Murphy Environmental Hollywood Ltd

Hollywood Great, Nag's Head, Naul, County Dublin
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EPA Waste Licence W0129-02

For the Attention of
Administration
Environmental Licensing Programme
Office of Climate, Licensing & Resource Use
Environmental Protection Agency
Headquarters
PO Box 3000
Johnstown Castle Estate
Co. Wexford

Our Ref.:	W0129-03/Unsol_280512
Direct Dial:	01 8433744
Direct Fax:	01 8433747
Date:	28th May 2012

Dear Mr. Meaney,

Re.: Murphy Environmental Hollywood Ltd. (MEHL), EPA Ref. W0129-03
An Bord Pleanála Decision and Inspector's Report for Strategic Infrastructure Development Ref. 06F.PA0018

Please find enclosed copies of An Bord Pleanála decision (**Appendix 1**) for Strategic Infrastructure Development Ref. 06F.PA0018 for the proposed MEHL integrated waste management facility at Hollywood Great, Nag's Head, Naul, Co. Dublin. **Appendix 2** contains the Inspector's Report for the planning application.

Yours sincerely,

Patricia Rooney
Director & General Manager, MEHL

Appendix 1:

An Bord Pleanála decision for Strategic Infrastructure Development Ref. 06F.PA0018

An Bord Pleanála

STRATEGIC INFRASTRUCTURE DEVELOPMENT

PLANNING AND DEVELOPMENT ACTS 2000 TO 2010

An Bord Pleanála Reference Number: 06F.PA0018

(Planning Authority: Fingal County Council)

APPLICATION for permission under section 37E of the Planning and Development Act, 2000, as amended, in accordance with plans and particulars, including an environmental impact statement, lodged with An Bord Pleanála on the 10th day of December, 2010 by Murphy Environmental Hollywood Limited of Hollywood Great, Nag's Head, Naul, County Dublin.

PROPOSED DEVELOPMENT: Integrated waste management facility at an existing landfill. The site is a former quarry and is currently operating as an Environmental Protection Agency (EPA) licensed landfill (Licence W0129-02) under planning permissions register reference numbers F04A/0363 and F07A/0262. The facility currently accepts construction and demolition and other inert wastes. It is proposed that the facility will be developed for the acceptance and landfilling of non-biodegradable inert non-hazardous and hazardous wastes. On-site waste recovery operations will be retained. The total waste input will be up to 500,000 tonnes per annum which is consistent with the existing planning permission and EPA Licence and does not, therefore, represent an increase from that already approved. The area of land in the ownership and control of Murphy Environmental Hollywood Limited is 54.4 hectares of which the proposed planning and EPA Waste Licence applications cover 39.8 hectares. The proposed development involves the construction within the site of (a) specially engineered landfill cells for inert non-hazardous and hazardous wastes, (b) a solidification plant of 398 square metres comprising 242 square metres ground floor, 78 square metres first floor and 78 square metres second floor with associated storage tanks and silos, (c) a storage building 1,285 square metres, (d) an administration office building of 128 square metres, (e) new weighbridges, (f) car parking for 15 cars, (g) an ESB substation/switch room of 25 square metres, (h) internal haul routes, (i) surface water ponds and leachate management facilities, (j) a temporary viewing platform for visitors from which the geology of the quarry faces can be viewed and (k) ancillary site works and landscaping. A new facility entrance, with reinstated set-back hedgerows, is proposed from the county road LP1080. The existing entrance on the LP1090 road will be used only for emergency access. The existing portacabin site offices at this location will be removed. Permission is sought

for a period of 25 years so as to fully complete the infill and restoration of the former quarry, in keeping with the surrounding landscape. It is proposed that the facility will operate to accept approved wastes on an all-island basis, all at Hollywood Great, Nag's Head, Naul, County Dublin.

DECISION

GRANT permission under section 37G of Planning and Development Act, 2000, as amended, for the above proposed development in accordance with the said plans and particulars based on the reasons and considerations under and subject to the conditions set out below.

DETERMINE under section 37H(2)(c) the sum to be paid by the applicant in respect of costs associated with the application as set out in the Schedule of Costs below.

MATTERS CONSIDERED

In making its decision, the Board had regard to those matters to which, by virtue of the Planning and Development Acts and Regulations made thereunder, it was required to have regard. Such matters included the submissions and observations received by it in accordance with statutory provisions.

REASONS AND CONSIDERATIONS

Having regard to:

(a) national policy in relation to waste management, as set out in the National Hazardous Waste Management Plan 2008-2012, which seeks to provide at least one hazardous waste landfill in Ireland,

(b) Article 16(2) of the Waste Directive 2008/98/EC particularly in relation to the principle of self-sufficiency in relation to waste management,

(c) the strategic location, including in relation to the two approved incinerator developments at Carranstown, County Meath and Poolbeg, Dublin, and the site's proximity to the national motorway network,

(d) the presence of an existing landfill facility on site and the associated benefits involved in co-locating an integrated waste management facility, such as that proposed, with an existing landfill development,

(e) the proposed construction of the engineered cells for the reception of hazardous, non-hazardous and inert waste, which is in compliance with, and exceeds the minimum requirements set down in Annex 1 of Council Directive 99/31/EC,

(f) the environmental impact statement (EIS) including the mitigation measures as set out and the supplementary information submitted at the oral hearing, and

(g) the report and recommendation of the person conducting the oral hearing, including in relation to the assessment of the environmental impacts,

it is considered that, subject to compliance with the conditions set out below, the proposed development would not seriously injure the amenities of the area or of property in the vicinity, would be unlikely to give rise to adverse impacts on the environment including groundwater or any European site, would be acceptable in terms of traffic safety and convenience and would, therefore, be in accordance with the proper planning and sustainable development of the area.

CONDITIONS

1. The development shall be carried out in accordance with the plans and particulars lodged with the application on the 10th day of December, 2010 and the plans and particulars submitted to the Board during the course of the oral hearing, except as may otherwise be required in order to comply with the following conditions. Where such conditions require points of detail to be agreed with the planning authority, these matters shall be the subject of written agreement and shall be implemented in accordance with agreed particulars.

   Reason: In the interest of clarity.

2. Prior to the commencement of any development associated with this permission, the applicant shall obtain a waste licence from the Environmental Protection Agency for the operation of the facility.

   Reason: To ensure that the proposed development is operated in such a manner which would not adversely impact on the surrounding environment.

3. Landfilling operations on site shall cease prior to the 31st day of December, 2036 unless prior to this date planning permission is granted for an extension to the life of the facility. The landfill shall be capped and the site restored in full in accordance with the EIS on completion of the landfill operations.

   Reason: To limit the long-term impact of the development on the amenities of the area and properties in the vicinity.

4. The annual waste intake at the facility shall be limited to a maximum of 500,000 tonnes.

   Reason: To control the scale of the development in the interest of the amenities of the area and the proper planning and sustainable development of the area.

5. All waste accepted on site shall be classified in accordance with the Waste Acceptance Criteria set out in Council Decision 2003/33/EC. All waste shall be classified off-site and shall be classified in accordance with the provisions of the above EU Decision prior to being placed in any of the landfill cells.

Reason: In the interest of orderly development and the protection of the environment.

6. The testing of the dense asphaltic concrete (DAC) liner, which is to be provided for hazardous waste cells, shall be carried out in accordance with Section 5.2.9 of the EIS and the submissions presented to the oral hearing by the applicant, details of which shall be submitted to the planning authority for written agreement prior to commencement of construction, and shall address the following:

- Appropriate testing of the raw materials required,
- testing of the asphaltic mix to ensure compliance with the mix design,
- provision of suitable sample test areas for the DAC liner, which shall be subject to intensive in-situ and core testing to ensure that the design specification is achieved; these test areas shall not comprise part of the completed liner,
- measures of temperature and compaction and other appropriate tests to be undertaken during laying operations, with particular attention being paid to jointed areas,
- structural testing of the completed liner for each cell, including testing of the seals at joints, particularly incorporating a review of the suitability of non-destructive test methods where appropriate,
- construction quality assurance procedures to address all of the above.

No test methods to be employed shall in themselves compromise the successful operation of the DAC liner in any way. The testing shall be completed as agreed, and the results submitted to the planning authority, prior to commencement of operation of each hazardous waste cell.

Reason: In the interest of public health and the protection of the environment.

7. Details of the proposed new access arrangements onto the LP01080 shall be agreed in writing with the planning authority prior to the commencement of development.

Reason: In the interest of traffic safety.

8. Details of all public lighting proposed within or around the perimeter of the facility, including any public lighting along the internal access road leading to the administrative area, shall be agreed in writing with the planning authority prior to the commencement of development.

Reason: In the interest of visual amenities of the area.

9. Construction and demolition waste shall be managed in accordance with a construction waste and demolition management plan, which shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. This plan shall be prepared in accordance with the "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects" published by the Department of the Environment, Heritage and Local Government in July 2006.

Reason: In the interest of sustainable waste management.

10. Prior to the commencement of development, an environmental monitoring committee shall be established. Details of the members of the committee shall be agreed in writing with the planning authority and shall include two public representatives, two officials from Fingal County Council and two members of the local community. The environmental monitoring committee shall monitor the development permitted by this consent and shall meet at least four times per annum or at such intervals as the environmental monitoring committee members agree.

Reason: In the interest of transparency and the protection of the amenities of the area.

11. The applicant, over the lifetime of the landfill development, shall annually set aside a fund, derived from charges for waste management, to provide appropriate environmental improvement projects and community facilities in the local community. The initial contribution to the fund shall be €1 per tonne of waste received and thereafter the contribution shall be updated in accordance with the consumer price index. Details of the management and operation of the community gain fund, which shall be lodged in a special community fund account, shall be agreed between the applicant and the environmental monitoring committee. In default of an agreement, the details shall be determined by An Bord Pleánala.

Reason: To mitigate the impacts of the landfill operation on the local community.

12. Details of the location of the wheel-wash facility on the proposed new internal access road shall be the subject of written agreement with the planning authority prior to the commencement of development.

Reason: In the interest of the amenities of the area

13. (1) During the construction of the inert, non-hazardous and hazardous waste cells dust levels at the site boundary shall not exceed 350 milligrams per square metre per day averaged over a continuous period of 30 days (Bergerhoff Gage). Details of the monitoring programme for dust shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. Details to be submitted shall include monitoring locations, commencement date and the frequency of monitoring results and details of all dust suppression measures.

(2) As part of the construction of the landfill cells a monthly survey and monitoring programme of dust and particulate emissions shall be undertaken to provide compliance with these limits. Details of this programme, including the location of dust monitoring stations, and details of dust suppression measures to be carried out within the entire site, shall be submitted to and agreed in writing with the planning authority prior to commencement of development. This programme shall include an annual review of all dust monitoring data, to be undertaken by a suitably qualified person acceptable to the planning authority. The results of the review shall be submitted to the planning authority within two weeks of completion of the review. The applicant shall carry out any amendments to the programme required by the planning authority following this review.

Reason: To control dust emissions arising due to the construction of landfill cells within the development and in the interest of the amenities of the area.

14. During the construction phase of the individual cell liners the noise levels generated shall not exceed 55dB$A_{LAeq}T$ when measured at the nearest occupied house. When measuring the specific noise, the time shall be over a 1-hour period.

Reason: In order to protect the residential amenities of property in the vicinity.

15. The hours of construction for all phases of the development shall be confined to the following hours, unless in exceptional circumstances as otherwise agreed with the planning authority:

0700 hours and 1900 hours, Monday to Friday;
0800 hours and 1630 hours on Saturdays;
No construction activity shall take place on Sundays, bank or public holidays.

Reason: In order to protect the residential amenities of properties in the area.

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16. All waste shall be transported to the site (hazardous, non-hazardous and inert) in covered and tightly secured holding areas within the vehicles.

Reason: In the interest of public health and environmental pollution.

17. A comprehensive boundary treatment and landscaping scheme shall be submitted to, and agreed in writing with, the planning authority prior to the commencement of development. This scheme shall include the following:

(a) Details of all proposed hard surface finishes, including samples of proposed paving slabs/materials for footpaths, kerbing and road surfaces within the development,

(b) proposed locations of trees and other landscape planting in the development, including details of proposed species and settings, and

(c) details of proposed boundary treatments at the perimeter of the site, including heights, materials and finishes.

The boundary treatment and landscaping shall be carried out in accordance with the agreed scheme.

Reason: In the interest of visual amenity.

18. Prior to the commencement of development, the applicant shall submit for the written agreement of the planning authority a biodiversity plan outlining measures to improve the overall biodiversity of the site and its surrounding lands, both during the operational phase of the development and the post-operational phase.

Reason: In the interest of maintaining and promoting biodiversity within the site.

19. Prior to the commencement of the construction phase of the hazardous waste cells, the applicant shall consult with Inland Fisheries Ireland to ensure all measures necessary are undertaken to protect the local aquatic ecology of the stream along the northern boundary of the site. In this regard the applicant shall ensure the following:

(a) Only clean uncontaminated water shall leave the development site and drain into the river network.

(b) Inland Fisheries Ireland shall be consulted in relation to any works to the stream (bridging, culverting or otherwise on the stream along the northern boundary of the site).

(c) In-stream work shall only be carried out during the period May-September of each year.

(d) All in-stream and riparian works shall be agreed with Inland Fisheries Ireland prior to such works being carried out.

(e) Preservation of a 10-metre wide riparian corridor shall be maintained along the southern boundary of the stream. All construction works undertaken adjacent to the stream shall conform with requirements for the protection of fisheries habitats during construction and development works at river sites.

Reason: In order to protect water quality and ecological habitats during construction.

20. The applicant shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site. In this regard, the applicant shall:

(a) Notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development, and

(b) employ a suitably-qualified archaeologist prior to the commencement of development. The archaeologist shall assess the site and monitor all site development works.

The assessment shall address the following issues:

(i) the nature and location of archaeological material on the site, and

(ii) the impact of the proposed development on such archaeological material.

A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the applicant shall agree in writing with the planning authority details regarding any further archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works.

Reason: In order to conserve the archaeological heritage of the area and to secure the preservation (in-situ or by record) and protection of any archaeological remains that may exist within the site.

21. The applicant shall pay to the planning authority a financial contribution of €10,000 (ten thousand euro) in respect of road lining and road signage in the vicinity of the site that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48(2)(c) of the Planning and Development Act 2000, as amended. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the scheme at the time of payment. The application of any indexation required by this condition shall be agreed between the planning authority and the applicant or, in default of such agreement, the matter shall be referred to the Board to determine.

Reason: It is a requirement of the Planning and Development Act 2000, as amended, that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the permission.

22. The applicant shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000, as amended. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the applicant or, in default of such agreement, the matter shall be referred to the Board to determine the proper application of the terms of the Scheme.

Reason: It is a requirement of the Planning and Development Act 2000, as amended, that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the development.

SCHEDULE OF COSTS

In accordance with section 37H of the Planning and Development Act 2000, as amended, the Board requires the following costs to be paid by the applicant-

To An Bord Pleanála towards the cost of determining the application	€11,880
To Fingal County Council as a contribution towards reasonable costs incurred in consideration of the application	€14,000
To Nevitt Lusk Action Group as a contribution towards reasonable costs incurred in consideration of the application	NIL
Total:	**€25,880**

Note: A breakdown of these sums are set out in the attached Appendix.

Member of An Bord Pleanála duly authorised to authenticate the seal of the Board.

Dated this 16th **day of** June **2011.**

An Bord Pleanála

Appendix 1.

Strategic Infrastructure Development
Cost of determining the Application and other Costs.

File No. 06F.PA0018

Brief Description of Development: Integrated waste management facility for the acceptance and landfilling of non-biodegradable inert, non-hazardous and hazardous waste at Hollywood Great, Nag's Head, Naul, Co. Dublin.

1. Sum to be paid to the Board towards the costs of determining the application.

	Board's Costs	€
(1)	Cost based on Inspectors' time	84,788
(2)	Costs invoiced to Board	27,642
(3)	Total chargeable costs	112,430
(4)	Application fee paid	100,000
(5)	Observer Fees paid	550
(6)	Net amount due to be paid by applicant, or	11,880
(7)	Amount due to be refunded to applicant	

2. Sum, which the Board considers reasonable, to be paid by the applicant to the planning authority or planning authorities.

	Name of Planning Authority	€
	Fingal County Council	14,000

3. Sums to be paid by the applicant to other persons as a contribution to the costs incurred by such persons during the course of consideration of the application.

	Name of Person	€
	Nevitt Lusk Action Group	NIL

Member of An Bord Pleanála duly authorised to authenticate the Seal of the Board.

Dated this 16th **day of** June **2011.**

Appendix 2:

Inspector's Report for the planning application

An Bord Pleanála

Inspector's Report

PL06F.PA0018

Development

Description:	Integrated waste management facility for the acceptance and landfilling of non-biodegradable inert, non-hazardous and hazardous waste.
Address:	Hollywood Great, Nag's Head, Naul, County Dublin.

Planning Application

Planning Authority:	Fingal County Council
Planning Authority Reg. Ref.:	n/a
Applicant:	Murphy Environmental Hollywood Ltd.
Type of Application:	S.37(E)
Planning Authority Decision:	n/a

Submissions:

Observers:
An Taisce
Jacqueline Yeomans
Claire Moore
Ben and Barbara Jones
Aideen Marry
Brigid and John Lenehan
Martin and Miriam Moore
Nevitt Lusk Action Group
Fedelma Geraghty
Indaver Ireland
The Confederation of European Waste Energy Plants and

Drogheda and District Chamber of Commerce.

Prescribed Bodies: Environmental Protection Agency
Health Service Executive
Inland Fisheries Ireland
National Roads Authority
Health and Safety Authority
Department of the Environment Heritage and Local Government
Meath County Council
Fingal County Council

Date of Site Inspection: 23rd February 2011

Inspector: **Paul Caprani**

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1.0 INTRODUCTION

An application has been lodged with An Bord Pleanala in accordance with the provisions of Section 37(E) of the Planning and Development (Strategic Infrastructure) Act 2006. The proposed development is for an integrated waste management facility at a former quarry currently used as a landfill for inert material at Hollywood Great, Nags Head, Naul, County Dublin. The facility currently accepts Construction and Demolition (C&D) waste and inert waste. It is proposed under current application that the facility be developed for the landfilling of non-biodegradable inert, non-hazardous and hazardous waste. The proposal also seeks to construct a solidification plant and other ancillary works on site. The application is accompanied by documentation including an EIS (with figures, drawings and appendices), an Engineering Report, a Planning Report and a letter sent to prescribed bodies as well as public notices and other material. An Oral Hearing was held in relation to the proposed development (see appendix 2)

2.0 PRE-PLANNING CONSULTATION WITH AN BORD PLEANALA

As provided for under Section 37(b) of the Planning and Development (Strategic Infrastructure) Act, Murphy Environmental Hollywood Limited (MEHL – the applicants) entered into discussions and consultations with An Bord Pleanala in relation to the proposed development (Case Ref. 06F.PC0087). Three meetings were held with An Bord Pleanala on dates between 25th November 2009 and 8th October 2010. A Board Direction issued on February 10th 2010, where it was decided that the proposed development constituted strategic infrastructure being development that comes within the scope of the 7th Schedule and Section 37A(2)(a) of the Act. The current application before the Board is made on foot of this Direction.

3.0 SITE LOCATION AND DESCRIPTION

The site which currently operates as a landfill is located at Hollywood Hill in North County Dublin approximately 31 kilometres north of Dublin City Centre. The site is approximately 4 kilometres south of the small village of Naul and 12 kilometres west of Skerries Town. The small village of Garristown is located approximately 9 kilometres to the west of the site and the village of Ballyboghill is located approximately 4 kilometres to the south of the site.

The M1 motorway is located approximately 3.5 kilometres to the east of the site. The nearest junction onto/off the motorway is located at Junction 5 (Walshestown Junction or Rowans Little Junction) which is c.4 kilometres to the north-east of the site. The R108 (Dublin – Naul Regional Route) is c.1 kilometre to the west of the site. Two local roads bound the southern and western boundary of the site, the LP01080 and the LP01090 respectively. The

former road which runs along the southern boundary of the site is generally the better of the two roads in terms of surface and width alignment. The LP01080 is between 5 and 6 metres in width.

The existing entrance to the site is located on the LP01090 along the western boundary of the site approximately 300 metres north of the junction with the LP01080. The road rises from south to north along the western boundary of the site. The 80kph speed limit applies to the wider area in which the site is located.

In terms of settlement, the area surrounding the landfill can generally be described as rural and agricultural with dispersed dwellings in the vicinity of the site. The predominant land use in the wider area is agricultural. There are a few dwellings within the immediate vicinity of the site. These dwellings are mainly adjoining the LP01080 and include two dwellings along the southern boundary of the site facing southwards onto the public road. The dwelling adjacent to the south-eastern boundary of the site is owned by the applicant and is currently vacant. A number of dwellinghouses and a small factory unit are located on the southern side of the LP01080 directly opposite the site. Further dwellinghouses are located on both sides of the LP01080 to the east and west of the site. There are no dwellings along the local road along the western boundary of the site. The nearest dwellinghouse located on this road is approximately 250 metres from the north-western boundary of the site. Three telecommunication masts and the Fingal County Council water reservoir are located adjacent to the LP01090. The Fingal County Council water reservoir serves the Naul area and is a covered reservoir to the immediate south of the existing entrance to the site.

The site itself has a stated area of 39.8 hectares. The overall landholding is stated as 54.4 hectares. The entrance to the site is provided off the LP01090 along the western boundary of the site. The main buildings are located on a concrete apron adjacent to the entrance. These include a portal cabin, which accommodates the site office, and a larger maintenance shed. A shed containing bunded diesel tanks are located at the lower level to the immediate north of the main buildings on site. Walled bays which provide a quarantine area for inert waste are located adjacent to the shed which houses the bunded diesel tank.

The main haul road traverses the site in an east-west direction to the immediate north of the main surface water bodies within the site (the excavated quarry areas to the south). The area to the north of the haulage road accommodates lined cells for the acceptance of inert materials. The cells on the western portion of the site are being actively filled at present and rise to a height of between 4 and 10 metres above the surrounding ground levels. Part of the central area to the north of the haulage road is being lined at present. This area has been excavated to a depth of between 10 and 20 metres below the surrounding area.

Two small settlement ponds are located centrally within the site adjacent to the northern boundary. Lands to the west of the site (located within the site boundary and within the EPA licence W0129-02) comprise of a 200 – 250 metre buffer zone. This area is under grass. A further 250 metre wide strip is

located further west. This land is within the ownership of the applicants but is located outside the confines of the site.

The geology of the site is reasonably complex. It comprises of various lithology's, the oldest being the Lucan, Naul and Loughshinny formations which are prevalent in the southern portion of the site where much of the quarrying has taken place. This limestone in the southern portion of the site has been excavated to the greatest depth – 50 to 60 metres below ground level (bgl). It appears that excavation may have taken place below the watertable in this area of the site. This carboniferous limestone is folded in a gentle syncline beneath newer rocks of Namurian age described in the EIS as the Walshestown and Balrickard formation. These rocks were laid down in deeper waters and in general are less permeable that the older carboniferous limestone. These newer formations dominate the eastern and northern portion of the site. The rocks in this area have been excavated to a lesser extent. The Namurian shale in the northern portion of the site is overlain with clay based soils and sub-soils. In general the clay cover over the northern portion of the site is generally thin. Further details in relation to the soils and geology are set out in Section 14.3 (Page 216 of the EIS). The geological formations relating to the site are set out in Figure 14.6 and 14.7 of the EIS.

4.0 PROPOSED DEVELOPMENT

The proposal was advertised in the Irish Independent (Thursday 9th December, 2009) and the Fingal Independent (Tuesday 7th December, 2009). The application was lodged with An Bord Pleanala on 10th December, 2010. The principle elements of the development are set out below.

4.1 Construction of Landfill Cells for Hazardous, Non-Hazardous Inert Waste.

Hazardous Waste

Three cells are proposed for the hazardous waste on site. These cells are to be located centrally within the northern portion of the site. The cells are to be developed in three separate phases. The first phase will involve the infilling of two sub-cells at the northern end of the landfill (hazardous cell H1). H1 will have an approximate capacity of 327,000 cubic metres.

The second phase will involve the infilling of two sub-cells (H2) to the immediate south of Phase 1. Hazardous cell H2 has an approximate capacity of 652,000 cubic metres. Moving progressively southwards hazardous cell H3, is the most southerly cells of the hazardous element of the landfill and has the greatest capacity of 756,500 cubic metres.

The hazardous element of the landfill therefore has a total approximate capacity of 1,735.500m³. The construction, filling and restoration of the landfill cells will occur over a 25 year period. The hazardous landfill cells are to be lined with a dense asphaltic concrete lining (DAC lining system). According to the

EIS (see summary in Appendix 1 and Section 4.5.1.2 of the EIS and Section 3.2 of the Engineering Report) this is a more effective barrier than the conventional clay linings. The Hazardous waste lining is described in more detail below.

The existing haul road is to be upgraded to 8 metres in width and is to separate the hazardous cells to the north from the non-hazardous cells to the south.

The non – hazardous cells

The non-hazardous sub-cells are located in the deepest part of the quarry area, nearest the southern boundary. The non-hazardous cell NH1, is to comprise of two sub-cells with a total capacity of 1,070.000m³. The proposed Site Layout Plan (sheet 1 of 7) indicates that an additional non-hazardous cell (NH2) is to be located to the immediate east of the main cell and to the immediate rear of the solidification plant. This cell is to have a cubic capacity of 254,000 cubic metres. The exact location and layout of this cell is not indicated in the more detailed layout plans (see layout plan in the main book of drawings sheet 3 of 7).

The inert waste cells

The proposed inert waste is to be located in cells located exclusively in the western portion of the site, to the north and south of the existing entrance to the site. There are currently three active inert waste cells on site contiguous to the western boundary of the site. It is proposed to develop three new inert waste cells (IN1, IN2 and IN3). Phase 1 in IN1 will have a total capacity of 853,000 cubic metres. (This will include relocating inert waste from existing cells amounting to 534,500 cubic metres). Inert INl 1 is located in the south-western corner of the site.

IN2 will involve the infilling of 271,500 cubic metres on lands adjacent to the existing inert waste cells. IN3 will involve the infilling of 165,500 cubic metres in the vicinity of the existing entrance serving the site.

In terms of the capacity for inert waste the total amount of additional waste to be accepted at the landfill is 755,500 cubic metres (excluding related inert waste already within the site).

The total void capacity for each of the waste streams is as follows:

Total Hazardous	1,735,500
Total Non Hazardous	1,324,000
Total Inert (including relocating existing inert waste)	755,500

In accordance with the existing waste licence (W 1029-02) the maximum waste acceptance in any one year is 500,000 tonnes. The facility will have a 25 year life.

4.2 Lining Systems Proposed for each of the Waste Types

4.2.1 *Hazardous Waste Lining*

It is proposed to use a Dense Asphaltic Concrete system (DAC) to line the base and sides of the hazardous landfill cells. This will comprise of the following:

- Engineered clay (0.5 metres in thickness). This will be laid down as a subgrade layer at base level immediately above the existing surface and 3 metres of the side wall.

- A geo-textile membrane will be located above the base layer.

- Granular stabilising layer (200mm thick). The purpose of this layer is to provide a stable surface on which equipment can be used to construct subsequent layers. The layer will also prevent pressure building up from water beneath the liner. This layer would be sprayed with bituminous emulsion to bind the granular stabilising layer. A leak detection system will be incorporated into this layer. The leak detection system will comprise of 250mm HDPE detection standpipe which is connected to a constructed sub at the base of the landfill cell.

- Asphaltic binder layer (60mm). This is a high permeability layer to allow the steam generated during the construction of the DAC layer to escape.

- Dense asphaltic concrete layer. This 80mm thick layer is comprised of an asphaltic mixture of continuously graded aggregate. This layer will be completely impenetrable and resistant to deformation. A fine mastic sealant will be applied to the top layer. This layer will be subject to laboratory testing. The DAC liner system will have a minimum permeability (K) of 10^{-12} but is more likely to have a K value of 10^{-15}. (The Landfill Directive for a hazardous waste facility requires a K value of at least 10^{-9}).

    - Above the dense asphaltic concrete layer a 500mm thick drainage stone layer will be placed on top with a hydraulic conductivity of 1 x 10^{-3} incorporating a system for leachate collection.

    - Above this layer it is proposed to place a polypropylene geotextile layer.

A cross-section is indicated on Drawing PP-SID-12-01 and figure 3.4 submitted with the application. The total depth of the landfill lining is 1.34 metres. According to the EIS this fully accords with the provisions set out in the Landfill Directive.

4.1.2 Lining System for the Non-Hazardous Waste

- The base layer will comprise of a composite clay layer with a minimum thickness of 1 metre (4 x 0.25 lifts) will be installed in the cells for non-hazardous waste. This will comprise a compacted layer 1 metre thick with a hydraulic conductivity of less than or equal to 1 x 10^{-9} metres per second.

- Above this it is proposed to install a 2mm thick welded geo-membrane HDPE liner.

- Above the HDPE liner it is proposed to place a non-woven geotextile cover.

- Placed above the geotextile sheet a 500mm stone layer with a hydraulic conductivity of 1 x 10^{-3} m/s will be placed with a leachate collection system.

- A geotextile layer functioning as a filtration layer will be placed on top of the stone layer onto which waste will be placed.

The lining proposed is indicated in figure 3.5 of the EIS

4.1.3 Cell Linings for Inert Waste

- The lining will meet the minimum requirements for inert waste set out in the Landfill Directive namely a 1 metre thick lining with a hydraulic conductivity less than or equal to 10^{-7} m/s. All existing cells for inert waste have been constructed using onsite clay deposits. All cells have been fully independently verified.

4.3 New Site Entrance and Access Road

It is proposed to construct a new access onto the LP01080 which runs along the southern boundary of the site. The new entrance will cater for all construction and operational traffic associated with the development. The existing entrance on the western boundary of the site would be used as an emergency access only. The new access point onto the road along the southern boundary of the site is indicated on Drawing PP-SID-07-01. The site entrance is located approximately 150 metres to the west of the existing dwelling at the south-eastern corner of the site. It comprises of an 8 metre wide internal access road leading directly to the solidification plant and administration buildings.

4.4 New Buildings on Site

4.4.1 Administrative Buildings

A new administration building is to be located in the south-eastern portion of the site adjacent to the new access road. The building finishes and internal layout are indicated in Drawing PP SID-10. It comprises of a single-storey flat roof structure c.6 metres high and has a gross floor area of c.150 square metres. Two weighbridges are to be located on either side of the administration building. The building is to be serviced by a packaged treatment system and raised soil polishing filter to the north-east of the building. A stormwater retention basin is located to the south-east of the building. Details of the proprietary wastewater treatment system are detailed in Section 5 of the Engineering Report submitted with the application.

4.4.2. Solidification Plant and Storage Facility

The solidification plant is necessary to treat flu gas residues (FGR's) which are classed as hazardous waste and the residues are very soluble. The soluble nature of the residues is susceptible to leaching, particularly in relation to soluble salts and heavy metals. This pre-treatment is required in the solidification plant. The plant and storage area is located between the largest non-hazardous waste cell and the administrative building. The building comprises of a three-storey structure encased within a shed where tankers will be able to discharge the FGR's under an enclosed pumping system. The central portion of the building incorporates three levels (staff area at ground floor, control room and mixing area at first floor and weigh room and store area at second floor level). The building rises to a height of 14 metres. Five silos incorporating a volume area of 78 cubic metres will flank each side of the building. Four of the silos are to accommodate ash and one silo is to accommodate cement. Two 30 cubic metre acid tanks are also proposed (one on top of the other) and these will be bunded to 110% capacity. The building will also incorporate noise attenuation cladding.

To the immediate south of the plant a solidification storage facility is proposed. This comprises of a large shed, 9 metres in height to the gross floor area of 1,295 square metres. The building is to be constructed on reinforced concrete with a HDPE liner. The building will be used for curing the solidified ash.

The solidification plant will have the capacity to process approximately 50,000 tonnes per annum of residue flu ash.

The storage building will incorporate a contained drainage system (indicated in Drawing PPSID11-01). Residues will drain to the leachate holding tank associated with the hazardous waste cells.

The separation distance between the solidification storage building and the plant area is approximately 30 metres. Both buildings are connected via an underground conveyer belt which can transport material between both buildings.

4.5 Process Details

Tankers will deliver the FGR's to the solidification plant for unloading. The residue will be pumped into the steel ash silo. The tanker will then immediately depart from the facility. The solidification process will involve the mixing (as yet undefined) ratios of residue to cement and water. The ratio will be determined in accordance with the EPA waste acceptance criteria. The derogation of three times the waste acceptance criteria will be sought from the EPA.

Following solidification the wet material will be deposited into c.1m³ bulk container bags and conveyed via the underground conveyer belt or by surface level to the curing storage area. The material will then be stored or "cured" for 2-4 days before being placed in a covered temporary area within the active hazardous landfill cell or alternatively being placed directly within the cell. The solidified material will be tested to ensure that it complies with the waste selection criteria specified. All wastes of this nature will be fully traceable.

4.6 Surface Water Management

According to the EIS, presently there are no surface water drainage features within the footprint of the proposed landfill. Surface water in the excavated quarry area is to be pumped out as required into two settlement ponds in the northern portion of the site. Water from the settling pond is then pumped into the adjoining stream along the northern boundary of the site. Surface water will be managed in a similar Fosshion (i.e. surface water which accumulates on site will be pumped to the settlement ponds before being discharged into the stream). Having regard to the underlying free draining soils on site, it is intended, where appropriate to percolate surface water from suitable areas directly to ground.

Once the facility is operating, surface water from the unfilled cells will be collected and pumped into the underground pipe network and will be discharged into a constructed wetland area in the north-eastern corner of the site.

Surface water in and around the hard-standing area in the vicinity of the solidification plant will be pumped into the holding tank which will collect leachate from the hazardous waste cells.

4.7 Leachate Management

Three leachate types will be generated on site from inert, non-hazardous and hazardous waste. Cell design will seek to reduce the leachate head to 1 metre at the base of each cell. Each sub-cell will contain a sub-area near the side wall of

the cell. The leachate will be stored in a holding tank adjacent to the administration building.

Leachate from the non-hazardous waste cells will be collected in a centrally located sump and will be pumped to a concrete leachate holding tank for non-hazardous waste.

Some hazardous leachate will be used in the solidification process. Excess leachate will be tankered off site to an EPA licence wastewater treatment plant.

4.8 Waste Acceptance and Handling on Site

Waste to be accepted on site will have to be EPA certified and in accordance with that specified in the waste licence. Suitable waste will only be accepted from holders of waste collection permits. Waste will be accepted in accordance with the principles set out in the compliance and characterisation tests contained in Annex II of the Landfill Directive. Upon arrival the operator will direct the waste vehicle to the appropriate cell or to the solidification plant. A segregated quarantine area will be provided for hazardous waste for further testing if necessary. Contaminate soils deposited in the cells for hazardous waste will be covered with clay to minimise fugitive emissions.

Bottom ash will be transported in covered trucks and deposited directly into the waste cell. A detailed waste placement procedure for bottom ash will be developed and agreed with the EPA. It may be possible in the future to reuse bottom ash as an aggregate or to undertake additional metal recovery.

The facility will operate from 8am to 6pm Monday – Friday and from 7am to 4pm on Saturdays.

5.0 SUBMISSIONS AND OBSERVATIONS

5.1 Submission from Prescribed Bodies

5.1.1 Submission from the NRA

The authority has assessed the proposed development in terms of its impact at the junction at Courtlough on the M1 (Junction 5) and has no comments to make in relation to the proposal.

5.1.2 Submission from Health and Safety Authority

In its submission of 21st January 2011 it is stated that the Health and Safety Authority are seeking more information in relation to the following issues:

- Clarification of the major accident hazard scenarios in terms of source pathway receptors.
- Additional detail on the measures for mitigating the consequences of major accidents involving loss of incinerator ash.

- Provide CAS numbers for diesel oil and FGT residues.
- Confirmations of certain figures in Table 1 of the notification to the HSA are correct.
- Clarify the maximum quantity of FGT residues which are likely to be present at any one time.
- Explanation of various statements contained in the EIS.
- Provide details of any Seveso an establishment in the vicinity including any such facility granted planning permission but has yet to commence operations.

The Authority will provide the Board with its advice within 5 weeks of the receipt of the requested information. This information is due to be submitted to the Board on or before March 5th 2011 (see submission below).

5.1.3 Submission from the DoEHLG

The Department sets out archaeological, architectural and nature conservation recommendations in relation to the site. In terms of archaeology details of archaeological monitoring to be employed in the undertaking of any works are set out.

In terms of architectural heritage it is recommended that the assessment of impact on architectural heritage should be taken into account in making an assessment of the impact of the development. It may be that there is little which might not suffer an adverse impact on account of the proposal. Nevertheless it should be established in order to avoid any undue challenge.

In terms of nature conservation it is stated that there is no objection to the proposal on nature conservation grounds on the basis of the comprehensive mitigation measures proposed. It is recommended that such mitigation measures be conditioned and that ecological consultants for the project be retained to advise and supervise these mitigation measures.

5.1.4 Submission from Inland Fisheries Ireland

The Corduff (Ballough) River represents a highly significant salmonoid catchment. It supports a small but biologically significant population of both Atlantic salmon and sea trout in addition to resident brown trout populations. Measures should be taken to ensure comprehensive protection of local aquatic, ecologic integrity.

- Only clear uncontaminated water should leave the development site.
- Any river manipulation works should be submitted to Inland Fisheries Ireland for consultation and approval.
- BAT mitigation measures should be implemented to ensure surface and groundwater protection.
- Leachate emissions should not be permitted under any circumstances.
- Attenuation ponds should allow for the settlement of fine particulate matter.

- Online monitoring and telemetry must provide a failsafe and an alarm enabled mechanism on all discharges.
- Construction work shall be carried out in accordance with requirement for the protection of fisheries habitats during construction and development works on site.
- It is essential that local infrastructure is available to cater for the increase in surface and foul water generated by the proposed development.
- The commitment to the preservation of a 10 metre wide riparian corridor is very important to the protection of the local aquatic ecological integrity and should be implemented in full.
- Under no circumstances should there be the possibility of cross contamination of two wastewater streams. Neither should there be any scope for foul water entry to the local surface water system.
- The installation of any wetland features should be undertaken "offline" i.e. not created within the boundary of the existing surface water channel wetted area.
- On-going monitoring of surface waters and culverts would be essential. Both biological and physiochemical data should be collected for salmonoid surface water so as to ensure adequate protection.

5.1.5 Submission from HSE

The Environmental Health Service has reviewed the EIS having particular regard to

- Proposed site and project description
- Air quality
- Noise and vibration
- Soil geology and hydrogeology.

The HSE considers that all the above areas were adequately addressed.

5.1.6 Submission from EPA

The EPA received a waste licence application in relation to the proposed development on 17/12/2010 (W0129-03). The EPA will assess the application. The procedures involved in assessing the application are set out. The EPA cannot grant a licence unless it is satisfied that the provisions of Section 40(4) of the Waste Management Act are met.

The EPA considers that the greatest potential threat posed by the application relates to leachate. The EPA is likely to consider the landfill lining and its compatibility with the Landfill Directive.

It is stated that there will be no wastewater generated by the hazardous waste treatment process and no process water discharges from the facility.

Should a licence be granted, mitigation measures will be required to minimise dust, odour, litter and noise emissions. Restoration and long-term aftercare proposals will be assessed to ensure that there is no potential for environmental impacts once the development is complete.

5.2 Local Authority Submissions

5.2.1 Submission from Fingal County Council

Fingal County Council acknowledged the national regional context for the proposed development and acknowledges strategic nature of the proposal but have the following concerns.

- There are serious concerns regarding the lack of natural protection at the subject site. The site offers no natural geological or hydrogeological protection for the development of a hazardous waste landfill. The applicant designates the southern part of the site as $R2^2$ under the EPA Classification. However it is considered that the Loughshinny aquifer is incorrectly classified and the southern portion of the site should have been designated $R3^2$. The EPA Draft Manual on Site Selection notes that landfill development is not generally acceptable within this classification unless it can be shown that there is a minimum consistent thickness of 3 metres of low permeability subsoil present.

- The lining system proposed is not considered adequate. The applicant proposes different basal linings and capping systems for each of the waste cell types. The systems proposed for the inert and non-hazardous landfill are in line with the EU Landfill Directive. However these assume that appropriate and acceptable hydrogeological conditions exist on site which is not the case here.

- The geological and hydrogeological conditions are a very important consideration in the site selection process. A hazardous waste landfill facility needs to be in a location that does not prove to be a serious environmental risk.

- A hazardous waste landfill facility should not be located near significant surface water features such as streams or ponds. All containment travel time should be based on groundwater migration.

- A hazardous waste landfill needs to be sufficiently isolated from nearby sensitive environmental features. For contingency measures to be viable, this separation distance must be large enough to allow for any contaminant relief to be detected and effective action must be taken before any damage can be done.

- In evaluating alternatives the applicant has limited the site selection process to existing landfills. There is no investigation of the

hydrogeological conditions of the site. This consideration should have been given more waiting in the site selection with the aim of choosing an R1 site based on national groundwater protection responses.

- According to the applicants waste license application a maximum of 122,600 tonnes shall be accepted at the subject site. The National Hazardous Waste Management Plan indicates that approximately 276,640 tonnes of hazardous waste per annum will be generated. The proposed development will therefore only deal with 44% of the all-Ireland hazardous waste identified. If the total hazardous waste generated was to be accepted at the landfill, the facility would only have a design life of 11 years. It is therefore considered that the proposed capacity of the facility is inadequate. Ideally much of the facility should have the capacity to deal with hazardous waste generated for up to 100 years.

- The applicant has provided little information about financial assurance. Given the long-term implications of such a development this is a serious concern. Financial assurance is required to ensure that sufficient funds are available for all reasonably expected activities associated with the facility operation after closure.

- Any owner of hazardous waste landfill facilities should provide financial assurance for the lifetime needs of the facility including construction, operation, maintenance and aftercare. The amount should be updated on a regular basis. The assurance should remain in place until a written document is prepared showing the financial assurance is no longer required. It should also include closure and post-closure costs.

- A number of shortcomings have been identified in the EIS including:

  § Inadequate evaluation of alternatives.

  § Inadequate information regarding financial assurances required for the lifetime of the development.

  § A Stage 3 Road Safety Audit and €10,000 should be paid in accordance with the provisions of section 48(2)(a) of the Planning and Development Act for signing and lining in the vicinity.

  § Further details are required in relation to surface water proposal, protection of groundwater and drinking water supply. In relation to the latter issue, reference should be made to the draft Fingal Groundwater Protection Scheme. The applicants should be requested to clarify detailed design considerations.

  § Information in relation to leachate management and the potential impacts on the adjoining Co. Council reservoir.

5.2.1.1 Study into Hydrogeological Issues carried out on behalf of Fingal Co. Council by RPS Consultants

RPS carried out a review of the hydrological aspects of the development and considers that there are a number of deficiencies in the information submitted. Principally the site has not been adequately assessed in order to demonstrate that the site does not pose a risk to groundwater. Specifically the following is highlighted.

- § It is also considered that the applicant has incorrectly classified the bedrock at this location.
- § Insufficient information has been submitted in relation to geological faults.
- § The interface between cells is insufficient and will provide very limited protection against migration of leachate and gas from higher risk cells to lower risk cells.

- § There are inadequacies in relation to the lining system. No details have been submitted in relation to the solidification process. This is particularly important in terms of pollution control and fly ash.

- § A biodiversity management plan should be produced for the subject site.

- § The geological and hydrogeological complexity of the site has been underestimated. There is no natural geological or hydrogeological protection for the hazardous waste landfill.

- § Although hazardous cells are located in an area where the rock is classified as PI, these rocks overlie an LM aquifer. And the PI aquifer is moderately permeable.

- § The information does not demonstrate that the Bog of the Ring is not at risk from the proposed development. The north-south fault runs beneath the hazardous waste cells.

- § The overall permeability in the bedrock is higher than that stated in the EIS.

- § The hydraulic conductivity gradients in groundwater as stated in the EIS are incorrect.

- § There is expected to be a greater degree of hydrogeological connection between the rock type due to extensive faulting.

- § Leachate in the hazardous cells will pose a hazard for a long period (expected to be 100 years beyond the estimated 35 year management period). A greater risk will be posed to groundwater when leachate is pumping is discontinued.

- Concern is expressed in relation to the interface between the cells. A valley should remain between each type of cell type to ensure that gas or leachate breakout from the cap can be identified and repaired.

- The lining system for the hazardous cell is not in accordance with the EPA Landfill Design Manual for Hazardous Waste which requires a minimum of 5 metres of protection. It has been reduced in this instance to a 500mm thick mineral layer lining.

- The nature of hazardous waste composition in this instance increases the risk of damage (higher PH values etc.) which can do long-term damage to the liner. No details are provided in relation to the proposed solidification process. This is unacceptable considering the significance in terms of polluting potential of fly ash.

Interdepartmental reports are attached to the Fingal County Council submission and are briefly summarised below:

5.2.1.2 The Traffic Report

This report concludes that the traffic impact is generally deemed to be immaterial. The Transport Department is satisfied with the proposed parking arrangements. The Transport Department supports the provision of safe access onto the LP01080. The internal layout is deemed to be satisfactory.

5.2.1.3 The Water Services Report

Concerns are expressed regarding the risk of the local water supply. While the submission is very comprehensive further details are required in relation to the detailed design of the water based infrastructure. The potential impact on the water reservoir that borders the site should be addressed. The size of this reservoir is likely to be increased. Leachate from inert cells should be collected and disposed of in an environmentally safe manner. Having regard to the extreme weather events of recent years, the design should be a 1 in 30 year design event appropriate for the leachate holding tank. There is no mention of surface water in the EIS non-technical summary document.

Details in relation to surface water management within the site need to be set out.

- Existing surface water in the voids and how it is proposed to drain them needs also to be addressed.

- The Q values for both Ballyboughal and Ballack Rivers are available and should be referred to in the report.

- The EIS has failed to mention the importance of the Eastern River Basin Management Plan which was adopted in 2010.It is

imperative that the applicants seek the views of the GSI in this regard.

5.2.1.4 Engineer's Report

The EIS has not identified asbestos as one of the wastes to be accepted at the facility. It suggests that the facility can only cater for 44% of the hazardous waste arising. Ideally such a facility should accommodate waste for up to 100 years. To permit this relatively short term development would undermine the financial case for the above proposal.

5.2.1.5 Biodiversity Officers Report

There is great potential for the creation and enhancement of wildlife habitats during the active landfilling phase and after the infilling is finished.

Murphy's quarry is included in the Green Infrastructure Network in the County Development Plan. It is recommended that the applicant be requested to develop a Biodiversity Management Plan for the quarry.

5.2.1.6 Manager's Report on the Proposal Presented to Members of Fingal County Council on 14/02/2011

Some Council members expressed concerns namely in relation to the environmental impact of the proposal. Reference specifically is made to hydrology and the proximity to the proposed Nevitt Landfill and the existing Lusk Landfill.

A number of councillors also supported the proposed development subject to environmental safeguards. It is noted that the applicant is in support of many local initiatives and is a good employer in the area.

5.2.2 Submission from Meath County Council

5.2.2.1 Planning Submission

Meath forms part of the north-east waste management region and the site is located outside this region. The existing landfill capacity within the region can cater for any non-hazardous material generated in the region either at the Carranstown Incenerator or any other source.

Meath County Council would urge the Board, if it is minded to grant planning permission to be satisfied or that it be conditioned conditioned that

- Transport companies use major routes and avoid using the lesser status roads.
- All material associated with the thermal treatment process should be taken by enclosed sealed containers.

- A disposal method for excess leachate from the hazardous cells should be identified and an agreed method and location for its disposal documented.
- The activities from construction and operation do not impact on the water quality of the catchment.
- The proposal should not impact on air quality.
- In terms of roads, no objections are expressed nevertheless it is recommended that any increase in traffic on the R108 should be monitored. The applicant should also be conditioned to provide a Traffic Management Plan showing how it will prevent traffic from the facility turning right on the R 108 towards Meath.

5.2.2.2 Submission from the Environmental and Water Services Department

This submission does not address the site suitability, environmental or technical considerations of the application. An overarching aim of the Waste Management Plan seeks to strive for self-sufficiency in terms of waste management. The submission outlines the achievements in waste management policy to date.

In this regard bottom ash generated from incineration facilities should be viewed as a resource such as fill material beneath roads and paths etc. As relevant standards are not put in place it is suggested that this material could be stored. It is also noted that bottom ash can be used as an intermediate landfill cover. The above activities should be promoted over the disposal of the resource.

As this resource is generated in the north-east region it should be recycled/recovered within this region. The MEHL facility should accept ash from Poolsbeg.

In terms of hazardous ash the north-eastern region Waste Management Subcommittee agrees that there will be a need to direct such material to suitable facilities outside the region. This is deemed also to be in accordance with the National Hazardous Waste Management Plan.

5.3 Submissions from Other Observers

5.3.1 Submissions in Favour of the Proposed Development

Three submissions were received in favour of the proposed development from

- Indaver Ireland
- The Confederation of European Waste Energy Plants and
- Drogheda and District Chamber of Commerce.

The submissions argue that the proposal represents:

- Modern sustainable waste infrastructure necessary for the region

- Self-sufficiency and job opportunities
- Strategic infrastructure of national importance
- Infrastructure which is in accordance with the National Hazardous Waste Management Plan
- .It is noted that the Carrenstown thermal treatment plant will produce approximately 10,000 tonnes of hazardous ash. This is currently exported. Managing the waste in Ireland reduces the cost of the Irish industry and produces local employment opportunities.

5.3.2 Submissions against the Proposed Development

A total of 8 submissions against the proposed development were received from

- An Taisce (also a prescribed body in this instance)
- Jacqueline Yeomans
- Claire Moore
- Ben and Barbara Jones
- Aideen Marry
- Brigid and John Lenehan
- Martin and Miriam Moore
- Nevitt Lusk Action Group

It is proposed to summarise the issues raised in the observation under various headings set out below.

5.3.2.1 Environmental concerns in relation to the nature of waste to be deposited onsite

- An Bord Pleanala and the EPA are requested to seek further information regarding the possibility of chemically treating bottom ash to lower the hazardous and corrosive properties of the ash. In the absence of a current National Framework for treatment and disposal of municipal solid waste/incinerator ash best practice and best available technology for the disposal of bottom ash is a critical issue.

- The proposed method of treatment of any such ash should be available in the EIS for public scrutiny and this information should be made available for comment prior to any proposed oral hearing that may be convened by An Bord Pleanala.

- Municipal waste incinerator bottom ash in its raw state contains a proportion of chemical constituents such as calcium-oxide and sodium hydroxide which constitute dangerous substances as defined by the Dangerous Substance Directive and are deemed to be eco-toxic. No National Plan exists for the treatment of bottom ash at source to neutralise these properties and to render it safe for landfilling. Untreated bottom ash will react with air and water and this should not be disposed of directly to landfill - without prior treatment.

- Untreated bottom ash can give rise to high temperature build-up which in turn can result in destruction to protective plastic and clay liners and associated pipework. As a result leachate will be released polluting groundwater.

- Bottom ash can also give rise to the emission of noxious gases including hydrogen which is flammable and potentially explosive.

- The UK Government Agency directs all bottom ash to be treated prior to disposal. An onsite bottom ash treatment facility prior to landfill should be incorporated. In the case of Moneypoint individual lorry loads of bottom ash are exposed to the atmosphere for a period of 12 weeks where they gradually loose their corrosive properties. This however has caused serious environmental problems at Moneypoint. It is therefore suggested that the treatment of raw ash in this way is not acceptable at this location particularly having regard to the sites exposed position on elevated lands.

- The characterisation of bottom ash in the European Waste Catalogue and Hazardous Waste Lists under Code 100115 as non-hazardous does not imply that the ash is non-dangerous particularly in its untreated or semi-treated state.

- The facility would have serious detrimental effects on the growing of crops for human consumption.

- The proposed development could seriously affect the air quality of the area. One of the observers suffers from asthma.

- The landfill lining systems have only been in operation for the last 30 years therefore their performance is uncertain.

- The linings cannot guarantee 100% containment. Concerns that leachate could escape from the liner and heavy metals like led and cadmium could be released into groundwater. Landfill liners will eventually fail due to natural deterioration.

- While fly ash and flu gas residues are solidified prior to disposal, weathering and erosion over time will ultimately cause their release back into the environment.

- Landfills can give rise to significant gas build-up.

- Questions arise over whether or not the applicants can adhere to the highest safety standards.

- The applicant fails to address the primary requirement in consideration of hazardous waste – namely the elimination of waste in the first

instance. In locations where hazardous waste is created, the first often should be treatment or containment of waste onsite rather than the transportation of waste to another site for landfilling.

5.3.2.2 Long-Term Ownership and Management Issues Associated with the Facility

- Initially to be decided by means of a Strategic Impact Assessment is the question of ownership and management. There is a strong case for state ownership of the facility having regard to the long-term implications of the facility.

- Reference is made in one submission to the EPAs "Guidance on Environmental Liability and Risk Assessment". These Guidelines specifically relate to conditions for holding and granting a waste licence including financial assurances that the applicant will be able to maintain and secure the facility in terms of aftercare over a long-term period.

- Post closure maintenance and monitoring of the landfill will be necessary and details of this are not provided. In this regard reference is made to the recent fire at the abandoned landfill in Kerdiffstown Co Kildare.

5.3.2.3 Waste Management Policy

- No National Plan exists for the removal of any of these dangerous substances prior to landfill. The production of such a plan is common practice in neighbouring EU countries.

- The proposal would allow Indaver Ireland Ltd. to landfill its entire non-hazardous bottom ash residue in the Greater Dublin Region rather than in the north-east region (i.e. the facility at Carrenstown). This is contrary to current national waste disposal policy.

- No National Waste Management Framework exists to address the many and varied environmental, logistical and health and safety issues. Such a plan is subject to the SEA Directive and this has not yet been carried out by the state in accordance with EU requirements. The proposal is premature and if it were granted would contravene the EU SEA Directive.

- The site has the capacity to accommodate non-hazardous waste from the Carrenstown facility only. The Fingal County Council landfill at Nevitt has an EPA licence for the landfill of bottom ash from Poolsbeg. The assertion that the site will take the non-hazardous bottom ash from Poolsbeg is spurious. It would be more appropriate that non-hazardous waste from the Carrenstown incinerator would be accepted at the Kentstown landfill which is in the same region.

- A report on the national newspaper (see reference 4 of the Lusk Nevitt Action Group Submission) indicates that the Poolsbeg incinerator consultants are not disposed to send any ash to the MEHL facility. Thus the financial viability of constructing the facility to its finality (i.e. Phases 3 and 4) is questioned.

- Transporting the material from Cork or BelFosst may not be viable and the proposal may never go beyond Phase 1. The quarry therefore would not be properly infilled and this would have implications on the restoration and visual amenity of the area.

5.3.2.4 Hydrological and Hydrogeological Issues

- Major concerns have been expressed in relation to the hydrogeological suitability of the site in the submission from Fingal County Council. These have been detailed above in the report. A number of other issues in relation to hydrogeology and hydrology were made in submissions by a number of observers. These are summarised below.

- In terms of hydrology, investigations in the EIS reveal that the site is located above an important and extensive aquifer. This aquifer is located adjacent to the Bog of the Ring which is an important potable water supply source in the north Dublin area. The proposal represents a long-term hazard to the aquifer. The effectiveness of the barrier will disappear over time. Thus the proposal is not located in a sustainable location.

- The residents of Jordanstown (c.3 kilometres to the east of the site) have particular concerns regarding the stream which runs along the northern boundary of the site. This stream also runs through some of the farmlands in Jordanstown. Silt attributed to the quarrying activities on site blocked the stream under the M1 Bridge. It is suggested that if silt originated in the quarry can travel along the streambed hazardous waste could also be transported in this manner. The stream runs through active working farms.

5.3.2.5 Traffic Issues

- Plans for a new school are at an advanced stage to be situated at the five roads roundabout on the proposed truck route to the facility. Trucks containing hazardous waste will pass the entrance of the school. The road has no lighting or footpaths and is in a bad state of disrepair. The road would need a major upgrade if the development were to go ahead.

- Transporting hazardous waste outside the front door of a residential dwelling is deemed unacceptable.

- The transport of highly toxic carcinogenic material on inadequate roads is totally unacceptable from a health and safety prospective.

