



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/Art14_080811
Direct Dial: 01 8433744
Direct Fax: 01 8433747
Date: 8th August 2011

Dear Mr. Meaney,

**Re.: Murphy Environmental Hollywood Ltd. (MEHL), EPA Ref. W0129-03
Response to EPA Correspondence of 26th July 2011 re. 'Article 14' Information**

Thank you for your correspondence of 26th July 2011 regarding notice in accordance with Article 1(2)(b)(ii) of the Waste Management (Licensing) Regulations 2004. MEHL responds as follows (EPA text is included as ***Bold Italics***):

- 1. *With reference to article 12(1)(f) of the Waste Management (Licensing) Regulations 2004, provide a revised Table B.7.1 and Table H.1(A) identifying the relevant classes of activity according to the Third and Fourth Schedules to the amended Waste Management Acts 1996 to 2011.***
 - 1.1 Please find revised Table B.7.1 attached in **Appendix 1**, based on the updated version (2011) of the EPA waste licence application form at www.epa.ie
 - 1.2 Please find revised Table H.1(A) attached in **Appendix 2**, based on the updated version (2011) of the EPA waste licence application form at www.epa.ie

- 2. *Clarify the location in the application of information or provide information to address the requirements of article 12(1)(t bis) of the Waste Management (Licensing) Regulations 2004.***
 - 2.1 12(1)(t bis) of the Waste Management (Licensing) Regulations 2004 (as amended) requires that the application shall "*describe in outline the main alternatives, if any, to the proposals contained in the application which were studied by the applicant.*"
 - 2.2 Chapter 3 of the Environmental Impact Statement (EIS) which accompanied the Waste Licence Application considered the site layout and design alternatives. Chapter 3 of the EIS also described the site suitability assessment for the proposed MEHL integrated waste management facility.
 - 2.3 For ease of reference, EIS Chapter 3 is attached as **Appendix 3**.



Directors: Seamus Murphy (Managing Director), Patricia Rooney, Rory Murphy, Emma Murphy
Reg. Office: Hollywood Great, Nag's Head, Naul, County Dublin
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- 3. Provide information to address the requirements of article 12(1)(v) of the Waste Management (Licensing) Regulations 2004, as amended, in relation to a description of how the waste hierarchy in section 21A of the amended Waste Management Acts 1996 to 2011 is applied. Please have regard to the requirements of section 29(2A) of the amended Acts in addressing this item.**
- 3.1 12(1)(v) of the Waste Management (Licensing) Regulations 2004 (as amended) requires that the application shall "describe how the waste hierarchy in Section 21A of the Act is applied".
- 3.2 Section 21A(1) of the Waste Management Acts 1996 to 2011 requires that the following waste hierarchy "shall apply as a priority order in waste prevention and management legislation and policy:
- (a) Prevention;
 - (b) Preparing for re-use;
 - (c) Recycling;
 - (d) Other recovery (including energy recovery); and
 - (e) Disposal."
- 3.3 Section 21A(2) states that "When applying the waste hierarchy referred to in subsection (1), the Minister, the Agency and the local authorities...shall take measures to encourage the options that deliver the best overall environmental outcome." Also, "Such measures may require specific waste streams departing from the hierarchy where this is justified by life-cycle thinking on the overall impacts of the generation and management of such waste."
- 3.4 Section 21A(3) states that "The Minister shall ensure that the development of waste legislation and policy is a fully transparent process, observing existing national rules about the consultation and involvement of citizens and stakeholders".
- 3.5 Section 21A(4) requires that "the Minister, the Agency and the local authorities shall take into account the general environmental protection principles of precaution and sustainability, technical feasibility and economic viability, protection of resources as well as the overall environmental, human health, economic and social impacts, in accordance with Article 1 of the Waste Directive and section 32(1)."
- 3.6 Article 1 of the Waste Directive states: "This Directive lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use". Section 32(1) [of the European Communities (Waste Directive) Regulations 2011] relates to the protection of human health and the environment.



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- 3.7 The MEHL proposed integrated waste management facility applies the priority order waste hierarchy as follows:

PRIORITY:	The proposed integrated waste management facility will:
(a) Prevention:	- Use appropriate materials for engineering works on site, thereby preventing waste
(b) Preparing for re-use:	- Not relevant to proposed development
(c) Recycling:	- Recover suitable materials and have consideration for possible recovery options in the future
(d) Other recovery (including energy recovery):	- Facilitate the development of modern and future waste management infrastructure, including energy from waste incineration by providing residual waste landfill capacity
(e) Disposal:	- Apply BAT for the safe and environmentally-sound landfilling of non-recoverable and non-combustible wastes and residues

Prevention

- 3.8 Waste prevention is largely outside the control of MEHL in that, by and large, material delivered to the MEHL facility would be considered waste.
- 3.9 MEHL can prevent certain materials from becoming a waste by using appropriate materials on-site, e.g. for site engineering works.

Preparing for re-use

- 3.10 'Preparing for re-use' means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing. Such activities are not deemed relevant at the proposed integrated waste management facility; however wastes received at the MEHL facility may have previously been subject to this activity further up the waste management chain.

Recycling

- 3.11 The Waste Licence Application (W0129-03) makes provision for recycling/recovery activities relating to inert/Construction & Demolition waste and the recovery of metals within wastes delivered to the facility.
- 3.12 As set out in Attachment H.3 of the Waste Licence application, it is proposed that waste placement at MEHL is controlled and recorded in a manner which could facilitate the future recovery of bottom ash from the site (a principle sometimes referred to as 'Design to Mine').

Other recovery (including energy recovery)

- 3.13 Whilst not directly relevant to the proposed development, the integrated waste management facility is deemed to be an integral part of the waste hierarchy. In this context, the facility would provide residual waste landfill capacity, which is a requirement of modern waste management infrastructure, including energy from waste facilities.
- 3.14 As stated in the EIS (Section 2.6), six of the ten waste management regions, representing 29 of the 34 county and city councils in Ireland, propose to develop waste to energy infrastructure. Of those authorities not proposing to develop waste to energy capacity, some are proposing to use neighbouring capacity.

Disposal

- 3.15 The proposed MEHL facility will involve the construction of fully engineered landfill cells, designed to international best practice standards, suitable for the acceptance of hazardous ash and soils and other compatible non-biodegradable waste streams; non-hazardous, non biodegradable wastes; and inert wastes.
- 3.16 The key piece of waste infrastructure missing in Ireland is a hazardous waste landfill. This need has been identified in multiple policy documents, including the National Hazardous Waste Management Plan 2008-2012, which recommends that at least one hazardous waste landfill be developed in Ireland, capable of accepting the wide range of hazardous wastes that would otherwise be exported for landfill.

General

- 3.17 The proposed development is located in a former quarry; infilling and restoration of the site will serve to restore the worked-out quarry, in keeping with the surrounding landscape.
- 3.18 Residual waste landfill capacity is an integral part of the waste hierarchy and facilitates the development of modern and future waste management infrastructure.
- 3.19 Wastes accepted at the integrated waste management facility will be subject to appropriate pre-treatment, as required under the EPA Municipal Solid Waste Pre-treatment & Residuals Management technical guidance document (2009). This guidance supports government policy in respect of the role of source segregated waste collection, for maximum waste recovery options and recycles value, as well as ensuring diversion of biodegradable waste from landfill.
- 3.20 The need for the proposed development is set out in Section 2.2 of the EIS, and may be summarised as:
- The National Hazardous Waste Management Plan 2008-2012 recommends that at least one hazardous waste landfill be developed in Ireland, capable of accepting the wide range of hazardous wastes that would otherwise be exported for landfill.
 - EU waste policy requires member states to achieve self-sufficiency in the management of waste. Currently there is no option but to export certain wastes.
 - Waste management plans adopted in the Republic and Northern Ireland acknowledge the need for all island solutions to hazardous waste.
 - Adequate waste management infrastructure is vital for economic development. Currently, Ireland's infrastructure for managing hazardous waste is deficient.
 - Managing such waste in Ireland will give rise to economic opportunities and a beneficial spin-off for local industries and local employment, which are currently foregone because the waste is exported.
 - Managing non-biodegradable wastes, residues and waste soils in Ireland will reduce the greenhouse gas emissions arising from the export of the waste and will reduce any risk associated with waste shipments.
 - EU waste policy requires member states to implement the waste hierarchy, which ranks energy recovery from waste which cannot be recovered or recycled, higher than disposal of the waste. The MEHL facility will facilitate the development of modern and future waste management solutions in line with the waste hierarchy.
- 3.21 Waste facility design and operation at the proposed integrated waste management facility will ensure the protection of human health and the environment, as further discussed in Section 4 overleaf.



