnected.

5.6.16. The furnace and boiler will be constructed and will be operated as one unit. They have been described separately below in order to explain the functions of the different parts.

Waste Feed Hopper

5.6.17. A hopper will be located on top of the waste feed chute to each furnace. The hopper is indicated as item 5 in Figure 5.2. The grab cranes will be used to feed mixed waste into the hopper. The waste will fall into the chute from the hopper. At the bottom of the chute hydraulic rams will push the waste into the furnace. The waste feed hoppers will be kept filled with solid waste in order to reduce air ingress into the combustion chamber during loading. If the level of waste in the chute falls to a preset level an alarm will sound in the control room.

5.6.18. The waste feed chute will be equipped with a port, which would allow sewage treatment plant sludge, in the form of a slurry, to be injected into the chute, should this be required.

Furnace

5.6.19. The furnace will be of a moving grate type. This is indicated as item 8 in Figure 5.2. The grate, which will form the floor of the furnace, will slope away from the waste feed chute. The movement of the grate floor components and the slope of the grate will cause the waste, as it burns, to move forward and downwards from the feed point to the ash discharge point. Movement of the grate floor components will also agitate the waste so that new surfaces will be continuously exposed to the flames. The rate at which the waste moves will be controlled to optimise combustion. The residence time of waste in the furnace will be approximately one hour.

5.6.20. The main sections of the grate will be water cooled. This will ensure that the primary air supply is used solely for combustion and the centre part of the grate will not be required to be air cooled.

5.6.21. When the waste enters the hot furnace it will be heated by contact with the hot combustion gases and radiant heat from the sides of the furnace. This initial heating will remove moisture from the waste. The next stage will be volatilisation, in which volatile gases and vapours will be emitted from the waste. These volatile gases and vapours will ignite. In the final section of the grate the char will be held for a sufficient period to ensure full burn out. The resulting ash will be discharged into a water bath and then to the bottom

ash bunker. The bottom ash handling equipment is indicated as item 27 in Figure 5.2. The ash characteristics, handling and recovery are described in chapter 10 “Residues and Consumables” of this EIS.

5.6.22. Small pieces of waste less than one mm in size will be able to fall through the grate. These are called siftings and typically consist of earth and other inert materials. The siftings will be collected in a closed system underneath the grate, cooled down and sent to the bottom ash water bath at the end of the grate.

5.6.23. The grate furnaces will be equipped with water-cooled double walls and internal and/ or external insulation, which will be suitable for the calorific value and corrosiveness of the waste to be incinerated.

Figure 5.3 Water cooled double walls

5.6.24. One of the benefits of a large furnace capacity is that it is better suited to handle variations in waste composition. For example one tonne of high calorific value waste such as plastic fed to a 35 tonne/hour furnace does not cause the same disturbance as one tonne of plastic would in a 4 tonne/hour furnace. Less disturbance results in more complete combustion and lower and more stable generation of carbon monoxide and volatile organic compounds in the flue gases.

Combustion Air

5.6.25. Primary combustion air is drawn into the furnace from the waste bunker and reception hall, thus keeping these areas under negative pressure and preventing the release of odours and dust from these areas to the outside. During normal maintenance only one of the two combustion lines will be shut down, leaving the other line fully operational to control the dust and odour by creating the necessary negative pressure in the reception hall and waste bunker.

5.6.26. The secondary air will be taken from the boiler house and bottom ash handling area in order to minimise any dust or odour problems from bottom ash handling.

Operating Conditions

5.6.27. The The EU Waste Incineration Directive 2000/76/EC specifies the operating conditions of waste incinerators. For incinerators using non-hazardous municipal solid waste, which

would have a content of 1% or less of halogenated organic substances, expressed as chlorine, there must be a minimum residence time in the furnace of 2 seconds at a minimum temperature of 850°C. Waste must not be added to the furnace until this temperature is reached and this temperature must be maintained while there is waste in the furnace.

5.6.28. Auxiliary burners will be used for start-up and shutdown, in order to ensure that the furnace will reach the required operational combustion temperatures, and for maintaining the required operational combustion temperatures when there is unburned waste in the combustion chamber. LPG will be used for the pilot flame of the auxillary burners. Diesel will be used for the main flame of the auxiliary burners.

Process control

5.6.29. The waste feed rate, the supply of primary and secondary combustion air and the grate speed will be controlled by an advanced combustion control system which will measure flow rate, flue gas oxygen and combustion temperature in order to obtain the best possible operational conditions and maximise steam production. The operation of the furnace and ash discharge system will be monitored, using CCTV cameras, by the operators in the control room. Figure 5.4 shows the image from a camera, which is used to monitor the burn out at the last section of the grate at Elsam's Odense WtE Facility.

Figure 5.4 Furnace with combustion control at Elsam's Odense WtE Facility in Denmark showing a stable and straight line of fire in front of the last grate section

Energy recovery

Power Output

5.6.30. The burning of waste in the furnace will produce hot gases. The energy in these hot gases will be recovered by passing the gases through a boiler, which will generate steam. The steam will be expanded across a turbine which will drive a generator to produce electricity for supply to the national grid.

5.6.31. The two furnace lines will supply steam to a single turbine/generator set, which will generate electricity. The electrical power output from the Facility is expected to be approximately 60 MWe., this is equivalent to the typical power requirement of circa 50,000 homes.