- The applicant has failed to justify or address the reasons for refusal for the location of the entrance under previous applications F08/A/749 and PL06F.230763.

- While there have been no accidents on the minor road which currently serves the site, there have been numerous accidents on the main road which runs along the southern boundary of the site.

- The relocation of the entrance will result in excessive amounts of spoil along the L01080 and will give rise to road safety concerns. There are many young families in the area. There are a large number of dwellings in the vicinity of the new entrance and this is not the case in relation to the existing entrance.

- The applicant has not considered alternative access arrangements.

5.3.2.6 Residential Amenity

- The noise generated from trucks passing in close proximity to residential dwellings will adversely impact on residential amenity.

- The air pollution from trucks travelling in close proximity to existing residential dwellings will adversely affect the residential amenities of the area.

- The proposal will devalue property in the area which will adversely impact on residential amenity.

5.3.2.7 *Development Plan Policy*

- The proposed development is contrary to the zoning objectives contained in the County Development Plan.

- The proposed development and in particular the construction of the silos associated with the solidification plant will impact on the visual amenity of the area and will be contrary to the zoning objectives in this visually sensitive area.

- While the backfilling of the existing quarry may be considered an appropriate development for an area zoned "high amenity", a toxic waste dump is not. The proposal would create a permanently contaminated site which is not in accordance with the high amenity zoning objectives for the site.

5.3.2.8 Health Issues

- No evidence has been provided which suggests that the long-term nature of the waste to be disposed at the site would not be harmful to human health.

- Studies have indicated that those living in close proximity to hazardous waste sites reported a higher risk of chromosomal abnormalities and congenital abnormalities. The applicants have been cavalier in their attitude to local people's health.

- The dust arising from activities on site could give rise to significant respiratory problems.

5.3.2.9 Ecology

- The proposed development could have a significant impact on the flora and fauna in the area.

5.3.2.10 Archaeology

- The name Hollywood is derived from pre-Christian times. It is not a Christian concept but is in fact a Celtic concept. Evidence was given at the oral hearing into the Newtownstown landfill that Hollywood could be an ancient royal site. It is disturbing that such an important Celtic site was not recognised or referred to in the EIS.

5.3.2.11 Other Issues

- The cumulative impact of an additional landfill next to the Fingal County Council facility can only be detrimental to the community at large.

- The proposed development will create very few jobs other than jobs associated with the construction phase.

- The entire basis on which infill development was originally accommodated on site was on the grounds that such a infill/landfill would be limited to inert material. The current proposal represents an entirely unjustified abrogation from the circumstances pertaining to the original application for landfill. The proposal would contravene the previous planning history and original EIS which sought permission for an inert landfill which would result in the reinstatement and integration with the existing landscape.

6 PLANNING HISTORY

The planning history associated with the site is set out in Section 1.2.3 of the EIS and details of each of the planning applications are contained in the Appendix of the Planning Report (Document 5 of 11) submitted with the original application. According to Section 1.2.1 of the EIS quarrying began at the Hollywood site in the late 1940s and Murphy Concrete Manufacturing (MCM) Ltd. took over operations in 1975. The main planning applications associated with the site is set out below.

Reg. Ref. 88A/32: Under this application planning permission was granted in June 1988 to infill, restore and reinstate that portion of the quarry which was excavated to that date. A 15 year permission was granted which expired in 2003.

Under **Reg. Ref. 88A/0032/E1** an extension was granted to the life of the permission for 18 months (to December 31st 2004) in order to give the applicant time to complete an EIS in line with the requirements of the EPA licence.

Under Reg. Ref. **F04A/0363** planning permission was granted for the infilling of the site with inert material for a period of 15 years at a rate of 340,000 tonnes per year (this limit is set out in the EPA licence). Planning permission was granted in October 2004.

Under **Reg. Ref. F07A/0262** planning permission was granted on 18th July 2007 to increase the rate of infilling to 500,000 tonnes per year.

Under **Reg. Ref. F07A/1241** Fingal County Council refused planning permission to relocate the primary entrance from the local road along the western boundary of the site (LP01090) to the road which runs along the southern boundary of the site (LP01080) as well as the construction of a new weighbridge, whealwash, single-storey administrative office building and proprietary wastewater treatment plant together with car parking etc. Fingal County Council refused planning permission for four reasons on 27th November 2007 on the grounds that

(a) The proposed development is not in accordance with the rural character of the area and would be suburban in nature which would materially contravene the zoning objective applicable to the site.

(b) The proposed development would have significant adverse impacts on the landscape and boundary character of the area.

(c) The proposed development would be seriously injurious to the residential amenity of adjacent dwellings through negative impacts of noise, dust and traffic generation etc.

(d) The applicant has submitted unacceptable proposals for the treatment of foul sewers associated with the development.

Reg. Ref. F08A/0749: Under this application planning permission was sought for essentially the same development to that sought under F07A/1241. On 7th August 2008 Fingal County Council again refused planning permission for the proposed development on the grounds that

(a) The proposed development was contrary to the zoning objective.
(b) The proposed development will injure the amenities of residents in the area and be visually obtrusive and
(c) There was an absence of information in relation to foul and surface water drainage.

The decision of Fingal County Council was the subject of a first party appeal to An Bord Pleanala under **PL06F.230763**.

An Bord Pleanala upheld the decision of the Planning Authority and refused planning permission for two reasons relating to zoning and that the applicant has not demonstrated that there is a need for the proposed new access or that the proposed access would not interfere with the safety and free flow of traffic on the public road.

7. ASSESSMENT

7.1 Introduction

I have read the entire contents of the file including the EIS and the documentation submitted with the EIS, I have read the entire transcripts of the oral hearing, had regard to all the submissions therein as well as submissions from prescribed bodies and the original written observations. I have also had regard to the various policy documents in relation to waste and in particular hazardous waste matters. I have visited the site and its surroundings and consider the following issues to be critical in determining the current strategic infrastructure development application before the Board.

- Strategic and policy context
- Waste classification and handling
- Site suitability assessment
- Geological and hydrogeological and hydrology issues
- Environmental concerns in relation to the nature of waste to be deposited on site
- Adequacy of the landfill liners
- Traffic and transport considerations
- Health and safety issues
- Residential amenity issues
- Site restoration and aftercare issues
- Other issues

7.2 Strategic/Policy Context

This section of the assessment will specifically address strategic considerations regarding hazardous waste and general waste management policy national, regional and local level. In assessing the site in strategic and planning policy terms I shall have regard to the following considerations.

- Compliance with The National Hazardous Waste Management Plan 2008
- Compliance The Technical and Economic Aspects of Developing a National Difficult Waste Facility
- Compliance with The Waste Management Plan for the Dublin Region 2005-2010
- Compliance with The proximity principle
- Compliance with The self-sufficiency principle
- Compliance with The polluter pays principle
- Requirement for a Strategic Environmental Assessment (SEA) of the National Hazardous waste Management Plan
- The absence of a national plan for the removal of dangerous substances from bottom ash
- Compatibility of development with the County Fingal Development Plan and in particular the zoning provisions set out in the recently adopted plan.
- General conclusions on strategic and policy considerations

7.2.1 The National Hazardous Waste Management Plan 2008-2012

This document was published by the EPA in accordance with Section 26 of the Waste Management Acts and Article 6 of the Directive 91/689/EEC which requires member states to make hazardous waste management plans. The current Plan (2008-2012) supersedes the original plan published in 2001. The Plan sets out guidance in relation to

- The prevention and minimisation of hazardous waste
- Improving collection rates for certain categories of hazardous waste
- Improving self-sufficiency in hazardous waste management
- The management of waste such as hazardous soils

Table 4 of the document sets out a summary of hazardous waste management from 2001 – 2006. It notes that in 2006 a total of 284,184 tonnes of hazardous waste was generated of which 134,904 tonnes (47%) was exported out of the country. Figures from the EPA National Waste Report 2009 (published in 2011) indicate that hazardous waste generation steadily rose from 2006 onwards before falling back in 2009 as Table 29 of the waste report (Page 45) indicates.

Year	2006	2007	2008	2009
Total hazardous waste produced	284,184	304,941	319,098	289,910
Tonnes of waste for export	134,904	147,542	157,207	150,395
Percentage exported	47%	48%	49%	52%

It is apparent from the above table that c.50% of waste was exported annually. The remainder of the waste was treated either on site at industry or off-site at an EPA licenced commercial landfill for either recovery or disposal.

Section 6.2 of the Plan acknowledges that a significant proportion of hazardous waste produced is exported. It is further acknowledged that in accordance with the provisions of the Waste Framework Directive, that Ireland should strive for greater self-sufficiency in hazardous waste management where it is technical or economically feasible. This approach recognises the proximity principle set out in the Waste Framework Directive. It seeks to ensure that overland and marine transport of hazardous waste is avoided. This has benefits in terms of safety and benefits in terms of the reduction of greenhouse emissions. The recommendation to strive for greater self-sufficiency is intended to maximise the treatment and disposal of hazardous waste in Ireland.

In this regard the National Plan recognises three overarching strategic needs if additional hazardous waste is to be treated in Ireland and if export is to be avoided. The most important of which for the purpose of this application is

"Development of landfill capacity to manage non-recoverable and non-combustible hazardous waste and residues including asbestos".

It is further noted in the Plan that such infrastructure should be "provided by a private organisation or through public private partnerships". The NHWMP is unambiguous in its recommendation on Page 69 that "at least one hazardous waste landfill be developed in Ireland, capable of accepting a wide range of hazardous wastes that would otherwise be exported for landfill. This facility would be expected to provide a key national service and should have an available capacity of at least 25,000 tonnes per annum". The hazardous waste capacity at the development amounts to 1.7355 million cubic metres over a 25-year period and this amounts to a capacity of just under 70,000 cubic metres per year. Based on a rate of 1.75 tonnes per cubic metre the tonnage that could be accepted at the facility on an annual basis is c.120,000 tonnes.

It is also suggested within the Plan that a national facility should be situated on a site good transport links. The appeal site is located generally in close proximity to the Poolbeg and Carranstown thermal treatment facilities and is in close proximity to the M1 motorway. It is also suggested in the National Plan that the facility could be co-located within an existing landfill or landfill facility in order to utilise existing infrastructure. The Board will note that the current facility accepts inert waste and therefore landfilling has been established on site.

The National Plan also states that it is further recommended that at least one other non-hazardous landfill facility be authorised to accept construction materials containing asbestos. Such a facility would be expected to provide at least a regional service to supplement a region or regions that are more distant from a national facility. It is not proposed to accept asbestos waste at this facility however a current application under the Strategic Development Act PA0019 were an extension of a landfill facility at Knockharley in Kentstown, County Meath proposes to accept asbestos waste.

In relation to contaminated soil, the Plan states that the actual scale of future arising's is unknown.

Recommendations 20 and 21 of the National Hazardous Waste Management Plan seek to commission a study in 2009 to clarify the technical and economic aspects of providing a hazardous waste landfill.

Recommendation 21 seeks to keep under review the provision of hazardous waste landfill capacity, taking into account any recommendations that can be made in the EPA study, consider the use of appropriate economic or other instruments to ensure that such capacity is provided whether by the private or the public sector by 2012.

It is apparent therefore that the National Hazardous Waste Management Plan seeks to reduce the exportation of hazardous material in accordance with the wider European waste objective of promoting self-sufficiency within member states. In this end the Plan recommends the provision of at least one hazardous waste landfill be developed in Ireland with an annual capacity of at least 25,000 tonnes. The National Hazardous Waste Management Plan offers no guidance in relation to appropriate location of such a facility however there can be little doubt that the facility in question would be in accordance with the broad locational requirements being close to a good road network and near sources of hazardous waste generation (this issue is dealt with in more detail below). The proposed development would therefore be in accordance with the main policies and provisions in relation to hazardous waste as set out in the National Hazardous Waste Management Plan.

7.2.2 The Regional Waste Management Plan for Dublin 2005-2010

This document was due to be reviewed by November 2010 in accordance with Section 22(4) of the Waste Management Act. The review of this Plan has not taken place at the time of writing this report. This fact was confirmed by the evidence of Mr. John Daly, an Engineer with Fingal County Council and also member of Dublin Waste Management Steering Committee on Day 1 of the Oral Hearing. In relation to the 2005 Plan there is no specific section in the Plan addressing the issue of hazardous landfilling of waste. Table 18.5 of the Regional Waste Management Plan sets out proposed infrastructure requirements for the Dublin region. In terms of infrastructure, reference is made to the provision of one hazardous waste landfill cell. Table 18.5 indicates the capacity of the hazardous cell is not known. It is acknowledged in the Waste Management Plan

that such a facility is required by the National Hazardous Waste Management Plan. It is anticipated that the local authority will lead the project by way of a feasibility study but it is not known whether the project will be developed by public, private or public private partnerships at this stage.

I do not consider that the current proposal in any way contravenes the above statements contained in the Waste Management Plan for the Dublin region 2005-2010.

7.2.3 Technical and Economic Aspects of Developing a National Difficult Waste Management Facility (July 2010)

This study was commissioned on foot of Recommendation No. 21 of the National Hazardous Waste Management Plan. The report details hazardous waste arising's in both Ireland and Northern Ireland and notes that a biomass incinerator based in Glenavy, Antrim is currently at planning stage. It also notes that the operators of the Poolbeg incinerator intend to export ash and flu gas residue to mainland Europe for treatment. Projected flu gas residues set out in Table 21 of the report is as follows:

Carranstown	3,500 – 5,000 tonnes
Poolbeg	24,000 tonnes
Ringaskiddy	6,900 tonnes
Glenavy, County Antrim	c.40,000 tonnes
Total	c.75,000 tonnes

The Board will note that the figures presented in this report are slightly at variance with the figures presented in Table 2.5 of the EIS which indicates the total projected gas flu residues at 86,640 Tonnes. It is important to note that in the NaDWaF document flu gas treatment residues at the Poolbeg incinerator are to be exported. The hazardous waste quantities set out in Section 2.7.2.1 of the EIS includes residues from the Poolbeg incinerator. I note the Board's Order in the case of Ref. 29S EF2022 with relates to the Poolbeg Incenerator (19th November 2007) states that:

'*This approval does not include approval for the incineration or thermal treatment of sewage sludge or for the disposal or treatment of residues including bottom ash other than by export as indicated in the application.*

Reason: It is considered that the application does not include the incineration of sludge or any alternative treatment or disposal of residues and to clarify any ambiguity which may arise in relation to the interpretation of this approval'.

It appears therefore that as it stands the conditions attached to 29S EF 2022 required that ash generated by the Poolbeg incinerator is required to be export. It is assumed that this condition was derived from the fact that no facility existed at the time to specifically facilitate such residues (the decision of 29S EF 2022 was prior to the granted of the Fingal Landfill project which was also licenced to accept bottom ash).

I consider that the operators of the Poolbeg incinerator could re visit the issue of exporting ash, if treating it within Ireland was deemed to be more commercially viable. I cannot envisage why any application to treat the incinerator ash from Poolbeg within Ireland would be refused on policy grounds. In fact any future commitment to landfilling such ash in Ireland rather than exporting it would be fully in accordance with the provisions of the NHWMP.

In terms of the non-hazardous ash arising's the NADWAF projects that the four incinerators will produce annual amounts of bottom ash amounting to 213,000 tonnes. Table 2.7 of the EIS suggests that the total amount of non-hazardous ash amounts to 261,000 tonnes. (However this figure also includes boiler ash). The NADWAF report suggests that other hazardous waste streams are too difficult to predict.

In terms of hazardous waste to be landfilled the NADWAF report states (Page 55) that the total aggregated prediction will be as follows (average per year).

2008-2013	2014-2019	2020-2025
216,534	277,139	306,526

The NADWAF (Chapter 8) highlights the fact that the stabilisation/solidification process involved flu gas residues will increase the weight of the material to be landfilled by a factor of 1.5-2.

Table 37 of the report outlines a total estimated annual hazardous waste landfill tonnage predicted on the baseline predicted model (post treatment).

2008-2013	2014-2019	2020-2025
257,000	235,000	185.000

It appears therefore that over time the treatment to be undertaken processing the hazardous waste will result in less waste being rendered hazardous and therefore the overall predicted hazardous waste will be reduced.

In terms of the technical and operational requirements and in particular liner design of any hazardous waste cells, the NaDWaF report states that where a geological barrier does not meet conditions set out in the Landfill Directive it can be completed artificially and reinforced by other means giving it equivalent protection. The issue of the suitability of the landfill liner will be dealt with futher in my assessment.

In terms of an all-Ireland facility it is noted that the acceptance of waste from Northern Ireland could increase the viability of an all-Ireland solution to hazardous waste management. However it is stated that a hazardous waste facility in the Republic is not critically dependent on receiving hazardous waste from Northern Ireland.

In terms of site selection, the NaDWaF report recommends that a study be undertaken to ascertain the availability of appropriate sites on the Island of Ireland including the potential for collocation. Section 3 of the EIS specifically deals with alternative sites which includes a site suitability study. The site suitability subject is the subject of a separate heading in this assessment. The benefits and disbenefits of co-location is set out in Table 48 (Page 155) of the NaDWaF report.

The NaDWaF report also recommends that a socioeconomic assessment of the proposed development be undertaken in assessing alternative sites and in the case of a hazardous landfill, a Health Impact Assessment should also be undertaken. A Health Impact Assessment did form part of the EIS.

I consider that the proposed development generally conforms with the main provisions set out in the NaDWaF report. The NaDWaF report sets out some estimation in relation to future hazardous waste projections. While the projected flu gas residues set out in the NaDWaF report is below the capacity of the MEHL Landfill, allowance should be made for the fact that the hazardous waste accepted on site will increase in weight and bulk due to the solidification process. The facility will also accept contaminated soils which may be classified as hazardous depending on their makeup. Forecasting future waste arising's of contaminated soil is difficult as it is project specific.

The EPA National Waste Report provides more up to date figures regarding hazardous waste production in Ireland. 2009 indicated again that approximately 50% of hazardous waste was exported in Ireland and in the case of 2009 this amounted to 150,000 tonnes. Residual waste which was not exported was either treated within the facility producing the hazardous waste or was sent to an EPA licenced treatment facility within the country. It would appear therefore based on the figures presented that the MEHL facility's capacity to accommodate c.120,000 tonnes of hazardous waste per annum may be below the current level of waste generated for export. However it should be kept in mind that not all hazardous waste arising's in the country will be accepted at the facility (for example asbestos waste is not to be accepted at the MEHL facility) and that improvement treating hazardous waste which will render less waste as being classified as hazardous will in the long-term reduce the exportation of hazardous waste. Furthermore the facility's capacity to accommodate c.120,000 tonnes per annum is well in excess of the requirements set out in the National Hazardous Waste Management Plan which seeks a facility to landfill at least 25,000 tonnes of hazardous waste per annum.

One thing is clear from the statistics and literature available in relation to hazardous waste; namely that it is difficult to accurately estimate quantities of future hazardous waste arising's which will specifically need to be landfilled. No doubt however that the proposed MEHL facility would play a significant role in terms of providing an alternative exporting such waste.

7.2.4 The Proximity Principle

The proximity principle has been enshrined in various waste policy directives and guidance. Article 16(3) of the Waste Directive 2008/98/EEC states that the *'(waste) network shall enable waste to be disposed of or waste referred to in Paragraph 1 to be recovered in one of the nearest appropriate installations, by means of the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health'*.

Nationally the proximity principle is incorporated into the National Waste Document entitled "Taking Stock and Moving Forward" (April 2004) which in terms of waste planning seeks to "*respect the proximity principle which encourages the management of waste in close proximity to the location of its production*".

The recently amended Section 22 of the Waste Management Act 1996, specifically states in subsection (2)(c)(iv) that any plan for hazardous waste *'meet the principles of self-sufficiency and proximity set out in section 37A'*.

A more flexible approach in relation to the proximity principle was incorporated in Government Circular WIR04/05. While the proximity principle primarily accepts that facilities provided in a region must deal primarily with the waste from that region, it also recognises that an unnecessarily restrictive approach may not be in-keeping with the philosophy underpinning the regional approach to waste management planning and by implication the rational use of waste management infrastructure.

The applicability of the proximity principle to the facility in question should be assessed in the context of both hazardous waste and non-hazardous waste (including inert waste).

In the case of hazardous waste, the facility proposed in this instance would provide first large scale national facility to accommodate such waste. In this regard the Island of Ireland could be seen as a region as a whole, and the location of a facility within this region would adhere to the proximity principle as it would negate to need transport hazardous waste overseas. According to the information contained in the EIS, the facility will take hazardous waste from the three incinerators south of Ireland and the planned incinerator in the north at Glenavy, County Antrim. In terms of accessibility and location it could be reasonably argued that the site is well suited to take hazardous waste from these three facilities in that

- The facility is located to c.35 kilometres from Poolbeg and is easily accessible via the Port Tunnel and the M1. It is acknowledged however that currently it is intended that all ash generated at the Poolbeg incinerator will be exported overseas. It is assumed however that this policy could be revisited on economic grounds in light of any proposed facility landfill hazardous waste in close proximity.

• The facility is located c.17 kilometres from Carranstown incinerator at Duleek and again is easily accessible via the existing road network including the M1 and the R108.

• The facility is located approximately 140 kilometres from Glenavy in County Antrim and again is easily and directly accessible via the A26/A3/M1 road network.

• While the facility is approximately 300 kilometres from Ringaskiddy, County Cork it should be noted that the entire route with the exception of the first 2-3 kilometres at either end of the journey accessible along the national primary road network and the vast majority of this network comprises of motorway.

In terms of location therefore the MEHL facility has inherent advantages in that it is located in close proximity to two incinerators and can be argued is optimally located between the other two facilities in Cork and Antrim. Just as importantly, access to the site can be facilitated in the case of all four facilities with a good motorway network. This issue was important in terms of road safety and has the added advantage that trucks carrying both hazardous and non-hazardous wastes will not travel adjacent to dwellings while on the motorway network. In national strategic terms the site is well located to accept hazardous waste having particular regard to the centres of hazardous waste production and road transport infrastructure between the site and the hazardous waste production centres. Even if hazardous waste from the Poolbeg incinerator were to be continued to be exported it could still in my view be argued that the site is appropriately located in terms of a single all-Ireland facility to accept hazardous waste.

In terms of non-hazardous waste the proposal would obviously have the same benefits as set out above. However the proximity principle in terms of regional waste management plans would be an important consideration as there are many other landfill facilities in the Island of Ireland which may also be suitable to accommodate non-hazardous waste material such as bottom ash within their own waste management area. While Table 2.7 of the EIS sets out the projected non-hazardous waste arising's from the four incinerators, the EIS also notes that "the quantities and sources of contaminated soil and other non-biodegradable non-hazardous waste other than non-hazardous incinerator ash are not possible to predict with any level of certainty. Likewise the quantity and sources of non-biodegradable inert wastes are difficult to predict'.

It should also be borne in mind that the existing facility has permission and a licence to fill 500,000 tonnes of inert waste. This amount is not proposed to change under the current application.

A total of 261,000 tonnes of ash are projected to be produced on an annual basis from the four plants referred to. It could be argued that the acceptance of all this non-hazardous ash at the proposed facility would be contrary to the proximity principle having regard to the fact that, with the exception of Poolbeg, all the other incinerators are located in different waste management regions. A question

arises however as to whether or not other landfills being specifically licenced to accommodate non-hazardous bottom ash. In the Dublin waste management area, the Nevitt Tooman Landfill has been licenced to accept bottom ash. In the case of the Carranstown incinerator, it is located in the north-east waste management region, and there is a current application before the Board under PA0019 for an extension of the landfill at Knockharley, Kentstown. The EIS for this application indicates (Section 2.2.3.5) that it is proposed to take up to 50,000 tonnes of non-hazardous bottom ash. Presumably this bottom ash will be sourced at the Carranstown facility. The Board will note that the landfill at Knockharley is in fact closer to the Carranstown facility than the MEHL facility (Although on a national basis the difference is negligible, the Knockharley facility is approximately 10km from the incinerator in Carranstown. The MEHL facility is approximately 19 km. It could also be argued that the transportation of waste is more appropriate between the Carranstown and the MEHL facility because much of the transport route is along the M1. The most direct route between Carranstown and Knockharley is along Regional Routes (R152 and R150 and the former N3 alignment) and would necessitate transporting the waste through Duleek village). It should also be acknowledged that the Knockharley facility is within the same waste management region as the Carranstown facility. No information is currently available as to whether or not any landfill facilities in Northern Ireland are specifically licenced to take non-hazardous bottom ash. It appears therefore that in relation to bottom ash there may be a number of facilities which are already licenced or are in the process of seeking to obtain a licence which may be better suited than the MEHL facility to accommodate bottom ash however it should be borne in mind that presently there appears to be no alternative to landfilling bottom ash presently in Ireland. No policy documents have been put in place for the reuse of bottom ash. Unlike municipal solid waste and biodegradable wastes, there is at present no policy objective in place which seeks to reduce the reliance on landfilling of bottom ash waste. It could therefore be argued that the provision of numerous facilities for the acceptance of non-hazardous bottom ash would not be contrary to the proper planning or sustainable development of the area. Furthermore having regard to the close proximity of Kentstown, the MEHL facility and the proposed Tooman Nevitt Landfill, the provision of non-hazardous bottom ash cells in each of the facilities not result in any significant transportation costs and therefore could be argued would not intervene in any material manner the proximity principle.

7.2.5 The Self-Sufficiency Principle

The principle of self-sufficiency in waste management is again enshrined in Article 16(2) of the Waste Directive 2008/98/EEC states that '*the (waste) network shall be designed to enable the community as a whole to become self-sufficient in waste disposal as well as in the recovery of waste referred to in Paragraph 1, and to enable member states to move towards that aim individually, taking into account geographical circumstances on the need for specialised installations for certain waste types'*. This principle was subsequently enshrined in the National Hazardous Waste Management Plan where it is stated Policy in self-sufficiency is recommended. In this regard Page 69 of the Plan specifically states that "*it is recommended that at least one hazardous waste*

landfill be developed in Ireland capable of accepting a wide range of hazardous wastes that would otherwise be exported for landfill.'
Again I would reiterate for the purposes of self-sufficiency that the recently amended Section 22 of the Waste Management Act 1996, specifically states in subsection (2)(c)(iv) that any plan for hazardous waste *'meet the principles of self-sufficiency and proximity set out in section 37A'*.

The environmental benefits of achieving self-sufficiency among member states include:

- A reduction in the risk of spillage on land or at sea in the transportation of waste
- Reduction in greenhouse emissions due to the transportation of waste
- Provision of security of supply particularly for disposal outlets of hazardous waste.

It is therefore apparent that the proposed hazardous waste facility is fully in accordance with the self-sufficiency principle.

7.2.6 The Polluter Pays Principle

Again I would refer the Board to the Waste Framework Directive and in particular Article 14 of the above Directive (2008/98/EEC). It states that in accordance with the polluter pays principle, '*the costs of waste management shall be borne out by the original waste producer or by current or previous waste holders'*. As waste is being produced in Ireland it is appropriate and in accordance with the above principle that the waste producer and in this instance the waste holder pay the costs of appropriately disposing of the waste. Ensuring that the cost of disposal is born by the waste holder implies that the long-term aftercare of the facility needs to be considered in the charges levied by either the EPA or the Planning Authority or both.

7.2.7 The Requirement for a Strategic Environmental Assessment of the National Hazardous Waste Management Plan

An observation submitted by the Nevitt Lusk Action Group (NLAG) argues that no National Framework exists to address the many and varied environmental, logistic and health and safety issues arising from the proposed development. The National Hazardous Waste Management Plan therefore should be the subject of a Strategic Environmental Assessment. It is further argued that a hazardous waste landfill is premature in this regard and were it granted it would contravene the EU SEA Directive.

The EU Directive 2001/42/EEC provides that a strategic environmental assessment must be carried out on certain plans and programmes including County Development Plans and National Plans. In November 2004 the DoEHLG published Guidelines for local authorities on implementing the SEA Directive. Section 1.7 of the Guidelines state that SEA is the formal, systematic evaluation

of the likely significant environmental effects of implementing a plan or programme before a decision is made to adopt the plan or programme.

This process includes preparing an environmental report where the likely significant environmental effects are identified and evaluated. This in turn involves:

- Consulting the public, environmental authorities, and any EU state affected by the environmental report and draft plan or programme.
- Taking account of the findings of the report and the outcome of these consultations and whether or not to adopt or modify the draft plan or programme.
- Making known the decision on the adoption of the plan or programme and how the SEA influenced the outcome.

It appears from Section 1.5 of the National Hazardous Waste Management Plan that a
Strategic Environmental Assessment was carried out in relation to the Plan. It is apparent from the EPA website that this plan was presented for public consultation alongside the proposed National Hazardous Waste Management Plan. A copy of the SEA report is attached (see Plans and Documents attached to this report) and includes the following information.

- A summary of how environmental considerations have been integrated into the Plan on foot of public consultation. Issues addressed included
- Prevention of hazardous waste
- Transport and collection of hazardous waste for households
- The reliance on export of hazardous waste to other countries and this was seen as a strategic weakness. Thus improving self-sufficiency within the country was considered a major consideration.
- The SEA addressed further issues in relation to enforcement legislation, infrastructure, planning and implementation etc.
- Countries which currently received hazardous waste from Ireland were also notified of the Plan.

Section 4 of the SEA indicated how environmental considerations and the various consultations have been taken into account in adopting the National Plan. A summary of the preferred option on foot of the SEA is set out in Table 3 of the SEA. In terms of co-locating hazardous waste disposal cells it is contended that any proposal could have a neutral impact in terms of water, air, soil and human health. The disposal facility would have a positive impact on climate, material assets and transport. Impacts in terms of biodiversity could be considered positive or negative.

In my opinion therefore the SEA process as carried out has evaluated the potential environmental impacts albeit positive, negative or neutral in the preparation of the National Hazardous Waste Management Plan. Table 5 of the SEA indicates how environmental considerations have been taken in account in the Plan. Section 5 sets out the reasons for choosing the adopted Plan. Section 6

and Table 6 set out details for the environmental monitoring of the Plan. Having consulted the SEA I am satisfied that the potential environmental issues have been identified and appropriate consultations have taken place and potential significant environmental impacts of the Plan have been identified and that any preferred option in relation to the National Hazardous Waste Management Plan was prepared on foot of this evaluation. The Strategic Environmental Assessment of the National Hazardous Waste Management Plan therefore has been prepared in accordance with the provisions of the Directive.

7.2.8 Absence of a National Plan for the Removal of Dangerous Substances from the Bottom Ash

This issue was again raised by the Nevitt Lusk Action Group. It states that municipal waste incineration bottom ash in its raw state contains a proportion of chemical constituents such as calcium oxide and sodium hydroxide which renders the raw untreated ash a dangerous substance as defined in the Dangerous Substance Directive. The ash in its raw fresh state is deemed to be corrosive and irritant and therefore eco-toxic. The issue of the toxicity and corrosiveness of bottom ash is dealt with further on in this assessment. It is not considered that a National Plan is required for the removal of any such dangerous substances from the bottom ash. If it were deemed appropriate bottom ash could be treated to reduce the alkalinity and PH value perhaps if it was to be reused for construction purposes. Any such treatment would not require the preparation of a National Plan in my view.

It is clear from the information contained in the European Waste Catalogue and Hazardous Waste List that bottom ash can be classified as both a hazardous and non-hazardous substance (see Code 100114 and 100115 of the waste classification code). Where bottom ash is classified as either hazardous or eco-toxic would be required to be treated accordingly and as such would be required to be placed within the hazardous landfill cells as opposed to the non-hazardous landfill cell. It would be a requirement that all waste accepted at the facility would be classified in accordance with Council Decision 2003/33/EEC and the recently adopted Waste Regulation SI126 of 2011.

7.2.9 Zoning provisions

It is argued that the proposed development is contrary to the zoning provisions contained in the Development Plan. The new Fingal County Development Plan came into effect on 20th April 2011. The site is zoned HA – *'to protect and improve high amenity areas'*.

Under the zoning objective waste disposal and recovery facility is not permitted. The Board will note that the previous Development Plan (2005-2011) did not have any specific statements under this zoning objective in relation to waste facilities. The application was lodged with An Bord Pleanala under the life of the previous plan and thus when lodged did not contravene the zoning provisions of the then plan.

It is apparent therefore under the recently adopted Plan that a waste disposal and recovery facility would not be permitted in accordance with the land use zonings. The Board will note that during the course of the oral hearing Fingal County Council did not express any concerns in relation to the proposed development being contrary to the zoning objectives contained in the then draft Development Plan. Its concerns were primarily predicated on hydrogeological concerns.

In relation to zoning issues it is also important to point out that the application is not a new facility proposed on a Greenfield site. A landfill facility is already in operation on the lands in question. Under the current application it is only proposed to change the nature of the waste being deposited onsite. The use in question is in conformity with all relevant planning permissions and licences previously issued. I have also argued above that the proposed development would not adversely impact on the visual amenities of the area and as such would not in my view in any way devalue the high amenity status afforded to the site over and above that which already exist onsite.

Finally in relation to the zoning issue the proposed development constitutes a strategic development in that it comes within the scope of the seventh schedule and Section 27A(2)(a) of the Strategic Infrastructure Act 2006. Having regard to the strategic nature of the development the Board would not be constrained by the zoning provisions contained in the Development Plan.

Therefore having regard to the established use on site and the strategic nature of the development the Board should in my view consider granting planning permission for the proposed development notwithstanding the fact it contravenes the zoning objective for high amenity areas set out in the recently adopted Fingal County Development Plan.

7.2.10 General Conclusions in relation to Strategic and Policy Considerations

Overall therefore I would conclude that the proposed development is in accordance with national and wider European based policies in relation to self-sufficiency, proximity and polluter pays principles. Furthermore the proposed development is fully in accordance with the recommendations set out in the National Hazardous Waste Management Plan and the NADWAF report, both of which seek to provide at least one national hazardous waste landfill facility on the Island or Ireland.

While future hazardous waste arisings are difficult to forecast, there can be little doubt that the capacity at the proposed landfill will go a considerable way to accommodating hazardous waste which up until now has been exported abroad. Having regard to the fact that the NHWMP seeks a landfill with a capacity of only 25,000 tonnes (minimum). It would seem unreasonable in my view to refuse permission for a proposal with an annual capacity of almost 5 times this amount on the grounds that there insufficient capacity at the facility. Other facilities may come on line for the acceptance of bottom ash. Any over- supply in the capacity of bottom ash is not a significant issue in my view as there are no policies to reuse this material at present for construction purposes and any acceptance of

bottom ash at the facility will not result in any increase in the volume of waste over and above that permitted at the facility.

In terms of its strategic location facility located in close proximity to two of the municipal incineration facilities Carranstown and Poolbeg and is equi-distant between planned facilities at Ringaskiddy and Glenavy in County Antrim. Finally a good national road network links the MEHL facility the various incineration facilities referred to above.

7.3.0 Waste Classification, Acceptance and Handling Procedures

As evidenced in the written submissions and highlighted throughout the course of the oral hearing there are some concerns in relation to the classification, acceptance and handling procedures to be incorporated during the day-to-day running of the facility. For this reason it is considered appropriate outline what is involved in relation to the day to day handling of waste at the facility.

7.3.1 Waste Classification

Waste will be classified as hazardous, non-hazardous and inert in accordance with the procedures set out in Council Decision 2003/33/EEC. The Council decision establishes criteria's and procedures for the acceptance of waste at landfills pursuant of Article 16 and of Annex 2 of the Landfill Directive 1999/31/EEC. Under this Council Decision limit values are set out for each of the waste types (hazardous, non-hazardous and inert wastes). These details are set out in the Annex attached to the Decision (see Folder 1 Section 9 for full copy of Council Decision 2003/33/EEC). Article 3 of the Decision states that member states shall ensure that waste is accepted at a landfill only if it fulfils the acceptance criteria of the relevant landfill class as set out in Section 2 of the Annex to the decision.

Section 1 of Annex 2 of the Decision sets out the procedures for the acceptance of waste at landfills. In terms of waste characterisation it states that the producers of the waste or, in default, persons responsible for its management, are responsible for ensuring that the characterisation information is correct. The basic requirements of characterisation is set out in Section 1.1.2 of the Decision. Waste regularly generated in the same processes can, over a period of time be considered characterised and shall be subject to compliance testing only, unless significant changes in the generation process occurs.

7.3.2 Waste Acceptance

Each load of waste delivered at the landfill facility shall be visually inspected before and after unloading. All required documentation will be checked at the landfill. Waste may be accepted at the landfill if it is the same as that which has been the subject to the basic characterisation and compliance testing as described above. The Decision makes it clear that if this is not the case the waste must not be accepted. Member states shall determine the testing requirements for onsite verification including where appropriate rapid test methods. Upon delivery

samples shall be taken periodically. The samples taken shall be kept after acceptance of the waste for a period that will be determined by the member state (not less than one month). A full copy of Decision 2003/33/EEC is contained in Appendix 9 of the applicant's submission at the oral hearing and is briefly summarised in the appendix 4 attached to this report.

The European Communities (Waste Directive) Regulations 2011 (enacted on March 31st 2011) sets out details in relation to waste handling procedures nationally. These Regulations support and are in accordance with Council Decision 2003/33/EEC. The more important points contained in the Regulations context of the current application before the Board are outlined briefly below.

Section 15 of the Waste Management Act 1996 is amended in that waste operators which collect or transport waste on a professional basis including those which produce hazardous waste, shall be the subject of appropriate periodic inspections by local authorities, the EPA and Dublin City Council where appropriate. Inspectors concerning the collection and transport operations shall cover the origin, nature, quantity and destination of all waste collected and transport. Section 15(2) of the Waste Management Act is also amended by making specific reference to monitoring and control and inspecting hazardous waste facilities. It states that the producers of hazardous waste and the establishment and undertakers which collect or transport hazardous waste on a professional basis or act as dealers or brokers of hazardous waste shall keep a chronological record of the quantity, nature and origin of the waste and where relevant the destination, frequency of collection and treatment methods foreseen in respect of waste shall make that information available on request to local authorities, the EPA or Dublin City Council as appropriate. In terms of hazardous waste, the record shall be preserved for at least three years and in the case of transporting the wastes records will be kept for at least 12 months.

Article 29 of the Regulations specifically relates to the classification of waste. It states that any list of hazardous waste shall take into account the origin and composition of the waste and where necessary the limit values of the concentration of hazardous substances. 29(4) specifically states that the reclassification of hazardous waste to non-hazardous waste shall not be achieved by diluting or mixing the waste the aim of lowering the initial concentrations.

Articles 32 and 33 specifically seek to protect human health and the environment in the treating and control of waste and require that the storage and treatment of waste be carried out in a way to protect the environment and human health to ensure traceability from product to final destination. Article 35 requires that all hazardous waste is appropriately labelled and accompanied by an identification document.

Articles 44 and 45 require establishments dealing with hazardous waste to be subject of appropriate inspections recordkeeping.

Article 46 permits authorised persons to halt proceedings at waste facilities on the grounds that the facility may pose a risk of pollution. Enforcement

proceedings and measures and penalties are set out in the subsequent articles of the Regulations.

Thus various issues raised by observers in relation to the handling, labelling and classification of waste were adequately addressed in the legislative provisions both at EU level and the recently enacted National Waste Regulations. In this regard it is important to highlight the following:

- All waste arising at the MEHL site will have been classified, will have been subject to basic characterisation, verification and compliance testing prior to arriving onsite. This unclassified waste will not be accepted, stockpiled or stored onsite awaiting any such testing or classification.

- Clear and ambiguous parameters are set out in Council Decision 2003/33/EEC as to what constitutes hazardous, non-hazardous and inert waste for the purpose of classification. Thus the scope for incorrectly identifying or mixing up waste significantly reduced.

- Article 34 of SI 126 2011 expressly prohibits the mixing of hazardous wastes. Thus the potential for chemical reactions within waste cells is virtually eliminated. This concern was expressed by NLAG during the course of the oral hearing.

- Article 35 of the same Regulations requires that there is a legal onus on the waste producers to take necessary measures during the course of transport and the temporary storage of hazardous wastes that these wastes must be packaged and labelled in accordance with international and commission standards that all wastes shall be accompanied by appropriate documentation.

- The Regulations and various articles also ensure that the waste handling process will be transparent and traceable throughout the production, transportation and disposal of waste.

- Article 33 specifically requires the production, collection and transportation of hazardous waste together with its storage and treatment shall be carried out in such a way to afford protection to human health and the environment. This legislation will prohibit against any spillage of such waste through the tailgates of trucks through any other means transporting the waste to the MEHL facility. This is another significant concern raised by the NLAG Observers.

- Finally legislative provisions are in place to ensure that appropriate recordkeeping of all waste handled at the MEHL facility and that legislative powers are enacted in relation to the monitoring, inspecting and enforcement of the legislation including severe penalties should the need arise. The most appropriate procedures are in place in relation to classifying, labelling, transporting, handling and inspecting of waste. I further note that there have not been any enforcement proceedings against the applicant to date in relation to planning or waste licencing matters. This point was alluded to on a number of occasions throughout the oral hearing and was again referred to in the closing

submission on behalf of the applicant. Based on the applicants record to date I have no reason to believe that the applicant will not continue to fully adhere to the legislative requirements set out regarding the acceptance and handling of waste on site.

7.4 The Issue of Site Selection and Alternatives

Observations by both Fingal County Council and third party observers both express concerns in relation to the methodology employed in the site selection process. The main issues raised were as follows:

- The site selection process failed to consider a Greenfield site.
- The site selection process did not place appropriate waiting on hydrogeological issues.
- The site selection process did not place appropriate emphasis on the EPA draft manual on site selection.
- The site selection process "mixed and matched" the site selection criteria to portray the MEHL site in the most positive light.
- The Knockharley site and the Tooman Nevitt site should have been scored more highly in the site selection process.

7.4.1 Background to the Site Selection Process

The methodology employed in the site selection process is set out in Appendix A3.1 of the EIS and in the statement of evidence presented at the oral hearing by Ms Louise O'Donnell (see Section 3 of applicants submission in Folder 1 attached).

The methodology employed referred to various planning documents including:

- The EPA Manual on site selection and landfills (consultation draft 2006)
- The BAT guidance notes and landfill activities (2003)
- The WHO – site selection for new hazardous waste management facilities (1993)
- The Landfill Directive 1999 (the New Zealand Ministry for the Environment and Landfill Acceptance Criteria for Wastes and Hazardous Properties) 2001.

The initial stage of the Study sought to consider Greenfield sites. The Study makes reference to various national documents which in turn reference the benefits of co-locating the hazardous and non-hazardous waste infrastructure. For this reason it appears that Greenfield sites were excluded in the overall assessment at this initial stage.

The assessment then confined itself to existing landfill sites in Ireland. Level 1 of the assessment involved evaluation of existing landfill sites in Ireland. The Study did not include within its scope waste licence review applications which are subject to assessment/decision by the EPA. Landfill sites which are restricted to site restoration and closure activities only or which were reported as closed were also deemed to be unsuitable. On foot of this a total of 39 sites were selected.

Level 2 of the site selection process involved the application of five tests to each of the landfills. The tests related to the following:

- Does the site have an existing landfill operating licence
- Is the site positioned within a reasonable distance of key hazardous waste generation corridors (Dublin, Cork, Belfast)
- Does the site have the potential capacity
- Is the site permitted to construct and operate engineered landfills
- Is there any planning history issues associated with the site.

Each of these tests were giving a specific waiting (between 1 and 5 – see Paragraphs 5.2.29 of Appendix 3.1 of the EIS). On foot of the Level 2 assessment three sites were deemed to have scored highly.

- The MEHL site
- Knockharley site in Kentstown, County Kildare
- The Drehid site in Kildare.

These three shortlisted sites were subject to the WHO criteria assessment. Each of the sites was judged against four criteria.

- To eliminate generally unsatisfactory areas
- To highlight promising areas
- To assess promising sites in detail
- To evaluate and rank sites.

In relation to hydrogeological conditions the assessment states (para. 5.3.12 – 5.3.14)

"The shortlisted sites have been approved by the EPA as having appropriate geological and hydrogeological settings suitable for the establishment of a modern landfill. All three sites are located in areas with limited groundwater resources and where the use of basal clay liners prevents direct discharges to groundwater.

While the basal liner at Hollywood is permitted to be more permeable than the basal liners at Drehid and Knockharley, this difference is not an intrinsic feature of the Hollywood site but a reflection of the reduced pollution potential of inert wastes presently allowed to be landfilled at Hollywood. As at Drehid and Knockharley, the glacial clays found at Hollywood could also be reworked to provide a lower permeability value basal clay liner required for landfilling of non-hazardous household and commercial wastes.

It is accepted that the clays found at Knockharley, Drehid and Hollywood can be reworked to provide the thicker basal liner required for landfills accepting hazardous waste. In doing so it is accepted that the three shortlisted sites of Drehid, Knockharley and Hollywood therefore score equally in terms of the

respective geological and hydrogeological settings and in particular on the potential impact on the underlying groundwater regimes".
Paragraph 6.06 of the Site Selection Study states:

In summary, this desk study concludes that the Hollywood site can accommodate the likely volumes of the target wastes that are likely to arise on the Island over the future 25-30 years and that the Hollywood site is ideally located regarding the likely centres of these waste arising's. Furthermore, it appears that the geological and hydrogeological conditions at Hollywood are equally comparable to those found at Drehid and Knockharley sites for the secure landfill of target wastes".

7.4.2 The site suitability assessment failed to appropriately consider a Greenfield site.

Section 6.5 of the EPA's National Hazardous Waste Management Plan highlight the benefits of co-locating a hazardous facility with existing infrastructure. There are inherent advantages in co-locating including the benefit of having already obtained planning permission and licencing applications. As such the existing sites have already deemed to be considered appropriate in terms of accepting waste. It is important to highlight that the applicant is obliged to consider suitable as opposed to the finding the best or the optimum site for the proposed facility. The onus is not on the applicant to methodologically evaluate all Greenfield sites in order to select the optimum site. It would appear reasonable in my view that the applicant restrict his/her evaluation of alternative sites to those sites which have been tried and tested in terms of being under the planning process and licence application process deemed to be appropriate for the purposes of accommodating a landfill. This argument is distinctly made in the closing submission on behalf of the applicant where it is stated "*the site selection study sets out what might reasonably be considered the highest possible initial criteria for assessment by only considering sites which had not only been identified as potentially suitable for landfill development but had been assessed in detail and determined by relevant authorities as actually being suitable were considered amongst the alternatives*" (Page 56, Day 7 of Oral Hearing Transcript). Thus the fact that specifically co-location is referred to in the National Waste Management Policy documents and the inherent advantages of co-locating and the fact that the existing sites are deemed to be acceptable in principle for the acceptance of landfill waste, I would consider it reasonable that the applicant would not consider in any great detail the proposition of locating such a facility on any virgin greenfield site.

Finally in relation to co-location I would refer the Board to Section 12 and in particular Table 48 of the NaDWaf Report which sets out the benefits and dis-benefits of co-location. This Table in my opinion clearly indicates that co-location has major advantages (for summary benefits v dis-benefits see pp.179 and 180 of this report).

7.4.3 The site selection process did not place enough waiting on hydrogeological issues.

The applicant in assessing criteria for site selection had regard in particular to three documents namely

- The EPA Manual on site selection (draft consultation 2006)
- The WHO publication on site selection for hazardous waste management facilities
- Landfill Guidelines "towards sustainable waste management in New Zealand (2001).

All three documents highlight the importance of the underline hydrogeological considerations in assessing a site. None however set out specific criteria as to what is acceptable or what is not acceptable on geological or hydrogeological grounds. The critical issue in this regard is obviously the protection of groundwater resources. The site selection process ranks the three top sites equally in terms of groundwater protection. This is predicated on the fact that with various landfill linings in place, each of the sites is unlikely to impact on groundwater. In particular it is stated that the site at Hollywood can be reworked to provide a thicker basal layer required for a landfill accepting hazardous waste. I would generally agree with both Fingal County Council and the third party observers that, as things stand presently on site, that the MEHL site should possibly score lower than both the sites at Drehid and Knockharley on the grounds that part of the MEHL site incorporates a worked quarry and for this reason part of the site has been stripped of its natural geological barrier and thus could be seen to be more vulnerable on hydrogeological grounds.

However it could be equally argued that with the appropriate barriers and engineered linings in place that none of the preferred sites would pose a threat to groundwater and therefore would score equally in terms of hydrogeological and geological considerations. For this reason it could be argued that as things stand the application site could be awarded a lower score on hydrogeological grounds however with appropriate works the site might still be deemed suitable in overall terms for hazardous landfill. The hydrogeological issues would be discussed in more detail further in this assessment.

7.4.4 The site selection process did not place appropriate emphasis on the EPA Manual on site selection (Draft Consultation Document 2006).

It is clear from the site suitability study that reference was made to the EPA's draft manual on site selection. The EPA Manual is specifically referred to in Section 4.1 of the site suitability study. This draft consultation document was published in December 2006. In the introductory section it is stated that the guidance is "*primarily aimed at municipal, industrial and commercial waste landfills falling into the non-hazardous waste category. There is at present no merchant (independent commercial) hazardous waste landfill within the state. In the event that one is proposed, the guidance herein may offer some assistance, but for additional screening and selection criteria appropriate to such a facility,*

consultation with statutory authorities is advised as is the use of any relevant international best practice (e.g. site selection for new hazardous waste management facilities WHO, European region Publication no. 46)".

It is clear therefore that the Manual relies on other guidance documents in relation to hazardous landfills. The applicant therefore is justified in not solely relying on the EPA Publications for the site selection criteria. A specific criteria highlighted by both the observers to the application and Fingal County Council is the fact that the EPA places considerable emphasis on groundwater protection responses for landfill as part of the site selection process and that the applicant, has not given sufficient waste to this issue in the site selection process. This is a moot point in that the applicant argues that the engineered protection proposed for the MEHL site will ensure that the proposal will not pose any risk to groundwater and thus will be fully in accordance with the EPA's groundwater protection responses for landfills.

I consider it reasonable that the applicant would place limited emphasis on the EPA guidance document as it is pointed out on more than one occasion throughout the EPA document that the guidance is for the citing of landfills for non-hazardous waste. It is also stated that the principals involved may also be applied to the site selection process for hazardous waste. It is reasonable however having regard to the hazardous nature of the landfill that the WHO Publication would be referred to, in offering more specific guidance. It is not unreasonable in my view that the applicant refers to and relies on documents other than the EPA Manual in the site selection process. As the EPA document is specifically aimed at non-hazardous landfill sites its applicability is limited to the current application.

7.4.5 The site selection process "mixed and matched" the selection criteria in favour of the MEHL sit and The Knockharley Landfill site and the Tooman Nevitt site should have scored more highly in the site selection process.

As referred to above it is apparent that the site suitability assessment made reference to the site selection criteria set out in a number of documents referenced above. The Nevitt Lusk Action Group (NLAG) argues that the entire methodology and criteria was totally biased and totally undermined the credibility of the whole site selection process (see Day 7, Oral Hearing, Page 37).

One criticism which could be levelled at the methodology employed by the applicant is that the five tests used in the Level 2 assessment was not qualified or justified. It is not clear as to where the tests referred to were derived. For example the tests place major emphasis on the existing regulatory issues such as existing operational licence, tonnage capacity, logistic capacity to handle goods and planning history etc. The tests however do not include environmental criteria such as hydrogeological characteristics of the site, residential impact on surrounding areas etc. On the other hand it could be argued that the fact that there are existing landfills on site at these locations implies that the environmental and amenity criteria have already been evaluated and deemed to be acceptable during

the course of the initial application for both planning permission and a waste licence.

The Level 2 assessment concluded that there were three preferred sites. These three sites were then subject to the WHO criteria assessment. The WHO criteria assessment is set out in Page 31 of the Publication (see documents and guidance notes attached). The criteria was applied in a systematic way to each of the sites. Again the same issue arises in relation to hydrogeology in that under the WHO screening criteria, the Hollywood site is given a high ranking and the Knockharley site is given a low ranking. It is entirely unclear as to why this is the case. This question was put repeatedly to Ms O'Donnell by both Fingal County Council and the Inspector (see Pages 16 and 17 of Day 4 of the Oral Hearing Transcripts). In response Ms O'Donnell could not proffer any reasons as to the justification for the various rankings other than to state that "*the inputs would have been on the basis of the information available in the public domain in terms of the EIS and licencing information. I think that is as far as I can go in the response*". (Page 17 of Day 4 of the Oral Hearing Transcripts).

Based on the evidence presented therefore I think an issue does arise in relation to the ranking of the sites specifically in relation to hydrogeology. It appears from the information contained on file that the Knockharley site may possess at least similar, if not better natural hydrogeological conditions for a landfill development than the applicant's site. In my view this should have been fairly and accurately reflected in the methodology utilised in the site selection process.

Notwithstanding this conclusion, it is also my opinion that this would not necessarily preclude the use of the site to accommodate a hazardous landfill development. The fact that the site may be ranked lower in terms of hydrogeology does not necessarily imply that the site is unsuitable in hydrogeological terms. Again this issue will be dealt with in more detail further on in this assessment. It should be borne in mind that the site selection process is employed to determine a suitable site for a particular type of development as opposed to the best or optimum site for that development. The site selection process seeks to determine whether or not a site is suitable for more detailed analysis in the form of an EIA. I think the applicants in this instance had demonstrated that the MEHL site is suitable for a more robust detailed analysis.

In relation to the Knockharley site, following on from the comments above, I would consider that the Knockharley site could have been ranked higher than the MEHL site particularly in hydrogeological terms. With regard to location analysis (issues such as distance from the sources of waste generation – see Appendix 5 of site suitability study) it appears that there is very little between the MEHL site and the Knockharley site as both sites are located in close proximity to each other. The fact that the MEHL site is in closer proximity to the M1 motorway gives it a slight advantage over the Knockharley site in my view. But it again comes back to the matter not of whether or not the MEHL site scores higher than Knockharley on all issues, rather it is a question or whether or not one or either of the sites in question is deemed suitable for a more detailed environmental assessment in a form of a planning application before the Board. A more detailed evaluation of the specific suitability of each of the sites would

be more appropriate in the case where the Board had two current applications before it for hazardous landfill facilities. Currently there is only one application before the Board specifically for the acceptance and landfilling of hazardous waste other than asbestos waste – the MEHL facility.

With regard to the Tooman Nevitt site this issue was addressed in Section 5.2.38 of the site suitability study. The site was excluded on the grounds that the waste licence is subject to judicial review proceedings and as a result the site does not presently offer the co-location benefits associated with established facilities. The site is not likely to accommodate waste from incineration in the short-term and for this reason it was unlikely to score highly in the assessment and was thus excluded. In my view it would be reasonable to exclude the facility for the reasons set out above.

7.4.6 Conclusions in relation to Site Suitability Study

I consider that an evaluation of alternative sites was carried out and on the basis of the evaluation it was determined that the site in question may be a suitable site (albeit not necessary the best site) to accommodate a hazardous landfill facility. A site suitability study is required to identify sites which may be brought forward for more detailed assessment in the form of a planning application and waste licence for the facility proposed. The purpose of a site suitability study is not necessarily to identify potentially the best or most optimum site for a facility such as that proposed, it is merely employed to identify sites which may be suitable to accommodate facilities such as that proposed.

Finally in relation to the evaluation of alternatives as required under EIA legislation I am satisfied that the applicant has evaluated and considered various design options and various design layouts in the EIS.

7.5 Hydrogeological and Geological Issues

7.5.1 Geological and Hydrogeological Characteristics of the Site

The basic geology of the site can be summarised as follows:

The oldest rock onsite comprises of Upper Carboniferous Loughshinny/Naul of Visean Age. Moving northwards across the site this formation dips, folding downwards beneath the rock of younger age namely the Balrickard and Namurian shale's. These latter rocks were formed in deeper water than the Loughshinny formations and in the main comprise of finely bedded sandstones and black shale's. As one moves northwards across the site the Loughshinny formation continues to dip and is therefore overlaying by an increasing thickness of Namurian deposits above.

The Loughshinny formation is a high yielding aquifer with yields of over 100 cubic metres per day mainly through secondary porosity (fractured rock). The pumping tests and packer tests (the latter tests estimate the amount of grout which would be used to block a fracture) were carried out on site. The pumping tests were carried out at Borehole 17 in the centre of the site (see Figure 14.13 of

EIS). The pumping tests indicate that the underlying Loughshinny aquifer has a high transmissivity of up to 300 metres per day.