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- 4. Provide information for the purpose of enabling the Agency to make a determination in relation to the matters specified in paragraph (j) of section 40(4) of the amended Waste Management Acts 1996 to 2011.**
- 4.1 Section 40(4)(j) of the Act states that "The Agency shall not grant a waste licence unless it is satisfied that the intended method of treatment is acceptable from the point of view of environmental protection, in particular when the method is not in accordance with section 32(1)".
- 4.2 Section 32(1) states that "A person holding, treating or otherwise in control of waste shall ensure that waste management is carried out without endangering human health, 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".
- 4.3 Waste activities at the proposed integrated waste management facility are compatible with the principles of environmental protection. Materials will be held, transported, recovered or disposed of only in a manner that will not cause environmental pollution. The proposed integrated waste management facility has been designed in accordance with Best Available Techniques (BAT).
- 4.4 An Environmental Impact Statement (EIS) has been prepared to provide information on the possible environmental effects of the construction and operation of the integrated waste management facility. The predicted impacts and recommended mitigation measures were comprehensively detailed in the EIS; summary information was provided as **Table 19.1** and **Table 19.2** in the EIS, copies of which are included in **Appendix 4**.
- 5. Confirm that information provided in the application is adequate to allow the Agency to address section 37A of the Waste Management Acts 1996 to 2011, as amended, or alternatively provide additional information to ensure all relevant points are addressed.**
- 5.1 Section 37A relates to the principles of self-sufficiency and proximity and states the following:
- "37A. (1) (a) In carrying out their respective functions under this Act and related waste prevention and management legislation and policy, the Minister (in cooperation with other Member States where this is necessary or advisable), the Agency, An Bord Pleanála and the local authorities shall take appropriate measures to establish an integrated and adequate network of waste disposal installations and of installations for the recovery of mixed municipal waste collected from private households, including where such collection also covers such waste from other producers, taking into account best available techniques.
- (b) (i) By way of derogation from the TFS Regulation, Dublin City Council may, following consultation with the Agency and any local authority concerned, in carrying out their respective functions under this Act in order to protect the national network, limit incoming shipments of waste destined to incinerators that are classified as recovery, where it has been established that such shipments would result in national waste having to be disposed of or waste having to be treated in a way that is not consistent with waste management plans.
(ii) Dublin City Council shall notify the Commission of any such decision.
(iii) Dublin City Council may also limit outgoing shipments of waste on environmental grounds as set out in the TFS Regulation.
- (2) The 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 subsection (1), and to enable the State to move towards that aim individually, taking into account

geographical circumstances or the need for specialised installations for certain types of waste.

(3) The network shall enable waste to be disposed of or waste referred to in subsection (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.

(4) The principles of proximity and self-sufficiency shall not mean that the State has to possess the full range of final recovery facilities within the State."

- 5.2 In its decision to grant permission for the MEHL integrated waste management facility under section 37G of Planning and Development Act, 2000, as amended, An Bord Pleanála cited the following reasons and considerations:

"(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."

National Hazardous Waste Management Plan 2008-2012

- 5.3 At present, there is no merchant landfill for hazardous waste in Ireland. The proposed MEHL facility meets the requirements of the National Hazardous Waste Management Plan 2008-2012 in relation to the identified need for a hazardous waste landfill facility.

- 5.4 The National Hazardous Waste Management Plan recommends a policy of moving towards national self sufficiency by seeking to minimise the export of hazardous waste. In order to achieve this, Page IX of the Plan notes that *"if Ireland were to become fully self-sufficient, hazardous waste landfill and incineration are measures which would be required"*. Furthermore, Page 69 of the Plan states that *"It is recommended that at least one hazardous waste landfill be developed in Ireland, capable of accepting the wide range of hazardous wastes that would otherwise be exported for landfill. Such a facility would be expected to provide a key national service and should have an 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 co-located with an existing or planned landfill facility with the objective of utilising existing infrastructure such as site roads, weighbridges and staff facilities, thereby saving costs."*

Proximity Principle

- 5.5 According to the European Environmental Agency, the proximity principle *"implies that waste should generally be managed as near as possible to its place of production, mainly because transporting waste has significant environmental impacts."*



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- 5.6 The Minister for the Environment, Heritage and Local Government has issued guidance under Section 60 of the Waste Management Act (Circular WIR: 04/05) which clarifies that the inter-regional movement and treatment of waste should be provided for in appropriate circumstances, while ensuring that the facilities are provided primarily for the needs of the region in which they are located and in line with the proximity principle.
- 5.7 The proximity principle does not specify or require every waste disposal facility to be local. The NaDWaF report (EPA (2010) *Technical and Economic Aspects of Developing a National Difficult Waste Facility*) states that: *"The point of disposal of waste as close to its production is not always appropriate in the case of the need for a national facility to deal with hazardous waste, therefore examination on a county by county basis for the national need applying the proximity principle cannot be appropriate. Instead proximity will mean within Ireland or the island of Ireland"*.

All Island Approach

- 5.8 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.
- 5.9 Page 6 of the UK Plan for Shipments of Waste published in 2007 by the Department of Environment, Food and Rural Affairs states that *"shipments of hazardous waste for disposal are allowed between Northern Ireland and Ireland. Such shipments will be allowed in either direction provided that such waste is both generated and disposed of within Northern Ireland or Ireland. Both EU and UK policy allow for the provision of an all island approach to the landfill of hazardous waste"*.
- 5.10 Waste management plans adopted in Northern Ireland also acknowledge the need for all island solutions to hazardous waste. The Area 21 Waste Management Plan published in 2006 by the Eastern Region Waste Management Group which covers eleven Councils in the east of Northern Ireland, states that *"in terms of all island cooperation, particular priorities might include utilising existing or planned treatment facilities on an all island basis"*.

Shipment of Waste

- 5.11 The EC Regulation on the Shipment of Waste (*Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on Shipments of Waste*) sets out the framework for the shipment of waste within, into and out of the European Community. Article 11 of the Regulation sets out methods by which Member States may object to shipments of waste for disposal. One of the grounds for objection relates to promoting the principles of proximity, priority for recovery and self sufficiency in the disposal of waste at both the Community and national level. Therefore Member States have the discretion to prohibit the shipment of waste in order to achieve objectives related to proximity and self sufficiency (NaDWaF report, page 34).

Revised non-technical summary

A revised non-technical summary for the Waste Licence Application is attached as **Appendix 5**. The information provided in this response is deemed not to impinge on the EIS non-technical summary.

This information is submitted in the format: one signed original and one copy, plus 16 No. copies on CD-ROM. Please accept this letter as a declaration that the content of the electronic files on the accompanying CD-ROMs is a true copy of the original.

If you have any further queries in relation to this matter please do not hesitate to contact me at 01-8433744.

Yours sincerely,



Patricia Rooney
Director & General Manager, MEHL

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LIST OF APPENDICES

Appendix 1: Revised Table B.7.1

Appendix 2: Revised Table H.1(A)

Appendix 3: Extract from EIS: Chapter 3, Consideration of Alternatives

Appendix 4: Extract from EIS: Section 19.2, Summary of Mitigation Measures

Appendix 5: Revised non-technical summary for the Waste Licence Application

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**APPENDIX 1:
Revised Table B.7.1**

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A.1 Type of Waste Activity, Tonnages & Fees

A.1.1 Specify the class or classes of activity in Table B.7.1, in accordance with the Third Schedule or Fourth Schedule to the Waste Management Acts 1996 to 2010, as amended by the European Communities (Waste Directive) Regulations, 2011, to which the application relates (check the relevant box(es) and mark the principal activity with a 'P').