The overlying Namurian rocks are confining rocks of poor permeability (referred to in the EIS as an aquatard – poorly productive bedrock). It is acknowledged that weathered or fractured zones within the Namurian shale will allow some groundwater movement and that this may hydraulically connect with the different lithologies within the Namurian shale. The permeable horizons of the aquatard (where weathering has taken place) is in the order of 10^{-6} metres per second. (This travel time would equate to approximately 1 metre of groundwater travel every 10 days). The permeability of the more confining layers within the Namurian shale is in the order of 10^{-7} or 10^{-8} metres per second (travel time for groundwater over 1 metre would range therefore from 4 months to over 3 years).

A large number of concerns have been raised by both the observers and Fingal County Council in relation to the sites suitability on hydrogeological grounds to accommodate a hazardous landfill. In environmental terms, perhaps the greatest threat posed by the hazardous landfill concerns contamination of groundwater due to a leaking of leachate from the landfill cells, particularly the hazardous landfill cells while it is stated in the EIS that the nature of hazardous waste is not harmful to humans it could potentially impact on aquatic life. The major concerns in relation to hydrogeology and groundwater are summarised below.

- Potential Impact of the Landfill on the Bog of the Ring Aquifer
- Risk of wells to the south-east of the site
- There is no natural hydrological or geological barrier on site
- The presence of geological faulting onsite
- The classification of the site in terms of the GSI Groundwater Protection Scheme
- The potential of contamination of the adjoining stream along the northern boundary of the site
- Potential impact on the adjoining water reservoir
- Concerns in relation to the Land Simulation model contained in the quantitative risk assessment.

7.5.2 Impact on the Bog of the Ring

It is argued that the proposed development overlies an important aquifer and the site may be hydro-geologically connected to the Bog of the Ring water supply which is an important water source for the North Fingal area.

The drawings submitted with the application including Figure 14.10 indicates that the Bog of the Ring inner source protection zone is located just over 2 kilometres to the north-east of the site. The outsource protection zone is located approximately 1 kilometre to the north-east of the site.

A critical issue in determining the extent to which the development could potentially impact on the Bog of the Ring is the direction of groundwater flow in the vicinity of the facility and also the rate of groundwater flow. According to the

information contained in Table 14.11 and Figure 14.13 of the EIS (the Board will note that there are a slight discrepancy in the figures presented in the table of the EIS and the Figure contained in the EIS. This is due to the fact that Table 14.11 of the EIS refers to minimum, maximum and average figures while Figure 14.13 shows groundwater levels plotted across the site on 20th May 2010). Section 14.4.6.4 of the EIS explicitly states that groundwater is flowing in a south-easterly direction and thus flowing away from the Bog of the Ring aquifer which is located to the north. Submissions by both the Nevitt Lusk Action Group and Fingal County Council suggest that groundwater flow in the vicinity of the site is more complex and it is suggested that some groundwater flow within the site flows in a north-easterly direction towards the stream. This stream in turn could provide a fast flowing conduit for many leaked contaminates from the landfill cell. It is also argued by Fingal County Council that groundwater flows in the north-eastern corner of the site are artesian in nature which in turn could result in a more direct path to the stream along the northern boundary.

As a result of the proceedings of the oral hearing and in particular the questions and cross-examinations of Mr. Shane Herlihy hydro-geologist on behalf of Fingal County Council and Mr. Eugene Daly hydro-geologist on behalf of the applicant it was determined that the groundwater divide between the application site and the Bog of the Ring water supply catchment areas runs in an east-west direction and flows towards the coast. The groundwater topography is somewhat complicated by the fact that a large north-south fault runs in a north-south direction approximately along the alignment of the M1 motorway. Much discussion took place during the course of the oral hearing as to the exact location of the groundwater divide to the north of the site and whether or not this groundwater divide fluctuates from season to season. A related concern was whether or not the north-south fault zone adjacent to the M1 motorway could provide any direct conduit into the contiguous groundwater catchment area which serves the Bog of the Ring. The regional groundwater flow pattern was mapped as part of the EIS for the Fingal Landfill Project (see figure opposite Page 317 of Volume 2 of Fingal Landfill Project (See Documents attached to this report)). This figure was reproduced for the purposes of the oral hearing and is contained in Appendix 9A of the applicant's submission to the Board. This figure indicates that groundwater flow in the vicinity of the site is in a south-easterly direction.

On the other hand Fingal County Council make specific reference to an older groundwater flow map which was contained in Figure 3.6.11 of an EIS prepared for the MEHL site in 1999 (see Documents attached) which indicates that some groundwater flow within the north-eastern corner of the site is in a north-eastern direction towards the surface water stream. Allied to this concern raised by Fingal County Council was that levels in Borehole 4(A) in Figure 14.13 of the EIS for the current application indicates that water levels in Borehole 4(A) was recorded as 91.96 and this was also an indication that groundwater flow may be in a north-easterly direction in the vicinity of the site.

The Board in this instance has the benefit of a number of detailed hydrogeological investigations both on the site in question and in the wider area which was carried out during previous EIS's associated with the site, the current

EIS associated with the site and detailed investigations undertaken as part of the Fingal Landfill Project to the east of the site.

While some evidence has been presented to suggest that the groundwater flow may occur in a north-easterly direction in the north-eastern portion of the site I would consider that the evidence that suggests a south-easterly flow across the site is more compelling.

Figure 3.6.11 contained in Folder 1 (Submission 8 –yellow tag) of the applicant's submission to the oral hearing clearly indicates a north-easterly flow from the centre of the site towards the north-east (see levels for Borehole 3 and Borehole 5). However this north-easterly flow would appear to be directly contrary to the predominant flow pattern in the area which is quite clearly south-easterly and easterly. This is apparent from the readings contained in the other boreholes in the vicinity of the site. The readings between Borehole 3 and Borehole 5 appear to be incongruous in the context of the readings of the other boreholes on site. If one were to consider the water levels contained in Borehole 6 to the north-west of the site which clearly indicates a drop in water levels of over 17 metres between Borehole 6 and Borehole 5 as opposed to a drop of just over a metre in the case of Borehole 3 to Borehole 5 it would suggest that when taking into consideration the readings of the three boreholes (Borehole 3, Borehole 5 and Borehole 6) that the predominant water flow between these boreholes is in a south-easterly, or at least easterly direction.

Concern was also expressed by Fingal County Council that the levels in Borehole 4(A) as indicated in Figure 14.13 which records a borehole water level of 91.96 is also an indication that groundwater flow onsite could veer towards the north-east. Having regard to the groundwater levels indicated on Figure 14.13 I would suggest that, at best, the levels indicated in Borehole 4(A) would suggest an easterly groundwater direction flow as opposed to a north-easterly groundwater direction flow. Furthermore again I refer the Board to the figure contained in Figure 3.6.11 of the 1999 EIS prepared for the application site which indicates a groundwater level in Borehole 4 of 98.1. The location of Borehole 4 approximates to the location of Borehole 4(A) as indicated on Figure 14.13. A level of 98.1 in Borehole 4 would again generally be consistent with the groundwater flow in a south-east direction approximately parallel to the surface water flow in the stream along the northern boundary of the site.

Even if the Board were to accept the evidence to suggest that some groundwater flow in a north-easterly direction may occur in the north-eastern portion of the site, it is highly improbable that this groundwater would cross the groundwater divide as indicated in the regional hydro-geological map prepared for the EIS of the Fingal Landfill Project. The regional hydro-geological map submitted as part of the application for the Tooman Nevitt Landfill Project is based on extensive investigations in the wider area. It is clear that the groundwater divide is located just south of Rowans Little Interchange (Junction 5 on the M1 motorway). Thus the groundwater divide is located to the north of the site and runs in an east/south-easterly direction approximately between Knockbrack Hill and Rowans Little's Interchange. This groundwater divide therefore roughly runs parallel with the northern boundary of the site and is located approximately 750

metres to the north of the site. This groundwater divide will provide a physical barrier between the two groundwater catchments. Mr. Shane Herlihy (hydrologists on behalf of Fingal County Council) during the question of cross-examination acknowledged that the groundwater divide is located to the north of the application site however the groundwater divide may shift as a result in seasonal variations in groundwater levels (see Page 71 of Day 5 of Oral Hearing). Later on in the question and cross-examinations however Mr. Herlihy did acknowledge that the figures presented in the previous EIS suggested that there was little shift in the groundwater divide in the area. As evidence of this I would refer the Board to Section 3.5.2 of the Fingal Landfill Project EIS. The fourth paragraph of this section states that in the case of the Fingal Landfill Project "the groundwater flow contours (given in Appendix A5) have not varied significantly from June 2005 to January 2006 and the groundwater divide is consistently approximately 1 kilometre north-east of the proposed landfill footprint". (This section of the EIS is reproduced in Folder 1 Appendix 7 – orange tag - of the applicant's submission to the Board during the course of the oral hearing).

It appears therefore that the groundwater divide is "saddle shaped" and runs along a west-north-west and east-south-east direction between 500 metres and 1 kilometre north of the site. There would therefore appear to be no hydraulic connection between the groundwater beneath the MEHL site and the Bog of the Ring aquifer. It also appears that the watershed along the north-south geological fault is also located to the north-east of the site and as such any groundwater flow from underneath the site if intercepted along this fault will flow southwards and not northwards.

7.5.3 Risk to Wells to the South-East of the Site

A major concern raised in the NLAG submission related to the potential threat to existing commercial wells located to the south of the site. Evidence was heard during the course of the oral hearing that there are a number of large wells used for commercial market gardening purposes which may be at risk from the proposed development (see evidence of Mr. White on behalf of the Nevitt Lusk Action Group (Folder 3 Submission no. 5)). In terms of groundwater flow the market gardening wells referred to would appear to be located along the groundwater pathway to the south-east of the site. The location of these wells are indicated in Folder 3 Appendix 18 maps 4, and 6 (see maps to the rear of the submission).

While there is little doubt having regard to my conclusions above that the wells in question may lie within the pathway of the groundwater flows beneath the site, the critical element that needs to be determined for the purposes of current application is the element of risk. The applicant points out that there is no designated source protection areas associated with these wells. This does not in my view absolve the responsibility of the applicant of maintaining appropriate water quality standards at these wells. The quantitative risk assessment carried out as part of the EIS (and will be dealt with in more detail below) indicates that even under very conservative and robust assumptions the proposal will have no impact on the quality of water at a point 300 metres down gradient of the site.

The quantitative risk assessment acknowledges that where there is a significant leak in the liner, a number of pollutants would exceed drinking water standards at a point 300 metres down gradient of the site. According to the quantitative risk assessment the parameters which would exceed drinking water standards would be as follows:

	Drinking water standard	**95 percentile concentration (maximum)**
*Arsenic	0.01	0.014
Selenium	0.01	0.02
Chloride	250	678
Fluoride	1	3.8
Sulphate	250	841

*****Background levels in existing groundwater levels exceed the drinking water quality standards.*

It is important to note that none of the contaminants listed in Table 18 of the quantitative risk assessment breach the water quality standards if there is no major default in the liner.

While certain parameters of the drinking water quality standards are breached if a breach in the liner occurs it is important to take into consideration that the contaminant concentrations referred to in the table above are assessed in the context of a theoretical phantom well located 300 metres from the boundary of the site. The wells referred to in the NLAG submission are 2-4 kilometres from the site. It is therefore likely that a considerable proportion of the heavy metals and contaminants referred to in the table above are likely to be absorbed or adsorbed in the soils and rocks on route to these potential receptors.

Another important consideration is the fact that the Land Sim model used in the quantitative risk assessment does not incorporate a lower clay liner. Thus any contaminants released from the DAC liner but still be contained by the engineered lower clay liner which is 0.5 metres thick. If a breach in the clay liner was also to occur much of the heavy metals contained in the contaminant would be absorbed very efficiently while passing through the clay layer. In this regard I refer the Board to the evidence of Mr. Piet Wens (Oral Hearing Proceedings, Day 6, Page 139) which notes that "*if the heavy metals would pass through the clay barrier for instance you would have a lot of heavy metals absorbing into the clay because the clay has a lot of negatively loaded surface and heavy metals being positive would absorb into the clay*". Thus the clay lining would further mitigate against any heavy metal contamination. While this issue would be revisited under a separate section below relating to the Land Simulation model, I am satisfied based on the evidence presented on file and during the course of the oral hearing

that the proposed development would not pose a risk to the groundwater wells to the south of the site because of

(a) The nature of the lining to be used
(b) The distances involved between the commercial wells and the landfill site and
(c) The amount of absorption, dilution and adsorption of contaminants and heavy metals which would take place along the flow path between the landfill and the receptor wells.

Finally it should also be noted that the concentrations estimated in the phantom well 300 metres to the south-east of the site under the Land Sim model, were breaching the lining to occur, are recorded between 100 and 300 years after the initial leak. There is no guarantee that the wells in question will be still in operation under this timeframe however it could equally be argued that other wells may be operational in the wider area which would equally be at risk if a leak in the landfill liner were to occur.

7.5.4 There is no natural hydrological or geological barrier on the site

Concerns are expressed that the site possesses little or no natural geological lining in that the bedrock in the southern portion of the site has been excavated and also that the lining underneath the hazardous cells in the northern portion of the site does not comprise of subsoil as required in the GIS classification but in fact comprises of namurian shale bedrock.

In relation to the latter issue, I note that the groundwater protection response for landfills makes reference specifically under the $R3^2$ category that there must be a 'consistent thickness of 3 metres of low permeability subsoil present'. Whether or not subsoil or namurian shale in the form of bedrock is present is not the critical issue in my view. The critical issue is the permeability of the material in order to protect underlying groundwater. The namurian shale in this instance appears to have been laid down in thick layers between 10 metres and 60 metres according to the EIS. The weathered shale would appear to have low permeability (see the samples submitted to the Board at oral hearing). This shale exhibits similar characteristics to that of heavy clay. Figure 11 attached to Eugene Daly's submission on behalf of the applicant (Folder 1 Appendix 15) also indicates a similar consistency and plasticity as that sample submitted to the Board. Thus because part of the site is classified as namurian shale and does not constitute a typical subsoil, it does not necessarily imply that it does not comply with the permeability requirements in GSI groundwater protection response for landfills. The critical issue in my view is permeability, and whether or not there is a consistent thickness of in excess of 3 metres of low permeability material so as to accord with the GSI groundwater protection response for landfills. I would conclude that the namurian shale represents such a material.

With regard to the second issue, the quarried area in the southern portion of the site results in no natural protection offered in terms of quaternary geology. The applicants argue that there is no requirement to have a natural geological protection and that there is no specific requirement in any of the guideline

documents or in the Landfill Directive that natural geological protection must be afforded on site.

The EPA draft consultation document on site selection states that it is essential to have an accurate understanding of the local geological setting and this will include aspects of the topography, details of the structure and characteristics of the solid strata, the composition and distribution of subsoils and the characteristics of the hydrogeology (aquifer permeability depth, groundwater resource protection zones etc.). The draft Guidelines do not specify that any minimum requirements regarding natural, geological or hydrogeological features must be in place prior to engineering the landfill cells. The document is silent in relation to whether or not there are any requisite natural geological or hydrogeological conditions required to be in situ on any given site prior to any works being carried out.

The GSI Groundwater Protection Response for Landfills are more explicit in terms of requirements. In terms of the response protection, the southern portion of the site is classified as "locally important aquifer – bedrock which is moderately productive only in local zones". In terms of vulnerability the southern portion of the site, where the most extensive quarrying has taken place can be classified as "extreme". If one was to accept the arguments proffered by Fingal County Council and a classification of $R3^2$ were to be given to the exposed area of limestone in the south-western portion of the site, the groundwater protection response states that the R32 designation implies that landfills are not generally acceptable unless it can be shown that

- *There is a minimum consistent thickness of 3 metres of low permeability subsoil present.*
- *There will be no significant impact on the groundwater.*
- *It is not practicable to find a site in a lower risk area.*

Again the groundwater protection response matrix is not explicit as to whether or not the "minimum consistent thickness of 3 metres of low permeability subsoil" constitutes natural conditions of whether or not engineered solutions would suffice. In my estimation the engineered solution would constitute an appropriate substitute in this instance provided that it offers the same protection to groundwater as the 3 metres of low permeability subsoil. The obvious and critical issue in the response matrix for landfill is the protection of groundwater.

In relation to the second point in the $R3^2$ designation, I have already argued above that the proposal will have no significant impact on groundwater resources in the area. The proposal does not represent a threat to the Bog of the Ring groundwater protection resource nor does it represent a threat to any of the wells to the south-east of the site for reasons argued above in my assessment.

In relation to the third criteria set out under the $R3^2$ designation it may be practical to find a lower risk in terms of groundwater protection however it could also be argued that with proper engineered liners in place the proposal could

offer an acceptably low risk to groundwater. The issue of landfill liners will be dealt with in more detail below.

Finally I would refer the Board to the Landfill Directive. Annex 1 of the Directive states that the hydrogeological requirements of a landfill in relation to location include inter alia……..

(b) The existence of groundwater, coastal water or nature protection zones in the area and
(c) The geological and hydrogeological conditions of the area.

Again no minimum requirements are set out in relation to the natural geological or hydrogeological conditions prior to engineering proposals for the landfill cells to be developed for the acceptance of waste.

Section 3.2 of Annex 1 sets out specification of the barriers to be used in the case of hazardous, non-hazardous and inert waste (I again reiterate for the purposes of this assessment that the exposed quarried area which could be categorised as extreme at present is to accommodate the non-hazardous and inert waste only). In the case of the non-hazardous waste a barrier is required with permeability characteristics of 1 x 10^{-9} metres per second with a minimum thickness of 1 metre.

In the case of the inert waste a barrier of 1 x 10^{-7} metres per second with a minimum thickness of 1 metre is also required.

Where a geological barrier does not naturally meet these conditions, the Landfill Directive states that it can be "*completed artificially and reinforced by other means given equivalent protection*". The Directive goes on to state that "an artificially established geological barrier should be *"no less than 0.5 metres thick"*.

Again it is clear therefore that the Landfill Directive permits artificially constructed cells with permeability characteristics at least equivalent to that specified in the parameters set out in Section 3.2 of Annex 1 of the Directive.

The lining system for the non-hazardous cells will comprise of a compact minimum layer 1 metre in thickness with a hydraulic conductivity less than or equal to 1 x 10^{-9} metres per second together with a 2 millimetre thick geo-membrane HDPE liner and a non-woven geotextile and geotextile filtration layer. Section 4.5.1.4 of the EIS states that in addition a supplementary bentonite enhanced soil mineral layer is proposed 1 metre in thickness for the permeability of less than or equal to 6.6 x 10^{-10} metres per second.

In the case of the cells for inert waste the EIS likewise states that they will comply with the minimum requirements set out in the Landfill Directive i.e. a 1 metre thick clay lining with a permeability less than or equal to 1 x 10^{-7} metres per second.

It appears therefore that the main guidance documents and in particularly the Landfill Directive do not require that sites selected for the acceptance of waste need necessarily have in situ geological and hydrogeological characteristics which make them suitable for landfilling in accordance with the specifications set out in the Directive. It appears that artificial barriers that can be put in place which meet the requirements of the Landfill Directive and the GSI response matrix for landfill will suffice provided that sufficient protection is provided in accordance with the specifications set out. In this regard I would conclude that notwithstanding the fact that the site does not have the natural geological and hydrogeological conditions in relation to render it suitable for landfill, the site can still comply with the requirements of the EPA, GSI and the EU Landfill Directive provided that artificially engineered cell linings are put in place which comply with the permeability requirements set out in these guidelines.

7.5.6 Geological Faulting on Site

The geological faulting on site was mapped on foot of a number of geological investigations carried out from the Environmental Impact Statement. The main faults are indicated on Figure 14.6 of the EIS. The most prominent fault/fracture runs in a north-south direction through the centre of the site. A secondary fault runs in an east-west direction between Borehole 17 and Borehole 19. The EPA Landfill Manual investigations for landfills (1995) and Draft Consultation Document on Site Selection (2006) both indicate that "*in locating areas suitable for landfill, it is difficult to avoid being on or close to geological faults. Even though the majority of faults increase the permeability of the bedrock in the fault zone it would normally not be appropriate to rule out or downgrade a site because of the presence of faults. Equally the absence of faults should not be taken as an absolute assurance that the site is geologically suitable*".

Concerns expressed by Fingal County Council specifically in relation to the fact that the main fault running through the site runs beneath the namurian shale and therefore under the proposed hazardous landfill cells. The fault is seen by the Council as a potential conduit for contaminant to underlying groundwater. The applicants dispute this and suggest that the north-south fault has limited (although it is acknowledged that it has not prevented) the groundwater movements across the fault. Fingal County Council highlight the figures presented in the pumping tests at Borehole 17 and note that there are significant levels of drawdown in the case of the boreholes to the north of the site, particularly in the case of Boreholes 5, 16 and 20 (the drawdown levels are indicated as between 0.62 and 0.93 metres – see figure attached to Mr. Shane Herlihy's submission (Folder 2 Appendix 20) on behalf of Fingal County Council where these figures are highlighted. The applicants acknowledge that there is a connection between Borehole 5 and Borehole 16 and this is attributed to the fractured/weathered/permeable horizons within the namurian shale's however it is argued that these connections are deemed to be localised and not significant.

The level of drawdown from Boreholes 5, 16 and 20 are relatively significant and may be higher than that expected with lower permeability namurian shale. Geological investigations indicated that there are various layers of different

permeability within the namurian lithology. The level of connectivity between the layers is difficult to ascertain and define. Evidence presented at the oral hearing by Mr. Eugene Daly (hydro-geologist on behalf of the applicant) suggested that the more permeable layers within the namurian shale "pinch out" and therefore there is little hydrogeological connectivity between the layers. What is apparent is conditions on site are far from isotropic. I refer the Board to Figure 14.2 of Mr. Herlihy's submission and in particular Borehole 19 which shows a much lower level of drawdown than that of Borehole 20 despite being much closer to both the geological fault and Borehole 17, the borehole in which the pumping tests were conducted. Likewise Borehole 15(A) is located contiguous to the faults and shows a drawdown of only 0.21 metres. Therefore while Borehole 5 and Borehole 16 show a relatively high hydrogeological connectivity to Borehole 17, Boreholes 19 and 15(A) which are in closer proximity to the pumping test do not. This may suggest that Mr. Daly's assertion that the connection between the more permeable layers within the namurian shale are localised in and around the site. The nature of weathered shale beneath the site is indicated in the samples submitted at the oral hearing. On examination of the sample it is clear that the plasticity inherent in the shale would minimise the amount of fractures within the underlying strata and therefore widespread connectivity between the namurian shale could be assumed to be less than extensive.

It is important to note that the issue of connectivity between the permeable strata within the namurian shale only really arises where there is a breach in the landfill lining. Furthermore geological investigations indicated that the namurian shale under most of the northern part of the site is between 10 and 60 metres in depth while localised hydraulic conductivity is evident large-scale connectivity which would provide efficient conduits for groundwater contamination to the underlying Loughshinny formation would not be likely.

The connectivity between the overlying namurian shale and the underlying Loughshinny formation would also be dependent on the downward gradient of groundwater through the geological strata. The applicants contend that the confining layer of the namurian shale results in an upward movement of groundwater in this section of the site which would obviously impair the downward movement of groundwater towards the Loughshinny formation. I do acknowledge however that Fingal County Council dispute that the confining layer of namurian shale results in an upward movement of groundwater in the vicinity of the proposed hazardous waste cells.

7.5.6 The classification of the site in terms of the groundwater protection scheme

Fingal County Council argues that the southern portion of the site should be designated as $R3^2$ in the GSI Landfill Response Matrix. The applicant has labelled the southern portion of the site as $R2^2$. The difference of opinion in this instance arises from a different interpretation of the GSI Matrix. The applicant designates the southern portion of the site as $R2^2$ on the grounds that it is proposed to put an engineered protective layer beneath the landfill cells which would result in a $R2^2$ classification. The applicant acknowledges that without the

protective layer a small portion of the southern part of the site would fall into the $R3^2$ classification.

In relation to the northern portion of the site again a different interpretation of the Landfill Response Matrix arises between the parties. Fingal County Council suggests that the absence of subsoil would result in a classification of $R2^2$. The applicant argues that part of this site is underlying by 10-60 metres of low permeability shale, while this is not strictly subsoil, it offers the same level of protection to the aquifer. I have argued above that whether or not the underlying strata is subsoil or rock the permeability of the strata is the critical issue therefore a strict interpretation of the GSI Landfill Response Matrix is not critical to determining the application before the Board.

7.5.7 Potential Contamination of the Adjoining Stream

Concerns were expressed by Fingal County Council that shallow groundwater flow in the vicinity of the stream could act as a conduit for groundwater flow to the stream. The hazardous waste cells are located in closest proximity to this stream. The applicant argues that the two closest wells to the stream are Borehole 6 and Borehole 11(A) (Borehole 11(A) is only 14 metres from the south of the stream). As these boreholes have water levels higher than the stream it is argued by the applicant that artesian conditions exist on this part of the site. As a result it is argued that the stream is not hydro-geologically connected to the groundwater and that groundwater is likely to discharge to this stream further south-east of the site. Based on the evidence presented it is difficult to form a definitive opinion as to whether or not shallow groundwater in the vicinity of the hazardous cells would migrate towards the stream. I would again rely on the Land Sim model which is a very conservative and robust model which indicates that with the DAC liner in place all groundwater in the vicinity of the site will comply with drinking water standards. Were contaminants to escape via groundwater it is likely that the confining layers in the namurian shale and clay overburden in the vicinity of the site would result in very slow groundwater migration towards the stream. Evidence is presented to suggest that groundwater levels in Borehole 11(A) are 4.5 metres higher than the stream and that this borehole is only 14 metres from the stream. It therefore suggests that there are very low levels of hydraulic connectivity within the namurian shale and clay subsoil. Such differentials in groundwater levels would suggest that groundwater is very confined within the clay/ namurian shale.

During my site inspection I noted large amounts of heavy clay in close proximity to the stream. The clay situated in mounds at the northern boundary of the site was probably due to the removal of overburden over the namurian shale strata in clearing that portion of the site for landfilling/excavation. Any groundwater movement in this area of the site is likely to move upwards as evidenced from the artesian wells at a very slow rate. As already pointed out clay is an efficient absorption medium for the removal of contaminants including heavy metals. With the construction of the hazardous landfill linings together with the nature of the underlying strata on the low levels of hydraulic conductivity in this portion of the site I do not consider that the proposal represents a real impact on the integrity of the water in the existing stream.

7.5.8 Impact on the Adjoining Water Reservoir

There is a water reservoir owned by Fingal County Council near the entrance of the quarry. This reservoir is a covered, sealed structure and currently serves the Naul area. While concerns are expressed in relation to the potential pollution of this reservoir in the original written submissions to An Bord Pleánala, no concerns were reiterated by any party during the course of the oral hearing. I do not consider that the proposed development would present a potential threat to the water reservoir. The inert cells are located closest to the reservoir and more importantly all parties acknowledge the groundwater flow in this portion of the site is in a south-easterly direction away from the reservoirs.

7.5.9 The Land Sim Model

The Land Simulation model was not the subject of any significant discussion or debate throughout the course of the oral hearing. Likewise the models or indeed the assumptions in which the models were based were not challenged in any of the written submissions to the Board prior to the commencement of the oral hearing. The information contained in the Land Sim model and the quantitative risk assessment associated with the model is critically important in my view in determining whether or not the proposed development represents a significant threat to groundwater. Therefore while the Land Sim model does not constitute a significant issue in terms of objections to the proposed development it should nevertheless be critically evaluated for the purposes of quantifying the potential risk of the proposed development to the environment.

Appendix 14.6 of the EIS specifically related to the hydrogeological quantitative risk assessment. It involved a modelling exercise using the programme "Land Sim V2.5 model" in order to quantify the potential risk to groundwater through leachate leakage. A phantom receptor (well) was located at the boundary of the site some 300 metres from the hazardous landfill cells. A summary of the results indicate the following:

- No hazardous substances (List 1) i.e. mercury or cadmium were predicted to be in the groundwater beneath the site with the appropriate landfill linings in place (and therefore not detected in the phantom well)
- Even with background concentrations non-hazardous contaminants are predicted to be below drinking water quality standards as indicated in Table 18.16 of the quantitative risk assessment. In short with the landfill linings in place no contaminants and concentrations above the EU drinking water standards are predicted to be present beneath the site. This conclusion is predicated on the grounds that all leachate will be fully contained within the cells.

Supplementary models were also carried out based on the assumptions that

(a) There is a significant breach in the liner and
(b) No liner was at all present on site.

The results are indicated in Tables 8.17 and 8.20 of the quantitative risk assessment. In the case where there is a significant breach in the lining system the results indicate that hazardous substances would enter the groundwater beneath the site or concentration exceeding drinking water standards. This is indicated in Table 8.17. With regard to non-hazardous substances the results indicate that if the DAC liner fails, contaminants with low retardation (i.e. chloride and sulphate) would be detected at phantom monitoring well at concentrations above drinking water standards. Fluoride and selenium would also be detected at rates above the drinking water standard between 100 and 300 years after the leak.

The model was also simulated where no landfill liner was put in place. The model simulation indicated that groundwater at the site boundary would exceed drinking water standards. However these results are lower than would be expected, would only be 3-4 times the drinking water standards (depending on the particular contaminant). The details for the hazardous contaminants are set out in Table 8.19 and non-hazardous contaminants in Table 8.20.

It is important to note that a number of conservative assumptions were built into the model and these are outlined in more detail where appropriate below.

Fingal County Council in its original submission suggested that the Land Sim model did not take into consideration the extensive faulting in the namurian shale and that the namurian shale has higher permeability than that presented in the model.

I have already evaluated and assessed the issue of faulting in the namurian shale underlying the site. I have concluded that based on the evidence presented and particularly the level of drawdowns in the boreholes that the hydraulic connectivity between the permeable layers in the namurian shale appears to be intermittent and localised. It also assumes that the water gradient moves vertically downward through the strata. The applicant argues that this is not the case. A number of artesian wells in the northern part of the site suggest that some levels of upward water movement exists beneath the site. Again any upward water movement of this nature would significantly reduce the possibility of groundwater moving vertically downwards towards the Loughshinny formation.

It appears from Section 2.4.5 of the quantitative risk assessment that the fact that the waste in question is to be pre-treated is taken into consideration in the quantitative risk assessment. The importance of this process is minimising the hazard is explained later in the assessment. It is important to point out however that the concentrations modelled in the quantitative risk assessment are the maximum amount of any particular contaminant which will be accepted to the landfill. It thus presumes that all waste accepted will be at the maximum concentration which again is a very conservative scenario. It is also important to note that the Land Sim model did not incorporate the low permeability mineral layer beneath the DAC liner for the purposes of quantifying the risk assessment. Again this is a very conservative approach. The siltation mineral layer would represent an important containment barrier were the DAC liner to fail and the mineral layer would also play an important role is adsorbing and absorbing

contaminants as they pass through the layer. The model also assumed a vertical downward movement of groundwater will take place on site and this may not necessarily be the case having regard to the confined nature of the namurian shale and the presence of artesian wells referred to above. In terms of a quantitative risk assessment it should be acknowledged, based on the information submitted, that the permeability levels in the DAC liner and the underlying mineral layer would significantly minimise the potential risks of hazardous contaminants being released into the underlying namurian shale.

Fingal County Council also suggested that the landfill model has limited applicability to the site in question because the unsaturated zone beneath the hazardous cells is either thin or absent. The applicants in the oral hearing (see Appendix A15) indicate that the model has been extensively used in the UK and it is equally applicable to the existing hydrogeological conditions that prevail on the MEHL site. The unsaturated zone thickness used in the model is based on the shallowest groundwater strikes observed during drilling. Again according to the applicant this represents a very conservative approach.

Finally in relation to the model the Board should note that these specific issues which are raised by Fingal County Council in its original submission were not discussed in any great detail during the questions and cross-examination of the oral hearing.

The only major issue which arose during the oral hearing in relation to the Land Sim model was the issue of hydrocarbons and Volatile Organic Compounds (VOCs). It was noted by Fingal County Council that the VOC contaminant was not modelled. Hydrocarbons could be a major constituent in relation to contaminated soil. Ms Lightfoot on behalf of the applicant when cross-examined on these issues stated that hydrocarbons were not modelled on the grounds that they did not constitute a major constituent of leachate (see Day 4 of the Oral Hearing, Page 151). It was also considered that the hydrocarbon content in contaminated soil was small. It was also stated by Ms Lightfoot (see Day 4 of Oral Hearing, Page 153) that hydrocarbons would be significantly retarded by the clay liners (should any escape) and therefore would move at a much slower rate than chloride or sulphate. Also in relation to the modelling of the hydrocarbon emissions it was stated that there was no WAC limit for hydrocarbon contaminants. Based on the evidence presented therefore it would appear that hydrocarbons or other VOCs do not pose a significant threat in terms of groundwater contamination.

7.5.10 Other issues in relation to Hydrology and Hydrogeology

A number of other issues particularly in relation to surface water considerations were also raised by observers in the original written submissions to the Board. Firstly Fingal County Council pointed out that there was no specific reference to surface water issues in the non-technical summary. It appears that surface water issues are not a major environmental concern in the context of the overall environmental impact of the proposed development. This is evidenced in my view by the fact that Mr. Harry Brett on behalf of the applicant gave a detailed

presentation on surface water drainage issues during the course of the oral hearing (see Folder 1 Appendix 7) yet no specific questions were put to Mr. Brett by any of the objectors. While there is no specific reference to surface water issues in the non-technical summary Section 15 of the EIS deals exclusively with the issue of surface water.

The statement of evidence by Ms Ria Lyden (see Folder 1 Appendix 8) also notes that a detailed assessment of the impacts on surface water was undertaken as part of the EIS.

7.6 Environmental Concerns in relation to the Nature of Waste to be deposited on Site

7.6.1 The Solidification Plant and Processing of Hazardous Waste Material

Concerns were expressed in an observation submitted that no details were provided in relation to the solidification plant which is to be constructed on site. Details of the plant are contained in Section 4.5.4 of the EIS and detailed drawings are indicated in Figure PPSID09 (two separate drawings are submitted with plans and elevations). The EIS sets out details of the physical structure and the operation of the plant. The solidification plant is also detailed in Section 3.5 of Michael Cunningham's statement of evidence (see applicants submission at the oral hearing Appendix A5).

Reference is also made to the treatment of fly ash and the statement or evidence of Mr. Piet Wens and Michael Cunningham (see applicants submission at oral hearing Folder 1 Appendix A18). Finally considerable discussion took place during the questions and cross-examination of Mr. Piet Wens and Michael Cunningham on the nature of ash to be treated during the solidification process (see Oral Hearing, Day 6, Pages 85-106).

The solidification treatment involves two separate processes which stabilise the heavy metals within the Flu Gas Residues (FGRs). In solidifying the FGRs, the heavy metals in encased in cement material which obviously reduces the solubility and leachability of heavy metals from the Flu Gas Residues. According to the evidence of Mr. Piet Wens "*rain falling on the waste does not actually have the possibility of getting in (contact) and therefore I would expect that the leachate at the hazardous waste landfill might even contain less heavy metal (than bottom ash)*" (see Page 105, Day 6 of Oral Hearing).

A separate chemical process is also undertaken during the solidification process. Again according to the evidence submitted at the oral hearing it is stated that heavy metals have a greater tendency to dissolve at lower pH levels. Thus an important component of stabilising the waste is increasing the pH value thus the cement which has a higher pH value together with the leachate which is re-circulated and used in the mixing process will help immobilise the heavy metals within the solidified material which will further reduce the solubility of heavy metals when deposited in the waste cells. Again the evidence of Mr. Wens indicated that different heavy metals reach different states of immobilisation at different pH levels. But all the heavy metals and fly ash become immobilised (to

different extents) at PH values ranging from 9 to 13. In general a “best fit recipe” is used in the solidification process which allows for the optimum amount of immobilisation of all heavy metals in the fly ash.

As a result of the solidification process, it appears from the evidence of Mr. Wens that the leachability of bottom ash which on the whole is a non-hazardous waste, may have greater levels of contaminants than the solidified treated FGRs and that the potential for leachability of waste classified as hazardous is significantly reduced as a result of the treatment processes undertaken.

Finally in relation to this issue I note that the Nevitt Lusk Action Group (NLAG) stated on more than one occasion during the oral hearing that there were no real concerns in relation to the nature and treatment processes involved in the handling of hazardous waste. The major concern of the NLAG related to the transport and placing of bottom ash within the cells. This issue will be dealt with in detail below. I further note that Fingal County Council concern essentially related to the hydrogeological suitability of the site. Little or no concerns were raised during the course of the oral hearing in relation to the treatment of hazardous waste on site.

7.6.2 Bottom Ash Disposal at the Facility

The nature, transportation and disposal of bottom ash at the MEHL facility are a major concern to the observers, particularly the NLAG. The main concerns can be summarised as follows:

- Bottom ash because of the high pH value can result in a very corrosive material and therefore can be harmful.
- Bottom ash is required to be treated prior to landfilling
- Bottom ash can give rise to noxious gases.
- Any atmospheric exposure to bottom ash can give rise to wind born deposition particularly as the MEHL site is exposed and elevated
- Exothermic reaction within the bottom ash could adversely affect the integrity of the liner and leachate collection pipes
- Bottom ash leachate can have an extremely high pH value and therefore should be classified as hazardous and dangerous.

7.6.3 The Corrosive Properties of Bottom Ash

Bottom ash can, in accordance with the European Waste Catalogue is classed as both hazardous (10 0114) and non-hazardous (10 0115). As already set out in this report waste will be classified as hazardous, non-hazardous or inert in accordance with SI126 2011 and Council Decision 2003/33/EEC. The non-hazardous landfill cells are to be located approximately over the deepest excavated area of the site. There is no natural geological protection to groundwater at this part of the site.

It is proposed to artificially construct cells in excess of the minimum criteria set out in the Landfill Directive. Details of the landfill lining for the non-hazardous waste have been set out elsewhere in this assessment.

The NLAG submitted documentation at the oral hearing which suggests that the pH of bottom ash can exceed 12 rendering the ash as being highly corrosive (see submission in Folder 3 received at the oral hearing on 29th March 2007 entitled "A Review of the Regulatory Status and Planning Issues Associated with Incinerator Bottom Ash in relation to the Rufford Energy Recovery Facility"). This paper submitted by the NLAG argues that bottom ash as a corrosive material is de facto hazardous in accordance with the definitions set out in the second schedule Part 3 of the Waste Management Act 1996 – being a substance which is classed as "corrosive".

This issue was subject to much discussion on Day 6 of the oral hearing. Mr. Wens indicated that during the incineration process metals such as iron and aluminium are being transformed into oxides together with cement and quicklime which are alkaline products and thus the pH of fresh bottom ash is normally between 10 and 12 (see Page 101 of Day 6 of the Oral Hearing). Mr. Wens also indicated that bottom ash is used as a daily cover for the largest municipal landfill in Belgium situated near Antwerp. Both fresh bottom ash (which normally has a higher pH value c.12) and cured bottom ash (bottom ash which has been exposed to the atmosphere for a period of days or weeks which reduces the pH to c.10) is used in covering the municipal solid waste material on a daily basis. The bottom ash is used to stop the municipal waste being carried away from the landfill cells due to wind. Mr. Wens indicated that bottom ash can be used as a temporary covering as it is not deemed to be hazardous waste in Belgium.

The critical issue in my view is whether or not the solid bottom ash to be deposited on site constitutes corrosive material that could have adverse environmental consequences in some form. It appears based on the evidence produced by Mr. Wens that while bottom ash has the potential to reach pH values as high as 12 particularly when leached, that the solid material in itself will not be corrosive when handled. This is due to the fact that the corrosive material such as the pure cement and quicklime will only come into contact with human skin along the surface area of the bottom ash. While the leachability of the bottom ash may well give rise to a pH value of 12 or in some cases even higher (in order for such high pH values to occur it would require a particular ratio of bottom ash to water in order to maximise the leachate value. That is to say that if modest amounts of water were added to the bottom ash elements with a high pH value would not be fully leached out of the material whereas if excess water was added to the bottom ash the overall pH value would become diluted). Therefore while the leachability of the bottom ash may well give rise to pH values of 12 of more, the handling of such bottom ash would not destroy living tissue on contact and thus would not render the bottom ash as being "corrosive" in accordance with the H8 criteria set out in Part 3 of the second schedule of the Waste Management Act 1996. This is explained in some detail during the questions and cross-examination of Mr. Wens on day 6 of the oral hearing (Page 111-113).

It was also pointed out during this question and cross-examination that bottom ash would tend to have a higher pH when incinerated at a higher temperature (such as 1400-1500°C). At such temperatures the quality of quicklime and cement would be higher and thus the pH value within the bottom ash would be higher. In the case of municipal solid waste incineration the temperature would be lower (c.900°C) and hence the potential to create bottom ash with higher PH values would be lower.

A reduction in the pH value is a prerequisite where bottom ash is to be recycled for use such as an underlay for road building etc. A critical point also made by Mr. Wens was that the potentially corrosive material such as cement and quicklime are generally in low concentrations within the bottom ash. He indicated that workers on the municipal solid waste landfill outside Antwerp when spreading the bottom ash do not wear protective clothing and gloves (see Page 135 of Day 6 of the Oral Hearing). This suggests that the bottom ash poses little risk to either the residents living in close proximity to the landfill or indeed the workers at the MEHL facility in terms of its potential corrosive properties.

7.6.4 Pre-treatment of Bottom Ash

Allied to the concern regarding the high pH value associated with bottom ash is the contention that bottom ash requires treatment prior to landfilling in order to lower the pH. It has been established during the course of the oral hearing that the "curing" of bottom ash to exposure to atmospheric conditions for a number of days/weeks reduces the PH value of the material, normally to a PH value of in and around 10. It is suggested again in the evidence of Mr. Piet Wens that any type of curing process is only necessary when the bottom ash is to be reused as a construction material. As the bottom ash is to be disposed directly into the lined cell (in Phase 1 of the development bottom ash will be placed in the hazardous waste cells pending the completion of the non-hazardous cells which are to be undertaken in Phase 2), and will therefore not come into direct contact with anything other than the atmosphere and other waste within the cell. I do not see any reason why bottom ash in this instance requires to be treated prior to being placed within the landfill cell. Furthermore it is likely that over a long period of time even if the bottom ash is not fully exposed to atmospheric conditions as it is assumed that the lower layers of bottom ash could be covered by subsequent layers that the pH value of the bottom ash will fall to about 10 notwithstanding the fact that it has been covered (see the evidence of Mr. Piet Wens Page 110).

With regard to the issue of noxious gases, all the evidence presented suggests that bottom ash will not result in any noxious gas. The calorific value of all municipal solid waste will have been incinerated. As a result waste, which normally gives rise to odours such as putrescible and biodegradable waste will not be present in the bottom ash. The potential for odour from bottom ash is therefore negligible. No other noxious gases will result from the placing of an inert hazardous and non-hazardous waste on site.

The original submission by the NLAG also suggests that the incinerated bottom ash can give rise to hydrogen gas and this is mainly associated with the

aluminium content of the bottom ash. This issue was raised in the original submission to An Bord Pleánala but was not the subject of any discussion during the course of the oral hearing. With regard to the production of hydrogen gas I would refer the Board to the statement of evidence of Mr. Patrick Foss Smith (see Folder 1 Appendix 12). On Page 13 of the statement of evidence it states the following: "*the production of hydrogen as either a viable, inflammable or explosive gas is unlikely since the auto ignition temperature for hydrogen is 585°C far above any temperature produced by any exothermic activity*". Furthermore hydrogen will only ignite in the presence of a supply of oxygen which is restricted in a fully lined landfill.

7.6.5 Wind Borne Deposition of Bottom Ash

With regard to wind born deposition of bottom ash outside the confines of the site, I note that the bottom ash will arrive at the facility as a wetted substance similar to wet earth and gravel which will significantly reduce the dust impact. The Board will note from the sample of bottom ash submitted in the oral hearing that the ash itself does not comprise of fine material but on the whole comprises of a heavier type grit/sand together with remnants of metal, brick and other non-combustible debris. It was also stated during the course of the oral hearing (see evidence of Ms Sinead White - Folder 1 Appendix 14) that bottom ash will be sprayed with water on being deposited within the cells in order to dampen the material. It is acknowledged however that the transportation of smaller dust particles could arise if the ash permitted to dry out.

The dust minimisation plan set out in the EIS states that any stockpiled material will be covered. The nearest property is 85 metres from a non-hazardous waste cell. With appropriate mitigation measures it is unlikely that dust from the non-hazardous bottom ash will cause a significant problem for residential receptors in the area. The Board should also note that currently the site is licenced for the landfilling of inert waste which may give rise to similar air quality and dust borne deposition problems than that associated with bottom ash. In this regard I note that the annual average mean background pollutant concentrations set out in Table 9.3 of the EIS indicates that the onsite monitoring to date illustrates compliance with the various limit values for pollution concentrations. Of particular importance is the PM_{10} and $PM_{2.5}$ values both of which are well below the existing and proposed limits.

Reference is also made to complaints received by residents in close proximity to the Moneypoint Power Station in County Clare. I visited the Moneypoint Power Station for the purposes of the current application and noted that bottom ash was being landfilled/spread within the confines of the Moneypoint Power Station site. It was also confirmed to me that complaints had been received from local residents in the vicinity with regard to dust deposition in the general area. It should be pointed out however that the ash spread in the case of the Moneypoint Power Station appeared to be a dryer residue than the municipal incinerator of bottom ash. It also appears (according to the Inspector's report PL03-204329) that the fugitive by-product in the flu gas desulphurisation process is a dry mixture of calcium sulphate, fly ash and untreated lime. It is quite possible therefore that this substance would incorporate different chemical/physical

constituents than that associated with the non-hazardous bottom ash which in the main comprises of non-calorific residues such as glass, brick, rubble, sand and metals. Therefore while problems may occur at the Moneypoint Power Station in relation to dust deposition it does not necessarily apply that the same problems will arise in the case of the MEHL facility because of the mitigation measures to be employed and the nature of the residue to be landfilled that such problems will occur at the MEHL facility.

With regard to the hazardous waste material it is noted that this waste will be treated and solidified within an enclosed area before being placed in a landfill site in a solidified state. The potential for dust emissions is therefore negligible.

Finally in relation to air pollution and dust deposition I acknowledge that the facility is located in an elevated position however the Board will note that the actual waste cells will be screened and sheltered due to the natural, and to a greater extent the manmade topography, within the confines of the site. The topography of the land together with the manmade berms will shelter the site, particularly to the south and east where winds from the Irish Sea are likely to be dominant.

7.6.6 Exothermic Reaction within the Bottom Ash

Concerns are expressed in relation to the potential for exothermic reaction which could take place deep within the cells containing the bottom ash. It is argued particularly by the NLAG that any heat arising from exothermic reaction could impact on the integrity of the HDPE liner and the leachate collection pipes. Again these concerns are primarily based on documentation attached to the original submission to the Board and also submitted at the Oral Hearing from a paper prepared by the Institute of Hydrochemistry from the University of Munich (See Folder 3 Appendix 12). The research concludes that bottom ash derived from municipal solid waste has shown that exothermic reactions may cause temperature increases in the landfill of up to 90°C. This issue was again discussed in some detail during the proceedings of Day 6 of the oral hearing (see Pages 179-184). Mr. Foss Smith on behalf of the applicants considered the papers presented by the University of Munich and also referred to other such similar trials (referred to generally as the German trails) in relation to exothermic reactions in bottom ash. According to Mr. Foss Smith three critical issues which were used in the placement of bottom ash in the German trials will not be incorporated into the workings of the MEHL facility.

In the case of the German trials bottom ash was placed within the cell in 3 metre lifts which creates a much higher potential for build-up of exothermic heat within the bottom ash. It appears that the build-up of exothermic heat is directly proportionate to the thickness of the layer of the bottom ash. In the case of the MEHL facility the depth of the bottom ash in any one lift will be 250 millimetres. These lifts will be separated by a mineral layer most probably soil or other inert material. Thus the potential for exothermic heat build-up will be significantly dissipated as a result of the more frequent layering of inert material and thus the potential for exothermic heat build-up would appear to be significantly reduced. It is also important to point out as evidence in Mr. Foss

Smith (see Folder 1 Appendix 12) that the maximum heat build-up occurs at the centre of the bottom ash and not at the basal liner of the cell where the HDPE lining and leachate collection pipes are located.

Secondly the various German trials which were conducted were measured at nine levels within the body of a landfill over a period of nearly three years. As the life of the MEHL facility is proposed over 23 years (the Board will note that the placement of bottom ash in the non-hazardous cells will only begin in Phase 2 – two years after the initial works are commenced onsite). The longer lifetime of the MEHL facility will allow the heat build-up within the bottom ash to dissipate over time. Mr. Foss Smith again gave evidence which is supported by the various German studies that the period of greatest temperature build-up due to exothermic activity was the first 8-12 weeks after which point the temperature of the ash decreased (roughly by about 0.6° per day). It is therefore apparent that a slower rate of layering of the bottom ash would help reduce temperature build-up.

Thirdly and perhaps most importantly in relation to the MEHL facility the HDPE liner and leachate collection system incorporates a total protective layer which will be 1 metre deep in the case of the German trials the drainage layer between the HDPE liner and the waste was only 250 millimetres. The HDPE liner and the leachate collection system will therefore be afforded greater protection from a heat build-up. The design of the landfill at Hollywood is such that it is unlikely to result in heat damage to any of the lining or leachate collection infrastructure beneath the waste as:

- The depth of the "lifts" of the bottom ash will only be 25% of those used in the German trials
- The laying of the bottom ash will be over a greater period thus allowing exothermic heat to dissipate before additional layers are added
- The protective drainage layer and lining will be significantly more protected in the MEHL facility than that used in the German trials.

Based on the evidence presented and particularly the evidence of Mr. Foss Smith I do not consider that the integrity of either the HDPE liner or the leachate collection pipe could be adversely affected by any potential exothermic reaction associated with the laying of the bottom ash.

7.6.7 Leachate Production

With regard to leachate production associated with the bottom ash it has already been established earlier on in my assessment that leachate derived from the bottom ash can have a PH of 12 which has the potential to be corrosive. The leachate if not properly managed represents a potential threat to the environment. Although it should be pointed out that leachate from any landfill including municipal solid waste landfills have likewise potential, if released, to adversely impact on the environment. The extraction of leachate from the MEHL landfill facility will require appropriate treatment, as in the case of any municipal solid waste landfill. If the landfill lining complies with the requirements set out in the

Landfill Directive and the leachate is managed and disposed of in an appropriate manner I do not consider that the leachate generated from the bottom ash represents an environmental threat.

7.7 Landfill Linings

A number of major concerns were expressed in relation to the lining systems to be incorporated at the MEHL facility. These are summarised as follows:

- The lining system is not in accordance with the EPA Guidelines.
- The DAC liner has not been tried and tested and has only been in existence for 30 years.
- Landfill linings cannot guarantee 100% containment.

7.7.1 Compliance with EPA Guidelines

In relation to the first issue it is argued that the proposed lining system for the hazardous cells is not in accordance with EPA Guidelines. The EPA Landfill Design Manual (EPA 2000) details in Section 6 the cell lining requirements. In relation to hazardous landfills the Guidelines state that two options are available. Firstly a single composite liner comprising inter alia of a 5 metre thick mineral layer with a hydraulic conductivity less than or equal to 1 x 10^{-9} metres per second. Secondly a double composite liner with two separate liners with a mineral layer of 1 metre in thickness with a hydraulic conductivity of 10^{-9} and a subjacent mineral layer 4 metres in thickness with a hydraulic conductivity of 1 x 10^{-9} metres per second with a separate leachate collection system in-between the respective mineral layers.

Annex 1 of the Landfill Directive sets out the basic requirement that any landfill for hazardous waste should incorporate a mineral layer with a minimum thickness of 5 metres and a hydraulic conductivity of 1 x 10^{-9} metres per second. The EPA guidance document appears to be predicated on the parameters set out in the Landfill Directive but offers an alternative double composite liner which is equivalent in terms of protection.

A critical point of note is that the Landfill Directive states that "*where the geological barrier does not meet the above conditions it can be completed artificially and reinforced by other means giving equivalent protection. An artificially established geological barrier should be no less than 0.5 metres thick*".

Likewise specifically in relation to a hazardous waste landfill Section 6.2.1 of the EPA Landfill Site Design Manual states that "alternative systems may be considered for pre-treated hazardous wastes e.g. solidification, stabilisation or vitrification of hazardous wastes".

While it is clear that the proposed linings for the hazardous waste cells at the MEHL facility do not strictly adhere to the design specifications set out in the EPA documentation, both the EPA Guidelines and the Landfill Directive provide for alternative methods provided that it offers equivalent protection.

The dense asphaltic concrete layer (DAC) liner comprises of an artificial liner which is 80 millimetres in thickness and is underlying by a 60 millimetre asphaltic binder layer and a 200 millimetre granular stabilisation layer/leak detection system together with a geotextile membrane and a 500 millimetre layer of engineered clay. While the DAC liner itself comprises of a layer only 80 millimetres in thickness I consider that the overall composition of the hazardous landfill layer (the binding layer, the stabilisation layer, the geotextile membrane, and engineered clay) creates a "artificial" barrier in excess of 0.5 metres in thickness and thus complies with the requirements of the Landfill Directive.

A more salient point relates to the permeability of the DAC liner. In this regard I refer the Board to the evidence of Ms Sinclair on behalf of the applicant (see Folder 1 Appendix 11). Ms Sinclair has first-hand experience of a DAC liner system at the Westmill landfill site in Hertfordshire in England. While this DAC liner referred to for the Westmill Site is a municipal solid waste landfill as opposed to a hazardous landfill, the Westmill site nevertheless overlies a regionally important chalk aquifer. The potential for groundwater contamination therefore was significant. The Board will also note that the applicants submitted during the course of the oral hearing details of a permit for Bradley Park Landfill near Huddersfield in West Yorkshire where DAC liners were used in the cell lining of a hazardous waste facility. It should be noted that in the case of both the Westmill Landfill site and the Bradley Park Landfill site both landfills were permitted subsequent to the implementation of the Landfill Directive. This suggests that the licencing agencies in the UK consider that the DAC liner complies with the Landfill Directive. Ms Sinclair when cross-examined indicated that in the case of both the Westmill facility and the Bradley Park facility that the DAC liner was likewise 80 millimetres in thickness.

Ms Sinclair's evidence (see Pages 41-72 of Day 2 of Oral Hearing and Folder 1 Appendix 11) stated that the DAC liner was subject to numerous checks (stress tests, temperature checks, joint bonding, nuclear density testing etc.). Tests are carried out both in a laboratory and onsite when the DAC liner is being laid. The liner is also the subject of a Construction Quality Assurance report. According to the evidence presented by Ms Sinclair the DAC liner has a stated permeability of 1×10^{-12} metres per second however she also stated that independent test results show typical values to be in the order of 1×10^{-16} metres per second, which is far in excess of the requirements of the Landfill Directive (see Page 52 of Day 2 of the Oral Hearing). Ms Sinclair indicated that when cross-examined that permeability of 1×10^{-9} over 5 metres results a travel time through the lining of approximately 150 years. 80 millimetres of DAC lining at a permeability of 10^{-12} would result in a travel time of 2,400 years. At permeability levels of 1×10^{-16} metres per second the travel time would be in the order of millions of years (however over such a long time scale the landscape and geological conditions will inevitably change considerably which would obviously impact on the integrity of the lining). There is little doubt however that based on the evidence

submitted the DAC liner complies with the minimum requirements of the Landfill Directive and as such in my view would comply with EPA Guidelines. The fact that numerous DAC liners have been installed in both the UK and other European countries including Germany and Switzerland since the late 1970's suggest that there is general agreement amongst EU member states that the DAC liner would comply with EU Directive/31/1999.

7.7.2 The proposed Linings have not been Tried and Tested

Another concern raised is that the DAC liner is a relatively new development and has yet to be tried and tested. The evidence of Ms Sinclair indicated that the DAC liner has been in use on the continent and in particular Germany and Switzerland since 1979. Mr. Cunningham when cross-examined after his statement of evidence stated that he had personally inspected a section of DAC liner which had been in use for over 30 years in Switzerland and that with the exception of a few blemishes on the surface, there was no evidence of any egress through the liner. (See Transcripts of Oral Hearing Day 1, Pages 164-165). The evidence presented suggests that the DAC liner is a highly effective barrier and more effective than the minimum requirements set out in the Landfill Directive.