Attachment B.7 should identify the principle activity and include a brief technical description of each of the other activities specified. There can only be one principal activity.

TABLE B.7.1 THIRD AND FOURTH SCHEDULES OF THE WASTE MANAGEMENT ACTS 1996 TO 2010

Waste Management Acts 1996 to 2010					
Third Schedule Waste Disposal Operations		Y/N	Fourth Schedule Waste Recovery Operations		Y/N
D 1	Deposit into or on to land (e.g. including landfill, etc.).	Y	R 1	Use principally as a fuel or other means to generate energy: This includes incineration facilities dedicated to the processing of municipal solid waste only where their energy efficiency is equal to or above: <ul style="list-style-type: none"> - 0.60 for installations in operation and permitted in accordance with applicable Community acts before 1 January 2009, - 0.65 for installations permitted after 31 December 2008, using the following formula, applied in accordance with the reference document on Best Available Techniques for Waste Incineration: Energy efficiency = $(E_p - (E_f + E_i)) / (0.97 \times (E_w + E_f))$ where— <ul style="list-style-type: none"> ‘E_p’ means annual energy produced as heat or electricity and is calculated with energy in the form of electricity being multiplied by 2.6 and heat produced for commercial use multiplied by 1.1(GJ/year), ‘E_f’ means annual energy input to the system from fuels contributing to the production of steam (GJ/year), ‘E_w’ means annual energy contained in the treated waste calculated using the net calorific value of the waste (GJ/year), ‘E_i’ means annual energy imported excluding E_w and B_f(GJ/year), ‘0.97’ is a factor accounting for energy losses due to bottom ash and radiation. 	N
D 2	Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.).	N	R 2	Solvent reclamation/regeneration.	N
D 3	Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.).	N	R 3	Recycling /reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), which includes gasification and	N



WASTE Application Form

				pyrolysis using the components as chemicals.	
D 4	Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.).	N	R 4	Recycling/reclamation of metals and metal compounds.	Y
D 5	Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.).	P	R 5	Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.	Y
D 6	Release into a water body except seas/oceans.	N	R 6	Regeneration of acids or bases.	N
D 7	Release to seas/oceans including sea-bed insertion.	N	R 7	Recovery of components used for pollution abatement.	N
D 8	Biological treatment not specified elsewhere in this Schedule which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12.	N	R 8	Recovery of components from catalysts.	N
D 9	Physico-chemical treatment not specified elsewhere in this Schedule which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 (e.g. evaporation, drying, calcinations, etc.).	Y	R 9	Oil re-refining or other reuses of oil.	N
D 10	Incineration on land.	N	R 10	Land treatment resulting in benefit to agriculture or ecological improvement.	N
D 11	Incineration at sea (this operation is prohibited by EU legislation and international conventions).	N	R 11	Use of waste obtained from any of the operations numbered R 1 to R 10.	N
D 12	Permanent storage (e.g. emplacement of containers in a mine, etc).	N	R 12	Exchange of waste for submission to any of the operations numbered R 1 to R 11 (if there is no other R code appropriate, this can include preliminary operations prior to recovery including pre-processing such as, amongst others, dismantling, sorting, crushing, compacting, pelletising, drying, shredding, conditioning, repackaging, separating, blending or mixing prior to submission to any of the operations numbered R1 to R11).	N
D 13	Blending or mixing prior to submission to any of the operations numbered D 1 to D 12 (if there is no other D code appropriate, this can include preliminary operations prior to disposal including pre-processing such as, amongst others, sorting, crushing, compacting, pelletising, drying, shredding, conditioning or separating prior to submission to any of the operations numbered D1 to D12).	N	R 13	Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced).	Y
D 14	Repackaging prior to submission to any of the operations numbered D 1 to D 13.	N			
D 15	Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced).	Y			

P = principal activity



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**APPENDIX 2:
Revised Table H.1(A)**

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H.1 Waste Types and Quantities – Existing & Proposed

Provide an estimation of the quantity of waste likely to be handled in relation to each class of activity applied for. This information should be included in Table H.1(a).

TABLE H.1(A). QUANTITIES OF WASTE IN RELATION TO EACH CLASS OF ACTIVITY APPLIED FOR

Waste Management Acts 1996 to 2010 3rd Schedule (Disposal) Operations		Waste Management Acts 1996 to 2010 4th Schedule (Recovery) Operations	
Class of Activity Applied For	Quantity (tpa)	Class of Activity Applied For	Quantity (tpa)
Class D 1	200	Class R 1	
Class D 2		Class R 2	
Class D 3		Class R 3	
Class D 4		Class R 4	1,300
Class D 5	445,000	Class R 5	600
Class D 6		Class R 6	
Class D 7		Class R 7	
Class D 8		Class R 8	
Class D 9	50,000	Class R 9	
Class D 10		Class R 10	
Class D 11		Class R 11	
Class D 12		Class R 12	
Class D 13		Class R 13	1,600
Class D 14			
Class D 15	1,300		

Please note that anticipated tonnes per annum (tpa) will, in general, be lower than above; however the application seeks to maintain the existing licence (W0129-02) limit of 500,000 tpa (please see Attachment H.1 of the Waste Licence Application).



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APPENDIX 3:

Extract from EIS: Chapter 3, Consideration of Alternatives

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3 Site Suitability and Alternatives

3.1 Introduction

This chapter describes the site suitability assessment for the proposed MEHL integrated waste management facility. The suitability of the site has been validated using published criteria for waste landfills. The site layout and design alternatives considered are also outlined in this chapter.

3.2 Site Suitability Study

3.2.1 Introduction

The existing MEHL landfill facility has planning permission to infill at a rate of 500,000 tonnes per year with inert waste (Planning Register References F04A/0363 & F07A/0262). In granting this permission, the Planning Authority envisaged that the void space in the former quarry would be filled by 2019 and the land reinstated and landscaped at that time.

The existing MEHL landfill facility and the proposed integrated waste management facility is unique in so far as it is, and will remain, specifically and exclusively operated for the acceptance of non-biodegradable materials, and has been since landfill operations commenced at the site in 2003. It was also the first landfill in Ireland whose licence was issued directly from the criteria set out under the EU Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills and can equally claim itself the first to attain ISO 14001 certification for a privately-operated landfill in Ireland. As landfill is a restricted and finite resource in Ireland the best advantage should be taken of such facilities, taking into account the following:

- Infrastructural gaps in the Waste Sector to address modern waste management and the preferred waste hierarchy.
- Proximity to markets.
- Safe handling and materials management.
- Restriction and/or elimination of export of waste to other jurisdictions.
- Site suitability and capacity to address the identified need.

Modern waste management in accordance with the waste hierarchy is moving towards diversion of waste from traditional landfill. Residual waste landfill capacity is an integral part of the waste hierarchy and facilitates the development of modern and future waste management infrastructure.

MEHL is aware of the government policy to reduce or eliminate the present practice of exporting hazardous waste to landfills in other countries, as soon as suitable landfill and other waste management facilities are available within the island of Ireland. In light of government policy and the reducing demand for landfill capacity from the construction industry, MEHL decided to investigate whether its facility at Hollywood would be suitable for the acceptance of hazardous and non-hazardous waste.

A two part site suitability assessment was undertaken to determine if the MEHL site was suitable for the acceptance of hazardous waste. The following is a description of the site suitability assessment, which was undertaken for the proposed MEHL integrated waste management facility. It should be noted that the Site Suitability Study was the first step taken to ascertain the suitability of the subject site for consideration and was undertaken before any consultant group was considered or appointed to compile the EIS.

1. In September 2009 prior to the preparation of the EIS, MEHL commissioned Patel Tonra Ltd and Manahan Planners to carry out an assessment of the suitability of the existing landfill at Hollywood, Great Naul, County Dublin, for the acceptance of hazardous waste. A full copy of the Site Suitability report is contained in **Appendix 3.1**.
2. Subsequently, Arup undertook a site validation exercise using published criteria for waste landfills, as part of the preparation of the EIS.