The argument presented that landfill linings cannot guarantee 100% containment forever, is valid only when one considers the effectiveness of any barrier over an extremely long timeframe. Ultimately all linings associated with landfills will fail. It appears however that the DAC liner in association with other measures (solidification of waste, clay linings and natural geology under the hazardous cells etc.) will ensure that the hazardous waste material will be encased for a very long time - possibly thousands of years. This is well in excess of the requirements of the Landfill Directive.

7.7.3 The Lining Cannot Guarantee 100% Containment

Again this argument is only valid when one considers the effectiveness of the landfill lining over a very long period. It has been adequately demonstrated in my view that the lining proposed constitutes an effective barrier which will contain the waste for a period in excess of the requirements set out in the Landfill Directive.

7.8 The Capacity of the Site to Accommodate Hazardous Waste

This issue has been dealt with to some extent previously under section 7.2 of this assessment which relates to strategic and policy context. However specifically Fingal County Council expressed concerns that the site may not have the requisite capacity to cater for hazardous material in the long-term. Fingal County Council suggests that based on current hazardous waste projections that the life of the hazardous landfill could be extinguished after only 11 years. This contention is predicated on the figures in relation to hazardous waste contained in the NaDWaF report (Table 23). Table 23 of this report contains the aggregate prediction for hazardous waste from 2008-2025 as follows:

2008-2013	216,536 tonnes per year
2014-2019	277,139 tonnes per year
2020-2025	306,526 tonnes per year

A number of points should be highlighted in relation to the above contention.

Firstly as already outlined previously in the assessment it is difficult to quantify future hazardous waste arising's for a number of reasons including the quantity of contaminated soils to be produced in any one year, changes in treatment methods which may render waste previously classified as hazardous now being classified as non-hazardous, fluctuations in the amount of hazardous waste which would be treated at the point of waste generation. Furthermore it is worth reiterating that the National Hazardous Waste Management Plan suggests a hazardous waste landfill facility which has a capacity to accommodate at least 25,000 tonnes per annum. The MEHL facility proposes to accept almost 5 times this amount.

The problems associated in predicting the waste streams is borne by the fact that baseline prediction model as set out in Table 70 of the NaDWaF report indicates that the average hazardous landfill tonnage capacity between 2008 and 2025 will reduce from 257,000 (2008-2013) to 185,000 (2020-2025).

Furthermore it should be highlighted that not all hazardous waste in Ireland will be accepted at this facility. For example asbestos waste will not be accepted at the MEHL facility. Currently a strategic infrastructure application is before the Board under PA0019 for the expansion of the Knockharley facility at Kentstown, County Meath which will include a facility for the acceptance of asbestos waste. While the details of the exact wastes permitted to be landfilled at the MEHL facility will be detailed in any waste licence issued by the EPA, it is likely that some of the waste listed as hazardous waste in Table 23 of the NADWAF report may not be accepted at the facility. According to the EIS the main hazardous waste to be accepted at the facility are essentially the residual ashes resulting from the national incinerator facilities.

In addition it is apparent from Table 29 of the EPA National Waste Report (see documentation attached to this report) that significant proportions of hazardous waste generated in Ireland are recovered or disposed on site at the industrial facility where the waste is generated under an IPPC licence. Furthermore there are offsite facilities in Ireland with the EPA have licenced for the treatment or recovery of hazardous waste such as the KTK Landfill facility in County Kildare which currently accepts small volumes of asbestos waste.

While it is likely that some of this waste will be transferred to the MEHL facility for treatment and disposal it is unlikely that all waste will be transferred. It is not clear whether all the hazardous waste residues referred to in Table 23 of the NaDWaF report would in fact be suitable for landfill and therefore some of it may still be required to be exported.

In conclusion therefore that the assertion that the MEHL facility will have an 11-year lifespan to accept hazardous waste is based on a rather crude evaluation of the figures presented in Table 23 of the NaDWaF report.

Before leaving the capacity issue, I would refer the Board to a statement contained in the draft statement of waste policy – for consultation which was prepared last year by the DoEHLG. Page 19 of this draft statement suggests that *'an examination will take place as to the classification of incinerator bottom ash as hazardous'*. If such a scenario were to arise the forecast of hazardous waste arising's will be significantly altered and this in turn would materially impact on the longevity of the life of the landfill to accommodate hazardous waste.

However based on the actual figures presented both in the EPA national waste report and in the NaDWaF report and for the reasons set out above, I would consider that a 25-year timeframe for the acceptance of hazardous waste is not an unreasonable forecast. It would be inappropriate in my view to refuse planning permission for the proposal on the possibility that lifespan of the proposal may be less than the anticipated 25 years. NHWMP stipulates that at least one hazardous landfill be developed in the Country. Thus the possible of providing another such facility as some future date, such the need arise, would not be contrary to national policy.

7.9 Long-term Ownership and Management of the Facility

The issue of long-term ownership, maintenance, monitoring and aftercare of the facility is a significant concern expressed by many of the observers. Reference is made to fires at other landfills, including the recent one at Kerdiffstown landfill in County Kildare as an example of problems associated with the lack of aftercare at landfill facilities. Specifically in relation to the problems at Kerdiffstown, the statement of evidence by Mr. Foss Smith (see Folder 1 Appendix 12) states problems associated with the Kerdiffstown facility could not occur at the MEHL facility on the grounds that combustible materials will not be landfilled at the proposed facility. Mr. Foss Smith also points out that the Kerdiffstown site was badly engineered, badly managed and not operated in accordance with current day EPA licence requirements. The same will obviously not apply to the current application before the Board.

In relation to the wider issue of aftercare, concerns were expressed that the applicant may not be in a financial position to carry out the monitoring and aftercare of the facility. It is anticipated that it will be a requirement under any EPA licence that detailed requirements will be set out for the care, restoration and aftercare of the facility. I note that the two previous waste licence issues (W0129-01 and W0129-02) that both licences contained detailed separate conditions relating to restoration and aftercare (condition no. 4 in the case of W12901 and condition no. 10 in the case of W0129-02) and financial charges and provisions (in the case of both licences - condition no. 12).

The restoration and aftercare condition requires a Closure, Restoration and Aftercare Management Plan (CRAMP). A copy of this Plan prepared on behalf

of the applicant in relation to the existing licence and submitted to the EPA is contained in the applicant's submission to the oral hearing (see Appendix 24 of the applicant's submission).

In terms of financial charges and provisions the applicant is required to pay

- An annual charge to the agency towards the cost of monitoring
- An indemnity dealing with environmental liabilities
- A financial security for the closure and aftercare of the facility.

In my view therefore these issues were comprehensively dealt with in the EPA licencing arrangements.

With regard to the applicant's ability to finance the long-term restoration and aftercare it is not necessarily within the Boards jurisdiction to request detailed financial statements regarding the applicant's financial affairs and his ability to fund any requirements set out. Nevertheless it is imperative that when planning permission is granted for any development, not just the development at the MEHL facility, that it is incumbent upon the applicant to comply with all conditions attached to the development including any financial contribution conditions which may be attached. Likewise it is imperative that in the granting of any waste licence the applicant would be required to comply in full with all financial contribution conditions and all restoration and aftercare conditions.

If the Board have concerns regarding the financial ability of the applicant to address long-term aftercare and restoration of the site, it could consider attaching a financial security condition to ensure that moneys are secured specifically to address the aftercare monitoring of the landfill – post closure. It may however be replicating conditions which would be attached to any EPA licence.

The details of the aftercare and management plan must be approved by the EPA, as part of any CRAMP. I note that this is a requirement of condition No. 10 of the existing waste licence. This likewise will be a requirement of the current application for a waste licence under review from the EPA. In terms of the long term Environmental Impact it is envisaged that any such licence will ensure that after the final capping, leachate will be continued to be pumped off site until leachate production finally ceases. As already stated, the issue of landfill gas will not arise because of the nature of the waste being deposited. The long term environmental impact of residential emissions will not be an issue therefore, if properly managed.

In relation to the buildings on site section 4.13 of the EIS states that the administration building and car park will be removed from the site and the residual area will be top soiled and landscaped as part of any restoration plan.

I am satisfied that the long term risk associated with the development has been described and evaluated in the application particularly through the quantitative risk assessment carried out as part of the EIA. I am satisfied that that if properly

managed, the facility will not pose a long term significant risk to the environment.

7.10 Traffic Issues

A number of traffic issues were raised by observers both in the original written submissions to the Board and during the course of the oral hearing. The main traffic issues are set out below.

- The EIS did not contain a comprehensive traffic assessment based on up to date traffic counts along the road network but relied on obsolete figures contained in assessment associated with the Fingal Landfill Project.
- The level of traffic associated with the facility would constitute a traffic hazard.
- The level of traffic associated with the facility will impact on residential amenity.
- The road leading to the development is not suitable to cater for the size and scale of the trucks proposed.
- The proposal is premature pending the provision of a new link road to the north of the site which is required in accordance with the grant of planning permission associated with the Fingal Landfill Project.
- Appropriate safety measures have not been put in place for trucks carrying the bottom ash and flu gas residues to the facility.
- Traffic to and from the facility will interfere with the safety of children being dropped off and picked up at Hedgestown National School to the east of the site.
- The applicant has failed to address the reasons for refusal under PL06F.230763.
- The applicant has not considered alternative access arrangements.

7.10.1 Traffic Figures Contained in the EIS

During the questions and cross-examinations of Donal McDaid Traffic Consultant on behalf of the applicant, much concern was expressed by observers in relation to the fact that a comprehensive transport assessment based on up to date traffic counts were not carried out for the purposes of the current application. Section 8 of the EIS specifically relates to roads and traffic. Section 8.2.1 of the EIS sets out the key assumptions associate with traffic. A key consideration in this regard is the fact that under the extant permissions on site the facility has an operational capacity of 500,000 tonnes per annum. It is not proposed to increase traffic volumes under the current application. A comprehensive traffic survey was carried out to ascertain traffic levels in the area under the Fingal Landfill Project (see Section 3.17.2 of EIS – main report Fingal Landfill Project, Page 287). These surveys were carried out in April 2005. The EIS for the current development before the Board factored in NRA growth factors in traffic to the year 2010 for the purposes of the current application. The fact that a comprehensive traffic survey was not carried out specifically for the current application would not be fatal to the overall

application of the EIS in my view. I base this conclusion on the fact that comprehensive traffic surveys were carried out for the Fingal Landfill Project which included traffic data collection, traffic surveys and junction capacity assessments for the area around the site and in particular traffic travelling to and from the M1 interchanges. Baseline information therefore was available to the applicant in order to ascertain the traffic impact. It is reasonable in my opinion that the applicant would merely factor in NRA growth figures along the road network in order to update the survey work already undertaken.

It is most likely that the traffic volumes on the surrounding road network in the vicinity of the site have decreased since the figures for the Fingal Landfill Project were ascertained. This would be primarily due to the fact that there has been a 90% decrease in the annual tonnage of the total loads per annum accepted at the MEHL facility between 2007 and 2009. This is due to the general economic downturn and is illustrated in Table 8.1 and Graph 8.1 of the EIS. The surveys undertaken in April 2005 for the Fingal Landfill Project would have incorporated traffic volume levels associated with the MEHL facility which is significantly higher than those associated with the facility today. Notwithstanding this the junction analysis carried out as part of the Fingal Landfill Project "clearly demonstrated that each junction tested has adequate capacity to accommodate the traffic flows expected to be generated by the Fingal Landfill in both the opening year and the design year".

It could be argued that any baseline traffic study in the vicinity of the site post 2009 would record significantly lower traffic volumes than those recorded in April 2005 for the Fingal Landfill Project. Therefore the proposed development would represent a significant increase in traffic levels over and above those presently associated with the facility (i.e. less than 50 movements per day as per the figures presented for December 2009). However any such argument would be overlooking the fact that planning permission has already been granted for an inert landfill with the capacity of 500,000 tonnes per annum. Thus the critical issue is that there will be no increase in traffic levels on the local road network over and above that already deemed to be acceptable by the Planning Authority. It would be inappropriate and inconsistent in my view to rule that an inert landfill with a capacity of 500,000 tonnes per annum is acceptable on site in terms of traffic generation and then subsequently decide that a hazardous, non-hazardous and inert waste facility was unacceptable on traffic grounds notwithstanding the fact that it is not proposed to increase the capacity of the facility. In terms of volume and bulk the nature of the waste, it is considered that inert, non-hazardous or hazardous waste is generally the same in terms of bulk, mass and density. Both the EIS and the NaDWaF report suggest that the waste will be somewhere between 1.5 and 2 tonnes per cubic metre. I note the submissions on behalf of the Nevitt Lusk Action Group which suggest that the bulk density of bottom ash has found to be 0.745 grams per millilitre (see closing submission of Mr. Short (Page 30, Day 7 or Oral Hearing and Folder 3 Submission 8). Obviously if bottom ash was of such a low density it would result in traffic volumes well in excess of those anticipated in the EIS. This would imply however that bottom ash would float. This in my view would be unlikely having regard to the presence of metals, ceramics and stones etc. within the material. In fact I tested some of the bottom ash which was submitted

to the Board at the oral hearing by placing it in water and noted that the vast majority of the material did not float. Based on the evidence submitted to me therefore I can only conclude that the bottom ash has a significantly high bulk density than that suggested in the evidence presented by the NLAG.

In conclusion therefore I do not consider that it would be a specific requirement to carry out a new comprehensive baseline study in relation to traffic having regard to the fact that a detailed evaluation was carried out during the Fingal Landfill Project and this assessment included traffic associated with the MEHL facility (see Page 304 of Fingal Landfill Project EIS). In addition planning permission already exists for a facility onsite capable of accommodating 500,000 tonnes per annum and it is not proposed under the current application to increase tonnage beyond this level. Thus it has already been determined that the site and the surrounding road network is capable of accommodating the traffic associated with the development. To put it another way, if the Board consider it appropriate to refuse planning permission for the current application on traffic grounds or on the grounds that there was an inadequate baseline study carried out as part of the EIS, The applicant under the extant planning permission and licence would still be entitled to transport inert waste to a level of 500,000 tonnes per annum which would have the same impact in traffic terms as the current application before the Board.

7.10.2 The level of traffic associated with the facility could constitute a traffic hazard.

The vast majority of traffic to and from the site will travel towards the M1 (98%). The Nevitt Road is a narrow road and does incorporate a number of bends which restrict views for oncoming traffic. However as already argued on a wider strategic level the site is located in good proximity to the national road network including motorways. Therefore it is only in the immediate vicinity of the site and particularly that part of the site between the MEHL facility and the M1 that incorporates a road network that could be deemed in any way substandard. As already pointed out however this road network was assessed in the context of a previous application including the extant permission which allows for 500,000 tonnes of inert material to be landfilled onsite. The development before the Board does not propose any increase in the amount of material to be deposited onsite. Therefore the potential impact of the proposed development will not be materially different than that associated with the extant permission onsite.

7.10.3 The road leading to the development is not suitable for the size and scale of the trucks proposed.

The same arguments hold true for this concern. The existing road network was already evaluated in terms of its appropriateness to cater for traffic for the existing facility. As the current application does not propose to increase the volumes of waste to be accepted at the facility there will be no change in traffic levels and volumes over and above that permitted onsite. I would reiterate that it would be inappropriate to refuse planning permission on traffic grounds for the proposed facility having regard to the fact that permission has already been

granted for an inert landfill facility which could generate comparable levels of traffic on the road network. In this regard it could be argued that the road network has been assessed and deemed to be suitable for the levels of traffic envisaged already.

7.10.4 The proposal is premature pending the provision of a new link road to the north of the site required in accordance with the permission granted under the Tooman Nevitt Landfill.

Under the planning permission issued for the Tooman Nevitt Landfill the applicant was required to build a new link road between the LPO0180 and Rowans Road to the north-east of the site. The new road is indicated on Slide 6 of the Statement of Evidence of Mr. Donal McDaid to the oral hearing (see Folder 1 Appendix A10, Slide 6). The proposed county road is to be located to the immediate east of the existing Tooman Road. When constructed it is envisaged that all traffic to and from the site from/to the M1 would use the proposed country road thereby bypassing the eastern section of the LPO01080 which incorporates the more poorly aligned sections of this local road. The construction of the proposed county road would be beneficial in terms of road safety and also residential amenity particularly in relation to the houses located along the LP01080 between the Ballyboughil Road and the M1. However I would not consider that any future decision by An Bord Pleánala in relation to the current proposal should be predicated on the construction of this road. The proposed county link road is specifically designed to facilitate traffic from the Fingal Landfill Project. The existing road network has been evaluated in the context of the MEHL facility and was deemed to be appropriate to facilitate traffic to and from the facility up to a level of 500,000 tonnes per annum. In terms of volumes of waste to be accepted no change is proposed under the current application.

7.10.5 Appropriate safety measures have not been put in place for trucks carrying bottom ash and flu gas residues to and from the facilities.

This issue was already briefly examined in relation to the nature of waste to be transported to and from the facility. I have argued previously in my assessment that this material does not represent a dangerous substance if it were to come into contact with residents along the transportation route. Again I refer the Board to the fact that under Article 32 of SI no. 126 of 2011 there is an onus on a person holding, treating or otherwise being in control of the waste, which it is assumed includes the transportation of waste, to ensure that the management of waste is carried out without endangering human health and without posing a risk to water, air, soil, plants or animals or creating a nuisance through noise or odours. There would be an onus therefore on the transport operator to ensure that no such problems arise in the transportation of the waste. Were such problems to arise the person in charge of managing the waste could be prosecuted. It is envisaged that no such problems would arise if tailgates of vehicles or property secured and as envisaged under the planning application that all trucks transporting waste to the facility would be covered.

7.10.6 Impact of the proposal on Hedgestown School

Hedgestown School is located in close proximity to a small roundabout (the Hedgestown roundabout) to the immediate east of the R132 approximately 3.5 km the east of the site. The school is indicated on Figure 8.1 (adjacent to the eastern boundary of the map). Currently some trucks while exiting off the M1 Courtlough Interchange (Junction 5) travel along the R132 in a southerly direction and utilise the Hedgestown roundabout before travelling westwards along the LP0180 towards the MEHL facility. Concerns are expressed that heavy trucks utilising the Hedgestown roundabout could pose a safety problem for parents and pupils dropping their kids to Hedgestown School. During the course of the oral hearing I carried out an observational survey of the parking arrangements at Hedgestown School during a morning drop-off. I noted that the vast majority of parents drop their kids outside the front of the school, away from the Hedgestown roundabout. Some of the observers at the oral hearing stated that there was a wide scale parking on the roundabout during the school pick-up/drop-off times. There were a small number of instances of cars being parked on the roundabout, however such occurrences were infrequent (I noted only four such occurrences during my 1 hour observation survey (8.45-9.45a.m.)). I further noted that while there were instances of traffic parking on the roundabout, space was available in closer proximity to the school for parking purposes. While it is inappropriate and illegal to park on a roundabout I noted that even where such parking occurrences occurred it would still be possible for trucks to access and utilise the roundabout for the purposes of gaining access to the facility. Again the same issue arises in that extant permissions exist to facilitate the volumes of traffic to and from the facility and these volumes are not proposed to be altered under the current application.

Concern was also expressed that it is proposed to relocate Hedgestown School to a Greenfield site on the northern side of the LP01080 to the immediate west of the M1 motorway. It appears from the proceedings of the oral hearing that detailed plans of the new school have not been prepared and therefore detailed access/parking arrangements etc. cannot be evaluated at this stage. It should be born in mind however that if the proposed county road associated with the Tooman Nevitt facility were to be constructed it is unlikely that any trucks associated with the MEHL facility would pass in front of the relocated Hedgestown School.

7.10.7 The applicant has failed to address the reasons for refusal under Board Decision PL06F.230763

This application sought planning permission for the relocation of the primary entrance together with a new boundary treatment and internal site access road, weighbridge, office and associated works. The decision was refused by Fingal County Council for three reason and the decision was upheld by An Bord Pleánala on the grounds that the proposed new access would be visually obtrusive and out of character with the high amenity area and that the proposed entrance has not been justified and could interfere with the safety and free flow of traffic on the public road. Two issues therefore arise in relation to this refusal namely the visual issue and the road safety issue.

While I acknowledge that the Board have already determined that new access arrangements onto the LP01080 would be visually obtrusive and out of character with the high amenity location I would not share such concerns. The proposed access arrangements in my view would not significantly impact on the visual amenities of the area and this is demonstrated in the various photomontages submitted with the application (see Figures 12.14.1 and 12.14.2 of EIS figures). I also note from the photomontages that associated infrastructure including the solidification plant, weighbridge etc. would not be visible from the site entrance. Furthermore I consider that the visual amenity implications of the proposed entrance should be balanced against the wider strategic objectives in relation to waste management and in particular the recommendation to provide a hazardous waste landfill development nationally, the strategic advantages of the site in question in terms of the road network and the existing facility onsite etc. should be taken into consideration.

In relation to the Boards second reason for refusal the proposed access is onto the LP01080 and not the R108 as referred to in the reason for refusal. The LP01080 is of a higher standard than the road which serves the existing entrance, the LP01090 in terms of width and alignment. Sightlines at the proposed new entrance are deemed to be adequate and traffic volumes along the LP01080 are not as high as those associated with the regional route R108 to the west. In my opinion therefore the proposed development would not interfere with the safety and free flow of traffic as suggested in the second reason for refusal.

Finally in relation to the relocation of the access I would refer the Board to the local objectives contained in the recently adopted Fingal Development Plan (2011-2017) (see attachment to the statement of evidence by Mr. Tony Manahan Chartered Town Planner on behalf of the applicant – Appendix A4). Local objective 92 in the draft Development Plan specifically seeks to "*facilitate the relocation of offices, weigh bridge, primary vehicular entrance and internal access road serving the existing quarry, to be sensitively designed and located on the site. Maintain existing entrance on the Baldaragh Road (LP01090) as an emergency entrance only*". It is therefore clear that it is the Council's objective to facilitate the relocation of the entrance as planned. Fingal County Council in its written submission to the Board in relation to the proposed application stated that there were no objections to the relocation of entrance as proposed. It should also be noted that there was no objection from the Transportation Department for the relocation of the proposed entrance under Reg. Ref. F08A/0749 (An Bord Pleánala Ref. 06F.230763).

7.10.8 The applicant has not considered alternative access arrangements.

One of the written observations suggested that the applicant should consider alternative access arrangements to the site although it is not particularly clear from the observation as to what specific alternative access arrangements should be considered. I have argued above that the relocation of the proposed access to the site as proposed in the current application is appropriate from a traffic safety

point of view and is in accordance with the objectives set out in the recently adopted Development Plan. I therefore do not consider it necessary that the applicant would consider further alternative access arrangements to or from the site.

7.10.9 Stage 3 Road Safety Audit

Other minor issue are raised in relation to roads and traffic and this includes a comment from Fingal County Council's Transport Department which suggests that a Stage 3 Road Safety Audit be carried out. A Stage 3 Road Safety Audit is appropriate after the works have been carried out onsite to ensure that any such works adhere to appropriate standards.

7.11 Residential Amenity Issues

The main residential amenity issues raised other than those already evaluated in the assessment above include:

- Noise from trucks
- Air pollution from trucks
- The devaluation of property in the area
- Spoil and dirt on the road as a result of the transportation of materials.
- Visual Impact

7.11.1 Traffic Noise

In relation to the first issue a comprehensive noise survey was carried out as part of the EIS. Details are contained in Section 11 of the statement. In particular Section 11.5.2 specifically relates to traffic accessing the facility. The EIS acknowledged that there may be occasions where vehicles driving past properties at a distance of 20 metres from the local road will be marginally above the day time noise criteria set out for the facility. However this scenario assumes that all worst case peak hour traffic entering the facility passes by the assessment locations within 1 hour. It should also be noted that the predicted noise level is similar to that currently experienced at properties along the local road network as determined during the baseline noise survey.

It appears that the only concerns raised by observers in relation to noise relates to trucks passing by houses. No specific concern was raised in relation to noise emanating from construction and operating activities on site. I would again reiterate that traffic volumes associated with the development will not be in excess of those already permitted under the existing planning permission and waste licence granted for the facility. The applicant therefore already has permission to accommodate waste volumes similar to that proposed under the current application. It is expected that noise levels associated with the

transportation of inert waste to and from the facility will be similar if not the same as that proposed under the current application.

7.11.2 Air Pollution Associated with Traffic

With regard to the issue of air pollution specifically associated with trucks going to and coming from the facility, again the EIS deals with the issue of air quality in Section 9. In terms of existing pollutant concentrations the EIS indicates that concentrations are significantly below standards set out in the National Guidelines. The annual mean background pollutant concentrations for Zone D is set out in table 9.3 of the EIS. Each of the pollutant parameters ($N0_2$ $N0_{x3}$ PM_{10} $PM_{2.5}$ CO_2 and Benzene) are all considerably below the permitted limit values). With regard to air pollution specifically emanating from trucks, the same argument applies to traffic generally, in that truck volumes associated with the proposed development would be comparable to the levels permitted under the extant permission for the inert landfill.

7.11.3 Spoil on Roads

With regard to spoil deposition on the roads the EIS states that waste to and from the facility will be transported in fully enclosed containers and therefore will not result in any spoil on the roads. This can be implemented by way of condition. The deposition of spoil on the roads adjoining the site is a a management issue. I note that the site currently accepts inert waste and there were no major problems or evidence of spoil or spillage of waste from trucks along the roads leading to the facility.

7.11.4 Devaluation of Property

With regard to the devaluation of property it is acknowledged that the proposed hazardous element of the landfill could give rise to some concerns in relation to property devaluation. The cumulative impact from the proposed development together with the Fingal Landfill is likely to give rise to some level of property devaluation in the immediate area surrounding the sites. The perception of residing in close proximity to a landfill could well impact on property prices. Any adverse effect is difficult to quantify. However the Tooman Nevitt development has already received planning permission from An Bord Pleánala (the waste licence however has been the subject of judicial review).

The MEHL facility is already operating as a landfill and already has planning permission for the acceptance of inert materials up to a rate of 500,000 tonnes per annum. In terms of property values it is therefore important to stress the fact that a landfill use is already established on site. Prior to landfilling, the site operated as a quarry which likewise can give rise to amenity issues. Having regard to the established use on site it can be reasonably argued that the proposed development will have less impact on property values than in the case where a greenfield site was being development as a landfill.

As already pointed out the volumes of the material will not change under the current application. While the nature of the material to be deposited onsite will

change I have argued above in my assessment that the hazardous material will not present an environmental threat and therefore will not impact on the amenities of the area. Any perceived environmental/amenity threat which may impact on property value must in my view be balanced against the wider national strategic objectives of providing a hazardous waste landfill facility within Ireland. While the proposed MEHL facility in its acceptance of hazardous waste may be perceived as having an adverse impact on property values in the area, I have argued above that the proposed development does not represent an environmental threat and therefore should not have any material impact on property values in the area.

7.11.5 Visual Impact

With regard to visual impact I do not consider that the proposed development will significantly adversely impact on the visual amenities of the area. I acknowledge that the site in question is zoned high amenity in the current Fingal Development Plan 2011-2017. A landfill facility currently operates on site onsite and this fundamental land use will not change under the current application. While the current application proposes to construct new administration buildings together with a solidification plant and storage area these buildings will not be readily visible from the surrounding areas due to the existing topography of the site and the presence of natural and manmade berms around the parameter of the site. It is clear from the photomontages submitted with the application and the landscape assessment in Chapter 12 of the EIS that the works to be carried out onsite will have a negligible impact on the wider environment. In fact the photomontages submitted indicate that the buildings proposed will not be readily visible from vantage points in and around the site. Indeed there is merit in the argument put forward that the progressive infilling and restoration of the quarry area together with the subsequent landscaping during the latter phases of the development that the proposal will progressively improve the visual amenities of the area.

It is also suggested in one observation that the proposal will create permanent contaminated soil which is not in accordance with the high amenity zoning objective of the area. The nature of the waste to be deposited onsite will in no way impact on the visual amenities of the area. I have argued elsewhere in this assessment that contaminated soil or other waste to be deposited onsite will not pose an environmental threat to the area and therefore will not impact on the high amenity zoning objective associated with the area.

7.12 Health Issues

The main issues raised in relation to health were as follows:

- Congenital abnormalities have been reported in close proximity to landfills
- No proper health impact was carried out in relation to the proposal

- Dust deposition gives rise to respiratory problems
- No proper contingency measures are in place for the containment of contaminants.

7.12.1 Congenital Abnormalities in Close Proximity to Landfill and Health Impact Assessment

In one of the original written observations the Board suggested that people living in close proximity to landfills are more likely to suffer from birth defects and abnormalities as a result of contaminants associated with the landfill. During the course of the oral hearing it was also suggested in relation to this matter that a proper Health Impact Assessment was not carried out as part of the Environmental Impacts Study.

Section 7.3 of the EIS specifically relates to health and safety issues. A full Health Impact Assessment is presented in Appendix A7.1 (a full copy of the report is contained in the CD). Within Appendix A7.1 there are six separate health studies which relate to the possible health effects resulting from people living in close proximity to landfills. The reports generally conclude that overall evidence is inadequate to establish a relationship between health effects and proximity to landfills. It is also pointed out in the EIS that one of the main difficulties about reviews of epidemiological evidence is that, they are by their nature historical. While they may accurately reflect the situation as it was, nowadays with far greater engineering control and much higher controls in relation to waste acceptance criteria, the management of potential emissions would be much greater and therefore unlikely to have an adverse impacts on human health. The EIS also points out that incinerator fly ash and residues from gas cleaning are classified as dangerous to the aquatic environment, bottom ash, fly ash and residues from gas cleaning is not classified as toxic or very toxic to human health. They are however according to Section 7.3.5.2 of the EIS classified as harmful.

This point is further elaborated upon in the statement of evidence by Dr. Martin Hogan (see Folder 1 Appendix 13). The statement of evidence states that although the flu gas treatment residue is classified as hazardous, this classification is hazardous in relation to the potential risk to the aquatic environment and not to human health. It is true that the flu gas treatment residues do contain substances such as heavy metals that can be hazardous to humans if they enter the body in sufficient quantities. However the proposed development, it is argued due to the nature of the landfill linings and the treatment process to be carried out onsite (solidification) would render the risk of high concentrations of hazardous materials to escape to be non-existent, as the hazardous substance has no route of escape.

7.12.2 Literature Research

Literature research has indicated that there is no conclusive evidence of a link between specific health outcomes and the proximity to waste facilities including landfill facilities. Studies relating to hazardous landfills and older non-hazardous landfills appear to be of limited relevance as these were not

subject to the same strict environmental safeguards as contemporary facilities. Furthermore the nature of waste to be deposited on the site is considered to be potentially harmful to the aquatic environment and not human beings. While it is acknowledged, and indeed accepted by the applicant that a release of contaminants contained in the hazardous ash in sufficient quantities could render it potentially hazardous to humans, the treatment and engineering proposals for the containment of waste leads me to conclude that the proposal would offer no health risk to the surrounding population. I therefore consider that the proposed development does not represent a threat to human health.

7.12.3 Respiratory Health Problems

With regard specifically to respiratory problems I refer the Board to Section 7.6.5 earlier in my assessment which concluded that the proposed development would not give rise to air pollution problems that would in any way exacerbate any respiratory problems associated with any residents in the vicinity.

7.12.4 Contingency Measures

While it is suggested that no proper contingency measures for the containment of contaminants are incorporated into the design of the development I would consider that the solidification of the flu gas residues together with the management practices and the nature of the landfill linings proposed in all the waste cells will ensure appropriate containment of contaminants.

7.13 Miscellaneous Issues

A number of other issues are raised and these are briefly dealt with below.

7.13.1 Cumulative Impact from the Fingal Landfill Project (Tooman-Nevitt)

An observation submitted argued that the current application before the Board failed to take into consideration the cumulative impacts arising from the MEHL development and the Tooman Nevitt development.

Section 18.7 of the EIS specifically deals with cumulative impacts. The major areas where cumulative impacts could arise between the current proposal and the Fingal Landfill Project relate to roads and traffic, noise and vibration and landscape and visual assessment. I consider that each of these issues was adequately dealt with in Chapters 8, 11 and 12 of the EIS respectively.

7.13.2 Evaluation of Environmental Impact Arising from Construction Activities

Section 5 of the EIS specifically deals with construction activities on site. This section of the EIS does not specifically quantify the levels of emissions etc

associated with the various construction activities on site. It does however set out detailed mitigation measures specifically associated with construction activities in order to minimise the environmental impact (see section 5.5 of the EIS). Other impacts associated with the construction phase are set out under the specific chapter headings.

In relation to traffic it is estimated that 290 two-way will arise during the peak construction phase on site. This trips have been factored in to the 'do something scenario' of the TIA which in turn has been factored into the 'Link traffic flow increases' and the 'Junction traffic flow increases' as set out in tables 8.4 to 8.9 of the EIS.

In terms of air quality section 9.2.2.1 of the EIS specifically deals with the potential environmental impact from construction activities. Reference is made to the NRA Guidance – 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (2006). It acknowledges that *"it is very difficult to accurately quantify dust emissions arising from construction activities"*. The Guidelines advise the use of a semi-quantitative approach to determine the likelihood of a significant impact which combines the proposed assessment with the mitigation measures. The potential distance for significant effects in terms of dust deposition is set out in Table 9.2 of the EIS (based on NRA criteria). The guidelines note works which result in significant soiling effects will affect a 50m distance in terms of PM_{10} and 15m distance in terms of vegetation. The evaluation of air quality impacts are set out in section 9.4.1.1. The EIS concludes that having regard to the separation distances between the cell construction and the potential receptors – 48 m in the case of non- hazardous cell and 284 meters in the case of hazardous cells, air quality impacts in terms of construction would be negligible. I consider this conclusion to be reasonable.

In terms of odour specifically resulting from the laying of the DAC liner, the EIS states that no significant impact is envisaged as the nearest sensitive receptor is 284 meters away. Given the nature of the works to be carried out on construction of the DAC liner with the use of mastic sealants and bitumen etc, it is not anticipated that any significant dust generation will arise. However the use of bitumen and mastic sealant will give rise to odour problems in the immediate environment of the works. It should however be taken into consideration that these works are temporary (according to the evidence of Ms Sinclair it takes approximately two weeks to construct a DAC liner for an individual cell). Having regard to the separation distances to the nearest receptor (284 meters), odour issues during the construction of the DAC Liner is not anticipated to be a significant issue.

Air pollution specifically arising from construction traffic is not anticipated to be a material issue (see section 9.4.1.2 of the EIS).

Noise derived from the site development and cell development works for each of the phases are set out in section 11.5.1.1 to section 11.5.1.4 of the EIS (see Tables 11.8 to 11.11). In the case of the 4 noise sensitive locations studied, the assessment concludes the noise levels would be within the day time operational

noise limits of 55dB(A). Again having regard to the separation distances involved and the fact that the side walls of the cells will create a natural buffer which will further attenuate noise levels within the site, I am satisfied that the noise levels associated with the construction phases will adhere to the appropriate limits as contended in the EIS.

Noise associated with the construction traffic at a distance of 20 m from the road edge is anticipated to be 57 dB(A). This is slightly above the operational daytime noise limits. However such an exceedance is deemed to be imperceptible according to the EPA Guidelines and regard should be had to the extant permission and waste licence which permits such high levels of traffic outside the residential dwellings on route.

Finally potential construction impacts on surface water are set out on section 15.14.1 of the EIS. Assuming all site management mitigation measures are adhered to, it is not anticipated that any adverse environmental impact will occur in relation to construction activities on site.

In conclusion therefore I consider that the EIS has specifically and appropriately evaluated the potential environmental impacts arising from the construction phases of the development and these impacts, once mitigation measures are put in place are not deemed to be significant.

7.13.3 Archaeological Considerations

The original submission on behalf of the NLAG made reference to the importance of the area as a pre-Christian royal site and suggests that place names in the area are associated with the former importance of the area as a royal site. It is also suggested in the NLAG submission that the site is important in terms of folklore. It is suggested that the proposed landfill development would adversely impact on the important cultural heritage of the area. The fact is that a landfill development already exists on site and what is proposed in this instance is a change in the nature of waste being deposited within the site. In my view the change in the waste stream will in no way impact on the cultural heritage of the area having regard to the presence of an existing landfill. In relation to the additional archaeological information put forward by the NLAG in its original submission and also at the oral hearing the archaeologist on behalf of the applicant, Mr. Moore was happy to accept and did not dispute any of the information put forward by the observers.

7.13.4 Ecology

One of the written observations made to the Board suggests that the proposed development could adversely impact on flora and fauna in the area. The EIS extensively deals with the issue of ecology in Section 13 of the statement. The site is not located in close proximity to any designated area of conservation. The nearest pNHA is the Bog of the Ring which is located 2.5 kilometres to the north-east of the site. I have already argued in the hydrogeology section that there is no hydraulic connectivity between the site and the Bog of the Ring and therefore the proposal will have no adverse impact on the integrity of this

potable water supply. The nearest cSAC is Rogerstown Estuary located 7.5 kilometres to the south-east of the site. The surface water catchment area in which the site is located is connected to Rogerstown Estuary. However I have again argued that the proposed development does not pose a significant or real threat to surface water bodies including the river along the northern boundary of the site which could ultimately impact on Rogerstown Estuary. Appendix A13.1 of the EIS sets out the Appropriate Assessment Screening required under the Habitats Directive to determine the effects, if any, of the proposed development on Rogerstown Estuary cSAC and SPA. The Rogerstown Estuary cSAC/SPA is an area of high biodiversity which supports a range of protected habitats and bird species. The main potential threat caused by the proposed development is through potential surface water and groundwater contamination. I have argued previously in my assessment argued that the proposed development has been designed to ensure that there is no possibility of contamination of either groundwater or surface waters in the vicinity of the facility which could ultimately impact on the integrity of the Rogerstown Estuary SPA and SAC.

In terms of fauna, the peregrine falcon is the most important bird species associated with the MEHL site. The site is known as a traditional nesting site for the peregrine falcon up until 2008. According to Section 13.7.1 of the EIS there has been no record of any peregrine falcons nesting within the site since 2008 although it continues to be an important foraging and roosting site for the birds. A detailed avian report was prepared as part of the EIS which specifically relates to the peregrine falcon and this is contained in Appendix A13.2 of the EIS. A statement of evidence was also presented at the oral hearing (see Folder 1 Appendix 17). The statement of evidence notes that the primary area of peregrine activity is in the south-western corner of the application site. It is acknowledged that the gradual infilling of the quarried area may ultimately displace the roosting areas associated with the peregrine falcon on the cliff face. Mitigation measures are proposed with the installation and creation of alternative nest ledges/artificial boxes near the top of the existing cliff on the southern and western quarry faces prior to the commencement of construction activity. A detailed monitoring programme will also take place during the course of the works.

In terms of flora within the site there are no records from the NPWS database of rare protected plant species from the site. Most of the proposed development is comprised of quarry spoil and recolonizing bare ground. The loss of this habitat is not significant other than that at local level. The site will be recolonized in time as part of the aftercare and restoration project.

7.13.5 Antisocial behaviour on site

One of the written observations submitted to the Board suggested that the proposed new access with the incorporation of public lighting etc. could result in antisocial behaviour.

The issue of antisocial behaviour is a management issue associated with the day-to-day running and operation of the site. However I do not envisage that antisocial behaviour presents a significant or real concern having regard to the rural location of the area.

7.13.6 Previous Permissions Onsite

The written observation from An Taisce suggests that the previous planning permission onsite specifically related to an inert landfill and the current application which incorporates a hazardous waste element constitutes an abrogation of the circumstances relating to the original permission onsite. Previous planning applications on sites have been adjudicated upon their merits and in accordance with the proper planning and sustainable development of the area. The fact that planning permission was granted for an inert landfill facility does not in any way preclude the applicant to apply for planning permission for the current development. Any application for an integrated waste management facility which includes the landfilling of hazardous waste material will likewise be adjudicated on its merits and in accordance with the proper planning and sustainable development of the area.

7.13.7 Financial Contribution Condition under Section 48(2)(c)

The original submission from Fingal County Council to the Board requested that in the case where planning permission is to be granted by An Bord Pleánala, that the applicant be required to pay a special contribution of €10,000 for signage and road lining in the vicinity of the proposed access to the site. The applicants on the other hand argued that this contribution was not warranted as the applicant was required to make a financial contribution of €500,000 towards road improvements under condition no. 9 of Reg. Ref. F04A/0363.

During the course of the oral hearing the Planning Inspector requested that Fingal County Council provide detail in terms of the basis of the above calculation and how the costs were specifically attributed to the development in question. The introductory statements of Mr. Flannagan's (SC) closing submission on behalf of Fingal County Council, deals with the issue of the financial contribution. The financial contribution is predicated on road lining requirements (3.8 kilometres at €2.30 per metre and the erection of 6 signs at €210 per sign which amounts to €10,000). Having regard to the fact that a current application seeks the relocation of the entrance I do not consider it unreasonable that the applicants be required to specifically contribute towards the costs of lining and signage associated with this new entrance. Therefore if the Board are minded to grant planning permission in this instance I consider that the applicant be requested to pay a special financial contribution under the terms and conditions of Section 48(2)(c) for road markings and signage.

7.13.8 Community Gain Fund

I would consider it appropriate that the Board would consider attaching a condition requiring that a set amount of monies based on annual tonnage to be

accepted at the facility to be set aside for a local community fund which would benefit local organisations and residents. This would help off- set some of the negative perceptions associated with the facility. I note that such a fund is referred to in section 17.3.4 of the EIS.

7.14 Legal Issues

A number of legal cases were referred to in the closing submissions on behalf of the various parties at the oral hearing, particularly the closing submissions on behalf of Fingal County Council and on behalf of the applicant. It is appropriate in my view that some comment should be made in relation to specifically three of these cases as they are directly relevant to the current application before the Board. The specific judgements which are relevant in my view are as follows:

- ECJ Judgement C-50/09
- The Waddenzee Judgement – ECJ C-127/02
- Usk and District Residents Association Ltd. vs. An Bord Pleánala (2009) IECH346

7.14.1 ECJ Judgement C-50/09

In the case of C-50/09 this is a recent judgement which ruled that the transposition of Articles 2-4 of Directive 85/337/EEC (EIA Directive) into Irish legislation is not in full compliance with the Directive on the grounds that there are several national authorities which take part in the decision making process. The ruling states that it is a requirement that an Environmental Impact Assessment must take place before consent is given. The Judgement notes that in a case where both the EPA and the Planning Authority (including An Bord Pleánala) are involved in an application for which a EIA is required, a situation could arise where the EPA could decide on questions of pollution before an application is made to the Planning Authority the latter being the competent authority for the purposes of determining EIA.

This situation does not arise in the case of the current application. An application was lodged for planning permission with An Bord Pleánala under Strategic Infrastructure Legislation on 10/12/2010. An application for a Waste Licence was lodged with the EPA on 17/12/2010. An Environmental Impact Statement accompanied the application for a waste licence. At a time of writing this report no decision has been made by the EPA in relation to the issuing of a waste licence. Furthermore as part of my planning assessment I have endeavoured to undertake a comprehensive evaluation of all environmental impacts associated with the proposed development. I would therefore conclude that any decisions by An Bord Pleánala in relation to the current application would not contravene in any way the judgements set out in ECJ-C-50/09.

7.14.2 Waddenzee Judgement ECJ C-127/02

With regard to the Waddenzee Judgement, this judgement requires that in all cases where a development may impact on a European Site that an Appropriate Assessment must be required unless the Board is satisfied beyond all reasonable doubt and based on objective scientific knowledge that a proposed development would not adversely impact the integrity of any such designated site. Furthermore there is an onus on the consent authority to satisfy itself, based on objective scientific assessments that there is no reasonable scientific doubt that the proposed development will not adversely affect the integrity of a designated site. This implies therefore that the Planning Authority must exercise a precautionary approach in considering applications likely to impact on designated sites. I have assessed the application in the context of the Waddenzee Judgement and I consider that the applicant has demonstrated through the EIA procedure and through a separate appropriate assessment procedure that the proposed development will in no way effect the integrity of any designated site in the vicinity (either the Bog of the Ring, NHA or the Rogerstown Estuary SPA/cSAC). I also consider that the applicant through the EIA process and through supplementary information garnered at the oral hearing has demonstrated beyond all reasonable scientific doubt that the proposed development will not adversely impact on the integrity of either of the designated sites referred to above or any other designated sites in the wider area. I am satisfied therefore that the Board is fully informed on environmental grounds as to the acceptability of the proposal. The proposed development therefore would not contravene the main environmental tests set out in the Waddenzee Judgement.

7.14.3 The Usk Judgement [2010] 2 ILRM 235

Finally in relation to the Usk Judgement, Part 5 of this Judgement is relevant to the current application before the Board. The Judgement acknowledges that a difficulty arises in relation to defining EPA/Planning Authority's jurisdictions over the construction and operational stage of any development. The Judgement also acknowledges that in the use of conditions, the Planning Authority has jurisdiction over the construction phase of the proposed development whereas the EPA have control over the operational phase of the proposed development. The demarcation between both areas of jurisdiction become somewhat confused in the case of an application such as that currently before the Board where both construction and operational activities take place simultaneously during the various phases of the proposed development. Having regard to the ruling it may be appropriate for the Board in this instance to attach conditions specifically relating to environmental emissions associated with the construction phase of the development.

8. CONCLUSIONS AND RECOMMENDATIONS

On foot of my assessment and evaluation above my main conclusions are as follows:

- It is clear from various national policy documents, most importantly the National Hazardous Waste Management Plan (2008-2012), that it is national policy that at least one hazardous waste landfill be developed in Ireland for the acceptance of hazardous waste. The proposed development is fully in accordance with this national policy.

- I note that future hazardous waste streams are difficult to forecast and therefore some questions may arise over the capacity of the proposed development to accept all the hazardous waste arisings for landfill within the Island of Ireland. Hazardous waste arisings are however likely to reduce overtime as a result of improvement in treatment technologies. Furthermore it is not envisaged that all hazardous waste will be landfilled at this facility. I would conclude that the 1.735 million cubic metres of void space proposed under the current application will have the capacity to accommodate a substantial portion of the hazardous waste generated in Ireland over a 25-year period and the capacity is considerably in excess of the 25,000 tonnes per annum minimum capacity suggested in the National Hazardous Waste Management Plan.

- I consider that there are significant benefits of co-locating a hazardous waste facility at an established landfill not least in terms of the fact that the existing facility has already been through the planning and licencing procedures and deemed to be acceptable for this land use.

- With regard to the issue of non-hazardous bottom ash it would appear that there may be an oversupply in the capacity available for landfilling in the immediate area, if the Tooman Nevitt facility goes ahead Knockharley facility at Kentstown were to be granted planning permission for the acceptance of such non-hazardous waste under PA0019 and the indication that all incinerator ash from the Poolbeg facility will be exported. I do note however that currently there are no proposals, policies or objectives in place currently which seek to reuse or recycle bottom ash. As a result the availability of excess capacity for landfilling bottom ash would not appear to be contrary to current waste management policy and practice. That is to say that currently there appears to be no policy which seeks to reduce the landfilling of incinerator bottom ash in favour of reusing and recycling this material. Any over-supply in terms of capacity would not constitute reasonable grounds for refusal in my opinion.

- In terms of the location of the MEHL facility I consider that the site is optimally located in terms of its proximity to the two incinerators which are planned and currently under construction in the Dublin waste management region and the north-east waste management region. Furthermore the site is well located in terms of any future incinerators to be constructed in Northern Ireland or in County Cork as the site is equally distant between the two

facilities and is well served in terms of its access to the national primary road network including motorways.

- It is apparent that aspects other than location also need to be considered in terms of site suitability for an integrated waste management facility such as that proposed. An important consideration in this regard is the hydrogeological conditions of any site. It is argued in this assessment that other sites shortlisted for evaluation as alternative sites as part of the EIA process may possess more appropriate underlying hydrogeological conditions than that of the MEHL site. The critical issue in my opinion is whether or not the site is suitable for the development proposed as opposed to being the optimal or best site for development. The sites appropriateness in environmental grounds ultimately depends on the quantification of an Environmental Risk Assessment associated with the site. The main environmental risks associated with the integrated waste management facility proposed are contamination of groundwater and surface water through leachate leaks/spills. I consider the overall design of the development as such that the risk to the environment through groundwater or surface water contamination is minimal for the following reasons.

(a) I am satisfied based on the evidence presented that the potable water supply at the Bog of the Ring will not be impacted upon. The evidence presented in the EIS and in the oral hearing overwhelmingly suggests that the MEHL site is in a different groundwater catchment area to the Bog of the Ring water supply.

(b) The proposed landfill linings comply with, in the case of inert waste, and exceed in the case of the hazardous and non-hazardous waste, the minimum requirements set out in Annex 1 of the Landfill Directive.

(c) In the case of hazardous waste the solidification process will physically and chemically immobilise contaminants within the waste material which will significantly reduce its leaching potential when placed within the hazardous waste cells.

(d) In the case of the hazardous waste the cells proposed are underlying by thick namurian shale deposits of generally low permeability which will further act as an impediment to groundwater contamination.

(e) There is evidence to suggest that groundwater movement beneath the proposed hazardous waste cells is in an upward direction due to the confining nature of the namurian shale in the northern portion of the site. The presence of artesian wells in the north-eastern portion of the site would support this conclusion. This characteristic of the northern part of the site will further militate against groundwater contamination.

(f) As part of the EIA process a quantitative risk assessment was carried out in relation to potential groundwater contamination. The risk assessment incorporated a “land-sim model” which indicates that the landfill linings as proposed will not result in any contamination of groundwater either beneath the site or down gradient of the site. It should also be highlighted that the

assumptions contained in the model were very conservative and that the design proposals to be incorporated into the landfill linings will protect potential receptors to an even greater extent than that suggested in the model.

(g) I am satisfied based on the information contained on file and in particular the land sim model that the proposed development will not adversely impact on the water quality of any of the commercial wells to the south-east of the site.

(h) There is no evidence to suggest that surface water in the vicinity of the site would be susceptible to any leachate contamination either through groundwater contamination or leachate management onsite.

- In terms of hydrogeology I can only conclude that the MEHL site represents an acceptable environmental risk which will not adversely impact on the environment and therefore will not adversely impact on the integrity of any designated conservation site be it either the bog of the ring NHA or Rogerstown Estuary cSAC and SPA.

- In relation to other environmental issues I would conclude that based on the evidence submitted I am satisfied that the non-hazardous bottom ash to be transported and deposited on site does not represent an environmental or health risk to surrounding residents in terms of its potential corrosive properties or in terms of potential exothermic reactions which might occur within the waste cells during the laying of the waste.

- In terms of traffic and transport issues I am satisfied, that the proposed development would not result in traffic levels over and above those levels already permitted. I base this conclusion on the fact that permission already exists for the landfilling of up to 500,000 tonnes of inert material onsite.

- In relation to the zoning provisions of the Development Plan, I would consider that the Board is not constrained by the fact that the proposed development does not comply with the zoning objectives contained in the recently adopted Fingal County Council Development Plan. I would base this conclusion on the grounds that an established landfill facility exists on site and that the current application is strategic in nature and therefore the provisions of Section 37(2)(b)(i) would apply.

- Finally I consider that the totality of the information submitted with the application in the oral hearing meets with the statutory EIA requirements and provides an adequate basis for the objective assessment of the proposal.

RECOMMENDATION

I therefore recommend that planning permission be granted for the proposed development in accordance with the plans and particulars lodged based on the reasons and considerations set out below.

REASONS AND CONSIDERATIONS

Having regard to:

- National policy in relation to waste management as set out in the National Hazardous Waste Management Plan which seeks to provide at least one hazardous waste landfill in Ireland.

- The presence of an existing landfill facility on site and the associated benefits involved in co-locating an integrated waste management facility such as that proposed with an existing landfill development.

- The strategic location of the site in close proximity to two planned incinerator developments currently under construction and the sites proximity to the national motorway network.

- The proposed linings of the engineered cells for the reception of hazardous, non-hazardous and inert waste which is in compliance with and in the case of the hazardous and non-hazardous waste exceed the minimum requirements set down in Annex 1 of Council Directive 1999/31/EEC.

- The existing facility has planning permission and a waste licence to dispose up to 500,000 tonnes of inert waste per annum,

It is considered that subject to conditions set out below the proposed development would not be unduly injurious to the amenities of the area or property in the vicinity, would be acceptable in terms of traffic safety and convenience and would be unlikely to give rise to adverse impacts on the environment and in particular groundwater and would therefore be in accordance with the proper planning and sustainable development of the area.

CONDITIONS

1. The development shall be carried out in accordance with the plans and particulars lodged with the application to An Bord Pleánala on 10/12/2010 and the drawings submitted to An Bord Pleánala during the course of the oral hearing on 22nd March 2011 except as may otherwise be required in order to comply with the following conditions. Where such conditions require points of details to be agreed with the planning authority these matters shall be the subject of written agreement and shall be implemented in accordance with agreed particulars.

   Reason: In the interest of clarity.

2. Prior to the commencement of any development associated with this permission the applicant shall obtain a waste licence from the Environmental Protection Agency to operate the facility.

Reason: To ensure that the proposed development is operated in such a manner which would not adversely impact on the surrounding environment.

3. Landfilling operations on site shall cease prior to the 31st December 2036 unless prior to this date planning permission is granted for an extension to the life of the facility. The landfill shall be capped and the site restored in full on completion of the landfill operations.

Reason: To limit the long-term impact of the development on the amenities and values of property in the area.

4. The total waste intake at the facility shall be limited to a maximum of 500,000 tonnes per annum.

Reason: In the interest of residential amenity.

5. All waste accepted on site shall be classified in accordance with the Waste Acceptance Criteria set out in Council Decision 2003/33/EEC. All waste shall be classified off-site and shall be classified in accordance with the provisions of the above EU Decision prior to being placed in any of the landfill cells.

Reason: In the interest of orderly development and the protection of the environment.

6. Details of the proposed new access arrangements onto the LP01080 shall be agreed in writing with the planning authority prior to the commencement of development on site.

Reason: In the interest of safety.

7. Details of all public lighting proposed within or around the parameter of the facility, including any public lighting along the internal access road leading to the administrative area shall be agreed in writing with the planning authority prior to the commencement of development.

Reason: In the interest of visual amenity.

8. Construction and demolition waste shall be managed in accordance with a construction waste and demolition management plan, which shall be submitted to, and agreed in writing with, the planning authority prior to commencement of development. This plan shall be prepared in accordance with the "Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects", published by the Department of the Environment, Heritage and Local Government in July 2006. [The plan shall include details of waste to be generated during site clearance and construction phases, and details of the methods and locations to be employed for the prevention, minimisation, recovery and disposal of this material in accordance with the provision of the Waste Management Plan for the Region in which the site is situated.].

Reason: In the interests of sustainable waste management.

9. Prior to the commencement of development an environmental monitoring committee shall be established. Details of the members of the committee shall be agreed in writing with the planning authority and shall include at least two members of the local community. The environmental monitoring committee shall oversee the environmental monitoring of the development and shall meet at least four times per annum or at such intervals as the environmental monitoring committee members agree.

Reason: In the interest of the amenity of the area.

10. The applicants over the lifetime of the landfill development shall annually set aside a fund, derived from charges for waste management, to provide appropriate environmental improvement projects and community facilities in the local community. The initial contribution to the fund shall be €1 per tonne of waste received and shall be the subject of review to be determined by the members of the environmental monitoring committee. In default of an agreement the details shall be determined by An Bord Pleánala.

Reason: To mitigate the impacts of the landfill operation on the local community.

11. Details of the location of the wheel wash facility on the proposed new internal access road shall be the subject of written agreement with the planning authority prior to the commencement of development.

Reason: In the interest of visual amenity and residential amenity.

12. (a) During the construction of the inert, non-hazardous and hazardous waste cells dust levels at the site boundary shall not exceed 350 milligrams per square metre per day averaged over a continuous period of 30 days (Bergerhoff Gage). Details of the monitoring programme for dust shall be submitted to, and agreed in writing with, the planning authority within two months of the date of this order. Details to be submitted shall include monitoring locations, commencement date and the frequency of monitoring results and details of all dust suppression measures.

(b) As part of the construction of the landfill cells a monthly survey and monitoring programme of dust and particulate emissions shall be undertaken to provide compliance with these limits. Details of this programme, including the location of dust monitoring stations, and details of dust suppression measures to be carried out within the entire quarry complex, shall be submitted to and agreed in writing with the planning authority within two months of the date of this permission. This programme shall include an annual review of all dust monitoring data, to be undertaken by a suitably qualified person acceptable to the planning authority. The results of the review shall be submitted to the planning authority within two weeks of completion. The Developer shall

carry out any amendments to the programme required by the planning authority following this review.

Reason: To control dust emissions arising due to the construction of landfill cells within the development and in the interest of amenity of the area.

13. During the construction phase of the individual cell liners the noise levels generated shall not exceed 55dBA_{LAeq}T when measured at the nearest occupied house. When measuring the specific noise, the time shall be over a 1-hour period.

Reason: In order to protect the residential amenities of property in the vicinity.

14. The facility shall only operate between 0800 hours and 1800 hours Monday to Friday and between 0700 hours and 1600 hours on Saturdays. The site shall not operate on Sundays or bank holidays.

Reason: In order to protect the residential amenities of the area.

15. All waste shall be transported to the site (hazardous, non-hazardous and inert) in covered and tightly secured holding areas within the vehicles.

Reason: To prevent spillage and to protect the visual and residential amenities of the area.

16. A comprehensive boundary treatment and landscaping scheme shall be submitted to and agreed in writing with the planning authority, prior to the commencement of development. This scheme shall include the following:-

(a) details of all proposed hard surface finishes, including samples of proposed paving slabs/materials for footpaths, kerbing and road surfaces within the development;

(b) proposed locations of trees and other landscape planting in the development, including details of proposed species and settings;

(c) details of proposed boundary treatments at the perimeter of the site, including heights, materials and finishes.

The boundary treatment and landscaping shall be carried out in accordance with the agreed scheme.

Reason: In the interest of visual amenity.

17. Within 6 months of the date of this order the applicant shall submit a biodiversity plan outlining measures to improve the overall biodiversity of the site and its surrounding lands both during the operational phase of the development and the post operational phase. The details contained in the biodiversity plan shall be agreed in writing with Fingal County Council or in default of agreement shall be referred to An Bord Pleánala for agreement.

Reason: In the interests of maintaining and promoting biodiversity within the site.

18. Prior to the commencement of the construction phase of the hazardous waste cells the Developer shall consult with the Eastern Regional Fisheries Board in ensuring all measures necessary are undertaken to protect the local aquatic ecology of the stream along the northern boundary of the site. In this regard the applicant shall ensure the following:

- Only clean uncontaminated water should leave the development site and drain into the river network.
- The Inland Regional Fisheries Board shall be consulted in relation to any stream manipulation works (bridging, culverting or otherwise on the stream along the northern boundary of the site).
- In-stream work can only be carried out during the period May-September of each year.
- All in-stream and riparian works must be agreed with the Inland Fisheries Board prior to such works being carried out.
- Preservation of a 10 metre wide riparian corridor along the southern boundary of the stream. All construction works undertaken adjacent to the stream shall conform with "requirements for the protection of fisheries habitats during construction and development works at river sites (http://www.fishingireland.net/).

Reason: In order to protect water quality and ecological habitats during construction.

19. The developer shall facilitate the archaeological appraisal of the site and shall provide for the preservation, recording and protection of archaeological materials or features which may exist within the site. In this regard, the developer shall:

(a) notify the planning authority in writing at least four weeks prior to the commencement of any site operation (including hydrological and geotechnical investigations) relating to the proposed development, and

(b) employ a suitably-qualified archaeologist prior to the commencement of development. The archaeologist shall assess the site and monitor all site development works.

The assessment shall address the following issues:

(i) the nature and location of archaeological material on the site, and

(ii) the impact of the proposed development on such archaeological material.

A report, containing the results of the assessment, shall be submitted to the planning authority and, arising from this assessment, the developer shall agree in writing with the planning authority details regarding any further archaeological requirements (including, if necessary, archaeological excavation) prior to commencement of construction works.

In default of agreement on any of these requirements, the matter shall be referred to An Bord Pleanála for determination.

Reason: In order to conserve the archaeological heritage of the area and to secure the preservation (in-situ or by record) and protection of any archaeological remains that may exist within the site.

20. The developer shall pay to the planning authority a financial contribution of €10,000 (ten thousand euro) in respect of road lining and road signage in the vicinity of the site that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. The application of any indexation required by this condition shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to the Board to determine.

Reason: It is a requirement of the Planning and Development Act 2000 that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the permission.

21. The developer shall pay to the planning authority a financial contribution in respect of public infrastructure and facilities benefiting development in the area of the planning authority that is provided or intended to be provided by or on behalf of the authority in accordance with the terms of the Development Contribution Scheme made under section 48 of the Planning and Development Act 2000. The contribution shall be paid prior to the commencement of development or in such phased payments as the planning authority may facilitate and shall be subject to any applicable indexation provisions of the Scheme at the time of payment. Details of the application of the terms of the Scheme shall be agreed between the planning authority and the developer or, in default of such agreement, the matter shall be referred to the Board to determine the proper application of the terms of the Scheme.

Reason: It is a requirement of the Planning and Development Act 2000 that a condition requiring a contribution in accordance with the Development Contribution Scheme made under section 48 of the Act be applied to the Development.

Paul Caprani,
Senior Planning Inspector.

26th May, 2011.

ym/cr

APPENDICES

Appendix 1 – Summary of Environmental Impact Statement (p107)

Appendix 2 – Other reports submitted with the Planning Application (p136)

Appendix 3 – Summary of the Proceedings of the Oral Hearing (p138)

Appendix 4 – Summary of National Regional and Local Plans (p175)

- National Hazardous Waste Management Plan (2008-2012).(p175)
- Technical and Economic Aspects of Developing a National
- Difficult Waste Management Facility (NaDWaF) Report 2010(p178).
- Draft Consultation Statement on Waste Policy DOEHLG Undated -2010(p 182)
- National Development Plan 2007 -2013(p182)
- Waste Management Plan for the Greater Dublin Region 2005-2010 (p 182)
- Changing Our Ways (DOEHLG 1998)(p183)
- Taking Stock and Moving Forward (DOEHLG 2004)(p183)
- Fingal Co Council Development Plan 2011-17(p184)
- Site Selection for New Hazardous Waste Management Facilities WHO Publications European Series No. 46(p185)

Appendix 5 – Key Directives, Legislation and Circulars Relating to Waste

- Waste Management Act 1996 (p187)
- SI 126 of 2011 European Communities Waste (Directive) Regulations(p188)
- Council Decision 2003/33/EEC (WAC Criteria)(p190)
- Council Directive 1999/31/EEC (Landfill Directive)(p192)
- Council Directive 2008/98/EC (Consolidated Waste Directive)(p195)
- Council Directive 91/689/EEC (Hazardous Waste Directice)(p195)
- Government Circular WIR 04/05 (Regional Waste Planning)(p196)

Appendix 6 – Summary of EPA Technical Guidance on Landfill

- EPA Landfill Manual – Landfill Design (2000)(p197)
- EPA Landfill Monitoring Manual (2003)(p200)
- EPA Landfill Operational Practices (1997)(p202)
- EPA Landfill Manual – Investigation for Landfills (1995) (p204)
- EPA Manual on Site Selection – Draft Consultation (2006) (p205)
- EPA European Waste Catalogue and Hazardous Waste List (2002).(206)
- EPA National Waste Report 2009(p207).

APPENDIX 1 ENVIRONMENTAL IMPACT STATEMENT

The EIS is set out in four separate volumes.

Volume 1 – Non technical summary

Volume 2 – Environmental Impact Statement (main text)

Volume 3 – Figures

Volume 4 – Appendices

The salient points contained in the main text of the EIS are set out below.

Chapter 1 Introduction

The introductory section sets out the profile of the existing operations on site including details of the current operations in relation to waste handling. The section also sets out the applicant's ties and involvement in the community. Details of the planning history of the site including the various planning applications and waste licence applications are set out in Section 1.2.3 of the EIS.

Section 1.3 of the EIS outlines in summary the proposed development. It is noted that the anticipated capacity of the facility is

- 1.7355million m^3 for hazardous waste.
- 1.324 million m^3 for non-hazardous waste and
- 0.7555 million m^3 of inert waste.

Section 1.5 of the EIS sets out the planning procedure involved so far in undertaken the current application including details of the pre- application stage required under the strategic infrastructure legislation and also sets out a list of the prescribed bodies consulted. Consultation with the local community is set out in Section 1.5.4 and is noted that all neighbouring premises within 1 kilometre of the site boundary were visited on 18th and 19th May 2010. The public information day was held in the Bracken Court Hotel on 1st September 2010. The summary of the consultations undertaken and key comments received are presented in Appendix A14.

Section 1.6 sets out the Environmental Impact Statement methodology and consultation processes involved. The EIS has been prepared with due regard to the EPA guidelines on the preparation of Environmental Impact Statements. The scoping of the EIS was predicated on consultations with various bodies including An Bord Pleanala, the EPA, the DOEHLG and Fingal and Meath County Councils. The scoping was also informed by responses from statutory and non-statutory consultees and issues raised at public information meetings. The EIS is structured in a group format in accordance with EPA Guidelines.

It is stated that there were no significant difficulties encountered during the preparation of the EIS.

Chapter 2 Project Need

Chapter 2 of the EIS sets out details in relation to the project need. This chapter argues that a hazardous waste landfill is a key component of waste infrastructure in Ireland which needs to be constructed. The National Hazardous Waste Management Plan 2008-2012 recommends at least one hazardous landfill to be developed in Ireland.

The proposal fully accords with

- The National Hazardous Waste Management Plan 2008-2012.
- Various EU policies which require member states to achieve self-sufficiency in the management of waste.
- The Waste Management Plans adopted in the Republic and Northern Ireland.
- A hazardous landfill will provide a key piece of infrastructure which is vital for economic development in that managing such waste in Ireland will give rise to economic opportunities and beneficial spin offs for local industries and local employments in the area. Addressing the issue of hazardous waste within this country will reduce greenhouse gas emissions arising from the export of waste and will reduce any risk associated with waste shipments.
- The proposed facility will assist in the implementation of waste infrastructure which will provide energy recovery from waste.
- The proposed development is fully in accordance with the proximity principle in that waste should generally be managed as near as possible to its place of production mainly because transporting waste has significant environmental impacts.

It is also stated that the UK plan for the shipments of waste (2007) seeks the provision of an all island approach in the case of shipping hazardous waste for disposal between/within Ireland and Northern Ireland. The Arc 21 Waste Management Plan (published in 2006 covering the eastern region of Northern Ireland) also states that priorities might include utilising existing or planned treatment facilities on an all island basis.

Section 2.3 of the EIS goes on to highlight references obtained in various reports and strategies which would, it is contended support the provision of infrastructure which would facilitate the disposal of hazardous waste within Ireland.

The following reports are referred to

- The National Development Plan
- The National Spatial Strategy
- The Innovation Task Force Report (March 2010).
- The Regional Planning Guidelines for the Greater Dublin Area 2010-2022.
- The Foras Waste Management Bench Marking Report (2009).

- The Foras Waste Management Bench Marking Report Update (2010).
- The National Climate Change Strategy.

Section 2.7 of the EIS sets out current and future national waste arisings. The EPA National Waste Report 2008 states that the total recorded quantity of hazardous waste managed in 2008 was 319,098 tonnes, an increase of 5% since 2007. This includes biodegradable hazardous waste but excludes contaminated soils. Between 2004 and 2008 contaminated soil exported from the country ranged from a low of 126,000 tonnes in 2007 to just under 300,000 tonnes in 2008.

The EPA National Waste Reports states that the total projected generation of industrial waste including non- process industrial waste decreased by 31% from 9.2 million tonnes in 2006 to 6.4 million tonnes in 2008. The top 10 sources of non-hazardous industrial waste are set out in Table 2.2 of the EIS.

According to the National Waste Report 2008 the quantity of construction and demolition waste collected in 2008 was 13.5 million tonnes which is a 24% decrease compared with 2007 data.

Section 2.7.2 sets out future trends in relation to waste arisings. The National Hazardous Waste Management Plan indicates that the general trend is for an increase in hazardous waste generation. The plan indicated that hazardous waste generation in 2016 is expected to be 405,481 tonnes compared with just over 314,000 tonnes in 2006. For the purpose of this project, an assessment was undertaken of the potential hazardous ash i.e. flu gas treatment residues from the major waste to energy projects which are expected to come on stream in the next six years. These include

- Carrenstown Incinerator (currently under construction).
- Ringaskiddy in County Cork (currently at planning stage)
- Poolsbeg Ringsend currently at construction stage.
- Provision for waste to energy in Northern Ireland.

It is estimated that 86,640 tonnes per tonnes of flu gas treatment residues is expected to be generated from those four projects. (This amount is based on the figures contained in the respective EISs associated with each of these facilities).

Table 2.6 of the EIS sets out hazardous soils and stones potentially suitable for landfill, in Ireland and Northern Ireland aggregated on a six year basis between 2008-2025. This ranges from an average of just over 142,000 from 2008-2013 to just over 195,000 tonnes per annum from the year 2020 to 2025.

For the purposes of the project

In terms of non-hazardous biodegradable waste reference is made to bottom ash and boiler ash from the four wastes to energy projects referred to above. It is estimated 261,000 tonnes per annum of non-hazardous bottom boiler ash is expected from these four projects (see table 2.7 of the EIS).

Chapter 3 Site Suitability and Alternatives

Chapter 3 of the EIS relates to site suitability and alternatives. It is noted that the existing landfill facility has planning permission to infill at a rate of 500,000 tonnes per year with inert waste. The EIS argues that the site is suitable to become the first hazardous landfill in Ireland. A full copy of the Site Suitability Report is set out in Appendix 3.1.
It is argued that the site is suitable on the following grounds.

It is the policy of the Government (to the Department of Environment, Heritage and Local Government – Changing Our Ways (1998) to extend existing landfill facilities rather than to provide new landfill sites.

The National Hazardous Waste Management Plan 2008-2012 states that any such hazardous waste facility should be co-located with an existing or planned landfill facility with the objective of utilising existing infrastructure such as site roads, weighbridges etc.

In terms of lead in time, established and operational sites offer significant advantages in terms of planning and licencing processes.

The financial realities for a hazardous waste disposal facility on a Greenfield site may prove prohibitive.

The applicant is in full ownership of the lands in question. The co-location of hazardous waste disposal infrastructure with other appropriate landfilling activities offers advantages in terms of shared infrastructure etc.

On the above criteria and taken into consideration other landfill sites which were deemed wholly unsuitable in the context of the current proposal due to severely limiting licensing factors relating to imminent site closure, three sites were considered Hollywood, Knockharley Kentstown, County Meath and Drehid, Carberry, County Kildare. Each of these sites were evaluated in relation to separate criteria under four separate steps and the application site was deemed to be the most suitable site under the criteria set out in Appendix 3.1 of the EIS particularly in relation to

- The capacity available to cater for the waste.
- The location and access of the site in terms of the likely centres of target waste arisings.

The site was also evaluated in accordance with the EPA landfill manual and in particular the manual on site select (consultation draft 2006). Reference is also made to international best practice and in particular site selection for new hazardous waste management facilities – WHO European Region Publication No. 46. Reference is also made to site assessment criteria and policy guidance in New Zealand for sustainable waste management.

It is argued that the site is compatible with surrounding land uses as the site is located in a rural and agricultural area where residential dwellings are dispersed. Fingal County Council proposed landfill site has the benefit of planning permission 1.4 kilometres to the south-east of the site. The site has sufficient land area requirements and availability to cater for the proposed development. It is acknowledged that the site is located in an area deemed sensitive in terms of landscape due to its elevated position. However the operation will not be highly visible from surrounding areas.

The comprehensive public consultation process with neighbouring landowners and interested parties has been undertaken. Buffer zones can be incorporated into the layout which would militate against adverse impact on amenity.

The geology and hydrogeology regime inherent in the site and its surroundings is considered to be suitable. The site is located outside the source of protection zone from water abstraction and the site is located over an area designated as a poor aquifer with the exception of the south-eastern corner which has been classified as a locally important aquifer which is generally moderately productive in terms of water supply. While investigative information suggests that there are faults present on site, the EPA manual on site selection recommends that there should be no general prohibition of landfilling siting on areas with geological faults. Appropriate hydrology and surface water protection measures will be incorporated into the design. There are no terrestrial habitats of regional or national importance in the vicinity of the site. In terms of archaeological heritage the ground has already been disturbed during the quarrying activities on site. While the site is located in an area of high amenity an existing landfill has been operating for a number of years on site.

While the site is located 15 kilometres north of Dublin Airport the waste type to be accepted at the landfill is non-biodegradable and as such will not attract birds. The proposal therefore will not represent a danger to aircraft. Traffic and access arrangements are deemed to be suitable and the reduction of the amount of the material to be transported overseas would be more sustainable from a transportation point of view. Cover material is available on site and additional material where required would be sourced locally. The site is considered acceptable in terms of security and service is available. A geotechnical investigation has been carried out taken in consideration, stability and settlement issues. Given the nature of waste which will be accepted, treated and disposed of at the facility it is anticipated that minimal settlement of the waste body will occur over time. It is expected that settlement will be within the allowable tolerance for a DAC liner. In the foregoing site evaluation no features of the MEHL site were identified which would render it unsuitable as a site of a hazardous waste landfill.

Section 3.4 outlines alternatives in relation to landfill lining technology. The various liner characteristics are set out in Table 3.2 of the EIS. The three options set out were a single composite liner, at double composite liner, and a dense asphaltic concrete liner (DAC liner).

Having considered the three options the DAC liner was considered superior for the hazardous cells. As the permeability of the DAC was considerably lower furthermore the DAC system can be constructed on slopes steeper than those achievable with

standard HDPE and clay composite linings and the method of installing DAC panels means that there is no weakness at the joint between the panels.

Section 3.5 sets out alternative site layouts. Four layout options were considered during the preliminary design stage. From the preliminary option appraisal four more options were considered and option 8 (preferred option) was decided upon. It is considered that the proposed options meets all the key environmental constraints and design requirements.

Chapter 4 Proposed Site and Project Description

Chapter 4 sets out the proposed site project description. This section is summarised in the main report under Section 4, for this reason it is not proposed to reiterate the detail here.

Section 4.9 of the EIS deals with health and safety aspects. The plant will be designed by skilled personnel according to internationally recognised standards and will be constantly reviewed and checked for safety hazards. Fire detection and fire fighting systems will be provided.

Section 4.9.3 outlines the regulatory framework and legal requirements applying to the labelling and transport of hazardous waste to the facility. Hazardous waste movements in Ireland are controlled under SI no. 47 of 1998. In order to move waste a C1 form system is required. This C1 form is a comprehensive way of tracking the movement and origin of the waste in question. There are various regulations which apply to the safe and transport of hazardous waste. All road tankers and trucks must be labelled clearly to show what they are carrying.

The applicants also operate an environmental management system which is independently certified to be in compliance with ISO 14,001: 2004 Environmental Management Systems. This environmental system is set out in the EIS. Details of the operational waste licence are also referred to in the EIS.

Chapter 5 Construction Activities

Section 5 sets out the construction activities to be undertaken on site. It is stated that detailed design in relation to duration and phasing will be completed post planning and licensing. The proposed landfill phasing plan is set out in Table 5.1 (page 63 of the EIS). Four phases are proposed.

Phase 1	2011- 2016
Phase 2	2014 – 2024
Phase 3	2022 – 2034
Phase 4	2034 – 2036

Final restoration will be carried out after 2036. Full details of the construction and operation activities to be carried out under each of the phases are set out in Section 5.2.1 to 5.2.5.

Section 5.2.6 sets out details of the construction of the lining system for the hazardous cells. Section 5.2.7 and 5.2.8 set out the stages involved in the construction of the non-hazardous and inert waste cells respectively. In situ material testing will also take place. This will involve

- Taken the temperature of material when laid and been rolled.
- Air void measurements using nuclear density gauges.
- Vacuum testing all joints.
- Core sampling taken for air voids and hydraulic conductivity measurement.
- Depth profiling to all pre determined markers.

Compliance testing will not be carried out on the final liner itself but on test parts to be constructed at the same time as the liner.

Section 5.2.10 sets out the time table for the construction of buildings on site. The main structures will be constructed in Phase 1 (administration building, solidification plant, and solidification storage building).

The DAC lining system will be constructed by specialist contractors who will specify and confirm the design parameters for the selected materials before they can be used in the DAC lining system.

In terms of employment during the construction of the facility, typically the work force on site will average 25 with a peak employment expected to be 50. A temporary site compound and access road will be located in the car parking area of the permanent works.

Mitigation measures for the construction activities including dust minimisation activities, site tidiness, construction safety and waste management are set out in Sections 5.5 to 5.8 respectively.

In terms of service requirements it is stated there will be a requirement to construct a substation and switch room adjacent to the administration building to provide electricity for site infrastructure. This will be constructed in compliance with ESB requirements. Other construction impacts are dealt with in separate chapters below. Every reasonable effort will be made to ensure that negative environmental effects will be minimised during the construction phase of the project.

Chapter 6 Planning and Policy Context.

Section 6.2 relates to international commitments and guidance and makes reference to the following:

- 'The Basil Convention on the Control of Transboundary Movements of Hazardous Haste at their Disposal (1992)'. This convention regulates transboundary movements of hazardous and other wastes which are made without consent and are illegal. It requires that all wastes are managed and disposed in an environmentally sound manner.

- ‘Kyota Protocol to the United National Framework Convention on Climate Change (1997)’. This document sets out guidance in relation to reducing greenhouse gases. As hazardous waste is currently exported the proposal will help Ireland meet its targets under the Kyota protocol.

Section 6.3 of the EIS relates to EU Directives and policy guidance.

- The EU Sixth Environmental Action Programme, one of the main principles of this programme seeks to improve final disposal of monitoring of waste. Waste that cannot be recycled or reused should be safely incinerated with landfill only used as a last resort. The proposal facility will be a highly controlled engineered landfill for those wastes which are not feasible to be recycled or reused and for residues from incineration.

- ‘The Thematic Strategy on the Prevention and Recycling of Waste/Proposal for a Directive of the European Parliament and of the Council on Waste (2005)’. This strategy recommends a combination of measures promoting waste prevention recycling and reuse. The proposal accords with the above guidance in that it seeks a highly controlled engineered landfill solution for those wastes which are not feasible to be recycled or reused.

- ‘The Self Sufficiency Principle’. The concept of the European Union becoming self-sufficient in waste disposal was introduced in a revision to the Waste Framework Directive in 1991. This has been incorporated into the Waste Framework Directive 2008/98/EEC. It seeks to enable member states to move towards self-sufficiently taken into account geographical circumstances or the need for specialised installations of certain types of waste. The proposed development would comply with the principles of self-sufficiency.

- ‘The Proximity Principle’. The 1989 European ComMsion Waste Strategy introduced the principle of that waste disposal take places as close to the point of production as possible. The proposal avoids the requirement for shipment of such waste streams overseas thus complying with the proximity principle.

- ‘EU Directive 2008/98/EC’(Waste Directive). This new Directive revises the existing Waste Framework Directive, the hazardous waste directive and the waste oils directives. This directive lays down a waste management principles such as the polluter pays principle and the waste hierarchy principle. Again the proposed development provides a safe disposal option for hazardous wastes in especially engineered cells in line with best practice internationally.

- ‘The EU Directive 1999/31/EC’ (Landfill Directive). The directive sets out criteria for the classification of landfills and the types of waste to be accepted at different classes of landfill. The Directive addresses the licensing, control and monitoring, closure and after care of landfills. In Article 6 the Directive states that only waste which has been subject to treatment, where possible, to reduce the quantity of hazard to human health or the environment is to be landfilled. The Landfill Directive outlines various technical requirements in relation to hazardous waste acceptance, landfill liner requirements etc. The proposal offers

the first hazardous waste landfill solution for the island of Ireland which is in line with the principles of self-sufficiency, polluter pays and proximity principle promoted in the Landfill Directive.

Section 6.4 sets out Irish National Policies and objectives and guidance on waste management and energy.

- Reference is made to the provisions of the National Development Plan (2007-2013). The National Development Plan seeks an integrated approach to waste management terminal treatment and energy recovery. The proposed development fully supports the provision of complete waste infrastructure for Ireland.

- 'The National Climate Change Strategy' (2007-2012) The facility will provide a residual waste disposal solution for waste energy developments which will in turn reduce the amount of biodegradable wastes being landfilled thereby reducing greenhouse gas emissions.

- In terms of national waste policy and in particular 'Changing Our Ways' (1998) 'Delivering Change' (2002) and 'Taking Stock and Moving Forward' (2004). The proposed Waste Management Facility complies with the objectives of Changing Our Ways and will form part of an integrated waste management infrastructure that is emerging in the Dublin region.

- With regard to 'The National Hazardous Waste Management Plan 2008-2012', In pursuance of the policies set out in the National Hazardous Waste Management Plan the EPA issued request for tenders in June 2009 to carry out a study in relation to the provision of a National Difficulty Waste Facility. The current site has the capacity to provide for such a facility which is set out as a national requirement in the National Hazardous Waste Management Plan.

- With regard to the 'Draft Statement for Waste Policy' (DoEHLG) it is noted that the classification of incinerator bottom ash as a hazardous waste will be examined. The proposal will support new technologies including MBT and waste to energy by providing a facility for the disposal of the residues. The proposed facility will be in the unique position of offering landfill disposal capability under all classes of landfill, inert hazardous and non-hazardous.

Section 6.5 of the EIS sets out regional policy and guidelines.

- With regard to the Regional Planning Guidelines for the Greater Dublin Area the Regional Guidelines acknowledge that waste management infrastructure provision is an important part of the physical infrastructure investment needed in the Greater Dublin Area for population and economic growth. It is stated that the proposed development would contribute substantially to the achievement of this objective.

- 'The Waste Management Plan for the Dublin Region 2005-2010' The plan's policy on hazardous waste disposal requirements states that the Dublin Local

Authorities have no role in planning for hazardous waste disposal. The regional Plan acknowledges however that Section 9.3 of the Hazardous Waste Management Plan requires that at least two engineered landfill disposal cells for hazardous waste - one of which will be in the Dublin area. The Dublin local authorities were considered a feasibility of establishing a hazardous waste landfill cell in the region.

Section 6.6 of the Development Plan sets out local policy and guidelines.

- In relation to the Fingal County Development Plan, the EIS states that with regard to waste management, the plan is closely integrated with the Dublin Waste Management Plan reiterating the long term objectives and targets of the region and setting out specific objectives for the area. The EIS sets out policies in relation to the North Fingal Uplands.

- Section 6.6.2 sets out the policies and provisions contained in the Draft County Fingal Plan 2011 to 2017 (the Board will note that this development Plan is likely to be adopted sometime after the end of March). It is noted that the Draft Plan has identified the quarry on site as a county geological site. The applicants have consulted with the geological survey of Ireland. Following the consultation agreement was made to make access available to interested parties to view geological features within the application site.

- It is noted that the site is zoned HA high amenity in the Fingal County Development Plan 2005-2011. The zoning objective seeks to protect these highly sensitive areas and scenic locations for many inappropriate developments .It is noted the site has been used as a quarry since the 1940s with the infilling of the quarry with inert waste commencing in 2003. The proposed landfilling activity will be carried out within the quarry void and will not be visible from the surrounding area.

Chapter 7 Human Beings

It is noted that the proposed development has the potential to impact on human beings in several ways.

An assessment of the principle potential receptors within the environs of the facility including homes, schools and commercial and industrial premises was conducted and is detailed below. The closest residence is approximately 300 metres from the centre of the MEHL site. The next nearest dwelling is approximately 340 metres from the centre of the site. Naul village is approximately 3 kilometres from the site and Naul National School is approximately 2.7 kilometres to the north-west. Hedgestown National School is about 2.9 kilometres to the east of the site. Details of other educational facilities, social and community facilities and sports facilities are indicated on tables 7.1 to 7.3 respectively. Agriculture and horticulture are the predominant land uses in the area. There are a number of small industries on the road surrounding the site. Details of the demographic trends locally, nationally and regionally are set out in Section 7.2.2 of the report.

Section 7.2.3 of the EIS outlines recent trends in employment both nationally and for Dublin..

Section 7.3 of the EIS sets out a health and safety assessment. A full health impact assessment is set out in a CD submitted with the application (See Appendix A 7.1- 6 separate reports relating to health are set out in appendix A 7.1). It is stated that two possible approaches can be used to assess the possible health effects of a project such as this. Method 1 is to assess the existing environmental baseline in terms of existing conditions, for example measuring levels of contaminants in the air and then examine how conditions will change due to emissions or influences associated with the construction and operational phases of the project. From this it is possible to estimate the resulting effects on human health.
Method 2 involves assessing the human health baseline identified in the study area and in particular vulnerable groups and estimating possible effects of probable emissions.

For the potential effects on human health a baseline evaluation has been studied taken into consideration the following steps.

- Identification of the study area and characterisation of baseline environment with the identification of sensitive populations and receptors.
- Review of public consultations undertaken and issues identified.
- Literature research to identify issues associated with similar projects elsewhere.
- Analysis of predicted residual changes, after mitigation in the environment attributable to the construction and operational phases of the project.
- Proposal of Additional Mitigation Measures where Applicable

The study area used in ascertaining the likely effects is generally confined to within 3000 metres of the proposed scheme.

Extensive consultation has already taken place with members of the public and other interested parties. The main concerns identified were:

- Leachate treatment and disposal
- Liner integrity and leak detection
- Potential for wind-blown dust
- Potential contamination of groundwater
- Potential impacts on farming
- Transport of hazardous materials by road

The EIS sets out various reports and reviews relating to potential health hazards associated with hazardous landfills. Specific reference is made to the
- WHO report,
- The Russi Report and
- The Porta Review.

Each of these reports concluded that there was insufficient evidence to suggest that residing near landfill sites results in adverse health effects. The EIS goes on to

outline the potential specific health effects investigation living in close proximity to hazardous landfills. They include

- Congenital malformations/reproductive problems and cancers. It notes however that much evidence is historic in nature and may reflect situations where hazardous landfill/dumps had much lesser environmental controls. Unfortunately there does not appear to be any literature specific on the landfilling of incinerator ash. At present there is little or no evidence to demonstrate a link between cancer and exposure to any landfill. Mitigation measures in relation to geology, hydrogeology and air are set out in the EIS.

Incinerator ash (bottom ash and fly ash and residues from gas cleaning) is not classified as toxic or very toxic to human health. It is classified as harmful (XN).

Section 7.3.5.3 of the EIS relates to risk assessment. The flu gas treatment residue is classified as hazardous to the aquatic environment. The solidified material (after processing) is not classified as hazardous.

The storage silos, road tanker and curing area will be located within a contained area so that any loss of containment will be prevented from entering water courses etc. The storm water from the contained area will discharge into a hazardous waste leachate holding tank and used in the solidification process. Flu gas treatment residues and other incinerator ashes are not toxic to humans. Equatious hydrochloric acid will be stored in abundant tank. This is a corrosive material.

The potential major accidents at the vicinity have been identified as follows:

- Loss of containment of incinerator ash from the road tanker at the facility.

- Loss of containment of the incinerator ash from the storage silo. Incinerator ash will be pneumatically transferred from the road tanker to the storage silers. Hoses involved in the transfer will be regularly pressure tested and inspected and will be replaced at regular intervals. The storage silos will be designed to international standards and will be provided with a vent filter to prevent the escape of dust. It is concluded therefore that the facility does not propose any risk to human health. The potential for damage to aquatic systems is minimised by providing robust primary containment of the hazardous materials.

The facility will be an establishment to which Article 6 and 7 of the Sesevo 2 Directive will apply. This means that the facility will be a lower tier establishment under the Directive.

No detrimental effect on human health or on food production or agriculture can result from potential emissions from the proposed development.

There will be a maximum number of 50 jobs created during the construction. There will also be a substantial number of indirect jobs. When the proposed development becomes operational it is anticipated that an additional 15 people will be employed in the facility.

The proposed mitigation measures will minimise nuisance and inconvenience to local residents during the construction and operation of the facility and will ensure any nuisance and inconvenience will be negligible.

Chapter 8 Traffic

Chapter 8 of the EIS relates to roads and traffic. It is stated that it is not proposed to increase the annual capacity for the landfill from that which currently operates under the terms of the planning permission and the EPA licence. The current application will involve the relocation of the existing site entrance from the local road LP01090 to LP01080. The existing trips to the proposed facility are mainly heavy goods vehicles. Car trips are not significant in this context. They have nevertheless been taken into consideration. The key assumptions are as follows:

- No proposed increase in the capacity at the facility thus there will be no increase in traffic levels on the local road network.

However trip assignment will change. Two scenarios were considered as part of the overall assessment. The first scenario involves the use of the existing road network. The second scenario is that the new county road link to the M1 as proposed as part of the Fingal landfill project would be operational.

The design year flows on the surrounding road network is based upon the forecast traffic flows obtained from the Fingal Landfill Project EIS 2007. No additional traffic surveys were conducted for the current assessment.

Existing peak hour traffic levels on the surrounding road network are estimated from the forecasted "do nothing" scenario traffic flows from the Fingal landfill EIS project.

In addition to the current year of assessment (2010) design year scenarios were also set out for

- 2011 (main construction stage)
- 2014(interim year) and
- 2024 (design year).

The various scenarios with and without the Fingal landfill project are set out in the EIS. With the current economic slowdown, the number of trips to the site have dramatically reduced in the last two years. This is set out in Table 8.1 which shows that tonnage and truck loads accepted by the facility over the last three years. The total tonnage accepted was as follows:

2007	433,572 tonnes
2008	225,996 tonnes
2009	40,206 tonnes

The total number of loads per annum was as follows:

2007	23,291
2008	11,472
2009	2,206

There has been a 90% decrease in the annual tonnage and total number of loads per annum accepted at the landfill between 2007 and 2009. The more recent data shows that less than 50 HGVs a day were entering the facility. The highest period of trip generation in 2007 sought 260 HGVs entering the site per day (520 in and out trips). This was observed during a period of significant economic activity and is unlikely to be reached again in the foreseeable future.

Section 8.3.3 of the EIS sets out details of the existing road network and junctions. The characteristics of the main roads in the vicinity of the site are set out. Section 8.3.4 sets out existing traffic levels on the local road network. These are set out at Table 8.2. The existing 2010 junction traffic flows (two-way, vehicle per hour) at the junction of the LP 1090/LP1080 has an am peak of 151 and a pm peak of 188 (see table 8.3). Figures for the remaining junctions particularly to the west of the site at the M1 interchange and the R132/Hedgestown roundabout are set out in Table 8.3 of the EIS.

Section 8.3.5 sets out the existing site access and car parking arrangements. It is stated that the existing site access is to be closed under the proposal and that there are currently no marked car parking spaces in the vicinity. The area where its staff and visitors currently park can cater up to 8 to 10 vehicles. There is no public transport in close proximity to the facility. Likewise currently there are no pedestrian or cycling facilities available along the road.

In terms of the proposed site entrance and access it is stated that the proposed entrance has been included as a special local planning objective in the Draft Fingal Development Plan 2011-2017. It is proposed to have 15 car parking spaces associated with the new development.

In terms of operational trip generation it is stated that there has been a dramatic reduction in the amount of waste the facility has been accepting due to the current recession. Assuming the facility is open for 300 days per annum, and an average of 20 tonnes per load was accepted on site. It is estimated that there would be 83 truckloads per day (166 two way movements if the maximum intake was achieved annually). Other daily movements would include staff visitors, delivery and collection of cement acid and leachate. Assuming a worst case scenario this amounts to an additional 51 two way trips per day. Therefore the number of trucks and other movements equates to a maximum average of 25 two way movements per hour in and out of the facility. For a robust assessment a peak hour factor of two has been assumed therefore 58 two way movements are assumed for appraisal purposes.

Section 8.5.2 of the EIS sets out the details in relation to trip generation for construction activities. At its peak it is estimated that three tipper trucks would be filled every 12 minutes equating to 240 (2-way) trips per day. It is estimates that there will also be 50 trips for construction workers. Throughout the life of the

proposed facility there will be intermittent periods of construction activity associated with the proposed development. However for a worst case scenario it is assumed that there will be 20 trips (2-way) associated with the construction activity in 2014 and 18 trips associated with construction activity in 2024 during the am and pm periods.

The trip assignments are set out for the "do nothing scenario and the do something scenario.". The existing directional split of traffic at the junction of the site is 98% to and from the east and 2% to and from the west. Likewise currently the vast majority of HGVs on reaching the M1 turn south - 98% and 2% to travel north. Under the "Do Something Scenario" it is considered that a higher proportion of waste accepted by the proposed development will originate from the north of the site. It is assumed therefore that the do something scenario that 80% of HGVs that are currently used in the M1 will originate from the south while the other 20% will originate from the north. The model also takes into consideration traffic flow both with the Fingal landfill and without the Fingal landfill. The results of the link traffic flows are set out in Table 8.4 in the EIS for the year 2011. The tables set out the am and pm peak period of the local road network surrounding the site without the operation of the Fingal landfill. Table 8.5 and 8.6 set out the link traffic flow increases for 2014 and 2024 respectively both with and without the Fingal landfill in operation for both the am and pm peak.

Section 8.6.2 sets out the junction assessments for the similar scenarios for 2011, 2014 and 2024. These are indicated on Tables 8.7 and 8.8 and 8.9 respectively. The section concludes that traffic levels at each of the junctions are low with the LP 1080/Tooman Road Junction (south-east of the site) having the highest level of traffic flow. An increase in 18 vehicles equates to an 8% increase in traffic flow during the am peak hour. The traffic levels are at a low level and it is not deemed necessary to provide further junction assessments for the 2024 scenarios. The M1 interchange roundabout experienced only a 1% increase in traffic due to the development. As there is no change to the peak volume of traffic entering and exiting the facility, mitigation measures are not required as a result of the proposals. There are beneficial residual impacts in terms of site access as the proposed new entrance of the LP01080 is much safer with greater visibility splays.

Chapter 9 Air Quality

Chapter 9 relates to air quality. Section 9.2.1 sets out legislation and guidance in relation to air quality. The limit values for the various pollutants are set out in Table 9.1 of the EIS. The existing facility is required to undertake dust imposition monitoring bi-annually and for location in accordance with the current EPA licence. The standard measures for dust mitigation are set out in the EIS. The following potential operational sources are considered in the EIS assessment.

- Odour
- Fugitive emissions

The UK Highway agency "design manual for roads and bridges" (2007) states that if daily traffic flows change by less than 1000 AADT or heavy duty vehicle flows change by less than 200 AADT than the impact on air quality can be considered to be

neutral. During the operational and construction phase no routes are predicted to achieve an increase of the level of significance set out in the manual.

In terms of EPA guidance on ambient air quality which is predicated on the Air Framework Directive (96/62/EEC), a member state is required to divide territory into zones for the assessment of management of air quality. In the case of Ireland there are four zones and the site in question is located in Zone D (outside main urban areas). All measured values are well within compliant with relevant limit values. While the facility is approximately 2 kilometres from the Fingal County Council landfill facility no cumulative impacts are anticipated and this is not considered further. The annual mean background pollution concentrations for Zone D are set out in Table 9.3. The existing facility is well within the parameters set out in the 2009 annual environmental report prepared for the facility indicated that dust deposition were significantly below the licence limit of 350 mg/m^2/day. The overall exceedance rate for dust deposition monitoring is 4%. Thus a compliance rate of 96% has been achieved since operations began in 2003.

Section 9.4 sets out the evaluation of air quality impacts. Based on the distance of the closest sensitive receptor to the proposed works no significant impacts are anticipated following the implementation of standard mitigation measures. However the construction of the inert cell (IN1) approximately 48 metres from the receptor has the potential to result in significant dust deposition even with the implementation of standard mitigation measures. Other than this no significant air quality impact is envisaged.

In terms of odour, odour from landfills is typically caused by the decomposition of waste. The proposed facility would not accept any biodegradable waste materials. Hence the potential for odour nuisance will not occur at the facility. Hydrocarbon contaminated soils may have the potential to release fugitive odours V0C emissions operational control procedures will be implemented to ensure that such waste are covered and treated as appropriate to prevent fugitive odour emissions. The applicants have not received any odour complaints in relation to current operations at the site. Hazardous waste in the form of flu gas treatment residues specified for pre treatment in the solidification plant will be transported by fully enclosed tankers and will be pumped via a fully enclosed system into an enclosed building. There will be no odour potential from the flu gas treatment residues or solidification process.

In terms of fugitive emissions it is stated that fugitive, volatile organic compound emissions could potentially arise from the handling of contaminated soil on site. The nearest sensitive receptor is 284 metres from the site. Given the distance to the closest sensitive receptor any insignificant amount of VOCs likely to be generated, no significant air quality impact is anticipated as a result of the landfilling of contaminated soils. Where heavy metals are present in the flu gas treatment residues they are retained within the solidified waste and will not cause fugitive emissions.

In terms of dust no significant dust impact is anticipated as a result of the continued acceptance of inert waste on site.

Mitigation measures are set out in Section 9.5 of the EIS. The contractor will be obliged to comply with the dust deposition limits set out in the existing EPA waste

licence. A contractor will compile a dust minimisation plan. In terms of construction and operational traffic no mitigation measures are required as no negative impacts are predicted. In terms of fugitive emissions dust monitoring will continue as per the existing waste licence and waste cells will be covered daily as necessary in order to minimise fugitive dust emissions. Water sprays will be used and the implementation of dust mitigation measures will place emphasis on areas in proximity to sensitive receptors. Routine walkovers of the site will be carried out to ensure any odour emissions are identified.

Chapter 10 Climate

Section 10.3 sets out policies in relation to climate change. Section 10.4 sets out details of the receiving environment and details of the climate of the area based on Met Eireann's 30 year average climate data (1961-1990). In general the proposed development will have a positive impact on CO2 levels as the proposed development will

- Facilitate the development of waste to energy plants to treat municipal and other wastes. This will reduce the amount of biodegradable waste being landfilled and will reduce therefore the amount of gaseous emissions of methane and carbon dioxide.

- The waste to energy plants will generate electricity which replaces the requirement for electricity generated by fossil fuels.

- The proposed development will eliminate the requirement to ship certain hazardous wastes abroad for disposal. The facility will accept non-biodegradable wastes only and therefore will not generate landfill gas.

In terms of micro climate it is stated that given that the site is already in use as a landfill for inert waste and that there will be no increase in annual tonnage of waste above the current licence limit of 500,000 tonnes per annum there will be no significant impact on micro climate.

Chapter 11 Noise and Vibration.

It is stated that the current waste licence for the facility does not contain vibration limits as no vibration generating sources exist on site. Section 11.3 sets out details of measurement locations (see figure 11.1 – three locations were selected to the south-west of the site, the south-east of the site onto the north-west of the site. The survey results and discussion are set out in Section 11.3.7 of the EIS. In terms of a location SO1 (dwelling house adjacent to the south-eastern corner of the site a daytime L_{Aeq} of between 57 and 58 dBA was recorded. This reduced to 38 to 51 dBA at night time. The main source of noise derives from occasional passing traffic along the local road. Bird song and leaf rustle formed the background noise environment. No activities from the existing facilities were audible during the survey.

At location SO2 (in close proximity to the western corner of the site L_{Aeq} levels of between 56 and 60 dBA were recorded during the daytime and levels between 34 and

55 dBA were recorded at night time. Again the main source of noise was from intermittent traffic passing along the local road and distant noise from the farmyard activity. Occasional aircraft were also noted to be faintly audible.

In location SO3 (circa 250 metres to the north of the site) L_{Aeq} levels were recorded of between 50 to 57 dBA during the daytime and 36 and 53 dBA at night time. Again the main source of noise was from traffic passing along the local road and bird song and leaf rustle formed the background noise environment. It is concluded that road traffic is the dominant source of noise in the existing environment and that the current facility does not contribute to the current noise climate. An evaluation of the noise and vibration impacts is set out in Section 11.5 of the EIS.

The site development and cell development noise calculations for Phase 1 (based on the worst case scenario is set out in Table 11.8. The indicative calculated noise levels set out in Table 11.8 are within the daytime operational noise limit of 55dBA at the closest locations to the works.

Similar conclusions are reached in relation to the operation and construction of Phases 2, 3 and 4 of development that is that levels of noise are within the daytime operational noise limits of 55 dB(a). The EIS goes onto to evaluate the potential impact in terms of sound exposure levels. The assessment carried out indicates that the result in traffic flows and changes in traffic associated with the development will result in traffic noise levels in the vicinity of roads and junctions surrounding the site will be less than 1dBA. The resultant impact is therefore considered to be imperceptive.

- Section 11.6 sets out mitigation measures in terms of site development and cell operation. The various mitigation measures include

- Limiting the hours during which activities are likely to create high levels of noise and vibration.

- All side access roads will be kept even so as to mitigate against the potential of vibrations from trucks.

- Selection of plant with low inherent potential for generation of noise and vibration.

- The erection of temporary barriers is necessary around noisy processes such as generators, heavy mechanical plant etc.

- Placing of noisy planned machinery far away from sensitive properties. Details of attenuation measures to be attached to the building services plant are also set out.

- In terms of additional traffic along public roads it is stated that the noise impact assessment outlined in Section 11.5 has demonstrated that mitigation measures are not required.

- During the construction and operation of the cells the predicted noise levels are within the noise limit values set out in the EPA licence.

Chapter 12 Landscape and Visual

Section 12 relates to landscape and visual impact. The assessment involved reviewing photographs, aerial photography, photomontages, plans and sections of the MEHL facility together with various publications and reports. Section 12.2 sets out the assessment methodology. The significance criteria set out in Table 12.1 and ranges from imperceptible to profound. Existing views of the site are set out in Figures 12.2 to 12.7 of the EIS. Landscape and restoration proposal are set out in Figures 12.8 to 12.12 of the EIS. Photomontages from six separate vantage points are taken.

- Vantage points 1 and 2 are taken from the local access road LP01080 along the southern boundary of the site.
- Vantage points 3 and 4 are located to the north of the site looking southwards across the site.
- Vantage points 5 and 6 are taken from the east of the site looking westwards across the site.

The photomontages include photographs of the site as existing, photomontages of the site are to the completion of Phase 3 of the restoration, and photomontages of the site when fully restored. Section 12.3 outlines in detail the existing environment including the site description comment topography vegetation and views available in the area.

Section 12.3.4 outlines that landscape planning context and makes reference to various statements contained in the Fingal County Development Plan. It is noted that the site is located in a high amenity area, the objective of which is to protect and improve high amenity areas. It is noted that there are a number of preserved views within the environs of the site and the local county road to the south between the R108 and M1 is listed as a preserved view, as is the R108 Naul Road to the west. The protected views are indicated on figure 12.20 of the EIS.

The protected views contained in the Draft Plan are the same as that in the County Plan with the exception that it is proposed to include a section of the local road to the immediate west of the site. In terms of likely significant impacts it is stated that the most significant changes would be to the elevated views south where the formation of the cells and gradual infilling of the waste would be scenic against the exposed southern slopes of the existing site. However as the proposal involves the infilling of an excavated area the change in ground profile would not be seen against the skyline. As the lands are progressively restored the impact would become more slight. This is depicted in the photomontages submitted. In terms of the impact on the landscape character any assessment of the impact of the proposed development on this sensitive landscape must be set within the context of the existing old quarry and MEHL site. Thus the proposed infill development will not significantly alter the character of the existing landscape. The quarry has to some degree altered the topography of the area by removing a section of local hill at Hollywood Great and principally affecting views from the north. However the ridge line of the hill has remained largely intact.

In assessing the impact on the landscape character it is considered that the degree of change that will result from the infilling of the existing site would be 'slight' and 'neutral'. The land profile at the end of the works will replace views of the existing quarry which will result in a small scale and positive change in the character of the local area.

With regard to the impact on views it is stated that from the west, south and east there will be no significant change to the existing views. The main change in character will be from the north and north-west where views are more open and elevated and the existing quarry is visible. The progressive infilling will provide some screening of the south and east facing quarry benches.

With regard to the visual impact from residential properties it is stated that a group of residential properties on local roads within the vicinity amount to 11 eleven properties which have open views of the site. The remaining properties (in excess of 50) in the wider area have either glimpsed views or are screened by intervening vegetation and/or topography. The EIS goes on to evaluate views from properties to the south-west, north-east and east of the site.

With regard to impacts from roads it is stated that there are glimpsed views of the site from local county roads to the immediate west, north and east. Views from the south are screened by the intervening ridge line. Views of the open exposed quarry will be improved as a result of the progressive filling particularly from vantage points to the north. In conclusion therefore it is considered that during the operational stages the progressive infilling in restoration of the site will not significantly change the character and nature of the existing views and there will generally be a slight positive impact in the medium term. As a result while the proposed development is located within a landscape of special value and sensitivity the proposal will not result in a diminution of the landscaping. In terms of preserved views it is stated that overall the local topography within the site provides good screening and the impact on preserved views would not be significant.

Section 12.6 of the EIS outlines mitigation measures including landscape screen planting, the retention and thickening of existing hedgerows, scrub planting, the retention of existing trees and the progressive restoration of the site.

Low level bollard lighting will be used along the entrance road to avoid light spillage onto adjoining properties. Higher lighting columns will only be used around the solidification plant.

Section 13 relates to the flora and fauna. Also included in this section is an appropriate assessment (screening) under the European Communities (Natural Habitats) Regulations 1997 which is attached in Appendix A13.1.

A Habitat survey was carried out in May 2010 to identify map and evaluate habitats and to verify the information gathered at the desk study stage. A survey of Peregrine falcon was undertaken in the summer of 2010 (See appendix 13.2). The site is not covered by any conservation designations such as an SPA, SAC and cSAC, NHA or pNHA. The nearest designated conservation area within 15 kilometres of the site are set out in Table 13.1.

There is a record of one rare protected plant species contained in the NPWS protected species database within the 10 kilometre square grid in which the site is located This plant is the red hemp nettle. This species was not found on the site in question. Generally the part of the county in which the site is located is described as having "the poorest flora of the 8 botanical districts in County Dublin according to the flora of County Dublin (Doogue et al 1998).

Section 13.4 describes the habitats and the habitats are shown in figure 13.2. The vast majority of the site comprises of spoil and exposed calcareous rocks. In a few places this land is beginning to be colonised with plants but is largely unvegetated.

Areas of recolonizing bare ground (ED3) are located primarily around the boundary of the site particularly along the south-west, north-east, north-west and south-eastern boundaries. These areas are being colonised with a good diversity of plants typical of calcareous substrates. The main plants are listed in Table 13.2 of the EIS.

The northern boundary of the site is defined by a water course designated as an eroding upland stream (FW1). The water depth is shallow and flow is described as "swift trickle". There is no aquatic vegetation. The southern bank of the stream is mostly fringed with mature trees forming a band of mixed broad leafed woodland. The water course is a tributary of the Ballough Stream which has a small but significant population of Atlantic salmon and sea trout. Adjacent to this stream is a mixture of mixed broad leafed woodland and scrub land. The woodland is mainly scots pine, oak, sycamore, birch larch ash and aldr.

There are a number of artificial lakes and ponds within the more deeply excavated area of the quarry and within the settlement ponds and within the lined cells of the site. There is little fringing vegetation around these water bodies and comprise mainly of soft rush, bottle sedge and horse tail.

In terms of mammals two hares were observed chasing on site the Irish hares protected under the Wildlife Act. The site offers good open spaces for hare but limiting foraging due to sparse vegetation cover. Therefore hares are unlikely to breathe on site. Other mammals' not seen but likely to use the site include fox and rabbit. Otters are also protected under the Wildlife Act and the EU Habitats Directive. They have found that many Irish watercourses and are likely to occur along the stream on the northern site boundary. The woodland edge along the stream would also be suitable for badger and other small mammals including rabbit and hedgehog.

In terms of insects, reptiles and amphibians butterflies were noted on site and nutes and tadpoles were also seen in the attenuation ponds.

In terms of birds, birds noted on the site are listed in Table 13.3 of the EIS. They include blackbird, black backed gull, cuckoo, house martin, meadow pippet, peregrine falcon, raven, ruck, sandmartin, swallow, wood pigeon. In terms of conservation status with the exception of the black backed gull, which is given a high conservation status, all other birds are ranked as low to medium status. The peregrine

falcon is listed on Annex 1 of the EU Birds Directive. The peregrine falcon is a species that has low conservation status in Ireland however it is much less common in the rest of Europe and therefore is listed in the Directive. A separate report contained in Appendix A13.2 describes in detail the use of the site by the peregrine falcon for foraging roosting and breeding as well as the distribution and occurrence of the peregrine falcon within the vicinity of North County Dublin.

Section 13.8 relates to site evaluation. Overall the site is of county importance due to the presence of the peregrine falcon and the exposed limestone cliff face of the former quarry which provides a suitable nesting habitat and the occurrence of a salmonid stream along the northern side boundary.

There will be no direct impact on any designated areas of conservation as these are located a considerable distance from the site. The impact of the proposed development on fauna is described as significant at local level as it will involve the infilling of the former quarry which will result in the displacement and loss of habitats supporting this fauna. There will be no direct impact on the water course thus there will be no impact on the otter. It should be remembered however that the above impacts are already been approved in the planning permission for the existing landfill. In terms of the impact on the aquatic environment and fisheries, it is essential that only clean water and uncontaminated surface water should be discharged to the water course at the northern boundary of the site. Provided there is no discharge of contaminated waters from the site there would be no direct impact on Rogerstown estuary which is the receptor as it is located within the hydrological catchment area in which the site is located. The construction phase of the project will result in disturbance of noise for the peregrine falcon. The EIS sets out mitigation measures which would be employed during the construction and operation phase in order to safeguard existing flora and fauna on site. If it is considered necessary, following monitoring, the creation of an alternative peregrine nest site away from the quarry at a suitable location within 5 kilometres of the site will compensate for any adverse impacts on this species.

Chapter 14 Geology and Hydrogeology

Section 14 of the EIS relates to soil, geology and hydrogeology. The first section of the EIS sets out the policy framework relating to ground water and makes reference to the European Union Directives relating to groundwater including the Water Framework Directive. Reference is also made to the various transposition of the EU Directives into National Legislation and in particular to the Water Pollution Acts (1977 to 1990), the Local Government Water Pollution Regulations 1978 and amended regulations 1999 and the Waste Water Discharge (Authorisation) Regulations 2007.

It is noted that the Regulations aim to establish and give new strength for the protection of groundwater in line with the requirements for the Water Framework Directive and the Groundwater Directive and to establish clear environmental objectives, ground water quality standards and threshold values for the classification of groundwater. The Regulations also introduce the legal basis for a more flexible proportion and risk based approach to implementing the legal obligation to prevent the upper inputs of pollutions into groundwater.

The existing conditions within the area of the proposed site have been interpreted from historic studies on the site as well as desk top and ground investigation data. The publications available and the site specific investigations which have been undertaken in relation to the existing operations on site are set out in the EIS. It is noted that numerous boreholes were drilled on site between 1998 and 2008 as part of the work for the existing EPA Waste Licence. These are situated on the site perimeter and are shown on figure 14.2. As part of this assessment, additional boreholes were drilled in the centre of the site within the proposed locations for the proposed hazardous and non-hazardous waste cells. This information was used to establish the geology of the area and further delineate the geological profile of the site. The new boreholes were also used as ground water monitoring installations. The new boreholes will be decomMsioned and grouted prior to the construction to prevent them from becoming a pathway for contaminants. Detailed information in relation to the borehole investigations are contained in Appendix 14.2 to 14.12 on the CD attached to the EIS appendices. Consultations were held with the GSI, EPA, Fingal County Council and An Bord Pleanala.

The underlying geology of the site is described. The area underlying the site is described as Balrickard formation which is described as micaceous sandstone with shale. The Walshestown formation is located to the immediate north of the site. The rocks in this formation are described as black shales with iron stone and subordinate silt stone with rippled fine sandstone bands calcareous mudstone and biosparite.

In terms of soil the EIS states that a glade group of soils cover most of the region. The site itself is characterised by the brown earth group soils. These are relatively mature soils. They are generally a well drained mineral soil. The typical profile is uniform with little or no differentiation in horizons. The soils in this group are generally good arable soils although sometimes low in nutrients. They have good drainage and structure characteristics with medium textures.

Geophysic results indicated that a major fall was mapped running roughly north-south through the site (see figure 14.8). The report highlighted another bedrock fault trending east-west through the site which intersects the north-south fall. The summary of the boreholes are set out in Table 14.3 of the EIS. Details of the depth of overburden and bedrock are set out for 20 boreholes within the site. The location of these boreholes are indicated on figure 14.5. Much of the naturally occurring soils on site have been stripped and stockpiled during the quarrying operations. Some stockpiling of soils has been carried out for use of the restoration of the quarry for the lining and capping activities associated with the landfilling activities. The soils vary in thickness and texture but are generally less than 5 metres thick and have a clay/silt matrix with a dispersed pebble class.