The site suitability study examined the suitability of the MEHL site for the disposal of hazardous waste and assessed how the MEHL site compared with other landfill sites in the Republic of Ireland in terms of suitability for the acceptance of hazardous waste.

Overview of Site Suitability Assessment Approach

A systematic assessment approach was developed in the Patel Tonra Ltd - Manahan Planners report to allow the MEHL site to be compared with a shortlist drawn from all available landfill sites in Ireland of other potentially suitable sites and a ranking was established. A schematic of the assessment approach is provided in **Figure 3.1**.

Initially, consideration was given to developing hazardous landfill disposal infrastructure at a new greenfield or undeveloped site.

However, developing hazardous landfill disposal infrastructure at a new greenfield site was not considered appropriate for the following reasons:

1. Section 5.2.2 of the Department of Environment, Heritage and Local Government policy document on waste, *Waste Management, Changing Our Ways 1998*, states that: "Where immediate landfill capacity problems exist, action to extend the life of existing landfill facilities, rather than to provide new landfill sites, should be a priority".
2. Section 6.5 of the EPA *National Hazardous Waste Management Plan 2008-2012* states the following: "The facility could be co-located with an existing or planned landfill facility with the objective of utilising existing infrastructure such as site roads, weighbridges and staff facilities, thereby saving costs".
3. The advantages offered by developing hazardous landfill capacity at an established, operational and currently licensed landfill site versus a greenfield site option were identified as follows:
 - Lead-in time – established and operational sites offer significant advantages in terms of planning and licensing processes. The lead-in time to get new waste facilities 'off the ground' can be viewed as prohibitive.

- Financing – the investment requirements of establishing Ireland’s first and only hazardous waste disposal facility is very substantial and the financial realities of such a project may prove prohibitive, particularly for greenfield sites.
- Land ownership – a company with full ownership and control over its site will have distinct advantages over companies which are required to identify, acquire and purchase an appropriate property.
- The co-location of hazardous waste disposal infrastructure with other appropriate landfilling activities offers advantages in terms of shared infrastructure, operation and management. Existing and operational landfill sites will have already invested in much of these requirements in order to comply with licence conditions.

Having determined that developing hazardous landfill disposal infrastructure at a greenfield site was not appropriate, the potential for developing hazardous landfill disposal infrastructure at a licensed landfill site was assessed using a staged approach as follows:

- Level 1 Assessment: The purpose of the Level 1 Assessment was to examine existing licensed sites and to exclude ones which were deemed wholly unsuitable in the context of the current proposal, due to severely limiting licensing factors relating to imminent site closure.
- Level 2 Assessment: For the existing landfill sites remaining after the Level 1 Assessment, a more detailed set of evaluation criteria were applied to each of the licensed sites and a shortlist of sites drawn up.
- Level 3a Assessment: Each of the shortlisted sites identified was assessed with regard to the WHO (World Health Organisation) criteria for site selection for new hazardous waste management facilities. The approach in the WHO guidelines has been adopted as a conservative benchmarking tool.
- Level 3b Assessment: For each of the shortlisted sites, the geographical location of the disposal site was examined with respect to the expected incinerator ash waste generation points in the country.

Following the Level 2 assessment three sites, including the MEHL site, were shortlisted.

As part of the Stage 1 Site Suitability Report produced by Patel Tonra and Manahan Planners in September 2009, an assessment of each of the shortlisted sites with respect to the WHO Guidelines was undertaken as part of the Level 3A assessment. Full details are provided in **Appendix 3.1**.

Screening (and exclusionary) criteria guide this process – these criteria aid in judging the overall suitability of a location and in differentiating candidate sites, but are not necessarily decisive in the choice of location. The assessment is a four-step process as follows:

Test 1 To eliminate generally unsatisfactory areas (geographically).

Test 2 To highlight promising areas (as per current use).

Test 3 To assess promising sites in detail (from health, community and environmental risk perspectives).

Test 4 To evaluate and rank sites (from the perspectives of community, environmental and social impacts).

The characteristics of the shortlisted sites, in terms of each of the four tests, are presented in Appendix 4 of the Site Suitability Report provided in **Appendix 3.1** to this Chapter.

In the Step 1 assessment, the MEHL site has a low sensitivity in seven of the eight relevant categories. It is of medium sensitivity in relation to areas with limestone deposits.

The Step 2 assessment shows that the MEHL site is a promising area as this site ranks highly in all three relevant categories, namely sites of existing waste management facilities, lands with major highway access and location close to waste generators.

In the Step 3 assessment, the MEHL site has a low sensitivity in seven of the ten relevant categories. It is of medium sensitivity in relation to existing developed areas, areas for which non industrial development are planned and agricultural districts.

In the Step 4 assessment, the subject site ranks highly in relation to eight out of the ten categories. It ranks medium in the two other categories.

Conclusion of Site Suitability Assessment

The assessment considered the suitability of the MEHL site for the secure disposal of hazardous and non-hazardous incinerator ash, hazardous and non-hazardous soils and inert soil arising on the island of Ireland.

Firstly, the capacity of the facility was reviewed in terms of the likely quantity of the target wastes that will arise over the 25-30 year period. The remaining licensed void space at MEHL was found to be substantial in comparison to other operating landfills and, most importantly, compared favourably with the likely volumes of the target waste arisings.

Secondly, the location and access to the site was considered in terms of the likely centres of the target waste arisings. Again, the Hollywood site scored highly in this regard as it is located on a national transport corridor and within the Greater Dublin Area. Its location in the Dublin-Belfast corridor is considered a significant advantage with regard to the generation of the target wastes within Northern Ireland.

A review of other landfills indicated that only two other existing landfills had the capacity to cater for the target wastes over the coming 25-30 years. However, one of these sites is somewhat less favourably located with respect to future target waste arisings, while the other site scores similarly in this matter to Hollywood.

In summary, the site suitability assessment concluded that the MEHL site has suitable capacity for the acceptance of the expected volumes of the target wastes that are likely to arise on the island over the future 25-30 years and that the MEHL site is ideally located regarding the likely centres of these waste arisings. Based upon the WHO Selection Criteria, the MEHL site enjoys a favourable rating.

3.2.2 Stage 2: Site Validation Using Published Alternative Criteria

The following two key documents were considered as part of the site validation exercise for the EIS. The Site Suitability study included an assessment of each of the shortlisted sites with respect to the WHO Guidelines. Refer to Section 3.2.2.3.

3.2.2.1 EPA Landfill Manuals, Manual on Site Selection (Consultation Draft, 2006)

The purpose of the EPA manual on landfill site selection is to provide guidance on the selection of a landfill site and assist those involved in assessing the impact of a landfill on the surrounding environment including those involved in the decision making in respect of such proposals.

The guidance is primarily aimed at municipal, industrial and commercial waste landfills falling into the non-hazardous waste landfill category. With regard to the hazardous waste landfill category, the guidance may offer some assistance, but for additional screening and selection criteria appropriate to such a facility, consultation with the 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 #46).

Part 5 of the manual states that “at an early stage in the site selection process exclusionary areas, i.e. areas considered to be generally unsuitable for landfill should be identified”. The following factors must be considered:

- Landfill Directive
- Regionally Important Aquifers
- Geological Unstable Areas
- Flood Plains
- Airports
- Designated Areas for Conservation
- Archaeological Heritage
- Areas of High Amenity

These factors have been considered by the Planning Authority as part of previous planning approvals and by the EPA in the granting of the waste licence for the existing MEHL landfill facility. All of these factors will be reassessed in this EIS.

Part 6 of the manual outlines criteria for site assessment and selection, as shown in **Table 3.1** below.

3.2.2.2 Centre for Advanced Engineering (CAE) Landfill Guidelines Towards Sustainable Waste Management in New Zealand (2000)

These Guidelines provide guidance on siting, design and construction with respect to new landfills and lateral expansions of existing landfills on a site specific basis.