Section 14.4 of the EIS relates to groundwater. Details of the rainfall in Dublin Airport are set out in Table 14.4. In terms of groundwater vulnerability figure 14.9 indicates that the western and southern portion of the site comprise of rock near the surface (due to the excavation of materials on site). The northern and eastern portion of the site comprise of soils with low vulnerability. The regional groundwater flow direction is towards the south-east.

Details of the hydrochemistry of the water is also set out.

Figure 14.10 shows the locations of all wells recorded by the GSI. Fingal County Council have developed a well field in the Loughshinny formation at the Bog of the Ring that supplies up to 4,000 cubic metres per day to Balbriggan and its environs. The GSI have defined a source protection area. The appeal site is located approximately 1 kilometre outside the outer source of protection area and approximately 3 kilometres from the abstract locations (inner source protection area) shown on figure 14.10. Recent monitoring reports have suggested that the supply is in decline. However it is generally thought that the sands and gravels in the vicinity of the Bog of Ring Well field may provide significant additional storage.

As a result of various hydraulic pumping tests, the permeability of the aquifer is considered to be moderate in the order of 10^{-4} to 10^{-5} m/s. The permeability of the more permeable horizons in the Namurian Shale appear to be in the order of 10^{-6} m/s. The permeability of the bulk of the Namurian start to appear to be significantly lower and is in the order of 10^{-7} to 10^{-8} m/s. Ground water levels as recorded in the various bore holes on site are indicated in Table 14.11. The hydraulic gradient of the aquifer is approximately 0.02 to 0.04 indicating that the water table has a moderate gradient.

Sections 14.5 sets out a description of the proposed development.

Section 14.6 sets out the evaluation of potential impacts. The aspects of the proposed development which have the potential to impact on the soils and geology of the site are

- It is stated that impacts to the hydrogeological regime may occur include the placement of waste which could act as a barrier and could also act to reduce the recharge of the aquifer thereby reducing its resource potential. The landfill will only act as a barrier to flow if the waste was placed significantly below the water table. The existing water table is currently below the base of the open excavation. Currently the majority of the site contributes little to the recharge of the aquifer. The infilling of the area with waste will cause an imperceptible impact on the recharge potential of the groundwater body. For this reason no mitigation measures will be required.

With regard to the issue of contamination the EIS states the following: Inert waste is not expected to have a significant impact on groundwater quality due to the waste acceptance criteria associated with it.

The potential impact from non-hazardous and hazardous waste is also set out in the EIS. These include the accidental placement of hazardous and non-hazardous waste in inert cells and the accidental leakage or spillage of leachate into the inert cells. Mitigation measures are set out in Section 14.8 of the EIS. With regard to general contamination and accidents, it is stated that any monitoring boreholes drilled during the investigation processes will be grouted to ensure that they do not allow a preferential pathway for contamination to develop. All potentially polluting materials will be stored in bunds. Contaminated water will not be discharged to surface water bodies. The water contained within the pond will be tested before disposal and will be appropriately treated and disposed as required.

With regard to mitigation measures for inert waste, The inert waste will be placed above the water table. The waste will be placed in cells lined with low permeability clay 1 metre thick. Separate leachate collection systems will be installed in each of the cells and measures will be implemented to ensure that leachate does not mix. An Environmental monitoring plan will be developed to monitor groundwater.

The mitigation measures are set out for non-hazardous waste and include a 2 millimetre thick HDPE liner and a 1 metre thick low permeability clay which would be designed in line with EU Regulations and EPA guidelines. The non-hazardous material is to be placed in the south of the site where the aquifer is shallower and an additional 1 metre thick low permeability natural material will be placed beneath the liner. Separate leachate collection systems will also be installed.

The mitigation measures for hazardous waste include the following:

Hazardous waste will only be placed on the poor aquifer of the site and will not be placed on the locally important aquifer. A DAC liner will be constructed on which the hazardous waste will be placed. Flu gas treatment residues will be solidified before being placed in the cells. Leachate generation will be minimised with temporary cover over the cells. The head of the leachate in the cells will be limited to 1 metre within the hazardous cells. Leachate collected from the hazardous cells will be reused in the solidification plant. A leak monitoring and collection system will be provided below the DAC to ensure that leaks will be detected early.

A quantitative risk assessment was undertaken for the proposed development. Three scenarios were modelled following consultation with the EBA. Full details of the assessment including justifications are presented in Appendix A14.10 of the EIS. The scenario was modelled over a 20,000 year timespan to assess any future mobilisation of contaminants.

In terms of groundwater resources it is stated that the provision of suitably lined cells to receive the various waste types coupled with the EPA approved groundwater monitoring programme will ensure that existing or proposed downgradient wells are suitably protected from contamination.

Chapter 15 Surface Water

Section 15 of the EIS relates to surface water. The principle potential impacts of surface water are associated with discharges to the receiving water courses from the proposed waste facility. It is stated that the risk to surface water systems during the operational phase will be minimal as drainage systems will incorporate sustainable drainage practices and pollution control mechanisms. Section 15.2.4 sets out the legislation and guidance in relation to surface water hydrology. Reference is made to the Water Framework Directive, the Surface Waters Regulations and the European Communities Priority Substance Directive. Reference is also made to the European Communities (Quality of Salmonid Water) Regulations 1988, the Water Quality Standards for Phosphorus Regulations 1998 and the Local Government Water Pollution Acts (1977-1990). Details of the water quality parameters set out in the

legislation is contained in Appendix 8.15.1, Tables 1 and 2. The hydrological baseline categorisation for water courses is also set out in Table 15.1 of the main text.

The stream that runs along the northern boundary of the site is a tributary of the Ballough Stream. The Ballough Stream is a salmonid river of county significance. The Ballough Stream flows into the Ballyboughal Stream and forms part of the upper sections of the most northern sub catchment of the Ballyboughal Stream catchment. The Ballyboughal Stream is the principle freshwater river system that flows into Rogerstown Estuary. This estuary is a protected ecological site. The Ballyboughal catchment is approximately 58 square kilometres in area of which the Ballough Stream subcatchment comprises of 32 kilometres. The stream that runs along the northern boundary of the site has an upstream catchment of approximately 0.7 kilometres squared.

In terms of flood risk it is stated that there has been no previous record of flood risk in the vicinity of the proposed facility according to the OPW website. The vicinity is located at the highest point of the Ballyboughal catchment thus the facility is not located in an area conducive to flood risk.

The stream along the northern boundary of the site indicated a flow of 2 litres per second. The surface water collected within the licence area is attenuated through two in line sedimentation ponds with a volume of approximately 600 cubic metres and this has controlled discharge to the stream. In terms of the biological quality of both the Ballyboughal and Ballagh streams, the streams are generally given a Q rating of 3 which is categorised as having poor status.

Section 15.3.5.2 sets out the physiochemical characteristics of the streams and these are summarised in Table 15.6 and 15.7. The surface water quality are summarised in Tables 15.8 and 15.9.

In terms of aquatic ecology it is stated that the Ballagh Stream is classified as a salmonoid river. Sea Trout have been recorded in both the Ballyboughal and Ballock Streams.

Section 15.4 sets out predicted impacts. The predicted construction impacts are set out and these are described as:

- Elevated silt loading in surface waters as a result of construction activities.
- The possibility of concrete, Bentenite and grout and other cement based products which are highly alkaline and corrosive impacting on water quality.
- Hydrocarbons from accidental spillage.
- And faecal coliforms from on-site toilet washing facilities.

The potential operational impacts are described as follows:

- Accidental spillage of waste from transportation of hazardous material.
- Hard-standing runoff associated with vehicular traffic.
- Applications of salt and grit during winter time to address icy conditions.

- Potential impact from leachate and the potential flood risk associated with the development. Each of these issues is dealt with in detail in the EIS.

The Impact Assessment is set out in Section 15.4.3. During the Construction it is stated that the potential impact on ecologically protected areas downstream at the Rogerstown Estuary can be expected to be adverse and short-term if mitigation measures are not implemented.

In terms of the operational impact the potential impact is expected to be adverse and permanent if mitigation measures are not implemented.

In terms of Flood Risk Assessment it is stated that there are currently no Flood Risk Maps available for the Ballyboughal catchment area. The OPW risk mapping did not indicate any flood incidents within 5 kilometres radius of the site. It is therefore considered that the site is most likely located in flood risk Zone C as set out in the Flood Risk Guidelines. The probability of flooding from rivers is low with a flooding event of less than 1 in 1,000 for both river and coastal flooding.

Mitigation measures are set out in Section 15.5 for the construction phase and the operation phase. The mitigation measures include appropriate management operations on site in relation to bunding and stock piling material as well as the provision of berms and diversion channels.

During the operational phase it is proposed to manage surface water on site by using a combination of SUDS, a wetland pond, a detention basin and rainwater harvesting. At all times the facility will be operated in accordance with the conditions set out in the waste licence.

Chapter 16 Archaeology, Architecture and Cultural Heritage

Section 16 relates to archaeological, architectural and cultural heritage. The first section of this chapter sets out guidelines and legislation in relation to archaeological, architectural and cultural heritage.

Table 16.2 lists all of the Record of Monuments and Places within 2 kilometres of the proposed site boundary. A total of 18 places were recorded. The closest RMP sites include a 'Barrow' approximately 80 metres on the western side of the road which runs along the western boundary of the site. This earthwork is approximately 80 metres from the entrance of the site. A ruinous church is located approximately 100 metres to the south-west of the south-western boundary of the site. An old graveyard is also located at this location. A ring ditch is located in the townland of Walshestown approximately 270 metres from the northern boundary of the site. All other recorded monuments are in excess of 500 metres from the appeal site. The location of these monuments are indicated on Figure 16.1. The barrow to the west of the site and the church including the walled graveyard to the south-west of the site are also listed in the Development Plan Record of Protected Structures.

In terms of predicted impacts the impacts are addressed under the following headings.

- *Deposition of Waste Material within the Quarry.*

Any potential features of cultural heritage value previously located within the footprint of the quarry excavation have been previously obliterated. Therefore there was no potential for impact from this activity.

- *Site Access*

No previously unrecorded cultural heritage sites were noted in the vicinity of the proposed site access. There is however potential to impact upon previously unrecorded archaeological deposits during the construction of the roadway.

- *Access from Local Road*

It is noted that the church and graveyard extends through the gated entrance to the road adjacent to the site and therefore construction traffic could impact upon the boundary of this monument and protected structure. However given that the proposed new entrance is to be located further from the graveyard than that which is currently in use will reduce the potential of impacting on this monument.

- *Impact Resulting from Capping Material*

There is also potential for direct impacts on undiscovered archaeology. It is recommended that works to undisturbed ground would be monitored by a suitably qualified archaeologist under licence and where deposits are discovered work will cease and contact will be made with the National Monuments Section of the DoEHLG.

Chapter 17 Material Assets

Section 17 relates to material assets. This section sets out the various land uses in the vicinity of the site. Reference is made to a study to estimate the disamenity costs of landfills in Great Britain published in 2003. It suggests that house prices are adversely affected at the beginning of landfill operations and that the impact decreases during the later workings of the landfill. It also notes that co-disposing of hazardous and non-hazardous material may increase the disamenity affect. However as the current facility will continue to accept non-biodegradable waste the typical potential nuisance impacts associated with the municipal waste landfill such as landfill gas, odours and vermin will not arise. Because of this factor it is difficult to predict with any certainty the effect if any of the proposed development on nearby property values. The applicants propose to pay contributions into a community gain fund allied with the tonnage and waste classification of materials taking into the site which are either non-hazardous or hazardous in nature. The amount of contribution will be consistent with other similar community gain models in existence.

Section 17.4 sets out details in relation to utility supply and usage. In terms of water and wastewater, the survey identified only three properties in the area which have wells extracting from groundwater. Two of these extraction wells are up-gradient of the site and only one is down-gradient. This down-gradient well is used for watering gardens and is not for potable water supply. All three locations noted were also

supplied by mains water. There is also an existing potable water supply on site. Water usage at the facitity in 2009 was just under 800 cubic metres.

Foul water is serviced by a septic tank which is emptied regularly and sent by tanker to the receiving sewage treatment works. In 2009 approximately 3.6 cubic metres was delivered to the Navan wastewater treatment plant. Extensions will be made to the existing mains water supply as part of the proposed development. The electricity supply required for the facility control area and requirements to divert power lines traversing the site will be undertaken in consultation with ESB Networks. In terms of electricity consumption 127,540 kilowatts was utilised in 2009. It is expected that approximately 330,000 litres of diesel will be used onsite per annum for plant and equipment.

Section 17.5 relates to natural resources. It is stated that as much as possible of the material will be reused on site for lining and capping. It is estimated that just under 200,000 cubic metres of material will be suitable for reuse on site. It is estimated that 480,000 cubic metres of excess subsoil's and shale's, the properties of which will not meet the engineering specification for use in the base layers will be exported offsite for reuse or recovery. A combination of imported materials and site deposits will be used to complete the capping layer covering it with topsoil and landscaping it. Opportunities for the recovery of bottom ash for the use in the construction are being investigated by the applicants and will be considered in line with the regulatory and market climate. However it is not part of the current application.

It is considered that the proposed development will have a positive contribution to the national economy in terms of avoiding the need to export hazardous waste from Ireland and also from the creation of job opportunities.

Chapter 18 Cumulative Impacts Other Impacts and Interactions

The matrix of potential effects is set out in Table 18.1. In terms of cumulative impacts the cumulative impacts have been addressed in the relevant chapters of the EIS. In Chapter 8 the Roads and Traffic Section took into account the proposed Fingal Landfill Project. Chapter 11 which relates to noise and vibration took into consideration the impact of the proposal when combined with background noise levels to determine the impacts. The cumulative landscape and visual impacts of the proposed facility in combination with the surrounding landscape were addressed in Chapter 12.The potential cumulative impacts from the facility with the Fingal County Council Landfill Project were considered in relation to flora and fauna archaeology, air quality, surface and groundwater.

Chapter 19 Summary or Impacts and Mitigation Measures

These are summarised in Table 19.1 and 19.2 of the EIS.

APPENDIX 2

Other Reports Submitted with the Application

Two other reports were submitted with the original documentation to the Board. These include Document 5 – Planning Report and Document 6 – Engineering Report.

Planning Report

The Planning Report sets out in detail the site location and description before outlining the planning history associated with the site. Included in the planning history are details of the An Bord Pleanala decision and it is contended that the reasons for refusal cited in the An Bord Pleanala decision are adequately addressed in the current application.

Section 3 of the Report sets out details the National Hazardous Waste Management Plan and in particular sections relating to the proposed development. Section 4 sets out local policy as set out in the Fingal Development Plan and the draft Fingal Development Plan. Section 5 contains a brief summary of the proposed development. Section 6 sets out the pre-application consultation which took place with An Bord Pleanala and various other meetings with other stakeholders including the EPA, the Public and the GSI/National Museum of Ireland.

Section 7 sets out the planning considerations relating to the proposal. Reference is made to

- National policy objectives
- Zoning objectives
- Traffic issues
- Residential amenity
- Visual amenity
- Safety issues
- The operations on site.

The appendices attached to the Planning Report set out in detail all planning decisions relating to the proposed development.

Engineering Report

Document 6 submitted with the application comprises of the Engineering Report. The first section of this report sets out the site location and topography of the area as well as the site description and the proposed development. Details of the phasing of the proposed development are set out in detail in Section 1.

Section 2 of the Report sets out details in relation to traffic and road construction matters.

Section 3 of the EIS sets out details in relation to landfill construction and in particular the construction of the landfill linings.

Section 4 sets out details in relation to the solidification plant.

Section 5 sets out details in relation to the proposed on-site wastewater treatment plant to serve the administration building.

Section 6 sets out details in relation leachate management and the anticipated leachate generation and holding tank capacity required for the development.

Section 7 sets out details in relation to water supply.

Section 8 sets out details in relation to surface water drainage infrastructure to be developed on site.

Section 9 sets out details in relation to ancillary site services and buildings.

A number of appendices are attached including:

- Details of borehole logs.
- A Road Safety Audit, Site Suitability Report.
- A SUDS site evaluation

The final section of the Report contains brochures in relation to various infrastructure associated with the site including soak-away details, weigh-bridge details, wheel-wash details, geo-membranes, cell linings, proprietary wastewater treatment systems and concrete silos.

APPENDIX 3 – PROCEEDINGS OF THE ORAL HEARING

An Bord Pleánala held an oral hearing into the proposed integrated waste management facility at the Bracken Hotel in Balbriggan, North County Dublin. The seven day oral hearing commenced at 11 O'clock on Tuesday, 22nd March 2011. The proceedings of the oral hearing are briefly outlined below.

Day 1

The Inspector made some introductory remarks before calling upon any observers who do not wish to question and cross-examine to make submissions at the outset of the hearing.

Submission by Fedelma Geraghty Observer

Ms. Fidelma Geraghty, Observer, then made a submission objecting to the proposed development. Concerns were expressed in relation to:
- The transport of the waste to the facility.
- The potential leaks of hazardous waste from the trucks travelling to the facility.
- The proposed development would utilise the smaller side roads off the M1 in accessing the facility.
- The development would give rise to noise pollution and traffic accidents and is in to close a proximity to Hedgestown School.
- The proposal would also have adverse implications for the wildlife of the area and would sit above a large aquifer which feeds water supplies to the surrounding areas.
- The fly ash is of concern because of its high mercury content and therefore would have health implications.
- The area is very important for agriculture and horticulture. The proposed development could jeopardise these industries.
- The cumulative impact of the proposed development from the Tooman Nevitt Landfill will further raise the risk of contamination in the area. If the applicant cannot guarantee that the proposed development would be 100% secure, then it should not be given the go-ahead.

When Ms. Geraghty's submission was concluded, the applicant was asked to present his formal presentation to the hearing. Mr. Mulcahy, Barrister-at-Law indicated that he would be calling upon at least 11 witnesses to present submissions at the hearing.

FORMAL SUBMISSION ON BEHALF OF THE APPLICANT

Submission by Ruairi Mulcahy BL Introductory Statement

The Submission by Ruairi Mulcahy BL outlined the legislative background to the proposed development making specific reference to Section 26(1) of the Waste Management Act 1996 and the need to make a National Plan for Hazardous Waste. The submission acknowledges the necessity to landfill some portion of the hazardous waste arising. The various recommendations contained in the National Hazardous Waste Management Plans are outlined and it is argued that the proposed development fully accords with this provision. It is also noted that co-location is considered important in the context of siting complementary waste management facilities. This

point is highlighted in the NaDWaF Report. It is noted that the public sector has done nothing to secure hazardous landfill capacity in Ireland and there are no private sector proposals, other than that currently before the Board in progress. Mr. Mulcahy's submission went on to outline the proposed development and outlines the applicant's excellent compliance record in terms of maintaining planning and environmental standards. It is stated that there will be no increase in traffic movements permitted and given that the proposal does not involve non-biodegradable waste, there will be no change in air or noise emissions from the site. It is stated that the applicant considered various alternatives for the all-important landfill liner of the hazardous waste and has chosen to use state-of-the-art Dense Asphaltic Concrete liner (DAC). This meets and exceeds the requirements of the Landfill Directive and therefore can be considered Best Available Technology. Where the worked out quarry exists on site some artificially engineered measures have been adopted to supplement the natural protections available in line with the provisions of the Directive in the EPA Guidelines.

Reference is made to the recent European Court of Justice Case 50/09 which criticised the manner in which the State has transposed the EIA Directive. It is suggested that no such difficulty arising from the judgement relates to this case. The applicants are currently engaged in the EIA process and as such there can be no infirmity surrounding the decision making in this instance. In terms of financial assurances it is stated that the applicant has been required to go through comprehensive assessments with the EPA in relation to previous waste licenses and financial assurance would not be an issue in this instance. Finally the submission makes reference to the requirements of the Landfill Directive and it argues that the proposed development complies with the over-arching objectives of the Directive.

Submission by Patricia Rooneyon the Background to the Development

Mr. Mulcahy then requested Ms. Patricia Rooney, Director and General Manager of Murphy Environmental Hollywood Ltd. to make an oral submission at the hearing. Ms. Rooney set out the background to activities on site and noted that the site became operational in the 1940s. She stated that the applicant has first-hand experiences in waste infrastructure in Ireland and beyond. They have used this experience to see how best practice could be achieved in the case of the current proposal. It is argued that the site is strategically located in north Dublin adjacent to the main population centre and next to the motorway network. Waste management processes for waste arrival on site are set out. The applicants will remain respectful of local needs and has been important in supporting community initiatives in the area.

Submission of Louise O Donnell on Site Suitability Assessment

Then Ms. Louise O'Donnell (Patel Tonra) Ltd. which specifically dealt with

- Site suitability, project need and waste management context.
- And aftercare management issues.

It is noted that the Site Suitability Study is included in Appendix A3.1 of the EIS. It is noted that a new Greenfield site was not considered appropriate due to the various policy statements set out in national waste documents including "Changing Our

Ways" and the EPA's National Hazardous Waste Management Plan which highlights the importance of using existing facilities and co-locating with existing facilities.

It was also considered that utilising an existing site offers significant advantages in terms of

- Planning and licencing processes
- Land ownership issues
- The provision of shared infrastructure and operation and management.

The Site Suitability Assessment then moved on to examine existing licence sites and exclude any which were deemed wholly unsuitable due to severely limiting licencing factors relating to imminent site closure.

Level 2 Assessment then set out detailed evaluation criteria in factors in relation to location, capacity, longevity and significant planning and licencing constraints. Following this assessment three sites, including the application site were shortlisted.

Each of the three shortlisted sites were then subject to the World Health Organisation (WHO) criteria for site selection for new hazardous waste management facilities. The submission goes on to reference the site selection process for new hazardous waste management facilities by the World Health Organisation. The initial site suitability study concluded that the Hollywood site could accommodate the likely volumes of target wastes for a proposed 25-30 year lifetime.

In relation to project need it is stated that this key piece of waste management infrastructure is lacking in the Island of Ireland. EU Waste Policies requires member states to achieve a level of self-sufficiency in the management of waste. By providing a landfill disposal capable under all classes of landfill (inert, non-hazardous and hazardous), the site will offer a 'one stop shop' solution to waste producers.

In terms of long-term aftercare, the need for long-term aftercare financial provision is addressed in the application to the EPA for a waste licence.

The Statement of Evidence finally specifically addresses issues raised in the various observer submissions to the Board.

The Inspector then put a number of questions to Ms. O'Donnell particularly in relation to the fact that an existing quarry exists on part of the site and whether or not this would be seen as a negative attribute in terms of the site selection process. Ms. O'Donnell indicated that they were fully aware of the fact that a quarry existed on site but overall the site was considered to have adequate geological protection for use as a waste facility.

Submission of Mr Tony Manahan on Planning Issues

After lunch the applicants called Mr. Tony Manahan of Manahan Planners, Chartered Town Planning Consultants. Mr. Manahan identified a number of key issues including the location of the site in the context of the strategic motorway network. It is noted that under a previous planning application Fingal County Council required a cash sum of €500,000 to be paid to the Council. It is stated that this condition was complied with.

In relation to the issue of the new entrance Mr. Manahan argued that the proposed new entrance was more suitable on traffic grounds and was also in accordance with a policy objective contained in the current Fingal Draft Development Plan. Mr. Manahan's submission also dealt with the issue of policy and highlighted the policies in the National Hazardous Waste Management Plan to provide at least one hazardous waste management facility in the country. In relation to the new application it is stated that the proposed development will not give rise to additional traffic and the new activity will take place in a void hidden from public view. The views will improve with time as the site is progressively restored.

Finally the submission goes on to specifically address some issues raised by the observations submitted to the Board. The Inspector put a number of questions to Mr. Manahan in relation to specifically the new entrance and the zoning objective contained in the draft Development Plan.

Submission of Mr Micheal Cunningham on Engineering Aspects of the Proposal

The applicants then asked Michael Cunningham to present his Statement of Evidence to the Board. This submission specifically dealt with the design and management of the facility. A summary of the phasing is set out in Table 3.1.2. The alternative landfill lining technologies considered is set out in Section 3.2 of the submission. It notes that the EPA Landfill Site Design Manual sets out alternative lining systems may be considered for pre-treated hazardous wastes such as solidification, stabilisation and vitrification of hazardous waste. The DAC liner was considered to be most suitable particularly because the low permeability of the liner and that the DAC system can be constructed on slopes steeper than those achievable with standard HDEP or clay composite lining systems. Also the DAC liner is extremely robust and there is no risk to damage to the liner when laying the drainage blanket. It is stated that the applicant met with the Environmental Protection Agency and it confirmed as set out in the Landfill Directive that alternatives to the 5 metres of clay could be considered provided that they were at least equivalent in terms of their protection. To this end the DAC performs markedly better than the HDPE and clay lining as it typically has a permeability of up to 10 x 10^{-15} metres per second. The design specification for the site will set a minimum permeability of 10 x 10^{-12}. Details of the key constraints and operational requirements identified in the landfill design are set out in the submission. Details of the lining systems for the hazardous waste, non-hazardous waste and inert waste are set out in the submission.

The submission goes on to outline details of the solidification plant and the leachate management. Leachate in the hazardous waste cells will be collected and used in the solidification process as described in the submission. The submission outlines details of the new site entrance and the new administrative building to be used.

Finally the submission specifically addresses issues raised by the observers in the submission to An Bord Pleánala.

The Planning Inspector then asked Mr. Cunningham a number of questions in relation to the density of the material to be deposited on site and details in relation to the DAC liner.

Submission of Mr Harry Brett on Water Management Issues

The applicant then requested Mr. Harry Brett to make a presentation on the oral hearing in relation to surface water management. The key issues described in this paper are

- The impact on water quality in terms of surface waters and ground waters
- Surface water management
- Management of leachate.

Section 3.1 of the submission outlines the main features of surface water design. The drainage system proposed for dealing with surface water runoff will follow the principle of sustainable urban drainage systems. Surface water will be discharged at two points, one to the north of the site to a wetland system which is directed to the west to the east flowing stream on the northern boundary. The second is through a Class 1 interceptor which will be discharged to a ditch at the south-eastern corner of the site which flows in a north-easterly direction and meets the east flowing stream on the northern boundary. The rate of stormwater runoff will be restricted to runoff associated with a greenfield site. Any flows in excess of the Greenfield runoff will be attenuated on site for a design event of up to 1 and 100 years.

In terms of leachate management it is proposed to minimise leachate generation by dividing cells. The leachate management system will be designed to minimise the leachate head on the basal liner to less than 1 metre. Leachate will be collected in a sump area and be pumped up the cell side wall to the side wall rising main to a sealed collection system. Leachate will be stored in a HDPE line concrete holding tank adjacent to the administration building. A leak detection system will be provided beneath the hazardous cell liner. Some leachate will be used in the solidification process. The remainder will be tankered offsite to an EPA licence wastewater treatment plant. It is intended to reduce leachate generation by using rainwater deflectors on the side wall. The management of non-hazardous and hazardous leachate would be the same.

Section 3.3 relates to the domestic effluent management system, a Carlow precast, sequencing batch reactor or similar package treatment is proposed. The proposed effluent treatment quality standards are set out in the submission. Section 4 of the submission specifically addresses concerns raised by observations submitted to the Board.

Submission by Ria Lyden on the EIS

Then the applicants called upon Ms. Ria Lyden. This evidence specifically related to the Environmental Impact Statement and sets out details in relation to

- The EIS content.
- The EIS methodology
- The EIS structure and format
- Contributors to the EIS
- Scoping of the EIS
- Consultation process.

In relation to concerns raised by third parties particularly in relation to the cumulative impact resulting from the proposed development in conjunction with the Tooman Nevitt Landfill. It is stated that the EIS adequately addressed this issue where potential cumulative impact was considered likely.

That concluded the submissions on Day 1.

Day 2

Submission of Mr Donal Mc Daid Transport and Traffic Issues

The applicants then introduced Mr. Donal McDaid Transport Engineer to deal with the traffic impacts associated with the development. Mr. McDaid's submission highlights that the current planning permission and EPA waste licence permit allows for the acceptance of 500,000 tonnes per annum to the facility. Therefore it is envisaged that the levels of traffic generated to and from it will not change in the future as it is not proposed to increase this annual intake. There will however be a change in traffic distribution on the road network surrounding the site. The Traffic Assessment takes into account the proposed Fingal County Council Landfill Project and in particular the construction of a more direct link to the site via a new "county road" which will facilitate direct connection westwards from the M1. The location of this county road is indicated on Slide 6 of Mr. Mc Daid's submission. The assessment scenarios and baseline information are set out in the Statement of Evidence. Baseline traffic surveys were conducted in 2005 on behalf of Fingal County Council as part of the Fingal Landfill Project. Three future year scenarios were considered as part of the assessment 2011 (during main construction stage), 2014 (interim year) and 2024 (design year). Traffic flow surveys 2005 have been modified to include those developments that would generate significant traffic movements in the future such as the M1 Business Park. Investigation into planning applications which were granted recently in the relevant local area showed that there is no significant additional traffic envisaged. It should be noted that the NRA recommended traffic growth factors as applied in the assessment will also account for traffic from such developments.

The existing road network is described. Details of the the proposed development including the new proposed site access is set out in the Statement of Evidence. For the purpose of the Traffic Impact Assessment the applicants have assumed the total waste

licence tonnage at the facility will be received on an annual basis. (166 two-way movements on the road network).

When considering construction traffic impacts, peak impact will occur at the early stages of Phase 1 construction during the bulk excavation works on site. The level of construction traffic reduces with subsequent phases of construction with peak hour construction traffic estimated as being 20 and 18 two-way movements for the 2014 and 2024 scenarios.

Section 6 specifically sets out the Traffic Impact Assessment for the 2011 peak construction period. The analysis indicates that sections of the road network from the LP01080 to the Tooman Road to the east of the site experienced some relative increase in traffic flows. However these roads and junctions have low volumes of traffic on them and it is not anticipated that the proposal would generate any significant additional journey time delays. There will be no significant negative traffic and transportation residual impacts associated with the proposed development.

Section 7 of the submission specifically goes on to address concerns raised by various observers in their submissions to An Bord Pleánala.

The Inspector then requested that Fingal County Council furnish details for the justification for the attachment of a financial contribution of €10,000 under the provisions of Section 48(2)(c) of the Planning and Development Act. The Inspector then asked a number of questions to Mr.Mc Daid regarding the trip generation associated with the peak operation and peak construction phase. Mr.Mc Daid indicated that the figures contained in the Statement of Evidence are quite conservative and that it is unlikely that the trip generation referred to in the statement would ever be achieved.

Submission of Ms Sinclair in relation to the DAC landfill Lining

The applicants then called upon Ms. Dianne Sinclair to make an oral submission to the Board in relation to the DAC liner. Ms. Sinclair indicated that she has been involved in the construction of 7 DAC lined cells. While DAC is a new concept for Ireland it has being used to line landfills in continental Europe since the late 1970s and in the UK since 1999. Specific reference is made to a site in England where a DAC liner was successfully implemented above a major aquifer. Under normal circumstances, according to Ms Sinclair, a landfill in this area would never obtain a permit for landfilling from the UK Environment Agency, however approval was granted on the condition that the DAC lining system was used. Independent checks are continually made throughout the construction project works to ensure that the end product is of the highest standard.

It is stated that the DAC system is part of a composite liner which comprises of a 500mm thick engineer clay geological barrier. A full characterisation of the clay is required to allow for the conditioning of the material to achieve the correct moisture content range, plasticity limits, density and sheer strength. Works are subject to independent checks and third party construction quality assurance. The compacted clay sampled and tested throughout the works by an independent accredited laboratory to

ensure that it is being placed at the correct moisture content with an air void content of less than 5%. Well engineered clay would be expected to achieve a permeability range of 1 x 10^{-10} m/ s and 1 x 10^{-11} m/s.

The Statement of Evidence goes on to outline details of the sub-base which comprises of geotextile panels. A DTp Type 1 material is installed to a thickness of 200mm directly over the geotextile. This material must be of a suitable grading to provide a minimum bearing ratio yet also be free draining.

Cationic bituminous emulsion is sprayed directly onto the sub-base which helps bond the upper surface of Type 1 head of the asphaltic binder layer.

The asphaltic binder layer is then placed on top as a permeable version of the DAC and the properties to the layer are set out in the Statement of Evidence.

The dense asphaltic concrete is then laid out. It is subject to thickness and temperature checks during the installation (rolling temperature of about 125°C). Once the DAC is cooled, nuclear density gaging is used to measure the bulk density of the material to ensure that the DAC achieves less than 3% air voids. Readings are taken every 20 metres along the installed material. The DAC is installed in lanes and hot DAC is installed in direct contact with the joints of the DAC. Field results have shown that re-compacted DAC shows higher levels of density and permeability. A mastic sealant is then applied to the whole surface area of the cell. A Quality Assurance Report is then compiled by an Engineer and reported to the EIA for approval. A leachate drainage system comprising of pipework and gravel will be installed above the DAC liner. Unlike other types of liners the DAC will not puncture and that is what makes it the best engineered lining system available for landfill containing.

The submission goes on to specifically address concerns raised by observers in their submissions to An Bord Pleánala.

When asked by the Inspector Ms. Sinclair indicated that she was personally involved in the West Mill Landfill site in Hertfordshire and confirmed that this liner was laid over a major aquifer which is chalk. When asked, Ms. Sinclair confirmed that the West Mill Landfill did not accept hazardous waste, just municipal solid waste. Approximately 3 or 4 sites in the UK have used the DAC system. Ms. Sinclair indicated that all these liners were installed after the Landfill Directive. Ms. Sinclair indicated that the Landfill Directive requires lining for hazardous landfills which has a permeability of 1 x 10^{-9} metres per second for 5 metres depth which effectively gives you a travel time of approximately 150 years. With a half metre of clay and 80mm of DAC the engineered lining gives a minimum travel time of 2,400 years which is considerably in excess of 150 years. Ms. Sinclair also outlined the major checks which are continually made during the construction period. Ms. Sinclair also set out details of how long it takes to construct the liner. Ms. Sinclair also indicated that the DAC liner has been subject to rigorous laboratory testing and has been subject to chemical attacks etc. DAC liners have been put under pressures of 600 bar. When asked about the corrosive possibilities resulting from the containment of waste with high PH levels Ms. Sinclair stated that she did not know the answer off the top of her head but she did state that DAC liners were used in the continent for the acceptance of incinerator ash and bottom ash so therefore she assumes that it is suitable to accept such ash. Some discussion took place

in relation to obtaining information in relation to the Environmental Permit received by the West Mill site by the English EPA. The applicants provided the oral hearing with some information regarding the permit applicable to the West Mill site.

Submission of Mr Foss Smith in relation to Fire

The applicants then asked Mr. Patrick Foss Smith to present a Statement of Evidence to the Board in relation to landfill fires and the possibility of exothermic reactions. Mr. Foss Smith's evidence stated that the types of waste to be accepted include incinerator ash, soils and other non-combustible materials. Liquids and combustible wastes are to be excluded from the site. The statement goes on to explain why the risk of fire which may reconnect the waste to the environment is eliminated. As the wastes proposed for this site are inerts are fully burnt out incinerator ash with only traced combustible material. There is no risk of fire at the site. Because of the nature of the waste to be deposited at the MEHL site there is no possibility of a landfill fire such as that which occurred at Kerdiffstown in County Kildare. The submission goes on to address other concerns regarding landfill fires raised in the written observer's submissions to the Board. The submission goes on specifically to deal with the issue of exothermic reaction and hydrogen gas. It is acknowledged that ash deposits very often show exothermic tendencies. However the Landfill Engineering Specification for the waste cells at MEHL will provide a higher degree of exothermic tolerance than was the case in the trials referred to in the observations submitted to the Board. The trials referred to in the observations were based on 1 metre deep layers of incinerator ash. In the case of the current application, ash layers will be limited to 250mm in depth which means that the maximum temperature experienced by the proposed HDPE liner should be less than that experienced by the German researchers. With regard to potential problems created by hydrogen gas it is acknowledged that incinerator bottom ash can give rise to hydrogen gas which is mainly associated with the aluminium content of the ash. This can undergo a redox reaction to produce hydrogen. The reactions are thought to occur mainly on small particles with a large accessible surface area. The production of hydrogen as either a viable, inflammable or explosive gas is unlikely in this instance as the auto ignition temperature for hydrogen is 585°C far above any temperature produced by exothermic reactions. Hydrogen will only ignite in the presence of oxygen which is restricted in a fully lined landfill.

Submission of Dr. Martin Hogan on Health Matters

The applicants then requested that Dr. Martin Hogan to present his evidence in relation to health issues. Dr. Hogan's submission notes that bottom ash is not considered hazardous and in many countries is used as a base liner for construction works. Although flu gas treatment residue is classified as hazardous the only potential risk relates to the aquatic environment and not human health. It is hugely important to realise that the proposals of landfill ash and residues from municipal incineration and other types of biodegradable hazardous and non-hazardous waste does not involve the production of any emissions to air or water. As a landfill will not accept municipal waste, vermin will not be an issue. In relation to leachate it is argued that based on the information contained in the EIS and the nature of the landfill liner to be used contamination of groundwater will not occur. Based on the above, it is considered that there is no risk to food or farming as there are no vectors or routes for emissions to

leave the site. The Planning Inspector then put a number of questions to Dr. Hogan in relation to the potential risks and hazards associated with the development. Dr. Hogan basically argued that while some of the substances to be deposited on site can be described as hazardous or poisonous in large concentrations, the management of the site will ensure that these wastes do not pose any risk.

Submission of Ms White in Relation to Air Quality and Climate

The applicants then requested Ms. Sinead White to present her Statement of Evidence in relation to air quality and climate. In relation to the construction and landfilling impacts, no significant PM_{10} or soiling effects are envisaged at any sensitive receptors. Likewise in relation to odours no significant issues will arise. There is a potential for VOC emissions as a result of hydrocarbons but measures will be put in place to ensure that such wastes are covered or treated as appropriate. Hazardous and non-hazardous leachate will be stored in closed concrete tanks, no odour impact from the storage of leachate is likely to occur. Gas flu treatment residues would be transported to the site using fully enclosed containers. For inert wastes dust deposition monitoring for the existing facility has demonstrated that monitoring levels are well below the licenced amount. It is noted that ash has similar properties to wet earth/gravel and will not be allowed to dry out. During the construction and operational phase with the implementation of all mitigation measures will ensure that no significant soiling or PM_{10} effects would be experienced at nearest sensitive receptors.

In terms of potential impacts on climate, it is stated that the proposed facility will eliminate the requirement to ship certain hazardous wastes abroad for disposal. It is estimated that a saving of approximately 3,100 tonnes of CO_2 would be made per annum. The submission goes on to address concerns raised by observers in their submissions to An Bord Pleánala.

The Planning Inspector asked Ms. White a number of questions particularly in relation to the tipping of bottom ash into the non-hazardous waste cells and the potential for dust generation arising from this. Ms. White indicated that sprays will be used prior to tipping which will minimise dust generation. Through the cross examination it was also clarified that bottom ash can comprise of lumps and clumps of material and does not constitute fine ash. When asked in relation to $PM_{2.5}$ Ms. White indicated that this size of particulate matter is not regulated as part of the Air Quality Standards in Ireland currently. It is also stated that this tiny particle remains airborne for a considerable period of time.

Submission of Mr Daly in Relation to Hydrogeology

The applicants then asked for the Statement of Evidence of Mr. Eugene Daly, Jelly Lightfoot, Gareth Jones and Catherine Buckley which related to the issues of geology and hydrogeology. Geological field mapping was undertaken to assess the actual location of the various rock formations on site. Details of the regional geological setting are set out. In terms of the hydrological setting the region is drained by four river systems that discharge into the Irish Sea. In terms of hydrogeological setting the rocks in the area can be divided into locally important aquifer and poor aquifer.

In terms of the Namurian deposits the hydraulic characteristic will depend on the lithology's present. Groundwater flow in the vicinity of the site will be generally south-easterly towards the Rogerstown Estuary. The GSI have defined the groundwater divide to the north of the site, therefore water will flow away from the Bog of the Ring water supply area. It is noted that the Bog of the Ring water supply is currently in decline and there is no significant scope for increasing the abstraction area without the unsustainable enlargement of the catchment area. Thus the zone of contribution around the well would not increase as in the future the aquifer cannot support it.

With regard to the geology and hydrogeology of the MEHL site it is stated that hydro-geologically the bedrock beneath the former quarry can be divided into

- An aquifer unit
- An aquatard unit.

Two faults have been mapped in the central portion of the site, a north-south fault which appears to restrict groundwater movement and an east-west fault which does not restrict movement. The groundwater levels in the aquifer unit are relatively consistent across the site and lie below the quarry floor aside from the large pond in the extreme southern part of the site. Groundwater levels in the overlying aquatard are more variable and are elevated in relation to those in the underlying aquifer and are artesian in certain horizons. This confirms the namurian layer as a confining layer. In terms of groundwater vulnerability over the majority of the site, the vulnerability rating can be described as moderate due to the natural protection provided by the Namurian deposits. The site investigation demonstrated that in the northern area there are at least 10 and up to 60 metres of low to moderate permeability material overlying the aquifer. To the south of the site where the Loughshinny crops out the vulnerability rating without the engineering measures in place is presently extreme.

The main potential impacts which could occur from activities on the site have been identified as

- Contamination of the aquifer and dependent receptors such as wells and streams to the east of the site.
- Groundwater resources, the sterilisation of the resource.

The potential risk to groundwater from each waste type will be dependent on where the waste will be placed. The majority of the site falls within the R^2 classification where the poor aquifer is classed as having moderate vulnerability. The southern portion of the site is classed as extreme, however the EIS provides for 1 metre of material with a permeability of 6.6×10^{-10} metres per second. This is equivalent to 3 metres of material with a permeability of 1×10^{-9} metres per second. The Landfill Directive merely requires 1 metre of impermeable material with an equivalent of 1×10^{-9}.

It is argued that the proposed development will not impact on the Bog of the Ring well field due to:

- Groundwater direction flow.
- The fact that the Bog of the Ring and the MEHL sites are located on different groundwater and surface water catchments.
- The site lies outside the catchment and zone of contribution of the bog of the ring.
- There is a groundwater divide located between the Bog of the Ring and the site.

Groundwater flows from the Bog of the Ring are not derived from any fault zones in the vicinity of the site.

The low permeability strata extends to c.300 metres OD below the MEHL site and the Bog of the Ring well field.

In terms of the sterilisation of resources the proposed development means that no groundwater wells will be installed on the MEHL site.

Section 3.4 sets out the mitigation measures proposed. It is concluded therefore that the residual impacts on groundwater are considered to be imperceptible with the proposed mitigation measures put in place.

Section 4 of the submission specifically deals with the various submissions by observers to An Bord Pleánala.

The Planning Inspector then raised a number of issues with Mr. Daly including groundwater direction flow, the nature of the soils and sub-soils on site, the confining nature of the Namurian shale and the lithology of the Namurian shale.

Submission of Mr Mark Ruddock on the Peregrine Falcon

The applicants then called on Mr. Mark Ruddock to make a presentation in the oral hearing specifically in relation to the Peregrine Falcon. It states that the primary area of Peregrine activity is in the south-western corner of the application site. The nearest Peregrine SPA (Lambay Ireland) is approximately 16 kilometres away from the proposed development. The potential impacts arising from the development at this location are described as

- Direct loss of breeding habitat.
- Direct loss of foraging habitat.
- Direct loss of a roosting habitat.
- Displacement of breeding habitat due to disturbance and reduced suitability of the quarry over time.
- Displacement of foraging range.
- Displacement from roosting habitat.

A number of mitigation measures are proposed including the installation and creation of alternative nest ledges.

Enacting temporal restrictions to construction from 1st March to 31st July. Other mitigation measures including monitoring, increased security and continuing liaison with local raptor field workers are also set out in the submission. Section 4 of the submission specifically addresses concerns raised by observers in the various submissions to An Bord Pleánala. It is concluded that over time the Peregrine Falcon will be displaced from this site. The creation of the additional nest site away from the location will be investigated in consultation with landowners and the NPWS. This could be located in another quarry or manmade structure. On foot of a question posed by the Inspector Mr. Ruddock indicated that Peregrine Falcons can tolerate significant amounts of noise associated with construction and landfilling activities.

Mr. Boyle (NLAG) then asked Mr. Ruddock a few questions in relation to buzzards and Mr. Ruddock stated that buzzards were not protected species.

Submission of Mr Micheal Cunningham and Piet Weins regarding Ash Composition

The applicants then requested Mr. Michael Cunningham to present a joint Statement of Evidence prepared by Mr. Piet Wens and Mr. Michael Cunningham. This paper specifically dealt with submissions made by observers to An Bord Pleánala in relation to key issues regarding the nature and composition of ash to be deposited on site. It states that the incineration of waste generates about 25% bottom ash. Across the EU this material is not considered toxic. During the incineration process most of the hazardous pollutants are transferred in the fly ash which amounts to approximately 3% of the initial waste mass. In bottom ash pollutants are diluted rather than concentrated when compared to the material incinerated. In terms of dioxins concentrations of dioxins are low and will not readily dissolve in water. The concentrated levels of heavy metals and dioxins in fly ash are immobilised through the solidification process. The submission sets out details in relation to the transportation of the flu gas treatment residue. The submission also deals with the issue of bottom ash and Eco-toxicity. Fly ash is considered hazardous because of the elevated concentrations of heavy metals and free lime content. Bottom ash is not considered hazardous because of the limited presence of these compounds. At the MEHL plant the potential eco-toxicity of the bottom ash is considered to be very limited because of the low concentrations of pollutions and the blocking of pathways to possible receptors with the installation of the appropriate liner system. The bottom ash disposal will be compliant with Best Available Technology and will be subject to WAC testing before arriving on site. The submission also addresses issues in relation to public health and safety in the characterisation of bottom ash and also issues in relation to exothermic reactions in curing resulting from bottom ash. The Inspector then put a number of questions to Mr. Cunningham in relation to the classification and testing of waste. Mr. Cunningham stressed that all testing is undertaken at the point of origin and not at the site in question.

The Inspector then adjourned the hearing until Day 3.

Day 3

Submission of Ms Catherine Duff in Relation to Ecology

The applicants then called on Ms. Catherine Duff to give her Statement of Evidence in relation to ecology. It notes that the site is not covered by any conservation designation. The nearest designated conservation area is the Bog of the Ring, Natural Heritage Area and Rogerstown Estuary c. Special Conservation Area and Special Protection Area. The other flora and fauna habitats are described and the potential impacts from construction and landfilling are set out. The mitigation measures proposed during construction are also set out. It is concluded that there will be no residual significant adverse impacts on the proposed development as the existing licence operation has resulted in a loss of most of the habitats and species on site. Section 5 specifically deals with submissions to the observations submitted to the Board. It is concluded that there will be no significant residual impact on the environment in the event of the proposed development proceeding and all relevant mitigation measures put in place.

When asked by the Inspector Ms. Duff indicated that it was not proposed to carry out a Biodiversity Plan on the site and that a Biodiversity Plan has not been requested by Fingal County Council.

In relation to the ecological survey it was stated that the survey was carried out at the end of May which is a very good time to gather enough evidence and assessment of the flora and fauna on site.

Submission of Ms Jennifer Harmon in Relation to Noise and Vibration

The applicant then requested Ms. Jennifer Harmon to present her Statement of Evidence in relation to noise and vibration. It notes that construction generated traffic will occur at the early stages of Phase 1 where the boundary of the facility will be reconfigured and redeveloped.

The predicted noise levels during peak construction are in the order of 50-57dBA_{LAeq} at properties along the access route and the nearest property to the site entrance. During the operational phase the predicted noise levels of the closest property to the entrance are between 47-55dBA.

A number of mitigation measures are proposed in relation to site development and cell operation and proper vibration and noise control techniques will be incorporated into the Building Services Plant. The submission then goes on to specifically address concerns highlighted by observers in their submissions to the Board. In conclusion therefore it is considered that during the initial construction phase of the project the impact on noise and vibration is predicted to be within the daytime noise limits as set out in the EPA licence. The noise limits are also considered to be within the noise limits specified during the operational phase of the licence. The resultant noise impact on the proposed development is therefore considered to be insignificant. The Planning Inspector then put a number of questions in relation to background noise levels to Ms. Harmon.

Submission of Mr Declan Moore in relation to Archaeology

The applicants then called on Mr. Declan Moore to make a presentation in relation to archaeology. He outlined the key issues in relation to cultural heritage, archaeology and architectural heritage. It concludes that the archaeological impact of the development as set out in the EIS is comprehensive. The impact will be positive on the known archaeological and cultural heritage sites in the vicinity of the site as there will be a reduction on the visual impact on the cultural heritage sites in the vicinity. Furthermore the relocation of the new entrance further away from the graveyard will also be positive. The proposed development will not directly impact on any recorded sites and mitigation measures have been put in place to address any potential impacts. Specifically in relation to the Hollywood place name Mr. Moore accepts that the place name may have an earlier origin and welcomes this additional information regarding the place name submitted by the Nevitt Lusk Action Group.

Mr. Moore was then questioned by Mr. Boyle from the Nevitt Lusk Action Group. These questions mainly related to the townland names in the vicinity of the site. This concluded the submission on behalf of the applicant.

FINGAL COUNTY COUNCIL SUBMISSION

Introductory Submission by Dermot Flanagan SC

The Planning Inspector then called upon Fingal County Council to make a submission to the hearing. Mr. Flannigan BL on behalf of Fingal County Council indicated that two submissions will be made on behalf of the Council, one by Mr. Peter Byrne, Senior Town Planner, Fingal County Council and one by Mr. Shayne Herlihy (RPS Consultants) in relation to hydrogeological aspects of the proposed development.

Submission of Mr Peter Byrne Senior Planner

Mr. Byrne's submission made reference to the strategic nature of the development and it is acknowledged that there is a need for a national difficult waste facility in Ireland. However it is argued that there are some shortcomings in relation to the subject site. Concerns are expressed in relation to the site selection appraisal for the proposed site. In particular all three sites were classified as low with regard to areas critical for aquifer recharge. It is noted that the three sites shortlisted Drehid, Knockharley and Hollywood scored equally in terms of their respective geological and hydrogeological settings. It is suggested that the Knockharley and Drehid sites are superior with regard to groundwater protection.

The applicant proposes that the subject site should have an operational period of 25 years, however in terms of national hazardous waste produced it is suggested that the proposal would have a capacity to accommodate hazardous waste on an all-Ireland basis for a period of only 11 years. The limited capacity of the site is a major disadvantage in its ability to meet the long-term strategic need for a national difficult waste facility.

The applicant has provided little information in relation to financial assurances and an appropriate Financial Assurance Plan should be enshrined in the decision making

process to ensure safe continued operation of the facility over its contaminating lifespan. A Financial Assurance Plan should consider the potential long-term threat of leachate and contain provisions to deal with leachate over the contaminating lifespan of the proposed development. On the basis of the information submitted the Board will have to consider whether the proposed development materially contravenes a development objection for the protection of groundwater sources indicated in the Development Plan and as such the proposal may be contrary to the proper planning and sustainable development of the area.

Statement of Mr.Shane Herlihy in Relation to Hydrogeological Matters

Fingal County Council then called upon Mr. Shane Herlihy to submit his Statement of Evidence on behalf of Fingal County Council in relation to hydrogeological matters.

It is argued that the site overlies a locally important aquifer and there are downward hydraulic gradients present on site with a significant fault zone running through the site with higher permeability that is likely to connect the two aquifers. It is argued that the applicant initially described the groundwater vulnerability as being extreme but then attempts to argue that it is moderate based on the Namurian bedrock being a subsoil This is fundamentally incorrect. The correct classification is extreme as there was less than 3 metres of low permeability sub-soil present above the bedrock aquifer. The groundwater protection response for landfills places emphasis on locating landfills on areas where there is both lower groundwater vulnerability and lower aquifer categories.

It is also considered that the groundwater levels have not been accurately measured for artesian conditions of monitoring wells BH6 and BH4A in the applicants Figure 14.13. Reference is made to the original EIS submitted with the same site for 1999 (see 1999 EIS for the MEHL site in documentation attached) which illustrates a more complex groundwater flow orientation and includes groundwater directions to the north-east under the northern part of the site. The applicant has indicated that the groundwater flow design divide in the topographic low point along the M1 motorway is located directly east of the northern boundary of the MEHL site. It is therefore critical that the applicant robustly demonstrate that there is no groundwater flow in this direction in order to definitively rule out the potential risk to the Bog of the Ring. It is suggested that the applicant should also more accurately measure the artesian water head at key boreholes including borehole 4A.

It is also contended that the applicant has incorrectly concluded that there is a vertical upward head gradient present beneath the site that will minimise the risk of downward leachate ingress into the bedrock aquifer.

The applicant has not properly assessed the interconnection between the Namurian and Loughshinny aquifers and the influence which the north-south fault across the site may have on levels of connectivity between the site. The applicant has failed to give due consideration to the permeability of the Namurian bedrock itself. It is argued that there is a hydraulic connection between the Namurian aquifer and the Loughshinny aquifer due to the substantial observed drawdown within the Namurian observation wells. It is suggested that the transMsivity of the Namurian shale is greater than that suggested in the EIS.

Mr. Flannigan then put a number of questions to Mr. Hurley for clarification purposes.

The Planning Inspector then asked Mr. Hurley a number of questions in relation to the Statement of Evidence.

That concluded the submission from Fingal County Council.

After lunch the Inspector called on the observers to make their submissions.

OBSERVERS SUBMISSIONS TO THE ORAL HEARING

Submissions on behalf of the Nevitt Lusk Action Group

Submission of Mr Shortt

Mr. Shortt stated that he lived in Nevitt and was living right along the transport route from the old N1 up to the landfill site.

Reference is made to the planning history associated with the site and the fact that the Board refused planning permission under PL06F.229681. It is clear from both Fingal County Council and An Bord Pleánala that they clearly felt that it was important to preserve this high amenity zoning which relates to the site. It is the responsibility of An Bord Pleánala to be consistent with its decision making and reject the application before it on the basis of precedents.

In relation to transport it is incomprehensible from a lay persons' prospective that an EIS for a proposed strategic infrastructure project does not have current data included and that they seek to rely on the data from the Fingal Landfill Project. The EIS seeks to fully inform the public and allow them an opportunity to review and critique an application. This is clearly not the case in the current application and on this basis alone the application should be rejected. The proposal will create a high risk of accidents with trucks carrying hazardous/toxic waste. The daily operations will affect the quality of the applicant's family's health and well being not to mention the devaluation of the property. There has not been any risk assessment from a health prospective being undertaken to the health and risks of people/residents exposed to pollution from all the vehicles used on the Nevitt Road. The applicant's house is under CPO from the proposed Fingal Landfill Project. There is traffic associated with other land uses in the facility which also add to the general traffic levels in the area. The Nevitt Road is not suitable for heavy vehicle transport. The road structure has totally substandard in many sections. There is also an extremely acute dangerous S-bend on the Nevitt Road and visibility on this bend is limited. Photographs are attached indicating the poor site visibility along this section of the Nevitt Road. Mr. Short then asked whether or not an Emergency Disaster Plan had been developed and discussed with local residents.

Submission of Ms Gemma Larkin

The Nevitt Lusk Action Group then asked Mr. Gemma Larkin to make a presentation to the hearing. The applicant states that she built her house in 1984 and can see the facility from her house. Over the years she has experienced noise, dust etc. but the observers never complained as they understood that this was part and parcel of living next to a quarry. Ms. Larkin would like to acknowledge the applicant engagement with us as members of the Nevitt Lusk Action Group and acknowledge the excellent proposal for the treatment and safe filling of fly ash. The observers concern is particularly in relation to bottom ash. Concern is expressed that the pH of bottom ash leaving the site will be of 10-12. This ash is likely to contain substances which are irritant and corrosive which make this ash a dangerous substance under the Dangerous Substance Directive. The site is very exposed and prone to high speed south-westerly winds. This can give rise to breeding difficulties. The observers therefore request urgently that the ash be treated or cured prior to transportation. Concerns are also expressed in relation to the exothermic reaction of bottom ash. The exothermic reaction resulting from the drying out of the engineer clay layer will create risk to the underlying PVC liner in the most hydrologically vulnerable area of the site. This cannot be considered precautionary. If the new county road fails to proceed the implications for people living adjacent to and using the LP01080 is very serious. There is no reference in the submission or the EIS to a new school at Hedgestown which has been granted funding and is presently going out to tender. This school is located on the LP01080 immediately east of the M1 motorway.

Submission of Mr Aaron Murray

Mr. Aaron Murray on behalf of the Nevitt Lusk Action Group made the following submission to the oral hearing. It is stated that he has worked as a Senior Analyst Chemist in the pharmaceutical industry over the previous 6 years. It is stated that the pH of the bottom ash is not 10 as has previously been stated but in fact has been routinely as high as 12. While a substance with a pH of 10 is potentially problematic, one with a pH of 12 is most definitely hazardous and is required by law to be labelled and treated as being so. The inhalation of a substance of pH12 will cause serious burns to the respiratory tract and eyes.

Concerns were expressed in relation to transportation of the ash. As a tipper truck incorporates a tailgate which is not hermetically sealed. Such a seal is required and would be necessary to transport finely divided wetted hazardous powder. This could cause caustic fluid capable of causing serious injury to any living organism to be leaked from the truck. In many cases fine material in the back of trucks such as that proposed to be transported can take on a behaviour akin to a liquid (liquifraction). Furthermore damp ash would be desiccated by air during the transportation of the material. Wind speed should be monitored at the site to ensure that airborne particles are not transported beyond the confines of the site. The impermeable clay barrier is also susceptible to damage at elevated temperatures. The proper containment of the bottom ash and placing a barrier over the various layers of bottom ash to be placed within the cells will reduce the rate of heat liberation from the wetted mass. The pH of the mass of ash will fall slowly over time as the carbonation of the two principle caustic components of the ash (namely calcium hydroxide and sodium hydroxide) take

place. The bottom ash will in Mr. Murray's opinion, have been safely deposited if the previous recommendations are complied with.

Submission of Mr. Declan White

The Nevitt Lusk Action Group then called upon Mr. White to make a submission to the Board.

Concerns expressed that the proposed development could impact on public water supply in the area. There is a need to protect wells for the horticultural industry which is very important in this area. The security of water supplies is important. Details of the various commercial activities and the amount of water used are set out in Mr. White's submission. The Geological Survey of Ireland has confirmed that there is potential for a new water supply along the north-south fault line. Mr. White believes in the case of the Nevitt Lusk Landfill that An Bord Pleánala did not recognise the importance of the water supply in relation to the wider area.

Submission of Mr Shay Lunney

The Nevitt Lusk Action Group then asked Mr. Shay Lunney to make a presentation. Reference is made in Mr. Lunney's statement to the recent earthquake in Fukushima in Japan where nobody identified the vulnerability of the plant to the earthquake and tsunami. In relation to the Tooman Nevitt Landfill it is argued that An Bord Pleánala sidestepped the illegal landfill that preceded the application. Reference is made to the Kerdiffstown site in Naas which is another perfect example of bad planning and has cost the EPA over €2 million (of tax payers' money) to address this fire. Reference is also made to the impact on the ecosystem from the oilrig explosion off the Louisiana coast. An Bord Pleánala granted planning permission for two developments which resulted in landslides in bogs in east Galway and west Cork in recent years (Derrybrein and Corrib pipeline (*sic*)). It is suggested that oral hearings are always biased in favour of the applicant. How can An Bord Pleánala and the EPA continually grant licences and approval for facilities such as this with apparent impunity?

Exposure to toxic material causes death and many serious medical conditions including cancer, birth defects, diarrhoea and other respiratory diseases. The EIS failed to consider psychological effects associated with the facility. It is suggested that the oral hearings related to the Nevitt Landfill were nothing short of a farce and a box ticking exercise. The chemical composition of the ash from this proposal has a pH level of 12. The EIS fails to consider the impact of the proposed development on the local school of Hedgestown. Mr. Lunney also submitted a number of newspaper articles to the hearing.

Mr. Lunney then read into the record a statement from Mr. John Keily who is from Walshestown and a neighbour of Mr. Lonny's and who could not attend the hearing.

Submission of Mr John Keily

Mr. John Keily's submission objected to the proposed development on the following grounds.

- In relation to biodiversity it is argued that the natural biodiversity of the surrounding MEHL site has suffered tremendously during years of quarrying.
- The noise pollution and thundering damage to quiet local roads have been unbearable. The quarrying licence was for inert waste only.
- The proposed development will impact on the peregrine falcons natural habitat.
- There is no National Framework guiding such a proposal, there is no Strategic Plan directing such a proposal.
- There is no legislation covering such a proposal.
- Previous planning approvals granted for incinerators stipulate export of ash.
- Previous planning approval refused to Fingal County Council (Nevitt site) for the temporary storage of ash. The proposal is located in too closer proximity to the Nevitt site.
- The site is located on a highly productive aquifer in farming, agriculture and horticultural communities. The submission then sets out the various reasons why planning permission should be refused for the development - basically on the grounds that there is no precedent for such a development.

Submission of Mr Patrick Boyle

Finally on behalf of the Nevitt Lusk Action Group Mr. Boyle made a presentation to the oral hearing. In relation to the site Mr. Boyle points out that the mean wind speed for the proposed site is estimated at 8.5 metres per second which will give rise to significant dust deposits. Mr. Boyle also suggested that there are large gravel deposits associated with high yielding aquifers to the south-east of the site. The EPA Guidelines for the protection of groundwater state that account should be taken of the presence of gravels and that the extent of the deposit should be investigated. The potential water supply from this area has never been fully investigated.

Concern is also expressed that untreated bottom ash will almost invariably have a pH value of c.12 which would be hazardous until such time as it is subject to a curing process. This process normally takes 12 weeks of exposure to the atmosphere. Reference is made to the EPA Annual Water Status Report which highlights the importance of the aquifer in the north Dublin area in the overall context of Leinster. A report carried out by RPS Consultants identified a potential total reserve of 40 million litres per day in the Fingal Section of the aquifer. Mr. Boyle highlighted how the overall aquifer in Fingal was such an important source of future water supply. In conclusion it is clear that the MEHL site is the worst possible location for a hazardous waste landfill in terms of groundwater protection and preservation not only in Dublin but along the entire Leinster coastal regions. It is argued that you could not pick a worse site from a hydrogeological point-of-view.

Submission by Bridget Lennihan

Then Ms. Bridget Lennihan on behalf of the observers made the following presentation to the oral hearing. The observer states that there are grave concerns in relation to health and safety grounds. There has been absolutely no consultation with residents regarding the development. The applicant is living 1 kilometre from the site and was not contacted in relation to the proposal.

Walking is an important amenity in the area and if the development goes ahead young mothers will not be able to take their babies out in buggies along the local road network. Pedestrians and cyclists must also find alternative routes during the opening hours of the facility. Another major consideration is the devaluation of property. No account was taken in the EIS of the proposed new school at Hedgestown which is under tender stage. The existing roundabout at the five roads is not adequate to facilitate the size of a truck. Trucks use the road from very early in the morning. Residents are also very disappointed that they will have to put up with traffic six days a week.

Submission of Mr Moore

Finally Mr. Moore made a submission to the hearing and stated that he lived on the Nevitt Road and agrees with everything Mrs. Lennihan said. Mr. Moore expresses concerns that the stream that flows down from Walshestown is adjacent to the site and flows through his lands. Over the years he had noted that after heavy rain and not so heavy rain the stream became discoloured and stayed in it for days. The stream stayed discoloured for a long time. Mr. Moore's primary concern relates to the potential siltation of the stream as a result of the proposed development.

Questions and Cross-Examination of Witnesses

Cross-examination of Mr.Mc Daid, Transport Engineer on behalf of the applicant

A number of questions were put to Mr.Mc Daid by the Nevitt Lusk Action Group. The questions specifically related to the bulk density of the material to be carried to the site and the specifications of the trucks carrying the waste. The Nevitt Lusk Action Group argued that the applicant has not carried out a detailed analysis of the type of trailer required to carry the goods safely and this has not been built into the EIS. Mr.Mc Daid pointed out that the proposal would not generate any additional traffic over that permitted by the current facility. The Nevitt Lusk Action Group argued that from a transport prospective using best practice in terms of vehicles, tyres, best low emissions etc. are important considerations which have not been taken into consideration in the EIS. The Nevitt Lusk Action Group also criticises the fact that a comprehensive survey was not carried out as part of the EIS. Questions were also put to Mr.Mc Daid in relation to the impact of the proposed development on the Hedgestown School. When asked about accident records in and around the facility Mr.Mc Daid stated that he was not 100% sure whether or not the EIS team investigated the accident records in the vicinity of the site and the Nevitt Lusk Action Group argued that the roads are totally unsuitable for traffic movements proposed under the application. A number of concerns were expressed by the Nevitt Lusk Action Group in relation to the noise and

traffic safety aspects associated with the proposed development. Concerns were also expressed that if the local county road proposed as part of the Tooman Nevitt Landfill does not go ahead it would have significant consequences in terms of health and safety for the residents living in the area. Day 3 concluded with the cross-examination of Mr.Mc Daid.

Day 4

Questions put by Fingal Co Council to the Applicant

Cross-Examination of Ms. O'Donnell

Day 4 began with the cross-examination of Ms. O'Donnell on behalf of the applicant by Mr. Flannigan specifically in relation to the issue of the Site Selection Study. Mr. Flannigan placed the importance on the geological and hydrogeological conditions of a site in terms of site suitability. Specific reference is made to the fact that the site selection process undertaken by the applicant was not solely referenced on the EPA Manual on site selection. It is suggested by Mr. Flannigan that the applicant is 'picking and choosing' criteria under the site selection process to suit the current application before the Board.

Mr. Flannigan then went on to cross-examine Mr. Eugene Daly and Co. on behalf of the applicant in relation to the issues of geology and hydrogeology associated with the site. Reference is made to the GSI Guidelines which refer to sub-soils as a layer of protection beneath the landfill. Mr. Flannigan argued that no such sub-soils exist on site but what actually underlies the landfill in this instance is Namurian bedrock. Mr. Daly argued the critical issue in this instance is not whether or not it is subsoil but the permeability of the underlying strata. It is argued that essentially the permeability of the clays and shale's are similar. Mr. Flannigan argued that bedrock however is more prone to fracture than clays. Mr. Daly pointed out that the question really relates to whether or not water can move through these fractures and in the case of the shale you get small lenses of sandstone and limestone which 'pinch out' and do not lead to the underlying permeable material. In terms of connectivity Mr. Flannigan referred to the information contained in the Quantitative Risk Assessment (QRA) which noted the fault running in a north-south direction through the site. Some discussion then took place in relation to the faulting on site. Detailed discussion then took place in relation to the nature of the pump tests and why the tests in the Namurian shale were disregarded.

Finally Mr. Daly was asked some questions in relation to groundwater movements through the site. The original EIS produced in 1999 for the site showed some groundwater moving in a north-easterly direction towards the stream. Mr. Daly pointed out however that under the current application there are more boreholes on site and this allows for more comprehensive assessment of groundwater movement. Mr. Flannigan also expressed concerns that there might be a potential pathway from the Namurian shale underneath the hazardous area to the stream. Mr. Daly pointed out that the boreholes in this area are artesian and therefore water will move upwards in the Namurian strata before it hits the stream.

Mr. Flannigan then asked Ms. O'Donnell a number of questions in relation to the strategic aspects of the proposed development and in particular the tonnage to be accepted in the facility. Ms. O'Donnell indicated that the planning application in the Waste Licence applies for 500,000 tonnes per annum maximum input. A breakdown is not sought in relation to the various categories of waste and also that the actual hazardous waste generation would significantly change year on year particularly in relation to the contaminated soil element. Mr. Flannigan suggested that the landfill in question could run out of capacity in a relatively short period of time. Mr. Flannigan then raised the issue of the aftercare and restoration and the need to ensure appropriate aftercare particularly as the development is to accept hazardous waste. The applicants pointed out that the operator is a fit and proper person and has always complied with planning and licence conditions.

Cross Examination of Ms Sinclair on Landfill Liners

Mr. Flannigan then asked Ms Sinclair a number of questions specifically in relation to the DAC liner. The Nevitt Lusk Action Group then put a number of questions to Ms Sinclair. Questions were put to Ms. Sinclair in relation to the stability of the liner having particular regard to the underlying geological faults on site. Ms. Sinclair indicated that the DAC liner was able to take deformations of up to 1 in 10 before stress cracks would appear. In relation to the clay Ms. Sinclair disputed the fact that desiccation to the clay liner would occur over time which would result in cracks in the clay. Engineered clay does not exhibit these tendencies. The Nevitt Lusk Action Group asked Ms. Sinclair have there been any accelerated stability studies showing the different conditions as to how the DAC liner is going to behave in the longer term. Ms. Sinclair indicated that the DAC liner was put under pressure of 600 bar and showed no evidence of deformation. Laboratory tests also looked at a chemical attack on the DAC as well. Mr. Short on behalf of the Nevitt Lusk Action Group pointed out that he had particular experience in relation to buying and testing polymers which are relatively new and have very little history. Questions were also put to Ms. Sinclair in relation to the slope stability calculations. Mr. Cunningham on behalf of the applicant indicated that there were no concerns in relation to the angle of the side scopes or the underlying ground conditions.

Question and Cross- Examination by Observers

Cross Examination of Mr Daly on Hydrogeological Matters

After lunch the Inspector called upon the Nevitt Lusk Action Group to put questions to Mr. Daly, the hydro-geologist on behalf of the applicant. Mr. Boyle put a number of questions to Mr. Daly in relation to groundwater movements. Mr. Boyle then put a number of questions to Mr. Daly in relation to groundwater protection zones and pointed out that there are a number of very important wells to the south-east of the site which rely on large amounts of groundwater supplies from the aquifer to the south-east of the site for commercial market gardening purposes. He also argued that under the Landfill Vulnerability Matrix and Groundwater Protection Schemes that the proposed development would impact on the inner source and outer source protection zones of these wells. Mr. Boyle then asked Mr. Daly a number of questions in relation to the

yields of domestic commercial wells to the south-east. Mr. Boyle pointed out that the zones of contribution for each of these commercial wells to the south-east of the site have not been designated. Mr. Daly acknowledged that he did not carry out detailed surveys in relation to all the wells in the entire area but points out that the Land Sim model does show that groundwater complies with drinking water quality at the boundary of the site which is 300 metres away. It is also pointed out that in Ireland there are probably 200,000 wells used for domestic and various purposes so there is likely to be a well within a kilometre of any site suitable for landfill. Mr. Boyle then asked Mr. Daly a number of questions specifically in relation to geology and hydrogeology of the other sites specifically relating to the site selection process. Mr. Daly stated he was not involved in this aspect of the development.

The inspector then put a number of questions to Ms. Jenny Lightfoot in relation to the Land Sim model. Ms. Lightfoot indicated that the levels contained in the Land Sim model are background concentrations already existing in the groundwater and that under the modelling exercise there will be no additional contaminants added to the background of this groundwater.

Then Mr. Boyle continued to question Mr. Daly. Mr. Boyle put a number of questions to Mr. Daly in relation to the fault lines to the east of the site and the possibility of water travelling to the Bog of the Ring source protection area along one of these fault lines. Mr. Daly pointed out that this was not likely to happen as it would require the water to cross over a groundwater divide.

Mr. Flannigan also put a question to Ms. Lightfoot in relation to modelling hydrocarbons in the Land Sim model. Ms. Lightfoot confirmed that no hydrocarbons were modelled however it is likely that hydrocarbons would be absorbed onto the liner. That concluded the question of cross-examination on Day 4. The oral hearing was adjourned until 11 o'clock Monday 28th March.

Day 5

Day 5 began with the recommencement of the question of cross-examination of the applicant by observers. Mr. Eugene Daly, Hydro-geologist was again cross-examined by Mr. Boyle. Mr. Boyle asked Mr. Daly a number of questions in relation to the Drinking Water Directive and in particular the fact that many of the vegetables grown in the area are washed with water drawn from the aquifer to the south-east of the site. Mr. Daly stated that he was satisfied that the proposed development will not result in any adverse impact on the quality of wells in the area. Mr. Boyle again asked Mr. Daly a number of questions regarding the source protection zones.

Questioning of Shane Herlihy Hydrogeologist on behalf of Fingal Co Council by Applicant

Mr. Shane Herlihy on behalf of Fingal County Council was then questioned and cross-examined by Mr. Ruairi Mulcahy BL on behalf of the applicant. Mr. Mulcahy put a number of questions to Mr. Herlihy in relation to the groundwater catchment area. It was generally agreed that the groundwater divide is to the north of the site however there was some debate as to whether or not the groundwater divide could shift due to seasonal variations. Mr. Herlihy did acknowledge however that there were no

significant variations in groundwater levels recorded in the area under the investigation for the Tooman Nevitt site. Mr. Herlihy did acknowledge that there is little concern or risk of groundwater migrating directly north from the MEHL site to the Bog of the Ring. Mr. Mulcahy also requested that Mr. Herlihy would accept that there is significantly more information in relation to boreholes on site than that associated with the previous planning application and EIS for 1999. Mr. Herlihy indicated that there are actually only a similar number of wells that have been used to draw the contours in the current application. Mr. Mulcahy then asked whether or not the groundwater flow in a south-east direction is entirely consistent with the findings of the hydrological investigations associated with the Nevitt Tooman application. Mr. Herlihy indicates that this was correct. A number of questions were then put to Mr. Herlihy in relation to the groundwater levels in borehole form where it is suggested that a level of 98.1 metres is entirely consistent with the 99 metre contour which shows water flowing in a south-easterly direction. Mr. Herlihy indicated that the figures presented in the 1999 EIS are entirely out of context over time and there are huge seasonal variations over that time period. Mr. Herlihy stated that the main concerns would be that there would be groundwater discharge into the stream which would mean there would be a relatively short pathway in terms of contaminated transport from beneath the site if there was leachate getting into the stream. Mr. Herlihy indicated that some of the groundwater could flow northwards from the groundwater divide towards the Bog of the Ring. In response to questioning Mr. Herlihy argues that the groundwater flow under the site is not compartmentalised between the two units as suggested by the applicant particularly along the fall zones. And this is directly underneath the hazardous cells and that is why there is a concern in the area. Mr. Herlihy reiterated that the pumping tests suggest that there was a higher level of hydrological connectivity within the Namurian shale due to the density of faults in the rock than suggested in the EIS.

Questioning of Mr. Shane Herlihy Hydro geologist / site selection study on behalf of Fingal Co Council by Observers

Mr. Boyle on behalf of the Nevitt Lusk Action Group then put a number of questions to Mr. Herlihy.

Mr. Boyle on behalf of Nevitt Lusk Action Group then put a number of questions to Ms. O'Donnell in relation to the site selection process. Ms. O'Donnell highlighted the advantages of co-locating the hazardous waste facilities with existing landfill facilities. Ms. O'Donnell then assured Mr. Boyle that there would be no biodegradable waste accepted at the facility. Ms. O'Donnell then provided more information in relation to the Waste Acceptance Criteria (WAC) testing and states that the EPA licence will not define the waste which is specifically acceptable but rather will justify the broad categories of suitable waste.

Mr. Boyle then put a number of questions to Ms. O'Donnell in relation to the nature of the waste to be landfilled on site. Questions were also put to Ms. O'Donnell in relation to "design to mine". Ms. O'Donnell then made some comments in relation to "design to mine" proposal. It is stated that if the situation ever arose another application would be lodged to mine out the bottom ash and reuse it in recovery options some way down the line. This is not an application currently before the Board. Mr. Boyle suggested that the site selection process should have played a greater role in the EIA process. The EIS

only goes on to describe how the facility was to be built at this particular site. It didn't go on to describe how it could be built in three other sites. Mr. Boyle also argued that the Carrenstown facility should send waste to the Knockharley site as it is in the same waste region. Ms. O'Donnell indicated in relation to bottom ash all this ash would need to be tested and it is ultimately a commercial decision as to where the ash is to be deposited.

Finally Mr. Boyle put a question to Ms. O'Donnell in relation to restoration and aftercare. Concerns were expressed that something unforeseen should happen such as the company going into liquidation and it won't be legally possible to enforce these aftercare arrangements. This issue should be the subject of a Strategic Environmental Assessment. Ms. O'Donnell argued that the proposed development cannot be deemed premature on foot of the publication of the National Waste Hazardous Management Plan. In addition no application has been proffered by either the private or the public sector with the exception of the current application. The applicants are quite happy that financial arrangements and financial provisions would be put in place prior to the acceptance of any waste arriving into the facility. The applicant will make funds available and they will be effectively locked away.

Questioning of Peter Byrne Senior Planner on behalf of Fingal Co Council by Applicant

Mr. Mulcahy on behalf of the applicant then put a number of questions to Mr. Byrne, Senior Planner for Fingal County Council. Mr. Mulcahy asked Mr. Byrne whether or not it was the case that the applicant had an exemplary planning record in relation to the site in question. Mr. Byrne responded that this was in fact the case. Mr. Mulcahy then asked Mr. Byrne to acknowledge that not all hazardous waste arising would go to the site in question and that the facility, to accept all hazardous waste arising would be a somewhat unrealistic proposition. Mr. Byrne accepted this point to a certain extent but notes that Fingal County Council based its assessment of the lifetime of the facility purely on raw figures. Mr. Byrne also accepted that co-location as an economic driver would have some merits and benefits. That concluded the questions of cross-examination on Day 5.

Day 6

Questioning of Applicant's Witnesses by Observers

Questioning of Dr. Hogan

On Day 6 the Nevitt Lusk Action Group began the questions and cross-examinations with the cross-examination of Dr. Hogan in relation to health issues. Mr. Hogan was asked wheather or not he carried out a Health Impact Assessment for the applicant. Mr. Hogan stated he carried out a Health Impact Assessment as part of the EIS. No standalone Health Impact Assessment was carried out.

In relation to the transportation of material Dr. Hogan indicated that all hazardous ash will be transported in sealed containers. Mr. Short on behalf of the Nevitt Lusk Action Group pointed out that the road infrastructure is so poor in the vicinity of the site that trucks would bounce along the surface creating considerable seepage of hazardous

material from the tailgate of the truck. Mr. Hogan pointed out that as he understood it the flu gas treatment would be transported in sealed containers and will not be wet. Mr. Hogan suggested that there was no need to carry out clinical trials on the hazardous nature of bottom ash as this material is transported throughout the world. This is not the first time that incinerator ash has been transported to a landfill. Mr. Short pointed out however that in most countries bottom ash is pre-treated before it leaves the facilities.

With regard to the health implications resulting from traffic going to and from the facility Dr. Hogan pointed out that this facility would not bring any additional traffic over and above that already permitted. Dr. Hogan does not consider that there would be any cumulative effects on health regarding emissions. Mr. Hogan agreed that there was not a lot of literature on engineered hazardous landfill sites because they have not been around long enough to actually look at the long-term implications. When specifically asked in relation to concerns regarding pathogens, Dr. Hogan noted in the case of the waste to be disposed there is no putrescible waste on which these pathogens could feed on and therefore pathogens would not be a significant issue at this facility. Dr. Hogan was then asked a number of questions in relation to vehicle emissions resulting from trip trucks accelerating up inclines and pressing breaks to stop accelerations etc. Mr. Short argued that the trucks on site would not be cleaned. The level to which pollutants will take place along the routes will depend on baseline air levels. A number of questions were also put to Dr. Hogan in relation to the Waste Directive. Mr. Short argued that it would be best practice to carry out a Baseline Quantitative Risk Assessment. Finally in relation to questions by Mr. Short, Dr. Hogan states that the best mitigation measure for concern is knowledge and the waste in this instance is safe and is not going to impact on people's health in that regard.

Mr. Boyle then put a number of questions to Dr. Hogan in relation to transporting hazardous ash in a sealed truck. As well as a number of questions to Dr. Hogan in relation to bottom ash and in particular the fact that bottom ash can be categorised as hazardous and non-hazardous. Mr. Boyle then put a series of questions to Dr. Hogan in relation to eco-toxicity of hazardous ash. Dr. Hogan stated that he does not confess to be an expert on the potential impact to the aquatic environment but points out that this is not particularly relevant in terms of human health. Mr. Boyle then asked a number of questions in relation to potential explosive reactions resulting from the waste to be deposited on site. It was pointed out to the Board that Dr. Hogan is not a chemist but a doctor. Discussion took place in relation to the corrosiveness of bottom ash. Dr. Hogan pointed out that the level of corrosiveness of the ash depended on the concentration of the substance. A number of questions were put to Dr. Hogan in relation to the high pH of bottom ash.

Questioning of Ms White on Air Quality

Then Ms. White on behalf of the applicant was asked a number of questions by the Nevitt Lusk Action Group in relation to air quality. Mr. Boyle asked Ms. White whether or not she was aware that there were various complaints as a result of the deposition of bottom ash in the vicinity of the Moneypoint Power Station. Ms. White said yes that she read that in Mr. Boyle's submission. Ms. White states that it is proposed to ensure that the bottom ash is retained in a moist form which will take the form of an earthy clay type substance which will minimise any potential dust emissions

when it is deposited into the cell. Questions were also asked in relation to the exposed nature of the site and problems arising from just generation associated with this exposure.

Questioning of Mr Peit Wens, Mr Micheal Cunningham and Mr Foss Smith in relation to matters concerning bottom ash.

After a short break Mr. Piet Wens from Pollux Consulting in Belgium made a brief statement in relation to the incineration process and then made himself available for questioning on the Nevitt Lusk Action Group. Mr. Weins outlined his qualifications. Mr. Weins outlined the incineration process and the various types of ash residues created from the process. It is stated that it is a general rule of thumb bottom ash is about 30% of the initial mass of municipal solid waste and boiler ash and activated carbon is more or less 3%. Mr. Weins pointed out that in terms of the hazardous waste criteria, the criteria for acceptance on landfill is not specifically a concentration but how much of the elements can be leached out from the leaching process that will actually make heavy metals dissolve in water and finally end up in the environment. The waste acceptance criteria for a landfill especially for heavy metals are always based on leaching the amount of leachable heavy metals rather than the total concentration of metals present in the waste. Mr. Weins also pointed out that a major constituent of leaching of heavy metals depends on the PH. Metals that come into contact with very low pH (acids) tend to dissolve. By increasing the pH, the stabilisation of the heavy metals occur. Mr. Weins pointed out that in Belgium much of the bottom ash is now graded and used for construction purposes mainly roads. It is also stated that bottom ash is used as a daily cover in a municipal landfill facility near Antwerp Co Belgium. When asked whether or not this bottom ash was subject to the curing process Mr. Weins pointed out that cured and fresh bottom ash were both used. Mr. Boyle then asked Mr. Weins a number of questions in relation to the pH value of bottom ash. Mr. Weins indicated that it can vary between 7 and 12 in the long run and ends up as PH10 and as such bottom ash is often referred to having a pH of approximately 10. Mr. Weins points out however that pH is associated with a solution and you cannot determine the pH of a solid material. Mr. Weins also pointed out that if you had a residue which comprised of for example pure cement then you would have a 100% active product creating a pH of 12. However in the case of bottom ash the cement in the bottom ash amounts to 2-3%. Therefore there was a much lower potential to create such a high pH. A number of questions were put to Mr. Weins in relation to the curing process which reduces the pH value to about 10. It is acknowledged that the curing process will go down when oxygen is depleted in the placement of ash in the cells. Mr. Weins during the questions and cross-examinations reiterated the fact that high pH levels are suitable for immobilising heavy metals in bottom ash.

After lunch Mr. Boyle on behalf of the Nevitt Lusk Action Group put a number of questions to Mr. Foss Smith and Mr. Weins in relation to exothermic reactions of bottom ash. Mr. Cunningham referred to a number of sites in Switzerland where bottom ash was accepted in a mono fill landsite. Mr. Weins was asked whether or not he has ever witnessed a worker at one of these facilities get contaminated with bottom ash. Mr. Weins said that some cement and quicklime is apparent in bottom ash but at low concentrations. One would suggest that people working in the landfill would wear gloves but he notes that generally people do not wear any specific protective clothes.

Mr. Weins also stated that he could not imagine the dust flying 100 or 200 metres away from the point of tipping.

When asked whether or not heavy metals will degrade Mr. Weins said no, you cannot destroy heavy metals. They will absorb, they will precipitate, they will react and they will be entrapped. He points out that the clay barrier is very important for absorbing heavy metals because the clay has a lot of negatively loaded surface particles and these would absorb the positive heavy metal particles.

With regard to the classification of the waste in terms of its composition etc. Mr. Weins stated that bottom ash is a rather homogeneous composition and therefore there is no need to check every truckload because there is unlikely to be significant variation. In relation to the transportation of bottom ash Mr. Weins stated that there were no problems experienced in Belgium in relation to the transportation of this bottom ash which amounts to approximately 400 tonnes annually. Mr. Weins stated that bottom ash in its wetted state from the incinerator should be cohesive so it will never end up on the side of the road.

A number of questions were put to Mr. Foss Smith in relation to potential changes to the HDPE liner which could result at high temperatures due to exothermic reactions. Mr. Foss Smith said no, at high temperatures the HDPE liner just loses its tensile strength. Furthermore the waste does not actually at any point come into contact directly with the liner. Mr. Weins was then asked a number of questions in relation to the reuse of bottom ash. It was suggested by the Nevitt Lusk Action Group that there is not enough detailed research into the incineration process and the nature of waste to be incinerated a thus the nature of bottom ash which will result from the process.

The Nevitt Lusk Action Group went on to cross-examine Mr. Foss Smith specifically in relation to the issue of exothermic reaction. Mr. Foss Smith was asked questions in relation to chemical reactions occurring as a result of the combination of materials/chemicals in the leachate or in the hazardous waste over time. Mr. Foss Smith stated that it would be a very very rare occurrence particularly as this in an inert site with the delivery of two materials that would inter react something like every 5 years. Mr. Weins indicated that he has no knowledge of hazardous landfills experience fires or explosions due to chemical reactions. Mr. Cunningham also indicated that the concentrations of metals would be so low that any chemical type reaction would be unlikely. Mr. Boyle read out a statement which suggests that exothermic reactions in bottom ash may cause temperature increases in the landfill of up to 90°. Mr. Foss Smith referred to the paper presented at the oral hearing which indicated an increase in temperature to approximately 48° after about 480 days after which the temperature started declining at a rate of approximately 0.6° per day. Mr. Foss Smith indicated that there were important differences between the German trials – referred to by NLAG and the MEHL proposal. The MEHL proposal requires ash to be deposited in 500mm lifts. Each lift is separated by a narrow layer of another layer of inert waste and the idea is to thermally decouple each layer. Furthermore the lifts are anticipated to take place over a 25-year period as opposed to a 3-year period under the German trials.

Observers Cross Examination of Ms O Donnell in relation to site selection matters

Mr. Short on behalf of the Nevitt Lusk Action Group then put a number of questions to Ms. O'Donnell in relation to the strategic aspect of the proposed development and in particular the site selection process. Mr. Short asked what input Indaver had into the site selection process. The oral hearing was informed that there was no involvement from Indaver in the site suitability study. Mr. Short also asked Ms O Donnell to comment on the fact that the Tooman Nevitt site wasn't included in the Site Suitability Study. Ms. O'Donnell commented that the Nevitt site had not actually been granted planning permission or a licence at the time of carrying out the report. Mr. Short suggested that the site selection scoring process based upon five tests was very biased in favour of MEHL. It is suggested that in terms of strategic location Knockharley would be a better facility than the current proposal before the Board. Mr. Short challenged the validity of the scoring mechanism. In relation to a question specifically relating to the EPA Site Selection Guidelines Ms. O'Donnell makes reference to the fact that the EPA Guidelines specifically make reference to the WHO criteria as being the only ones for hazardous sites. Mr. Short then suggested that the bulk density of bottom ash is considerably less than 1.75 tonnes per cubic metre and is likely to be 0.745 kilos per cubic metre. Ms, O'Donnell states that the range of 1.5-2 tonnes per cubic metre contained in the EIS is based on her experience from Europe. The Nevitt Lusk Action Group suggested that the applicant had not provided any evidence that the density would be so high.

Mr. Short on behalf of the Nevitt Lusk Action Group again raised the issue of the lack of technical data particularly in relation to the transportation element of the proposal. Mr. Mulcahy on behalf of the applicant stated that issues in relation to transport had been dealt with in the EIS.

Mr. Short on behalf of the Nevitt Lusk Action Group made reference to the fact that asbestos is not going to be handled at this facility but is likely to be handled at the Kentstown facility. In this regard the proposed development cannot be considered a national hazardous waste facility strategically placing hazardous waste in different sites represents a piecemeal approach to the issue. The Nevitt Lusk Action Group also raised the question, does the building of this landfill reduce incentive to recycle bottom ash. Mr. Mulcahy on behalf of the applicant stated that the recycling of bottom ash is not currently possible under the Irish Regulatory system.

It is also suggested by the Nevitt Lusk Action Group that there is no need for this facility to accept bottom ash in strategic terms. There is a fragmented approach to national policy at present. In relation to asbestos, the applicant stated that the only reason why asbestos has not been accepted in the proposed facility is that the applicant specifically excluded it with consideration for its neighbours. It is again argued by the Nevitt Lusk Action Group that the Kentstown facility is much more appropriate in terms of proximity in accepting bottom ash from the Carrenstown incinerator. The applicant stated that it will be a commercial decision for the operator as to where it disposes its material.

In relation to restoration and aftercare, the applicants were asked do they have a letter of approval from the EPA in relation to the proposed restoration and aftercare. The applicant stated that there is no such letter on file but it will quite often be the case that

reports are lodged with the Agency as a matter of course and that the Agency would not necessarily respond.

Mr. Short on behalf of the Nevitt Lusk Action Group then put a number of questions to Mr. Cunningham on behalf of the applicant. Mr. Cunningham was asked questions in relation to potential spillages of leachate or hydrochloric acid on site. Mr. Cunningham stated that any spillages would be diverted back to the leachate holding tank. Mr. Cunningham was asked what explosion clarification is the building designed to. Mr. Cunningham indicated that he did not know off hand. Mr. Short indicated that there have been explosions at almost every single chemical plant in this country every five years. Mr. Cunningham rejected this contention and made specific reference to the Abbott Factories facilities in Sligo which have not had any explosions in the last 20-30 years. It is also noted that the health and safety authority have not expressed any concerns in this regard. A number of questions were asked in relation to the bunding provisions around the solidification plant. Mr. Cunningham indicated that the building was enclosed but Mr. Short pointed out that there are no bunding arrangements indicated in the drawings submitted. Mr. Boyle then put a number of questions to Mr. Cunningham in relation to exothermic reactions. Mr. Cunningham stated that in terms of laying the bottom ash to Alay concerns in relation to exothermic reactions the critical issue was the depth.

Finally Mr. Short on behalf of the Nevitt Lusk Action Group wished to put a number of questions in relation to the financial capabilities of the applicant. The Inspector pointed out that the applicant as part of any development consent process would be required to submit some type of financial assurance. The Board generally do not request detailed financial information in relation to the applicant's ability to carry out the application or otherwise. The Inspector highlighted the fact that it is imperative that the applicant comply with any financial conditions and financial bonds associated with the development consent and for this reason issues in relation to financial assurance are not dealt with in any great detail by An Bord Pleánala. That concluded Day 6 of the oral hearing.

Day 7

Day 7 of the oral hearing specifically related to closing submissions.

Closing Submission of Fingal Co Council

The Planning Inspector first asked Mr. Dermot Flannigan, Councillor on behalf of Fingal County Council to make his closing submission. Before making his closing submission Mr. Flannigan outlined the basis for the €10,000 financial contribution in relation to roads. The contribution is to cover the cost of signing and lining relating to the development.

Mr. Flannigan asked the Board to critically look at Waddenzee judgement and invited the Board to adopt a similar standard in relation to this critical development. Reference is made to the EIA decision making process where it is one where consultation and information gathered must be taken into consideration in the development consent procedure. It is important that the Board do an assessment of all the information submitted including the information proffered during the oral hearing process. The

Board if it considered it appropriate has the untrammelled right to seek additional information if the need arises. The Board can ultimately seek a revised EIS if it is deemed appropriate. It is Fingal County Council's view that significant scientific and technical doubt has been raised in relation to the adequacy of the EIS.

The second issues raised is the relationship between An Bord Pleánala and the EPA. The Board must be satisfied that the proposed development is acceptable on environmental grounds. The Board has a central role in relation to the control of the development particularly in relation to water and aftercare remediation. We say that the Board is entitled and obliged to have the fullest information to it to carry out its assessment. If there is a doubt raised in relation to the adequacy of the information submitted for the purposes of the Board's decision making process, there is a requirement arising from those judgements to fully engage with the EPA. The Board is not seeking to determine or impose conditions for the control of emissions. In terms of the physical planning process the Board is ensuring the acceptability of the proposal on environmental grounds. Specific reference is then made to the Landfill Directive. It is argued that the Directive frontloads the question of location of the landfill and frontloads the question of geological and hydrogeological conditions. The highest level of risk assessment should be done in the development consent process. It is not appropriate just to comply with the minimum standards set out in the Directive. The Waddenzee Judgement raises the bar further in that there should be no reasonable scientific doubt in relation to the proposal. In this regard there is a very high order of assessment required by the Board. Concerns were expressed that on the site suitability question there is a sense of mixing and matching different guidance documents so as the site selection approach has produced a favourable result for the applicant's site. It is suggested that the sites at Knockharley and Drehid from a groundwater prospective have better characteristics. An Bord Pleánala as the competent authority does require further information in relation to the strategic capacity of the landfill. There is a concern that the Board in doing its assessment that it is precluded in the absence of necessary scientific and technical data from carrying out an appropriate assessment as a decision making body.

Closing Submission from NLAG

The Inspector then requested that the Nevitt Lusk Action Group make their closing submission. Two submissions were made by Mr. Short and Mr. Boyle.

Mr Shortt's Submission

Mr. Short argued that there is technical and methodological insufficiencies identified in the oral hearing in relation to the EIS. It is not satisfactory that the community are presented with an EIS which is severely lacking in empirical data on which an authority could make an informed decision. Much of the application depends on clarity regarding the outcome of the Nevitt Landfill proposal. The MEHL relies on the provision of a new county road which will be built to service the Nevitt Landfill. If the Nevitt facility goes ahead there will be no waste intake for the MEHL facility. Reference is made to the fact that An Bord Pleánala refused planning permission for the relocation of the entrance on a previous occasion. Both Fingal County Council and An Bord Pleánala have both made a consistent assessment of the County Development Plan and the activities that are allowed in a high amenity zone.

In relation to transport it is argued that the Traffic Assessment is flawed. No baseline traffic survey was carried out for this EIS. No 2010 traffic count was carried out.

It is also argued that the existing road is inadequate and dangerous. A new county road would have to be in place before the facility is permitted. An Bord Pleánala already deemed the construction of a footpath necessary if the Nevitt Landfill is to go ahead. And there is evidence suggesting that the road is of insufficient width and there have been numerous near misses and accidents on the same road. Vehicles carrying hazardous toxic goods would have to pass within 10 metres of Hedgestown National School. No evidence has been provided of an Emergency Disaster Plan. It is clear that the traffic consultant clearly did not know or use bulk densities in assessing the number of lorry movements to and from the facility. In terms of the bulk density of the bottom ash this has been seriously underestimated and will result in significantly more levels of traffic as well as major impacts in terms of noise etc.

According to the applicants the only reason that we are not reusing bottom ash is down to the fact that the EPA have not come up with a policy/protocol. This situation is not acceptable. The approval of this landfill will negate the incentive to landfill which is in contravention of the waste strategy for Ireland. Nowhere in the EIS are we provided with a breakdown as to how the proposal will reduce the overall cost of waste disposal. The doubt in relation to waste intake is extraordinary in this application. The applicant has made absolutely no case for continuing to hold onto a historic 500,000 tonnes per annum quota. Nothing in the documentation presented to the EPA or An Bord Pleánala prevents the applicant accepting non-hazardous waste streams of significantly lower density than that currently permitted. The Knockharley facility can easily accommodate the needs of the Indaver Facility. Reference is made to condition no. 2 of 29SEF.2022 which relates to the Poolbeg facility as the application does not include proposals for the exception of sewage sludge at this facility or the treatment of ash other than by export.

An Bord Pleánala does not have sufficient information to assess the construction effects of the landfill liner. There is a significant chance that the EPA will require some alternative liner construction.

The applicant has not received an approval letter from the EPA nor is it apparent that financial requirements will be met. The potential for fire at the solidification plant is high. The applicant was unable to advise us as to what explosion class the building was designed to or how it is proposed to deal with a major accident or spillage problem on site.

In terms of Health Impact Assessment no baseline survey of the local community was carried out and there is no empirical data in relation to the impacts of the landfill on health.

In relation to the site selection process the applicant failed to use the EPA Guidelines. The entire methodology was totally biased in favour of the applicant's site which undermines the credibility of the process. No evidence has been put forward that the applicant has the financial capability to carry out this development appropriately. Based on the nature of the products being landfilled and the longevity of the site it

would be prudent to have companies with a necessary solid balance sheet to take on such responsibilities.

Mr Boyle's Submission

Mr. Boyle stated the following:

The applicant failed to adequately demonstrate that there would be no risk to local water sources.

The location of the site will result in permanent loss of a large water resource to the south-east of the site which is contrary to the Groundwater and Water Framework Directive. The applicant failed to adequately demonstrate that there would be no impact on local streams.

The site selection was flawed in that it was biased in favour of the applicant.

The transport of incinerator bottom ash and non-hazardous waste from distant locations is contrary to the Proximity Principle and inconsistent with previous An Bord Pleánala decisions regarding regional waste policy.

The local access road is inadequate and the proximity to local residents constitutes a health risk.

There is a history of non-compliance with waste covering during the transportation to the site. The local road has not been properly maintained by the local authority. There is a strong case for such a facility to be under the ownership and control and management of the state both short and long-term.

No consideration was given to the advantage of placing a hazardous waste site on a national rail network to facilitate transfer of hazardous waste and corrosive bottom ash in sealed good carriages designed for this purpose. Incinerator bottom ash and cement have similar corrosive properties as evidenced by expert witnesses on behalf of the applicant. No regard was taken of the cumulative environmental effect associated with the proximity of the proposed Nevitt municipal waste site. The proposed landfill incinerator bottom ash at the Nevitt site is a duplication of landfill space for incinerator bottom ash with the Greater Dublin Area Plan.

The application is premature in that no National Guidelines are available in relation to critical aspects of the project such as ownership, location and groundwater protection.

The second part of the submission specifically relates to conditions which should be attached if the Board considered it appropriate to grant planning permission. A total of 17 conditions were referred to.

Closing Submission in behalf of the Applicant

The Planning Inspector then called upon Mr. Mulcahy to make a closing submission on behalf of the applicant. The proposal is consistent with all the relevant policies which are associated with this type of waste infrastructural development. It is also clear that the waste industry in this country is moving more towards private sector involvement. The proposal is to provide a necessary piece of infrastructure and an existing EPA licence facility where there is existing void space. It therefore avoids the necessity for significant construction and displacement of material. The site is the benefit of three existing planning permissions and two EPA waste licences and has been the subject of three pervious Environmental Impact Assessments. There are few sites which have been subject to such a comprehensive Planning and Environmental Assessment even before submitting a planning application. The applicant also has an excellent planning and compliance record.

With regard to the zoning in the Development Plan it is noted that Fingal County Council have raised no objections in these grounds. The submission then goes on to deal with the issue of compliance in the Development Plan. In terms of impact on amenity this proposal does not make any substantive change compared with the impact of the existing permitted facility. The submission goes on to detail and address the Inspectors queries in relation to a potential non-conforming use regarding the zoning of the Development Plan. It is clear from the NaDWaF report that hazardous waste arising's are variable and therefore flexibility is needed to deal with peaks and troughs arising from hazardous waste. With regard to the relocation of the entrance it is noted that there has been very little controversy in relation to this issue during the course of the hearing and the application for the relocation of the entrance is supported by the Transport Section of Fingal County Council. There is no proposal to increase the amount of waste which can be dealt with at the facility and therefore there is no proposal to increase the amount of traffic which might be associated with the facility. While concerns have been expressed regarding traffic movements these concerns in effect refer to the existing permitted movements. The applicants have already paid €500,000 towards the cost of maintaining roads and these are within the control of Fingal County Council. The applicant has also proposed to pay a contribution into a community gain fund based on the tonnage and waste classification of materials taken into the site. The EIS represents a comprehensive assessment of all the potential impacts associated with the development including cumulative impacts.

In terms of site selection the criteria for assessment only considers the sites which were already licenced and permitted in other words only sites which had been identified as potentially suitable for landfill development and that had been assessed and detailed and determined by relevant authorities to be actually suitable. It is argued therefore that this is the highest possible starting point for site selection. The site selection process is extremely robust. There has been no picking and choosing between criteria. The WHO criteria were applied in full and then the New Zeeland criteria were applied in full. All that is required of the site selection criteria is to ensure that the site is a suitable alternative and therefore being capable of being brought forward for further analysis. While the Board must consider the environmental impact they are not required to ignore the fact that the EPA will also be imposing conditions for the purposes of controlling emissions.

In relation to the landfill liner the EPA have not set higher standards than the standards set out in the Landfill Directive and this is apparent from the EPA's submission to the Board dated 8th February 2011.

Typical problems associated with municipal solid waste landfills in relation to noise, odour, vermin etc. are largely absent in the current proposal. There are no major impacts in relation to ecology. In terms of hydrogeology it is clear from the evidence of Mr. Daly that the level of confidence in the assessment carried out by himself and his team is high. In terms of hydrogeology the applicant has carried out a comprehensive analysis of borehole data and provided a conceptual site model which shows a flow in a south-easterly direction across the site. This flow was confirmed by the data in the former well borehole 4 which shows a level of 98.1 before the ground was excavated. Fingal County Council acknowledged that there is a low risk and the information submitted is incorrect. No evidence has been provided that the proposal would cross the groundwater divide. While the site itself is low risk the low risk is only half the story because the proposed mitigation measures are significant. These include the DAC liner. The DAC liner dramatically exceeds the requirements of the Directive. It has been approved in the UK for a municipal solid waste landfill overlying a regionally important aquifer. And the proposal here represents a far lower risk than the use in the UK. While we are dealing with non-biodegradable waste here it should be noted that we are dealing with hazardous waste which according to the Waste Acceptance Criteria is deemed to be appropriate for landfill. The solidification plant will ensure that there is little or no possibility of the accumulation of leachate containing heavy metals.

Bottom ash has been successfully transported and deposited in landfills elsewhere. The applicants have carried out a comprehensive quantitative risk analysis using the Land Sim model. Fingal County Council have accepted that the inputs into the model is conservative. The model showed that there was no risk to groundwater at the phantom well receptor at the site boundary and that groundwater was of drinking water quality after 20,000 years. The proposal therefore embraces the precautionary principle.

Specifically in relation to the Nevitt Lusk Action Group concerns which mainly centred on hydrogeology traffic and bottom ash the following is stated.

In relation to hydrogeology it is noted that there is no source protection area for the wells discussed by Mr. Boyle. The presence of a well does not automatically sterilise all development within its potential zone of contributions. Furthermore none of the wells raised at the hearings are within 2 kilometres of the boundary of the site. Reference is made to the GSI document for groundwater protection responses. However concerns by the observers ignore the engineered geological barrier which would be put in place and where no doubts have been raised. Concerns have also been raised regarding the potential traffic impacts from the development. The traffic impact can only be considered in the context of the traffic movements which have already been permitted on this road infrastructure. Fingal County Council has described the difference between the two as immaterial. In relation to the waste streams it is considered that the evidence of Mr. Weins is particularly important. He concluded that if the facility was properly managed there was no cause for concern in relation to the management or transport of bottom ash or flu gas residue.

In relation to minimal requirements set out in the Landfill Directive it is clear that if you read any of the EPA Guidance documents that the purpose of the guidance is to ensure that whatever is being built and the best available technology is to achieve the requirements of the Landfill Directive. The proposal is not impacting on the Habitats Directive and this again is something which points to the suitability of the site. Finally Mr. Mulcahy specifically dealt with the conditions suggested by the Nevitt Lusk Action Group in its closing submission were the Board to grant planning permission for the proposed development.

By way of conclusion it is stated that the applicants have no difficulty in principle with the requirement that the development shall not commence on site until a waste licence for the proposed activity has been granted. It is also suggested that there is no basis for the special contribution of €10,000 required by Fingal County Council for road improvements as the applicant has already made substantial financial contributions under previous permissions. The applicants do not see any necessity for a biodiversity management plan. The applicants withholds that they have addressed some of the concerns raised by Fingal County Council and the Nevitt Lusk Action Group. It is noted that many of the prescribed bodies invited to the hearing have all indicated that they have no objection to the proposal. The HSA are also fully satisfied with the EIS. The applicants therefore commend the proposal to the Board.

Finally the Inspector thanked all the parties for the way they conducted themselves at the oral hearing and closed the oral hearing at midday on Wednesday March 30th.

APPENDIX 3

NATIONAL, REGIONAL AND LOCAL PLANS

NATIONAL HAZARDOUS WASTE MANAGEMENT PLAN 2008-2012

The primary objectives of these plans are to

- Reduce the generation of hazardous waste by industry and society generally.
- Minimise unreported hazardous waste with the view of reducing the environmental impact of this unregulated waste stream.
- Strive for increased self-sufficiency in the management of hazardous waste and to reduce hazardous waste export.
- Minimise the environmental, social and economic impacts of hazardous waste generation and management.

Table 1 of the document sets out the recommendations contained in the first plan (2001). Priority no. 7 included the development of a hazardous waste landfill and terminal treatment capacity for hazardous waste requiring disposal to achieve self-sufficiency.

It is stated that the position at the time of adopting the current plan (2008) was that no hazardous waste landfill has been proposed. A proposal from Indaver Ireland for a hazardous waste incinerator in Ringaskidae has been granted planning permission and an EPA licence.

Section 2 of the Plan sets out details in relation to hazardous waste legislation.

The National Hazardous Waste Profile is set out in Section 3 of the report. This includes:

- Unreported hazardous waste (29,888 tonnes in 2006)
- Managed (reported) hazardous waste.

This comprises of onsite treatment of hazardous waste, offsite treatment of hazardous waste and exported hazardous waste. The details of this type of waste are set out in Table 3 and it amounts to 284,185 tonnes. Of this 134,904 tonnes was exported in 2006. The countries receiving the largest amounts of hazardous waste from Ireland are Britain (34%) and Germany (30%).

With regard to contaminated soil it is stated that the quantity of contaminated soil generated each year varies as it arises from the remediation and redevelopment of contaminated urban sites. Details of the management of contaminated soil are set out in Table 8. In 2006 almost 407,000 tonnes of contaminated soil was generated for treatment. Less than 10% of this soil was treated in Ireland. Of the 90% of soil exported 92% of this soil was landfill in Germany.

Section 4 of the Report details unreported hazardous waste. The challenge and particular priority of the Plan is to minimise and seek to eliminate the phenomenon of unreported hazardous waste.

Section 4.2 of the Plan sets out recommendations for the approved collection of hazardous waste.

Section 5 of the Plan relates to prevention of hazardous waste. Details of key recommendations for each hazardous waste sector are set out in Table 13 of the Plan.
Section 6 of the Plan sets out details in relation to the treatment of hazardous waste. It notes that the EU Waste Framework Directive requires that a policy of national self-sufficiency in disposal installations be adopted by member states where it is possible on the grounds of strategic need and conformance with the Proximity Principle. The promotion of some technologies (namely cement kilms and landfill) is actively encouraged in the interest of reducing exports by using existing infrastructure. Section 6.2 of the Plan sets out arguments for self-sufficiency vs. the export of hazardous waste.

Reference is made to the Waste Framework Directive where member states shall take appropriate measures, incorporating with other member states where it is necessary or advisable, to establish an integrated and adequate network of disposal installations, taking account of the best available technology not involving excessive costs. The network must enable the community as a whole to become self-sufficient in waste disposal and the member states to move towards that aim, individually, taking into account geographical circumstances and the need for specialised installations for certain types of waste. Given this principle established in European law, and considering the data presented in Section 6.1, it is recommended that Ireland should strive for a greater self-sufficiency in hazardous waste management where this is technically and economically feasible. This, it is argued is in accordance with the Proximity Principle and is also in accordance with sustainable transport principles and reduces the possibility of an accident during the transportation phase.

One of the actions required in order to avoid the exportation of waste includes:

- Development of landfill capacity to manage non-recoverable and non-combustible hazardous waste and residues including asbestos.

Section 6.5 of the Plan sets out details in relation to the landfill of asbestos and other hazardous waste. It is noted that one facility KTK landfill is authorised to accept up to 6,000 tonnes of waste construction materials containing asbestos. This facility is scheduled to close in 2009. No other commercially available capacity exists for hazardous waste landfill in Ireland and there are no facilities at the time of writing the report proposed to replace this asbestos disposal capacity. It appears appropriate that providing landfill capacity for asbestos waste should be actively promoted. Capacity for up to 20,000 tonnes of asbestos waste per annum is recommended for capacity planning purposes. Other than asbestos, a relatively small amount of hazardous waste (other than contaminated soil) requires access to offsite commercial landfill just under 7,000 tonnes in 2006. It is likely that licence conditions for the landfill disposal of this material would require an element of pre-treatment (such as stabilisation or

solidification) which would increase the volume of landfilled waste. Therefore up to 10,000 tonnes per annum is recommended for capacity planning purposes. It is recommended that at least one hazardous waste landfill be developed in Ireland capable of accepting a wide range of hazardous wastes that would otherwise be exported for landfill. Such a facility will be expected to provide a key national service and should have available capacity of at least 25,000 tonnes per annum. A national facility should facilitate good transport links with the main urban and industrial centres. The facility could be collocated with an existing or planned landfill facility with the objective of utilising existing infrastructure such as site roads, weigh-bridges, staff facilities thereby saving costs.

It is further recommended that at least one other non-hazardous landfill facility be authorised to accept construction materials containing asbestos. Such a facility would be expected to provide (at least) a "regional" service to supplement regions that are more distance from the national facility. A capacity of up to 5,000 tonnes of construction materials containing asbestos per annum should be accommodated. The recommended capacity for hazardous waste landfill facilities are set out in Table 19.

In support of these recommendations and to clarify the issues and barriers, the EPA will comMsion a study to explore the technical and economic aspects of developing hazardous waste landfill capacity.

A commitment to the export ban on hazardous waste that requires landfill may provide additional incentive to local authorities and/or potential investors. An export ban should not restrict the movement of hazardous waste to authorised Northern Ireland landfills. An export levy on hazardous waste for landfill disposal could equally incentivise investment and should be considered as an alternative to an export ban.

If the private and local authority sectors fail to initiate a proposal for a facility on foot of this plan by the end of 2009, then the situation should be reviewed by the Department of the Environment, Heritage and Local Government and consideration given to appropriate policy or economic instruments designed to deliver domestic hazardous waste landfill. Such instruments might include

- Policy directions or incentives for existing local authority or private sector landfill operators.
- A national contract or public private partnership and/or
- An export ban or levy as discussed above.

It should be noted that the operation of hazardous and municipal waste incinerators will result in the generation of hazardous ash that will require landfilling. The proposed capacity of any national landfill facility, particularly one established on foot of any initiative provided by a public authority, should take into account this capacity requirement.

Section 6.8 of the Plan relates to the potential for all-Ireland cooperation.

It is stated that there are potentially considerable economies of scale to be achieved through full opening of the Northern Ireland or the Republic of Ireland waste markets.

Certain companies already operate on an all-Ireland basis and certain hazardous waste streams currently move across the border including waste oils, florescent lamps and waste electrical and electronic equipment.

Section 7.1 of the Plan sets out details in relation to contaminated soil. In relation to options for the management of contaminated soil in Ireland plans should set an objective to avoid export where treatment in Ireland is technically an economically feasible and where such treatment would not result in greater emissions or other impacts being generated from transport. Section 8 sets out recommendations in relation to implementation. The particular recommendations relevant to the current application include:

- **Recommendation 20:** ComMsioned a study in 2009 to clarify the technical and economic aspects of providing hazardous waste landfill capacity (responsibility Environmental Protection Agency).

- **Recommendation 21:** Keep under review the provision of hazardous waste landfill capacity, and taking into account any recommendations that may be made in the EPA Study (see Recommendation 20 above) consider the use of appropriate economic or other instruments to ensure that such capacity is provided, whether by private or by public sector by 2012 (responsible Department of the Environment, Heritage and Local Government).

- **Recommendation 23:** ensure that all-Ireland considerations are taken into account in the implementation of recommendations 20-22 (responsibility DoEHLG and the EPA).