The Guidelines deal specifically with landfills intended to accept municipal solid waste. Chapter 3 of the Guidelines deals with Landfill Siting, in particular:

- Landfill siting philosophy
- Strategic planning
- Site selection process
- Landfill siting criteria

The Guidelines state that it is unlikely that any site will meet all siting criteria. Therefore the assessment of the suitability of a site for a landfill becomes a balance of trade-offs with respect to:

- Comparison of site characteristics with alternative locations
- The potential for engineered systems to overcome site deficiencies
- Methods of operation proposed for the site
- Social and cultural issues associated with the site

In order to minimise future risk to the environment from landfilling activities, primary considerations should be given to key issues and potential fatal flaws with respect to geology, hydrogeology, surface hydrology and site stability, as shown in Table 3.1 below.

Table 3.1 EPA and New Zealand Site Assessment Criteria

Site Assessment Criteria	EPA Manual	NZ CAE Guidelines
Land Use/Compatibility with surrounding land use	✓	✓
Land Area Requirements/Availability	✓	✓
Local Community/Community Issues	✓	✓
Buffer Zones for Sensitive Receptors	✓	x
Geology and Hydrogeology	✓	✓
Geological Faults	✓	x
Hydrology and Surface Water Protection/Surface Hydrology	✓	✓
Topography	✓	✓
Site Visibility/Natural Screening	✓	x
Ecology/Environmentally Sensitive Areas	✓	✓
Archaeological Heritage/ Environmentally Sensitive Areas	✓	✓
Areas of High Amenity/Environmentally Sensitive Areas	✓	✓
Airports	✓	x

Site Assessment Criteria	EPA Manual	NZ CAE Guidelines
Meteorology/Climatic Conditions	✓	✓
Traffic/Access	✓	✓
Availability of Cover Material	✓	x
Services and Security	✓	x
Site Stability	x	✓
Leachate Management	x	✓
Landfill Gas Management	x	✓

✓ - Criterion is addressed in the EPA Manual / NZ CAE Guidelines

X - Criterion is not addressed in the EPA Manual / NZ CAE Guidelines

Each of the site assessment criterion listed in **Table 3.1** are considered in turn below with respect to the proposed MEHL integrated waste management facility.

Land Use/Compatibility with surrounding land use.

The MEHL site is located within a rural and agricultural area where residential dwellings are dispersed throughout the surrounding areas. The predominant land use in the immediate vicinity of the proposed site is agricultural. To the north and south it is mainly pasture. There is a waste permitted facility located to the north-west of the MEHL facility, which has been in operation since January 2005. The waste facility permit (WPT 60) was issued on 30th June 2004 and was extended for a further three years on 30th June 2007. There is a second waste permitted facility to the south-west of the facility, operational since 2009. The waste facility permit for this facility was issued on 28th May 2008 (WPT 136). The Fingal County Council proposed landfill site (not yet commenced or operational) is located 1.4 km to the south east of the MEHL site. Refer to **Figure 3.2**. To the south-east, east and west the land is predominantly used for tillage.

The site and its environs are zoned Objective HA (High Amenity) in the Fingal Development Plan 2005 – 2011 where the objective is '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.

The MEHL landfill has been operating since 2003 within this zoning and previously the site operated as an active quarry for many decades. The site will, in time, once filled and restored, serve to enhance its scenic and amenity qualities.

Land Area Requirements/Availability

The proposed MEHL development will occur within the proposed waste licence site boundary with sufficient area available in the ownership and direct control of MEHL to allow a buffer zone to be maintained around the perimeter of the site. There is no proposed change to the licensed landfill area or red line planning boundary at the site.

The site is located in an area deemed sensitive in terms of landscape, due to its position at a high point within its surroundings. The visual impact during the operational stages of landfilling is deemed to be insignificant as the landfill operation will not be highly visible from surrounding areas. Only during the final stages of operations, when works are at or near the level of the surrounding ground will there be a potential for a visual impact.

A combination of imported materials and site deposits will be used to complete the capping layer and restore the site in accordance with the agreed final restorations plan. The quality and quantity of cover material will be in accordance with EPA and Landfill Directive requirements.

Local Community/Community Issues

Consultation is ongoing to ensure that the views of various stakeholders, including the local community and individuals are taken into account in the decision making process. A comprehensive public consultation process with neighbouring landowners, potential receptors and interested parties has been undertaken. Refer to **Chapter 1 Introduction** for more details.

Buffer Zones for Sensitive Receptors

Buffers are intended to provide space or distance between an activity and a sensitive receptor for the purpose of mitigating an actual or potential environmental risk to that receptor. For example, in a landfill situation where potential impacts might include noise, dust, odour, visual, gas migration, etc., a buffer would be created by setting the active landfill back from adjoining sensitive receptors. MEHL has created buffer zones around the entire perimeter of the site where the perimeter could or might encroach on a neighbouring property.

The proposed waste types to be accepted are non-biodegradable, hazardous, non hazardous and inert wastes. These waste types do not generate landfill gas.

There is sufficient area available to allow a buffer zone to be maintained around the perimeter of the site and the hazardous cell will be located centrally on site to allow for additional buffering by the non hazardous and inert waste cells.

Geology and Hydrogeology

A detailed bedrock geology assessment carried out at the site indicated a complex sequence of lithologies. These range from Namurian interbedded sandstones and shales in the north of the site to Brigantian interbedded limestones and shales in the south-eastern corner of the site.

The majority of the site is underlain by the shales and sandstones belonging to the Donore, Balrickard and Walshestown Formations. These are classified as a Poor Aquifer (PI) which is generally unproductive except for in local zones.

The Loughshinny Formation which is present in the south eastern corner of the site has been classified as a locally important aquifer (Lm) which is generally moderately productive. The groundwater in the Loughshinny aquifer is used for public water supply in Balbriggan, however the site is outside the Source Protection Zone for the abstraction.

The selection of landfill liner and the layout of the proposed cells have considered the local underlying geology in compliance with EPA guidelines. The hazardous

waste cells will be sited on the Donore, Balrickard and Walshestown Formations in the northern part of the existing landfill. The non-hazardous cell will be located in the southern portion of the site with the inert cell to the west of the hazardous and non hazardous cells.

It is proposed to use dense asphaltic concrete (DAC) lining on both the base and side walls of the hazardous cells. The DAC lining system will be engineered to provide complete containment of leachate rather than controlled seepage, thus making it a more effective barrier than the single, composite or multiple lining system traditionally used for landfills.

A leachate management system is proposed for the MEHL facility. Leachate from the hazardous and non-hazardous cells will be collected separately and will be retained for use in the solidification process. If any excess leachate is generated, it will be tankered off site and disposed of at an appropriately licensed facility.

Geological Faults

Detailed geological mapping of the site along with geophysical surveys and intrusive site investigation information suggests that there are faults present on the site. The EPA Manual on Site Selection, Page 17 recommends that there should be no general prohibition of landfill siting on areas with geological faults. Faults are ubiquitous in Irish bedrock and the guidance suggests that they be fully investigated.

Hydrology and Surface Water Protection

The primary aim of the proposed surface water management system will be to restrict site runoff and prevent any potential pollutants entering the stream, located on the northern boundary of the site and surface water along the southern boundary. The surface water management system has been designed in accordance with Sustainable Drainage Systems (SuDS) principles and the requirements of the GSDS (Greater Dublin Strategic Drainage Study) Regional Drainage Policies. It is unlikely that the proposed development will have any impact on surface water as there will be no uncontrolled runoff to surface waters. All surface water collected inside landfill cells which has not been in contact with waste will be collected and pumped to a retention pond. Surface water from haul roads will be collected and discharged with the surface water from undeveloped areas and unused cells. The surface water from the solidification plant hardstanding will be collected and pumped to the leachate holding tank and used in the solidification process.

The handling of leachate from the hazardous and non-hazardous cells is described above.

Topography

At the northern end of the landfill the excavations were deep into the native limestone units. Active extraction was carried out in the middle part of the site and the northern part of the site has been filled and restored with inert waste and another inert cell is nearing completion on the western side of the facility. Settlement ponds are also located at near land surface level to the north of the site.

As the existing site is a large former quarry void with steep faces, the landfilling operation within the void space will be screened by the side slopes for a large part of the operational phase.

Site Visibility/Natural Screening

The visual impact during the operational stages of landfilling is not expected to be significant as the site is not highly visible from surrounding areas. Only during the final stages of operations, when works are at or near ground level is there a potential for a notable visual impact. The locating of a solidification plant onsite may be deemed to have the potential to have a visual impact. However, the solidification plant will be located within a depressed area of the site in order to avail of natural screening by surrounding lands.

Overall, the restoration of the facility, given its former quarry activities, will have wholly positive impacts on the landscape and visual impact, by restoring it to its former levels and to possible alternative uses. Filling and restoration will be conducted such that contours similar to the pre-quarry activity (as per existing planning permission).

Ecology

There are no terrestrial habitats of Regional or National Importance in the vicinity of the site.

As part of the proposal, a new access road will be constructed onto County Road LP01080 Walshestown Road which will result in the removal of some existing hedgerows along the southern boundary of the site. Peregrine falcons have come to nest at the MEHL site and appropriate mitigation measures will be implemented for the proposed MEHL development. There are no significant additional impacts on flora and fauna associated with the change of material intake from inert to non hazardous and hazardous non biodegradable waste streams.

Archaeological Heritage

The ground in the quarried area of this site has already been disturbed during previous site works. However, there is undisturbed land lying to the north east of the site outside the boundary line of the licensed landfill footprint.

A field walking survey within the area of the MEHL site did not reveal any archaeological remains, neither within the boundary of the licensed landfill or on surrounding buffering lands held within the ownership of MEHL.

Areas of High Amenity

The proposed site is zoned Objective HA in the Fingal Development Plan 2005 – 2011, aiming to protect and improve high amenity areas.

However, the landfill has been operating for a number of years within this zoning and previously the site operated as an active quarry and will in time, once filled, provide a positive impact of landscape of its receiving environment.

Airports

The MEHL site is located 15 kilometres north of Dublin airport. As the waste type to be accepted at the landfill is non-biodegradable, it will not provide a food

source for birds. Therefore, the anticipated numbers of birds that would be attracted to the site would be low.

Meteorology

The annual rainfall recorded at Dublin airport in 2009 was 918mm. Rainfall is an important factor when considering the collection and containment of any leachate generated at landfill facilities. The primary objective of the proposed leachate management system is to minimise the amount of leachate generated and subsequently collect and dispose of leachate in an environmentally safe manner. It is proposed that all leachate collected from the hazardous cells will be retained for use in the solidification process. If any excess leachate is generated, it will be tankered off site and disposed of at an appropriately licensed facility. Leachate generated in the inert cells will be re-circulated as is the current practice.

Mitigation measures will be employed to minimise leachate generation. Dust control measures will be continued at the facility including the use of wheel washes, sprinklers and road sweepers.

Flue gas treatment residues from waste to energy plants will arrive at the facility in sealed containers and will be pumped directly into silos for solidification.

Once solidified, the material will resemble a solid concrete block. It will be transferred to the hazardous waste cell and deposited directly to the cell for hazardous waste.

Traffic/Access

The proposed MEHL facility is at an existing and established waste facility, providing landfill services to customers on a nationwide basis. The site is located on a national transport corridor, and is conducive to North-South co-operation on strategic hazardous waste management, which otherwise would need to be exported overseas. Recommendations have been made to mitigate any potential traffic impacts on the local road network.

A Traffic Impact Assessment has been undertaken based on the proposed new entrance to the MEHL site from the County Road LP01080 Walshestown Road, and the new road that is part of the Fingal Landfill Project, granted planning permission by An Bord Pleanála in October 2009, which may be used by the MEHL traffic to access the M1.

Availability of Cover Material

Cover material is available onsite. Any additional cover material required will be sourced locally where viable and imported as required. As only non-biodegradable wastes will be accepted at the MEHL facility, there will be no odour, vermin or fly nuisances.

Services and Security

Water and telecommunication services are located along the public road just outside the site boundary. The proposed development works will not affect these services. The existing facility has a connection to both the mains water and telecommunication. The connection points will be relocated closer to the new entrance.

The construction of the new entrance and access road will require the diversion of overhead electrical lines, one a medium voltage line and the second a low voltage line. The electrical supply required for the facility control area and the requirements to divert power lines will be undertaken in consultation with ESB networks and in accordance with their specifications.

A new domestic effluent treatment plant is proposed for the MEHL facility. An assessment was undertaken by Waste Water Maintenance Ltd in 2008. The assessment concluded that the site was suitable for discharge to ground by providing a mechanical aerated treatment system and gravity type polishing filter constructed with imported fill.

Waste will not be accepted from the public or contractors that are not pre-registered (or spot customers). Members of the public will be able inspect the EPA licence records providing the site is pre-notified and an appointment made. All visitors will need to sign the visitors' book upon arrival and wear a visitors' badge whilst on site.

A new site entrance and security system will be installed and perimeter fencing, to prevent unauthorised access to the site, is in place.

Closed-circuit television cameras have been installed at the site entrance and reception area, which are monitored by the Weighbridge Operator. A split-screen system has been installed, which enables the operator to view a number of different camera views at any one time. CCTV data is recorded, stored and archived in conjunction with the office computer system. Similar systems will be in place in the proposed facility.

Site Stability

A geotechnical investigation of the site has been carried out and design proposals have taken into consideration stability and settlement issues. As mentioned previously, the landfill design proposal will take into consideration the location of the geological fault.

Given the nature of the 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.

Some of the existing slopes required to form the landfill side slopes will require regrading and excavation to meet the construction requirements for the lining systems proposed. The natural ground is composed primarily of soft rocks, comprising weathered shales and limestone. Indications from the site investigation are that groundwater levels will not affect slope stability.

The expected settlement will be within the allowable tolerance for the DAC liner of 10% depth to length i.e. max 40mm deflection in 400mm. The nature of the wastes that will be accepted at this landfill will minimise settlement potential. The solidification of the hazardous residue prior to landfill will reduce settlement. There will be minimal settlement of the final capping.

Leachate Management

It is proposed to separately collect the leachate produced within the hazardous and non-hazardous cells into holding tanks and recycle it in the ash solidification

process where appropriate, with any excess being removed off-site to an appropriately licensed facility.

Landfill Gas Management

The proposed waste streams will be non-biodegradable and therefore will not produce landfill gas.

3.3 Conclusion

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.

3.4 Alternatives Landfill Lining Technology Considered

3.4.1 Lining Technology for Hazardous Cells

For hazardous landfills the EPA landfill site design manual presents two options, a single composite HDPE liner and a double composite HDPE liner and states that the option to be used shall be selected dependent on the nature of the waste materials being deposited. Refer to **Figure 3.2**. The manual also clearly states that “alternative lining systems may be considered for pre-treated hazardous wastes e.g. solidification, stabilisation and vitrification of hazardous wastes”.

The design options appraisal for this facility considered both single composite and double composite HDPE liners, as well as an alternative lining system comprised of dense asphaltic concrete DAC which is commonly used in Europe. Refer to **Figure 3.3**. A comparison of three lining technologies is presented in **Table 3.2**.