TECHNICAL AND ECONOMIC ASPECTS OF DEVELOPING A NATIONAL DIFFICULT WASTE FACILITY (NADWAF) EPA July 2010

The Plan notes that it is a key objective of Ireland to improve its ability to become self-sufficient in term of waste management. It is stated that the development of any such facility should be compatible with the objectives stated in the National Hazardous Waste Management Plan. The waste considered during the course of this Study includes the solid hazardous waste not suitable for incineration. It notes that hazardous waste types that have been consigned to landfill, either in Ireland or abroad include:

- construction and insulation materials containing asbestos filter cakes (containing heavy metals)
- salt cakes,
- acid and alkaline waste,
- hydrocarbon,
- solvents
- contaminated sludge's,
- pharmaceutical wastes,
- waste paint,
- varnish containing organic solvents,
- waste from thermal processes etc.

It is indicated that the treatment capacity needed in conjunction with the landfill capacity shows that up to 2019 between 235,000 and 260,000 tonnes per annum of hazardous landfill capacity could be required. This reduces to 185,000 tonnes per annum as a result of assuming that treatment techniques advance. Table 70 of the report summarises the estimated landfill capacity needed up to 2025.

With regard to the basic technical containment of the landfill, stringent operational and technical requirements are necessary in order to prevent or reduce negative effects on the environment as well as any residual risk to human health from landfilling waste during the whole lifecycle of the landfill. The basic components of landfill containment are

- capping,
- covering and lining to control waste,
- leachate containment and collection,
- landfill gas containment and collection,
- minimisation of rain and surface water within the cells.

A review of best international practice and guidance for this Study was carried out. It is recognised by both jurisdictions of Ireland and Northern Ireland that by creating an all-Ireland waste market, both jurisdictions may benefit from increased competition, reduced waste management costs and improved reliability of service, although the economic gains may be variable in different regions in both jurisdictions.

It is noted that the existing tonnage of hazardous waste (12,337 tonnes in 2007 and 6,070 tonnes in 2008) is too low to justify the development of a disposal/treatment facility in Northern Ireland.

In terms of the siting of waste facilities, it is acknowledged that hazardous waste facilities is an emotive subject especially for the general public and local communities. A site selection exercise must be in general conformity with relevant European Directives, National, Regional and Local Development Plans and planning guidance. The co-location of waste treatment and/or disposal facilities with existing waste or IPPC licence operations has its merits and demerits (see section 12 of the report below).

Various waste scenarios are considered including

- Current treatment options
- Specialist disposal options
- Specialist treatment options
- No treatment
- Storage

Specialist disposal is deemed to be the most expensive option. Maintaining current treatment is given as least cost but this is based on current assumptions about price increases. In reality these are likely to increase substantially particularly with the increasing restriction on landfill availability.

Section 11.3 of the Report sets out details in relation to site selection criteria. In this regard it is considered important that a transparent and clear structured procedure is developed to allow for a fair and objective selection of sites in accordance with the 1998 Aarhus Convention. Reference is made to the Landfill Directive and the EPA Draft Landfill Manual on site selection. It is noted however that the EPA Manual is focussed primarily on non-hazardous and inert landfills and that the WHO publication on Site Selection Criteria for New Hazardous Waste Facilities must also be considered (for summary of this document see section below).

In assessing areas for development each selection criteria should be assigned a score based on the potential impact of the hazardous waste facility. Other important considerations are

- Land use constraints
- Accessibility
- Waste arising's
- Geology and soils
- Landscape and visual
- Nature conservation
- Water resources
- Amenity, air quality and environmental nuisance.

Details of the site selection and criteria scoring are set out in Table 47 of the Report.

Section 12 of the Report sets out details in relation to co-location issues. Section 12.3 and Table 48 of the report sets out the benefits and dis-benefits of co-location. The main benefits include:

- The established waste management or industrial use on-site
- The economies of scale
- Existing infrastructure
- Integrated waste management facilities compliant with waste planning policy
- The reduction in "waste miles" and in compliance with the proximity principle.
- Containment of potential environmental instances are theoretically easier.
- A reduction in the number of facilities needing long-term aftercare.
- The potential to open up new markets for hazardous waste treatment with operators having the capacity and experience in treating and disposing of waste
- The reduction in the need to develop a Greenfield site

The dis-benefits include:

- The difficulty of defining a source of any contaminant released and historic pollution in the event of an imminent risk to the environment
- Community perception issues and public accessibility
- Potential cumulative environmental effects
- More legislative loopholes to pass through before the hazardous facility is acceptable especially if the site is not used for this purpose at present
- For certain waste types it may be difficult for existing waste operators to demonstrate that they are suitably competent
- Section 13 specifically deals with economic appraisal.

Section 13.3 sets out the methodology used in the economic modelling. This section of the Report seeks to provide a generic economic assessment model to provide indicative costs for the development and operation of treatment/disposal options. The scenarios considered do not include potential for co-location.

Chapter 14 sets out a socioeconomic assessment of developing a national difficult waste facility. The potential social and economic impacts have been identified and assessed by considering the following variables.

- Probability of the event occurring
- Number of people potentially effected
- Duration of impacts (long-term vs. short-term)
- Value of benefit and cost to impacted group (intensity of impacts) the extent that the impact is reversible or can be mitigated
- The likelihood of causing significant indirect or secondary impact
- Uncertainty over possible effects.

The discussion of the key impacts is set out in Section 14.5.1 of the document.It is stated that the key to minimising and managing the potential negative impacts of landfill is to ensure that effective consultation and engagement is undertaken. This is particularly important as key negative impacts tend to centre on people's beliefs associated with the proposed project including the extent of affected parties, trust in political institutions and attitudes towards the project. Careful consultation and engagement could reduce the extent of interested and affected parties that are concerned along with people's negative perceptions and beliefs in the impacts of the proposed facility. The concept of community gain is set out in Section 4.7.

Section 15 sets out conclusions and recommendations. The main conclusions are as follows

- An increase in self-sufficiency for the treatment and disposal of hazardous waste as well as the reduction in export of the hazardous waste is a key objective of the NHWMP. In principle there is an acceptance at policy level in Ireland and Northern Ireland for the development of an all-Ireland waste management facility. The report considers that the overall amount of hazardous waste will reduce up to 2025 as a result of advancement and treatment techniques.

- In terms of technical requirements and site selection it is stated that the facility and operation must obtain a waste licence and relevant authorisations to proceed. It therefore must meet or exceed BAT requirements while ensuring that it does not give rise to environmental pollution or damage to human health.

- A landfill must be situated and designed so as to meet the necessary conditions for preventing pollution of soil, groundwater and surface water and ensuring the efficient collection of leachate.

- In terms of the socioeconomic assessment, all treatment methods present at least a minor deterioration against the baseline conditions. Landfill and thermal desorption present a significantly higher negative impact than the other treatment methods considered. The reasons for this include perceptions of risk, health and safety and attitudes towards the project. However effective consultation and engagement with the local community can significantly allay concerns in this regard.

DRAFT STATEMENT FOR WASTE POLICY (Consultation Only) DOEHLG

Page 19 of these draft policy statements is specifically relevant to the current facility before the Board. It states that "the classification of incinerator bottom ash as hazardous will be examined in conjunction with the EPA which is in charge with the licencing of such facilities. In particular the application of eco-toxicity testing to the material will be examined. (Section 6.9 of document).

WASTE MANAGEMENT PLAN FOR THE DUBLIN REGION (2005-2010)

The Board will note that a subsequent Waste Management Plan has yet to be adopted for the region. Part 2 of the Plan sets out the present position in relation to waste generation in the region. The hazardous component of waste arisings in the region is set out in Table 4.11. It comprises of household waste, litter and street sweepings, commercial and industrial waste, C and E waste, contaminated soils, ash and incinerator residues, mining and quarry waste, healthcare waste and industrial sludge's.

In total this amounts to 228,644 tonnes of which 179,416 tonnes (78%) relates to contaminated soils (there is an assumption that all arisings in relation to contaminated soils are hazardous). Ash and incinerator residues currently amount to 512 tonnes. Section 19.1 of the Plan sets out policies and objectives in relation to hazardous waste streams at household level and for small businesses.

Table 18.5 sets out proposed infrastructure requirements. Listed is a hazardous waste landfill cell, the capacity of which is not specificifed according to the Plan. The Waste Management Plan notes that a hazardous waste landfill cell is required by the EPA and the local authorities will lead by means of a feasibility study, but is not known whether the facility will be developed by the public, private or partnership at this stage.

NATIONAL DEVELOPMENT PLAN

Under the Waste Management Sub-Programme €753 million will be invested in dealing with the problem of legacy landfills and in supporting the recycling and recovery effort. The Plan seeks to encourage competition in the waste market. The Plan notes the degree to which major private sector operators are initiating infrastructure projects. In line with national policy of the integrated approach to waste management, thermal treatment with energy recovery will be the preferred option for dealing with residual waste after achieving ambitious targets in respect of waste prevention, recycling and recovery. These Waste Energy Plans will be provided as entirely private sector developments or by way of a public private partnership.

There are no specific statements in the National Development Plan in relation to dealing with hazardous waste.

The Plan will however pursue cooperation with northern authorities in relation to a number of areas including wastewater.

CHANGING OUR WAYS (1998)

The original policy statement on waste management "changing our ways" set out the waste management hierarchy for the first time and this has remained the cornerstone of Irish waste management policy. There are no specific references to hazardous landfill requirements in the document. Section 7.7.1 of the document however states that in general, materials recycling and waste energy incineration are fully compatible with an integrated approach to waste management. While landfill disposal of residues will always be required, mass burning of waste to energy is effective in diverting over 70% of municipal waste away from landfill, and if properly controlled has a considerably lower environmental impact than landfill.

TAKING STOCK AND MOVING FORWARD (2004)

A further national waste management policy document was prepared on foot of CHANGING OUR WAYS in April 2004.

Two key points are particularly important as set out in this document.

Key point 10, thermal treatment, with energy recovery has a role to play as one element in the integrated approach to waste management; facilities will be the subject to stringent control through licences issued by the EPA and through substance licence enforcement and facility monitoring.

Key point 11 states that landfill, subject to rigorous light licencing will have a continued role as a waste management tool but it will progressively change to a residual role, in accordance with its place at the bottom of the waste hierarchy. Local authorities, when updating their Waste Management Plans will need to ensure that a timetable for the provision of the range of integrated waste infrastructure is provided so that an appropriate balance can be struck between:

- Having sufficient landfill capacity available in the short to medium-term pending the delivery of an alternative "higher in the hierarchy" infrastructure and
- Guarding against the overprovision of landfill which would be incompatible with its "residual" role in the integrated Waste Management Mix.

Section 4.5 of the document which relates to activities within the waste hierarchy states that while good progress has been made in relation to recycling, there is a need to secure greater advances on activities higher in the hierarchy – in relation to waste prevention and minimisation as well as those at lower levels in terms of thermal treatment and residual landfill. Section 4.5.7 of the report notes that while landfill is the least preferred waste management option – a reduced reliance on landfill will have an important beneficial impact from a climate change point of view – it nevertheless

has a role and will continue to have a role (albeit of a progressively reduced scale) to play in providing an outlet for residual waste which cannot be prevented, reused, recycled or otherwise recovered. It is therefore imperative that sufficient landfill capacity for this purpose is made available, particularly in the short to medium-term until the road out of alternative facilities can be more significantly advanced.

FINGAL COUNTY DEVELOPMENT PLAN

The MEHL site is within an area designated as LG3 (Landscape Group 3) and high lying agricultural. This forms part of the North Fingal Uplands (LG2, LG3 and LG4). These are described in the Development Plan as follows:

There are a number of important visual ridges on these uplands which are visible over a wider area of Fingal and Meath. There are spectacular views from the roads in the LG3 extending from the Wicklow Mountains in the south to the Mourne Mountains in the north and to Lambay Island to the east. Almost a whole county can be seen from the higher roads. The character of the uplands is very attractive in its own right with a mixture of pasture and arable farming combined with strong hedgerows on the area and there is a pronounced absence of any substantial deciduous or carnivorous woodland.

In terms of sensitivity it is stated that it is likely to be difficult to locate any built development in these areas without it becoming unduly obtrusive. Views of the upper elevations of the uplands are available from long distances and over a wide area of the surrounding lower lying countryside. Panoramic views are available from the uplands to the surrounding areas. These views should be protected. Rural uses such as houses, forestry, masts, extractive operations, landfills and large agricultural units have the potential to give rise to substantial impacts.

In terms of zoning for the site the MEHL site is covered by the zoning designation of "HA – High Amenity". The zoning objective is as follows:

Objective HA – *To protect and improve high amenity areas.* The zoning objective seeks to protect these highly sensitive and scenic locations from any inappropriate development. Only agricultural uses and low impact amenity uses will be considered, when it can be shown that the special qualities of these areas will not be eroded by any proposed development. In recognition of the amenity potential of these areas, opportunities to increase public access will be sought. It is noted that under the use classes related to the zoning objective extractive industry and major waste energy uses are not permitted.

The current **DRAFT DEVELOPMENT PLAN 2011-2017** is currently going through the third and final consultation period. Special County Council meetings are scheduled to take place on 22nd and 23rd March. Under the draft Plan the site is likewise governed by the zoning objective HA - High Amenity. The objective is to protect and enhance high amenity areas.

The vision seeks to protect these highly sensitive and scenic locations from inappropriate development and reinforce their character, distinctiveness and sense of

place. In recognition of the amenity potential of these areas, opportunities to increase public access will be explored. Uses not permitted include waste disposal and recovery facility (low impact) and waste disposal and recovery facility (high impact).

A specific local objective has been incorporated to the plan Objective which seeks to relocate the access and weighbridges from the current location on site, to the access road which runs along the southern boundary.

SITE SELECTION FOR NEW HAZARDOUS WASTE MANAGEMENT FACILITIES WHO PUBLICATION EUROPEAN SERIES NO. 46

This publication is not specific to landfills but relates to general hazardous waste management facilities. Of particular importance are the site selection criteria.
It suggests that screening criteria should be used to eliminate generally unsuitable areas. These would include as Step 1 the following:

- Coastal Areas
- Coastal Wetlands
- Areas with limestone deposits
- Areas with subsurface mining
- Areas critical for aquifer recharge
- Lands designated for preservation
- Areas of high well yield
- Areas including an aquifer that is the sole source of water for human consumption
- Areas of reservoir watersheds

Step 2 is to highlight promising areas such as:

- Industrial areas
- The sites of existing waste management facilities
- Compatible public lands
- Abandoned properties
- Lands with major highway access
- Lands near waste generators

Step 3 is to assess promising sites in detail. Areas listed below normally pose a risk to health and environments:

- Riverine areas subject to floods
- Freshwater wetlands
- Areas with flood hazards related to dams
- Coastal waters for shellfish and fishing
- Areas of upstream water supply intakes
- Areas with subsurface mining

The characteristics of soil and groundwater of each site should be also be assessed as should factor affecting the community. As to the latter the following should be considered.

- Areas of special significance
- The visual corridors of scenic rivers
- Existing developed areas

- Areas for which non-industrial development is planned for
- Agricultural districts

Step 4 is to evaluate and rank sites. This involves the consideration of factors affecting health and the environment such as:

- Population density
- The response time of rescue squads and emergency services
- Whether the site includes critical habitats or areas of potential mineral development
- Groundwater and soil characteristics
- Slope

Factors in the community that require assessment include:

- Access to sewers
- Transport restrictions
- Structures along transport corridors
- Whether the area contains historic sites
- Whether the land is used in ways incompatible with hazardous waste management
- Visual impact
- The feasibility of acquisition

Details of the screening procedures used in the case of a site in Ontario in Canada are set out in appendix 3 of the publication.

APPENDIX 5

KEY LEGISLATIVE PROVISIONS AND GOVERNMENT CIRCULARS RELATING TO WASTE

WASTE MANAGEMENT ACT 1996

Section 42(a) of the Act sets out definitions in relation to waste, hazardous waste, disposal and recovery.

In this Act hazardous waste means – 1. Hazardous waste for the time being mentioned in the list prepared pursuant of Article 1(4) of Council Directive 91/698/EEC of 12th December 1991 being either

1. ***Category 1 waste*** *that has any of the properties specified in Part 3 of the second Schedule or*

2. ***Category 2 waste*** *that*

(a) contains any of the constituents specified in Part 2 of the second schedule and
(b) has any of the properties specified in Part 3 of the said schedule.

(ii) Such other waste, having any of the properties specified in Part 3 of the second schedule, as may be prescribed for the purpose of this definition.

Category 1 waste means waste specified in any of the following paragraphs of Part 1 of the second schedule, namely Paragraphs 1-18.

Category 2 waste means waste specified in any of the following paragraphs of the said Part 1, namely Paragraphs 19-40.

For the purposes of the Act, hazardous waste is set out in the second schedule.

Part 1 sets out the categories are generic types of hazardous waste (Categories 1 and 2) and Part 2 sets out constituents of Category 2 waste which would render it hazardous when it has properties specified in Part 3.

Properties of waste which render it hazardous include the following:

- Explosive
- Oxidising
- Highly flammable
- Flammable
- Irritant
- Harmful
- Toxic
- Carcinogenic
- Corrosive
- Infectious

- Teratogenic
- Mutagenic
- Eco-toxic
- Residuary hazardous property

STATUTORY INSTRUMENT 126 of 2011 EUROPEAN WASTE (DIRECTIVE) REGULATIONS

These Regulations were enacted in March 2011 and contained amendments to the Waste Management Act of 1996 and Regulations to give effect to the Waste Directive. Some sections of the Regulations which are specifically applicable to the application before the Board are briefly summarised below. The Board may also wish to note that these Regulations were enacted subsequent to the application being submitted and the Oral Hearing proceedings thus there is no references to them in either the Planning application or the Transcripts of the Oral Hearing.

Section 15 of the Waste Management Act 1966 is amended by including the following

- Establishments or undertakers which carry out waste treatment operations, establishments are undertakers which collect or transport wastes on a professional basis, brokers and dealers, and establishments are undertakings which produce hazardous waste, shall be subject to appropriate periodic inspections by local authorities, the Agency (EPA) and by Dublin City Council as appropriate.

- Inspections concerning the collection and transport operations shall cover the origin, nature, quantity and destination of the waste collected and transported.

Section 15 subsection (2) of the Waste Management Act is amended as follows

- Persons referred to in Section 39(1), the producers of hazardous waste and the establishment and undertakings which collect or transport hazardous waste on a professional basis, or act as dealers or brokers of hazardous waste, shall keep a chronological record of the quantity, nature and origin of the waste, and, where relevant, the destination, frequency of collection, mode of transport and treatment method foreseen in respect of the waste, and shall make that information available, on request, to local authorities, the Agency or Dublin City Council as appropriate.

- For hazardous waste the record shall be preserved for at least three years (except in the case of establishments, and undertakers transporting hazardous waste which shall keep such records for at least 12 months).

- Documentary evidence that management operations have been carried out shall be supplied by the establishment or undertaking concerned at the request of the local authorities, the Agency or Dublin City Council or of a previous holder as appropriate.

Section 22(b) is amended as follows:

- The Agency shall, in accordance with Section 26, establish such a Plan for the State in respect of hazardous waste.

The Plan shall

- Lay down measures to protect the environment and human health by preventing or reducing the adverse impacts on the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use.
- Be in accordance with the Waste Hierarchy set out in Section 21(a)
- Meet the protection of human health and the environment obligations set out in Section 32(1) and
- Meet the principles of self-sufficiency and proximity set out in Section 37(a).

Waste Management Plans and Hazardous Waste Management Plans in existence at the commencement of the Regulations of 2007 shall be evaluated by 31st December 2012 and consequent on any such evaluation, where appropriate, be revised and brought into line with the requirements of the Waste Directive.

The following sections in Part 3 of the Regulations are also relevant in the context of the application before the Board.

Article 32 specifically relates to the protection of human health in the environment in that a person holding, treating or otherwise in control of the waste shall ensure that its management is carried out without endangering human health and without harming the environment and in particular

(a) without risk to water, air, soil, plants or animals
(b) without causing a nuisance through noise or odours and
(c) without adversely affecting the countryside or places of special interest.

A person who contravenes Paragraph 1 shall be guilty of an offence.

Article 33 specifically relates to the control of hazardous waste. It shall be the duty of waste producers and waste holders to ensure that the production, collection and transportation of hazardous waste as well as its storage and treatment are carried out in conditions providing protection for the environment and human health in order to meet the requirements of Section 32(1) of the Act 1996 and Regulation 32 including action to ensure traceability from production to final destination and control of hazardous waste in order to meet the requirements of Section 15(2) of the Act 1996 and Regulations 45 and 50. A person who contravenes Paragraph 1 shall be guilty of an offence.

Article 34 provides for the ban on mixing of hazardous waste. It should be the duty of waste producers and waste holders to ensure that hazardous waste is not mixed, either with other categories or with other waste substances and materials. The mixing shall include the dilution of hazardous substances. Again a person who contravenes this subparagraph shall be guilty of an offence.

Article 35 relates to the labelling of hazardous waste. It shall be the duty of waste producers and waste holders to take necessary measures to ensure that, in the course of collection, transport and temporary storage of hazardous waste, such waste is packed and labelled in accordance with international and community standards. Whenever hazardous waste is physically transferred within the state by a person, it shall be accompanied by an identification document, which shall be in electronic form containing appropriate data specified.

Article 44 allows inspections to take place of establishments or undertakings which carry out waste treatment operations, establishments or undertakings which collect or transport waste on a professional basis, brokers and dealers, and the establishments and undertakings which produce hazardous waste shall be subject to appropriate periodic inspections by local authorities.

Article 45 relates to record keeping and requires establishments or undertakings referred to including the producers of hazardous waste and the establishments and undertakings which collect or transport hazardous waste on a professional basis or act as dealers or brokers of hazardous waste shall keep a chronological record of the quantity, nature and origin of the waste and where relevant the destination, frequency of collection, mode of transport and treatment method foreseen in respect of waste, and shall make that information available inspection.

EU COUNCIL DECISION 2003/33/EEC

This Decision establishes the criteria procedures for the acceptance of waste at landfill in accordance with the principles set out in Directive 1999/31/EEC (Landfill Directive).

Section 1 of the Annex attached to the Directive lays down the procedure to determine the acceptability of waste at landfills. This procedure consists of the basic characterisation, compliance testing and onsite verification as defined in Section 3 of Annex 2 of the Landfill Directive.

Section 2 of the Annex attached to the Directive sets down acceptance criteria for each landfill class.

Section 1.1.2 sets out the fundamental requirements for the basic characterisation of the waste. These include

(a) Source and origin of the waste
(b) Information on process producing the waste (description and characteristics of raw materials and products).
(c) Description of the waste treatment applied in compliance with Article 6(a) of the Landfill Directive, or a statement of reasons why such treatment is not considered necessary.
(d) Data on the composition of waste and the leaching behaviour where relevant.
(e) Appearance of the waste (small, colour, physical form).

(f) Code according to the European Waste List (comMsion decision 2001/118/EEC).
(g) For hazardous waste in the case of mirror entries the relevant hazard properties according to Annex 3 of Council Directive 91/689/EEC of 12th December 1991 on hazardous waste.
(h) Information to prove that waste does not fall under the exclusions of Article 5(3) of the Landfill Directive.
(i) The landfill class of which the waste may be accepted.
(j) If necessary additional precautions to be taken at the landfill.
(k) Check if the waste can be recycled or recovered.

Section 1.3 sets out onsite verification procedures.

Section 2 of the Directive sets out waste acceptance criteria and lists the various in-earth wastes for which testing is not required prior to landfill.

Section 2.2 sets out criteria for landfills for non-hazardous waste. It states that member states may create subcategories for landfills for non-hazardous waste.

Section 2.3 sets out criteria for hazardous waste acceptable at landfills for non-hazardous waste pursuant to Article 6(c)(iii). This includes stable nonreactive hazardous waste which has the leaching behaviour of waste which will not change adversely in the long-term under landfill design conditions for foreseeable accidents.

Section 2.3.3 of the Directive sets out the waste acceptance criteria for asbestos waste.

Section 2.4 of the Directive sets out criteria for waste acceptable at landfills for hazardous waste. Leaching limit values are set out in Table 2.4.1.

Section 2.5 sets out criteria for underground storage. Section 3 of the Directive sets out sampling and testing methods.

Appendix A sets out the Safety Assessment for acceptance of waste in underground storage and highlights the importance of the geological barrier and the site specific risk assessment (source pathway receptor).

Appendix B sets out an overview of the landfilling options provided by the Landfill Directive. Options are provided for in-earth waste landfill. It states that if the waste is not hazardous and meets the criteria for waste to be landfilled in-earth landfill the waste may be placed in in-earth landfill. In-earth ways may alternatively be placed in landfills for non-hazardous waste provided it fulfils appropriate criteria.

In relation to non-hazardous waste landfills if the waste is neither hazardous or in-earth then it must be non-hazardous and should grow to a landfill for non-hazardous waste. Member states may define subcategories of landfills for non-hazardous waste in accordance with their own National Waste Management Strategies. National acceptance criteria may be developed by member states.

If the waste is hazardous the treatment of any such waste may have enabled the waste to meet criteria for placement of stable non-reactive hazardous waste in non-hazardous

waste landfills within cells for inorganic waste with low organic/biodegradable content which meet the criteria set out in Section 2.2.2. This waste may be granular (rendered chemically stable) or solidified/monolithic. If the hazardous waste does not meet the criteria for placement in a cell for non-hazardous waste the next question could be whether or not it meets criteria for acceptance at a landfill for hazardous waste (Class C). If the criteria are met then the waste may be placed in a hazardous waste landfill. If the criteria for acceptance at a hazardous waste landfill are not met the waste may be subject to further treatment and tested again against the criteria until they are met. The diagram showing the landfill options provided in the Landfill Directive are set out in Figure 1.

LANDFILL DIRECTIVE 1999/31/EEC

The aim of the Directive is by way of stringent operational and technical requirements on the waste and landfills, to provide for measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air and on the global environment including the greenhouse effect, as well as any risk resulting to human health from the landfilling of waste during the whole life cycle of the landfill.

Article 2 sets out definitions and includes definitions of hazardous waste, non-hazardous waste and in-earth waste. The definition of hazardous waste is as set out in Directive 91/689/EEC.

Article 4 sets out the classes of landfill and states that each landfill shall be classified in one of the following classes.

- Landfill for hazardous waste
- Landfill for non-hazardous waste
- Landfill for in-earth waste.

Article 5 of the Directive requires each member state to set up a national strategy for the implementation of the reduction of biodegradable waste going to landfills. The targets are set out in Article 5(2) of the Directive.

Article 6(b) requires member states to take measures to ensure that only hazardous waste which fulfils the criteria set out in accordance with Annex 2 is assigned to a hazardous landfill.

Article 7 requires each member state to ensure that certain information is submitted in order to issue a permit for a landfill development.

Article 8 requires that a number of conditions be met before any landfill permit is issued by the competent authority.

Article 9 sets out the content of any permit including the list of defined types and total quantity of waste which are authorised to be deposited in the landfill.

Article 10 requires member states to take measures to ensure that all costs involved in the setting up, operation and aftercare of the landfill site are covered.

Article 11 sets out waste acceptance procedures at any landfill. This includes keeping a register of the quantities and characteristics of waste deposited including the origin, date of delivery, identity of the producer and collector etc.

Article 12 sets out procedures in relation to the control and monitoring during the operational phase of the landfill.

Article 13 relates to closure and aftercare procedures at the landfill.

Article 14 relates to existing landfill sites and requires member states to take measures in order that landfills which have been granted a permit are already in operation during the transposition of the Directive may not continue to operate unless steps which are outlined in Article 14 are adhered to as soon as possible and within 8 years of the date of the Directive (2007).

Annex 1 sets out general requirements for all classes of landfills.

In relation to location the location of the landfill must take into consideration requirements relating to

(a) The distances from the boundary of the site to residential and recreational areas, waterways, water bodies and other agricultural and urban sites.
(b) The existence of groundwater, coastal water and natural protection zones in the area.
(c) The geological and hydrogeological conditions of the area.
(d) The risk of flooding, subsidence landslides or avalanches on site.
(e) The protection of the nature or cultural patrimony of the area.

Part 2 of the Annex sets out details in relation to water control and leachate management and requires appropriate measures to be taken with respect to the characteristics of the landfill and the meteorological conditions in order to ensure that the landfill poses no potential hazard to the environment. It is also a requirement to treat contaminated water and leachate collected from the landfill to an appropriate standard.

Article 3.2 relates to the geological barrier. The barrier is determined by geological and hydrogeological conditions. The landfill basin sides shall consist of a mineral layer which satisfies the permeability and thickness requirements with the combined effect in terms of protection of soil, groundwater and surface water and at least equivalent to the one resulting from the following requirements.

- Landfill for hazardous waste. K less than or equal to 1 x 10 to the – 9 metres per second thickness greater or equal to 5 metres.
- Landfill for non-hazardous waste K less than or equal to 1 metre x 10 to the – 9 metres per second thickness greater than 1 metre.

- Landfill for in-earth waste K less than or equal to 1 x 10 to the – 7 metres per second thickness greater than or equal to 1 metre.

Where the geological barrier does not naturally meet the above conditions it can be completed artificially and reinforced by other means giving an equivalent protection.

Article 3.3 sets out requirements in relation to a leachate ceiling system and collection.

Annex 2 sets out waste acceptance criteria and procedures for the composition, leachability, long-term behaviour and general properties of the waste to be handled at the landfill must be known as precisely as possible. Before the definition of such analysis methods and limit values member states should at least set a national list of waste to be accepted or refused at each class of landfill or define the criteria required to be on the lists. The criteria for acceptance at a specified class of landfill must be derived from a consideration pertaining to the protection of the receiving environment including health hazards to humans. The general procedures for the testing and acceptance of waste is based on

- Basic characterisation
- Compliance testing
- An on-site verification.

In the case of in-earth waste landfills only in-earth waste is defined in Article 2(e) can be accepted on the list.

In relation to non-hazardous waste landfills in order to be accepted on the list a waste type must not be covered by Directive 91/689/EEC.

Hazardous waste landfills are preliminary rough list for hazardous waste landfills will consist of only those waste types covered in Directive 91/689/EEC. Such waste types should however not be accepted on the list without prior treatment if they exhibit total contents or leachability of potential hazardous components that are high enough to constitute a short-term occupational or environmental risk or to prevent sufficient waste stabilisation within the projected lifetime of the landfill.

Annex 3 of the Directive sets out control and monitoring procedures in operation and aftercare phases. These set out requirements in relation to the collection of the meteorological data, emission data and groundwater data. A trigger level must also be determined taking account of this, specific hydrogeological formations in the location of the landfill and groundwater quality. A trigger level must be laid down in a permit wherever possible.

COUNCIL DIRECTIVE 2008/98/EC

This Directive became operative since December 2010. It sets out basic concepts and definitions in relation to waste management and lays down principles in relation to 'Polluter Pays Principle' and the 'Waste Hierarchy'.

The Directive sets out a 5 step hierarchy of waste management options which must be applied to Member States when developing their national waste strategies namely:

- Waste Prevention
- Re-use
- Recycling
- Recovery
- And Waste Disposal (least preferred option).

Member states must report periodically on progress and the Directive sets out new targets on recycling. The directive also defines conditions where mixing of hazardous waste is permissible

COUNCIL DIRECTIVE ON HAZARDOUS WASTE (91/689/EEC)

The main purpose of this Council Directive is the approximation of the national laws on the controlled management of hazardous waste. Hazardous waste is defined as having one or more of the properties set out in Annex 3 of the Directive. The Directive requires that all hazardous waste shall be recorded and identified. Appropriate measures shall be undertaken in order to ensure that hazardous waste is disposed of, recovered or collected and transported in an appropriate manner. It is also a requirement that different categories of hazardous waste or hazardous and non-hazardous waste are not mixed. The Directive also requires that hazardous waste be properly packaged, labelled and stored in accordance with international and community law.

In order to be classified as hazardous waste the waste must have one of the following properties as set out in Annex 3 of the Directive.

- Explosive
- Oxidising
- Highly flammable
- Flammable
- Irritant
- Harmful
- Toxic
- Carcinogenic
- Corrosive
- Teratogenic
- Mutagenic
- Eco-toxic

GOVERNMENT CIRCULAR WIR04/05

This Circular from the DoEHLG dated 3rd May 2005 issues policy guidance in pursuant of Section 60 of the Waste Management Act 1996 (as amended). It specifically deals with

(a) Action against illegal waste activity.
(b) Movement of waste.

In relation to the second issue it notes that the policy document "Taking Stock and Moving Forward" recognised the trend whereby certain planning permissions in respect of waste infrastructure restrict facilities to dealing only with waste arising within the area to which the Waste Management Plan arise. The policy document reflects acceptance that facilities provided in a region must deal primarily with the waste from that region. However it also recognises that an unnecessarily restrictive approach may not be in-keeping with the philosophy underpinning the regional approach to waste management planning and by implication, the rational use of waste management infrastructure. The EPA have stated that "the interregional movement and treatment of waste should be provided for in appropriate circumstances".

The Minister confirms that one of the fundamental components of policy in regard to the regulation of the movement of waste is the application of the Proximity Principle. The application of the Proximity Principle does not entail interpreting administrative waste management planning boundaries in such a manner as to inhibit the development infrastructure which will support the attainment of national waste management policy objectives to the rational development and use of such infrastructure.

APPENDIX 6 EPA TECHNICAL GUIDANCE AND DOCUMENTATION

Landfill manuals, landfill site design (200)

This document was prepared by the EPA in 2000. Chapter 1 sets out details in relation to waste policy and an introduction to landfill site design. Chapter 2 sets out design objectives and considerations. Chapter 3 sets out site development works. Site preparation works and materials requirement and balance are important considerations. It is important that the designer estimate the quantities of materials required and the quantities arising from site development. In terms of phasing to avoid frequent and disruptive proprietary works it is recommended that the design lifespan of a phase be a minimum of 12 months.

In terms of phased preparation it is stated that the numbers of cells in a phase and cell size should be based on water balance calculations.

Section 4 relates to site infrastructure. Details in relation to access traffic and traffic controls are set out. Details in relation to site accommodation, weigh bridges, wheal cleaner and site services are also set out.

Section 5 relates to groundwater and surface water management.

Groundwater management may be required in order to minimise/prevent

- Interference with the groundwater regime during the construction period
- Damage to the liner due to uplift
- Transport of contaminants from the landfill and
- Leachate generation by preventing groundwater infiltration.

Groundwater control measures are set out in Section 5.2.3.

Reference should be made to

- The groundwater regime
- The permeability and hydraulic conductivity of all data beneath the landfill
- The distribution, thickness and depth of sub-soils and bedrock
- The attenuation properties in the subsoil
- The location of any potential targets including wells, springs etc.
- Groundwater contours, gradients and rates of permeability
- Groundwater protection zones
- Relationship with surface water
- Catchment areas
- Groundwater vulnerability
- An aquifer category.

Details of surface water management including surface water collection systems are set out in Section 5.3.

Section 6 sets out details in relation to lining systems. In relation to a hazardous waste landfill it is stated that a minimum composite liner should be used for hazardous waste landfill sites. Two options are presented. Alternative systems may be considered for pre-treated hazardous waste such as solidification, stabilisation and verification of hazardous wastes. It should consist of the following

- A minimum 0.5 leachate collection layer having a minimum hydraulic conductivity of 1 x 10 to the – 3 metres per second.

- A top composite liner consisting of a minimum of 2mm HDEP flexible membrane liner.
- A 1 metre thick layer of compacted soil with a hydraulic conductivity of less than or equal to 1 x 10 to the – 9 metres per second constructed in a series of compacted lifts no thicker than 250mm when compacted or a 0.5 metre artificial layer of enhanced soil or similar.

- A minimum 0.5 metre thick leachate detection layer having a minimum hydraulic conductivity of 1 x 10 to the – 3 metres per second or a geo-synthetic material that provides an equivalent performance.

The bottom composite liner should consist of a minimum of

- 2mm HDPE or equivalent flexible membrane liner upper component.

Basin side wall minimal layer minimum thickness of 4 metres having a hydraulic conductivity of less than or equal to 1 x 10 to the – 9 metres per second and a minimum 1 metre of the 4 metre thick minimal layer should form the lower component of the composite liner and should be constructed in a series of compacted lifts no less than 250mm when compacted. Details of non-hazardous biodegradable landfill liners and in-earth landfill liners are also set out and indicated on Figures 6.1(a) for hazardous waste landfill liners and 6.1(b) for non-hazardous biodegradable waste landfills and in-earth waste landfills.

Section 6.3 sets out details in relation to natural clay linings. Reference is made to the clay content, the particle size distribution, the density, the compaction method and the moisture content. It is stated that the hydraulic conductivity of such liners can be tested in a laboratory. Details of the construction process is set out in Section 6.3.5.

Quality assurance and quality control are required to verify that the construction materials are adequate, the compaction process is adequate and that the surface layer is smooth enough to prevent any damage to a flexible membrane liner.

Section 6.4 relates to bentenite enhanced soils. Bentenite may be added to natural soils to improve permeability characteristics. Bentenite is mixed with soils either in thin layers or in a batching plant. Geo-membranes (flexible membrane liners) are set out in Section 6.6. It is stated that geo-membrane liners need to have long-term chemical stability with suitable friction characteristics. In general geo-membranes in basin liner system range from 1.5 to 2.5mm in thickness. Details of the installation are set out in Section 6.6.3.

Section 6.7 sets out geo-membrane leak location surveys. Electrical leak location surveys should be undertaken on newly constructed landfill liners to investigate the presence of holes through the geo-membrane. Detected holes should be repaired before the landfill is brought into service. The permanent leak location survey consists of a grid of electrodes installed beneath the composite liner when a defect is identified within the grid spacing it is subsequently pinpointed using a portable volt meter and moving probe. The defects should then be uncovered, repaired and retested.

Section 7 relates to leachate management.

The main constituent of leachate is set out in Section 7.1.2. It is normally measured in terms of BOD, COD or TOC. The degradation process is generally divided into five successive stages namely

- Aerobic
- Hydrolysis and fermentation
- Acetogenesis
- Mephanogenic and
- Aerobic

It states that tree leachate is characterised by high organic material content within BOD/COD ratio of greater than 0.4 and a low PH. The significant constituents of leachate are set out in Section 7.1.3. They include:

- Ammonia
- Organic loading
- Chloride
- Phosphorus
- Metals
- Sulphate
- Dissolved gases
- And other compounds which may be toxic and hazardous.

Stage 3 the acetogenic phase incorporates the percentage of maximum concentration of leachate constituents. Section 7.2 sets out leachate volumes and quality. These are determined by effective rainfall, liquid wastes and the absorptive capacity of the waste and the overall waste input. Water balance calculations are important and should be carried out using a number of scenarios in relation to rainfall events and volumes of leachate generated.

Section 7.3 sets out leachate collection and removal systems. Section 7.4 relates to leachate storage.

It is stated that recirculation of leachate is practiced in many countries mainly to promote more uniformed degradation rates and a short-term leaching storage measures. (The Board will note that leachate is to be used in the solidification process proposed in the current application).

Section 8 sets out details in relation to leachate treatment. The Board will note that leachate treatment is to be carried out off site.

Section 9 relates to landfill gas. As biodegradable waste is not proposed to be accepted at the application site landfill gas management does not arise.

Section 10 sets out details in relation to capping, design and construction. The objective of capping is to minimise infiltration of water into the waste, promote surface water drainage and maximise runoff as well as to provide a physical separation between waste and plant and animal life. Details of the components of the capping system set out in Section 10.4 and comprise of topsoil, subsoil drainage layer, a barrier layer, a gas drainage layer and a system for leachate recirculation. Recommended capping systems are set out in Section 10.5. In relation to hazardous landfill capping systems the capping system for this type of facility should consist of at a minimum the following:

- Topsoil of 150-300mm and subsoil of at least 1 metre total thickness, a drainage layer of 0.5 metres of thickness having a hydraulic conductivity of 1 x 10 to the – 4 metres per second.

- A compacted minimum layer of 0.6 metres thickness having a hydraulic conductivity of less than or equal to 1 x 10 to the – 9 metres per second in intimate contact with a 1mm flexible membrane liner.

Details of landfill capping systems for hazardous, non-hazardous and in-earth landfills are indicated in Figure 10.1.

Section 11 relates to quality assurance and quality control.

Section 12 relates to health and safety aspects of landfill design.

EPA Landfill Monitoring Manual (2003)

The introductory chapter sets out the reasons for and the requirements of landfill monitoring. Section 2 sets out the monitoring programme and notes that monitoring is required throughout the life of the landfill. Monitoring of the following should be made.

- Surface water
- Groundwater
- Leaching
- Landfill gas
- Odours
- Noise
- Meteorological conditions
- Dust particulate matter
- Topography and stability
- Ecology
- Archaeology.

The document then sets out details in relation to

- The selection of suitable monitoring points
- Monitoring parameters
- Monitoring frequencies
- Equipment to be used in monitoring
- Sampling and analytical measures to be employed in monitoring
- Quality assurance and quality control procedures.

Section 3 sets out quality assurance/quality control parameters to be included in landfill monitoring programmes. Specific reference is made to field operations and laboratory operations.

Section 4 relates to surface water and sets out guidance in relation to monitoring locations and suggests that monitoring should be undertaken at not less than 2 locations. In relation to surface water draining from the landfill site monitoring before and after any discharge to receiving water should be undertaken. Section 4.3 sets out details in relation to monitoring frequency and parameters for analysis.

Section 4.4 sets out details in relation to biological assessment of surface water quality.

Section 4.6 sets out trigger levels. It states that the licensee may need to determine normal levels and trigger levels for parameters such as TOC and conductivity for the water entering the surface water management features such as settlement and holding ponds. Sampling guidelines are set out in Section 4.7. The procedure for collecting a representative water sample is set out in Figure 4.1.

Section 5 relates to groundwater. It provides guidance in relation to monitoring locations and the design and construction of boreholes in order to monitor groundwater. Details are also given in relation to trigger levels and sampling guidelines.

Section 6 relates to leachate. It notes that the main factors that influence the generation of leachate include:

- Meteorological conditions on site
- Waste composition
- Waste density
- Age of waste
- Depth of infill
- Moisture content
- Rate of water movement
- System of lining.

It sets out details in relation to monitoring locations, frequencies and parameters for analysis. It also suggests that occasional proxticity limits may also be set out in a waste licence. Details of sampling are set out in Section 6.5 of the Manual. Section 7

sets out details in relation to landfill gas which is not applicable to the current application.

Section 8 sets out monitoring details in relation to odour which likewise is not applicable as no biodegradable waste will be deposited within the landfill.

Section 9 relates to noise. It sets out details in relation to monitoring locations and in particular noise sensitive monitoring locations. In relation to noise monitoring it is stated that all monitoring of noise should be in accordance with ISO 1996, Parts 1, 2 and 3.

In terms of noise emissions it is suggested that general guidelines are that noise emissions monitoring at noise sensitive locations should not contain any tonal component or impulsive component and should not exceed an $_{LAeq}$ T-value of 55dBA during the day time and 45dBA at night time.

Section 10 deals with other monitoring issues including monitoring of meteorological data (precipitation, temperature, evaporation, atmospheric pressure and humidity etc.).

Dust and particulate matter

Topography and stability including the structural integrity of the landfill and ecology and archaeology. In relation to the latter it is stated that the potential impact of a landfill will be disturbed and in some instances cover archaeological remains.

Finally Section 7 sets out the reporting of monitoring and refers to both routine reporting and annual environmental reports.

Landfill Operational Practices (EPA 1997)

This guideline produced by the EPA in 1997 sets out details in relation to the operation of landfills. The introductory section sets out EU and national policy and the role of the landfill. It states that the objective of the Manual is to contribute to the improved management of existing biodegradable landfill sites while providing guidance as to how new sites should be operated. Section 2 sets out details in relation to site record keeping and management and highlights the importance of the Environmental Management Plan. Section 3 sets out details in relation to site appearance and infrastructure. In terms of infrastructure the Manual deals with access security, plant and buildings, waste inspection areas, wheal wash facilities, weigh bridges, quarantine areas and fuel storage. It states that weigh bridges should be installed at all sites with annual inputs of greater than 10,000 tonnes. In terms of quarantine areas it is stated that provision should be made for an area of temporary storage of rejected loads or other materials which are deemed unsuitable.

Section 4 sets out details in relation to waste in-placement. All areas earmarked for filling should be cleared of surface water, vegetation and other materials. A basin drainage system should be included. Deposited waste should generally be compacted into shallow layers of up to 2 metres. The working phase should be maintained at a slope no greater than 1 in 3. A number of landfilling techniques are also set out

including face tipping and the onion skin method. Details of waste compaction are also set out.

Section 4.4 relates to disposal of difficult wastes. These refer to wastes which may not fall within the criteria of hazardous waste under the Waste Management Act, however due to the properties may require special arrangements for disposal to landfill. Section 4.5 relates to water balance and waste in-placement. The importance of covering material to reduce the amount of leachate is highlighted.

In terms of cell sizes it is suggested that it is crucial that the cell size should be maintained to minimum practical dimensions. Minimising the cell sizes will

- Provide the smaller surface area of exposed waste (reducing leachate)
- Assist in controlling windblown litter
- Reduce the requirements for cover material.

It is also desirable that part of the cell is reserved for the disposal of waste with high paper content of times of high winds. This can be located at a sheltered location at the landfill.

Details of cover materials as set out in Section 4.6 of the Manual. It is noted that traditional cover is typically composed of sub-soils and other excavation wastes or construction industry waste such as bricks and crushed broken concrete.

Details of temporary capping and final capping are set out in Section 4.7 of the Manual.

Section 5 deals with leachate and leachate generation. The various stages of leachate generation and the typical leachate composition is set out in Figure 9 in Table 3 of the Manual respectively. In details of leachate collection methods are set out in Table 5.4. It is stated that an effective leachate collection and removal system is a prerequisite for new sites. It notes that an uncontrolled outflow of leachate may have significant effect on local environment particularly on aquatic systems. Typically the leachate collection system involves two stages. These involve the installation of a system which directs leachate to a small number of collection points and secondly the extraction of leachate from the collection points themselves. The leachate collection pipework should be surrounded by at least 0.5 metres depth of granular low finds aggregate. The base of the site should be constructed so that at least a 1 in 50 gradient is attained in the direction of the leachate collection points.

Section 6 relates to landfill gas control. The Board will note that this is not an issue in relation to the current application as it is not proposed to replace biodegradable waste at the landfill.

Section 7 relates to nuisance control and deals with issues in relation to vehicular traffic, litter, odours, noise, birds, vermin's, fires and dust and mud.

Section 8 relates to safety issues at the landfill.

Section 9 relates to public liaison and public consultation. It is important that complainants have access to the sites local management so the problems can be dealt with by the person directly responsible from the site. The possibility of establishing a local liaison group between the landfill operator and neighbours of the site should be considered.

Landfill Manuals, Investigations for Landfill

This document was produced by the Environmental Protection Agency in 1995. The introductory sector sets out the role of the EPA National Policy, EU Policy, Environmental Impact and reference is also made to the Waste Bill 1995 (subsequently Waste Management Act 1996). Section 2 sets out the objectives of the investigation including site suitability considerations. In this regard reference is made to the site selection process placing particular emphasis on the identification of environmental effects. Safety assessments and aftercare are also important considerations. In terms of site design information is required on the particle distribution, permeability, strengths, compressibility and poor water conditions of the underlying ground to assess the deformation, behaviour and ceiling potential of the subsoil and the stability of the sub-rock.

Section 3 relates to planning and procurement. The principle elements of site investigation is set out in Section 3.1.2. It involves an initial appraisal.

- Desk study
- Walkover survey
- Geophysical survey
- Preliminary assessment
- Definition of objectives of detailed assessment
- Design of detailed assessment
- Work programme for detailed assessment
- Installation of monitoring equipment
- Reporting
- Inclusions and recommendations in relation to the sites examined.

The investigation contractor will require specialist expertise in relation to hydrology, hydrogeology, geology, ecology etc.

Section 4 sets out the preliminary assessment and the extent of investigations required at this level. It elaborates on issues in relation to ecology, hydrogeology, landscape etc.

Section 5 sets out what is required in a more detailed assessment of the site and outlines the nature and extent of investigations required to be undertaken.

Section 6 relates to contract documents and contractors selection.

Section 7 relates to investigation management.

Section 8 relates to interpreting the results of the investigations.

Appendix A sets out details relating to investigation of existing landfill sites and the importance of undertaking such investigations. Appendix B sets out various investigation techniques required for site selection.

EPA Manual on Site Selection – Draft for Consultation (December 2006)

This is similar in nature to the above document but sets out key environmental principles subsequently adopted at European level including the Proximity Principle, the Precautionary Principle and the Polluter Pays Principle in determining suitable sites.

Greater emphasis is placed on local development policy and in particular the requirements of the Local Development Plan. The document also highlights the importance of public consultation in determining appropriate landfill citing.

Section 5 of the Manual sets out the importance of identifying exclusion areas. Reference is made to Annex 1 of the Landfill Directive 1999/31/EEC in particular

- The distances from the site to sensitive receptors (residential recreational waterways etc.)
- The existence of groundwater, coastal water or natural protection zones in the area
- The geological and hydrogeological conditions of the area
- The risk of flooding
- The protection of cultural heritage

The importance of regionally important aquifers, geological unstable areas, flood plains, designated areas for conservation and airports are also referred to. Archaeology and amenity considerations should also be taken into consideration.

Section 6 sets out the criteria for site assessment and selection.

Figure 1 shows the step by step approach for site selection. In the criteria assessment reference is made to

- Land use
- Land area requirement/availability
- Impact on the local community
- Road safety
- Visual amenity.

Section 6.6 highlights the importance of buffer zones for sensitive receptors. Section 6.7 highlights the importance of geological and hydrogeological issues and Section 6.8 relates to geological falls. It is worth noting that the Manual states that in locating areas suitable for landfill it is difficult to avoid being on or close to geological falls. Hydrology and surface water protection issues are set out in Section 6.9. Section 6.10 relates to topography while Section 6.11 deals with the issue of visual impact and potential for natural screening. The potential for the proposal to impact on the ecology

and in particular designated areas is set out in Section 6.12. Details regarding archaeological issues, areas of high amenities and airports are set out in Section 6.13 to 6.15 respectively. Other issues dealt with in terms of the important criteria for determining site selection include meteorology, traffic/access, availability of cover material and services and security in Section 6.16 to 6.19 respectively.

Section 7 relates to shortlisting of sites and site selection. Section 7.2 sets out issues to be addressed in the preliminary assessment while Section 7.3 concerns issues to be assessed in the detailed assessment.

In relation to site selection Section 7.5 specifically relates to private landfills. It notes that private sector operator's do not have the powers of compulsory purchase so must locate the best site in the area from those locations that are or will be made available.

With regard to the preferred site the Manual highlights Annex 1 of the Landfill Directive which states that the landfill can only be authorised where the characteristics of the site or the corrective measures to be taken indicate that the landfill does not pose a serious environmental risk.

Appendix A sets out the Groundwater Protection Response for landfills. These are set out in Table 1. As a general rule landfills are not deemed to be acceptable in areas that have a vulnerability rating of extreme or high in the case of inner or outer source protection areas and regionally important aquifers. In the case where the vulnerability rating of the site is deemed to be moderate landfills are generally not acceptable in inner and outer source protection areas and in regionally caustic important aquifers.

In the case where the vulnerability rating is low landfills are not deemed to be acceptable in inner source protection areas. In all other resource aquifer protection areas landfills are generally deemed to be acceptable subject to qualitative safeguards which are set out in the Groundwater Protection Response.

EPA European Waste Catalogue and Hazardous Waste List (January 2002)

The definition of waste as set out in the Waste Management Acts 1996 and 2001 is set out. The definition of hazardous waste as defined in Section 4(2) of the Waste Management Act 1996-2001 is also referred to. In order to be classified as hazardous waste a waste must

- Appear on the hazardous waste list or prescribed under Section 4(2)(a)(ii) of the Waste Management Act.
- The properties listed in Annex 3 of Directive 91/689/EEC is set out in the document.

Chapter 10 of the Waste Classification List specifically relates to waste from thermal processes. These are listed below

1001: Waste from power stations and other combustible plants (except 19).

100101: Bottle mash, slag and boiler dust (excluding boiler dust mentioned in 100104).

100102: Coal fly ash.

100103: Fly ash from peat and untreated wood.

100104: Oil fly ash and boiler dust (hazardous).

100105: Calcium based reaction waste from flu gas desulphurisation in solid form.

100107: Calcium based reaction waste from flu gas desulphurisation in sludge form.
100109: Sulphuric acid (hazardous).

1001013: Fly ash from emulsified hydrocarbons used as fuel (hazardous).

100114: Bottom ash, slag and boiler dust from co-incineration containing dangerous substances.

100115: Bottom ash, slag and boiler dust from co-incineration and other than those mentioned in 100114.

100116: Fly ash from co-incineration containing dangerous substances (hazardous).

EPA NATIONAL WASTE REPORT 2009

Particularly important chapters in relation to the current application are Chapter 8- Construction and Demolition Waste and Chapter 9 - Hazardous Waste.

In relation to construction and demolition waste (C&D waste) the total quantity of construction and demolition waste collected in 2009 was estimated at just under 5.1 million tonnes, a decrease of 62% since 2008. 99% of this waste was recovered. The remainder was disposed in landfills (c.56,000 tonnes). In 2009 local authorities reported a total of 639 active waste facility permit holders authorised to accept C & D waste.

Chapter 9 relates to hazardous waste. The total amount of hazardous waste managed in Ireland in 2009 is presented in Table 29 and in Figure 13 of the report. In 2009 a total of 289,910 tonnes of hazardous waste was produced. 150,395 tonnes was exported.

Just less than 90,000 tonnes was treated off-site in Ireland and just under 75,000 tonnes was treated onsite in the various industries.

The treatment of various hazardous wastes in Ireland excluding contaminated soil is set out in Table 30. The major treatment of hazardous wastes relate to solvents, oil waste and salt cake. These categories of wastes between them account of 66% of the hazardous waste treated in Ireland. In terms of methods of treatment of hazardous waste in Ireland (including contaminated soil) a total of 15,238 tonnes is landfilled representing just fewer than 10% of the total hazardous waste treated nationally.

Table 32 sets out the category of waste type which was exported from 2007-2009. Solvents accounted for just over a third of the waste exported. Industrial hazardous waste, lead acid batteries, aqueous washing liquids and construction and demolition waste, and asbestos waste accounted for an additional 40% of waste exported.

The disposal and recovery of reported exported hazardous waste in 2009 is set out in Table 33.

Details of the treatment of hazardous waste at Irish IPPC licence facilities in 2009 are set out in Table 34.

The detail of export destinations of hazardous waste in 2009 is set out in Figure 14. Exports to Great Britain accounted for 42%, exports to Belgium accounted for 26% and exports to Germany accounted for 22%. Details of the destination of hazardous waste exports are set out in Table 35.

In relation to contaminated soil it is stated that there was a large decrease in the treatment of contaminated soil off-site in Ireland in 2009 compared to 2008. All reported off-site treatment takes place in a facility in Portlaoise. Overall there was also a significantly large decrease in the reported export of contaminated soil. Only 4% of contaminated soils were reported as exported for treatment in 2009 principally to the Netherlands and Germany. The reported off-site management of contaminated soil 2001-2009 is set out in Table 36. Approximately 12,500 tonnes was predominantly recovered or recycled off-site in Ireland where a total of 476 tonnes was exported out of the country.

Section 10.4 relates specifically to a hazardous waste landfill. It notes that Ireland currently has no designated hazardous waste landfill disposal facility. In 2010 the EPA published a Study commissioned under the National Hazardous Waste Management Plan 2008-2012 that examined the technical and economic aspects of developing a national difficult waste facility (incorporating hazardous waste landfill) (NaDWaF Report). This Study took an all-Ireland view in relation to a needs assessment and concluded that there was an annual need for c.216,000 tonnes hazardous waste landfill capacity rising to 300,000 tonnes by 2020. A significant governance aspect for hazardous waste facilities is the “care in perpetuity” commitment. The environmental and health risks for hazardous waste such as asbestos etc. does not diminish in time or degrade so even after safe containment there is a long-term institutional control to ensure the maintenance of the facility integrity.

Finally in relation to hazardous waste the report notes that during 2010 Murphy Environmental Hollywood Ltd. who operates an industrial waste facility at the Naul, County Dublin announced that they were entering the strategic infrastructure process with An Bord Pleánala for the development of a hazardous waste facility at its Hollywood site.