Table 3.2 Summary of Composition and Characteristics of Hazardous Cell Lining Technologies - Composite HDPE and DAC Lining Systems

	Single Composite Liner ^{Note 1}	Double Composite Liner ^{Note 1}	DAC Liner ^{Note 2}
Liner Characteristics	Upper component of the composite liner must consist of a flexible membrane liner (FML). This must be a minimum of a 2mm thick HDPE liner or equivalent (with the necessary flexibility to be robust but not prone to excessive cracking/construction difficulties),	Top composite liner must consist of a minimum 2mm HDPE or equivalent FML and a 1m thick layer of compacted soil having a hydraulic conductivity less than or equal to 1×10^{-9} m/s constructed of compacted lifts no greater than 250mm thick when compacted. Alternatively a 0.5m thick artificial layer of	The DAC liner must comprise a multi layered lining system comprising <ul style="list-style-type: none"> (i) a mastic sealant which can be laid to a minimum density of 1.5 to 2.6 kg/m² on slopes up to 1 in 1.6 (ii) a minimum of 80mm thick dense asphaltic concrete having a maximum hydraulic conductivity of 1×10^{-12} (iii) a minimum thickness of 60mm asphalt binder layer (hydraulic conductivity not less than 5×10^{-6} m/s and not greater than 1×10^{-4} m/s

	Single Composite Liner ^{Note 1}	Double Composite Liner ^{Note 1}	DAC Liner ^{Note 2}
		enhanced soil or similar giving equivalent protection as the foregoing (also constructed of compacted lifts no greater than 250mm thick when compacted) Bottom composite liner must comprise as a minimum of 2mm HDPE or equivalent FML upper component	(iv) a cationic emulsion tack coat as specified in the National foreword to BS EN 13808 or equivalent (v) a minimum 200m granular drainage layer in accordance with the requirements of SHW Clause 803, having a minimum CBR of 30%. The granular material must not contain any plasticity or reclaimed materials. (vi) a separating geotextile membrane
Leachate Collection Layer	Minimum 0.5m thick leachate collection layer having a minimum hydraulic conductivity of 1×10^{-3} m/s	Minimum 0.5m thick leachate collection layer having a minimum hydraulic conductivity of 1×10^{-3} m/s	Minimum 0.5 m thick leachate collection layer having a minimum hydraulic conductivity of 1×10^{-3} m/s
Mineral Layer-Base and Side Wall Characteristics	Base and Side Wall Mineral layer comprising a minimum of 5m thick having a hydraulic conductivity less than or equal to 1×10^{-9} m/s	Base and Side Wall Mineral layer comprising a minimum of 4m thick having a hydraulic conductivity less than or equal to 1×10^{-9} m/s	Base and Side Wall Mineral Layer comprising a minimum of 0.5m thick having a hydraulic conductivity less than or equal to 1×10^{-9} m/s. (Engineered clay is only required 3m up the side wall from the base - Full DAC system as specified above is otherwise continued to top of the cell wall.)

Note 1: Design criteria as per EPA Landfill Manual, "Landfill Site Design", EPA, 2000

Note 2: Design criteria provided by WALO UK

Having considered the three options, the DAC lining system was considered superior to the single and double composite liners for use as a landfill liner for the hazardous cells. The permeability of the DAC was considerably lower when compared to alternative options, so low that it effectively provides total containment. In addition to having a much lower permeability the DAC liner has two other key features that made it preferable over the two alternative options which are:

- The DAC system can be constructed on slopes (up to a slope of 1:1.5) steeper than those achievable with standard HDPE and clay composite lining systems.

- The method of installing DAC panels means that there is no weakness at the joint between panels as can be the case with HDPE. The DAC liner is much more robust and no damage to the liner will occur when laying the drainage blanket.

In the development of the design and consideration of liner type, the project team met with the EPA and discussed the requirements of the Landfill Directive 99/31/EC and in particular Clause 3.2 of Annex I. The EPA confirmed that alternatives to the 5m of clay (as set out in the directive) could be considered provided they are equivalent in terms of their protection. The Directive states that *“The landfill bases and sides for a hazardous landfill shall consist of a mineral layer... at least equivalent to the one resulting from the following requirements i.e. for a hazardous landfill a mineral layer with a K value i.e. permeability, $K <= 1 \times 10^{-9}$ m/s with a thickness of $\geq 5m$ ”*. DAC performs markedly better than HDPE and clay lining as it typically has a superior permeability of up to 1×10^{15} m/sec.

3.4.2 Lining Technology for Non Hazardous and Inert Cells

For non hazardous cells, it is proposed to employ standard HDPE and clay lining technologies as per the EPA Landfill Site Design Manual and in accordance with the requirements of the Landfill Directive 99/31/EC. The inert cells will be lined with clay. Standard HDPE and clay technologies have been used to line all of the major modern non hazardous landfills in Ireland to date and have been demonstrated to be highly effective in the protection of the local environment from the risks posed by landfill to ground water surface water and soils. Clay lining systems have been employed effectively at Hollywood for existing inert waste cells.

3.5 Alternative Site Layouts

The primary consideration in the development of design options for this proposed MEHL facility has been the balancing of the relative proportions of hazardous, non hazardous and inert capacity within the constraints of the receiving environment and the operational requirements. As a starting point, four preliminary layout options were developed for the site based on the available environmental and design information from previous licence applications. The key constraints and operational requirements identified were:

- Suitability of topography and ground conditions for construction methods,
- Groundwater protection and management,
- A superior landfill lining system, providing full containment of hazardous landfill cells, where appropriate,
- Protection of the environment and minimisation of environmental nuisances,
- Public and employee health and safety,
- Visual impact,
- 25 year operational life,
- Surface water and leachate management,

- Waste acceptance for inert, non hazardous and hazardous non-biodegradable wastes within the parameters of prescribed Waste Acceptance Criteria (WAC),
- Construction costs,
- A practical and workable site from an operational viewpoint,
- Integration of existing inert waste cells and the requirements of EPA Licence W0129-02.

3.5.1 Preliminary Design Options Appraisal

The four preliminary design options produced (referenced Options 1 to 4 as presented in **Appendix 3.2**) comprised various cell configurations, for consideration by the design team. Though the initial layout options included some preliminary information on the locations of site infrastructure such as the solidification plant and the site entrance, these aspects were only fully considered and located during the development of the preferred layout.

From the outset, the steep slopes and confined south western corner of the site were considered unsuitable for the hazardous lining systems, otherwise the remainder of the site was initially considered suitable for any of the proposed landfill cell types subject to general environmental constraints. The site is to be developed to achieve a 25 year operational life. The intention is to infill the existing quarry, with additional excavation as required to allow construction of stable cell side slopes. The current site waste licence W0129-02 does not permit the formation of the landfill liner below a topographic level of 104.5 mOD. The formation level for the new application will be 102.5 mOD and is explained below.

The facility will be restored to match surrounding ground levels and previously agreed restoration profiles with levels no higher than 149 mOD.

Layout Option 1

This layout provides for hazardous void space of 1.52M m³ and non hazardous void space of 1.42M m³ waste within the main quarried section of the site. A lesser void capacity is provided for inert waste (0.694M m³) along the edge of the existing inert cells, along the north western boundary. This layout is based on a formation level of 104.5mOD. The hazardous cell was located across the majority of the quarried site from north to south, with the non hazardous cell located in the south western corner of the site.

Layout Option 2

With this option the size of the hazardous waste cell was maximised to 2.25M m³ within the excavated area, and no non hazardous cell was provided. As outlined above the south western corner was considered unsuitable for the construction of a hazardous cell and therefore provides inert waste capacity (1.59M m³). This layout is based on a formation level of 104.5mOD.

Layout Option 3

The non-hazardous cell (0.64M m³) was located in the north eastern corner of the quarry, extending approximately half way down the length of the site towards the south. A central bund would separate the non hazardous from hazardous cells (1.4M m³) running from east to west across the middle of the site. The inert waste

cell (1.59 m³) was located in the steep sided south western corner and along the southern edge. This layout is based on a formation level of 104.5mOD.

Layout Option 4

The hazardous waste cell (0.64M m³) was located in the same location as the non hazardous cell shown in Layout Option 3 extending approximately half way down the length of the site towards the south. The non hazardous cell (2.1M m³) was located in the south and south western corner of the site. Limited capacity was provided for inert waste (0.694M m³) along the edge of the existing inert cells on the north western boundary of the site. This layout is based on a formation level of 104.5mOD.

3.5.1.1 Preliminary Options Appraisal Conclusions

Having considered the preliminary layout options in the context of the key environmental constraints and operational requirements, Options 2 and 3 were eliminated as the hazardous cell was located on a locally important aquifer i.e. the Loughshinny formation and this was considered unacceptable. It is proposed that the hazardous cells will be constructed on poor aquifers only, i.e. the Donore, Walshestown and Balrickard formations. In addition, Option 2 was also considered undesirable as one of the key requirements is that the facility must provide capacity for inert, non hazardous and hazardous cells and Option 2 did not include a non hazardous cell.

Of the preliminary options, Options 1 and 4 were therefore preferable. However, ultimately neither Option 1 nor Option 4 were considered to meet all of the necessary requirements. Option 5 was therefore developed (as described below) from Option 4 and incorporating aspects of some of the other eliminated options. Further revisions of this preferred layout are described below and shown in **Appendix 3.2**.

3.5.2 Preferred Layout Options Development

Layout Option 5

This layout consisted of a reduced non hazardous waste cell, with an inert cell of 203,000 m³ replacing a portion of the non hazardous cell in the southwestern corner. This layout is based on a formation level of 104.5mOD.

The layout includes the site infrastructure, access road, and administration area and solidification plant. The main entrance, access and facility control area are located on the north western boundary. The solidification plant is located within the hazardous cell in the middle of the site.

Layout Option 6

This layout has primarily the same distribution of the cells as Option 5 though the size of the non hazardous (1.89M m³) and hazardous cells (0.979M m³) were adjusted slightly. This layout is based on a formation level of 104.5mOD. The administration building was located on the eastern side of the site. The main access was provided off the LP0 1090 road. The solidification plant was located on the opposite side to the entrance on western side of the site, where the inert quarantine area is currently located.

Layout Option 7

This layout represents a combination of the preferred aspects of Option 5 and Option 6.

Layout Option 8 (Preferred Option)

The current preferred site layout has been developed from Option 7. The entrance is to be constructed from the southern boundary off the LP0 1090 road and a new facility control area located on the eastern side of the landfill cells. Some minor modifications were required to the cell distribution. The site investigation clarified the northern boundary of the Loughshinny formation and the hazardous cell (1.735M m³) was adjusted accordingly. The subsequent loss of void space required the widening of the hazardous cell to the east. The need for a stable embankment on the west of the hazardous cell necessitated the removal of inert waste from the existing cells on the west. To reduce the visual prominence of the solidification plant, the plant was located inside the cell, by widening out the non hazardous cell which now has a capacity of 1.324M m³. The formation level of the final preferred site layout is 102.5 mOD which is above the piezometric head of the groundwater in the aquifer and are also above any of the major water strikes encountered in the weathered and faulted areas in the Namurian deposits on the site. Refer to **Chapter 14 Soils, Geology and Hydrogeology** for further details.

3.5.2.1 Preferred Layout Option Development Conclusion

The site layout for the proposed facility has been prepared having developed various iterations of configuration options ultimately concluding with the final preferred layout attached. The proposed layout meets all of the key environmental constraints and design requirements.

3.6 References

Centre for Advanced Engineering (CAE) Landfill Guidelines Towards Sustainable Waste Management in New Zealand (2000)

EPA Landfill Manuals, Manual on Site Selection (Consultation Draft, 2006)

EU COUNCIL DIRECTIVE 1999/31/EC Landfill of Waste

Sloan William M. (1993) Site Selection for New Hazardous Waste Management Facilities, WHO Regional Publications, European Series – No. 46, Copenhagen, Denmark



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APPENDIX 4:

Extract from EIS: Section 19.2, Summary of Mitigation Measures

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19.2 Summary of Mitigation Measures

Table 19.1 Construction Phase Mitigation

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
Site Preparation & Enabling Works		
<ul style="list-style-type: none"> Removal of topsoil Bulk excavation and general site re-grading Diversion of existing overhead power lines and telecom cables Setting up of site fencing, site office, site facilities, secure storage compound, temporary car parking Importation of equipment 	<ul style="list-style-type: none"> As required by the Construction Regulations, a Health and Safety Plan will be prepared which will address health and safety issues from the design stages through to the completion of the construction and maintenance phases. Any overhead and underground services within the site, mature hedgerows, monitoring infrastructure and existing open drains will be identified and protected. Consultation will be undertaken with ESB networks regarding diversion of existing power lines and works will be carried out in accordance with their specifications. Within the necessary constraints of performance, durability and cost, construction materials will be sourced from local suppliers and manufacturers where feasible. A construction environmental management plan will be prepared and implemented with the objective of keeping disruption and nuisance to a minimum. The plan will have regard to the guidance contained in the handbook published by the Construction Industry Research and Information Association (CIRIA) in the UK, Environmental Good Practice on Site, CIRIA 2005. 	<p>Negligible No significant impact predicted</p>
Site Tidiness		
<ul style="list-style-type: none"> Untidy site 	<p>The following are some of the measures that will be taken to ensure that the site and surroundings are maintained to a high standard of cleanliness.</p> <ul style="list-style-type: none"> Daily site inspections will be undertaken to monitor site tidiness. A regular programme of site tidying will be established to ensure a safe and orderly site. Scaffolding will have debris netting attached to prevent materials and equipment being scattered by the wind. 	<p>Negligible No significant impact predicted</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<ul style="list-style-type: none"> • Food waste will be strictly controlled on all parts of the site. • Mud spillages on roads and footpaths outside the site will be cleaned regularly and will not be allowed to accumulate. • Wheel-wash facilities will be provided for vehicles exiting the site. In the event of any fugitive solid waste escaping the site, it will be collected immediately and removed to storage on site, and subsequently disposed of in the appropriate manner. 	
<p>Generation of Waste</p> <ul style="list-style-type: none"> • Construction waste, sewage and domestic type waste • Excavated Material 	<p>A construction and demolition waste management plan will be developed and maintained. The key principles underlying the plan will be to minimise waste generation and to segregate waste at source. The measures to achieve these aims include:</p> <ul style="list-style-type: none"> • Ordering of appropriate quantities of materials with a just-in-time philosophy. • Immediate and careful storage of materials delivered to the site. • Storing under cover and raised above ground, materials which are vulnerable to damage by rain. • Careful handling of materials, using appropriate equipment, to avoid undue damage. • Designating separate storage areas for different types of waste in order to maximise the re-use and recycling potential of the waste. • Temporary site sanitary accommodation will be connected to a holding tank which will be pumped out as required and disposed of in an appropriate manner to a licensed disposal facility. 	<p>Slight</p> <p>Waste not suitable for reuse or recovery will use up landfill space</p>
<p>Human Beings</p> <ul style="list-style-type: none"> • Capital Investment of approximately €20 million. 	<ul style="list-style-type: none"> • No controls or mitigation measures required. • In addition to the direct employment during the construction phase, there will be 	<p>Moderate Beneficial</p> <p>Employment.</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
<ul style="list-style-type: none"> 50 (peak) jobs on site and additional indirect jobs off-site. 	<p>substantial direct and indirect off-site employment and economic activity associated with the supply of construction materials and services during the construction phase.</p>	
Traffic		
<ul style="list-style-type: none"> Construction traffic during Phase 1 works. 	<ul style="list-style-type: none"> During Phase 1 construction, peak traffic is expected, however operational traffic will be minimal due to considerable site reconfiguration during this period. No roads and traffic mitigation measures are required for the proposed scheme as no impact is predicted. 	<p>Negligible No significant impact predicted.</p>
Air Quality		
<ul style="list-style-type: none"> Emissions from construction plant and vehicles. Dust from movements on site in dry windy weather. 	<p>The Contractor will be obliged to comply with the dust deposition limits set by the existing EPA Waste Licence No. W0129-02 or any future licence.</p> <p>A dust minimisation plan will be prepared and implemented by the contractor during the construction phase of the project. The following measures will be implemented as part of the dust minimisation plan to reduce dust emissions particularly during the site clearance and bulk excavation phase.</p> <ul style="list-style-type: none"> In the unlikely event that stockpiled material dries out and has the potential to release dust, the stockpile will be covered entirely by impervious sheeting or sprayed with water. Any dust-generating material being removed from site will be transported in covered trucks. Exhaust emissions from vehicles operating within the site, including trucks, excavators, diesel generators or other plant equipment, will be minimised by the Contractor; this will include an appropriate regime of planned preventative maintenance for machinery. Training will be completed by relevant personnel on how to control dust emissions from construction activities. 	<p>Negligible No significant impact predicted.</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<ul style="list-style-type: none"> The implementation of the dust mitigation measures will place particular emphasis on areas in proximity to sensitive receptors. 	
Climate	<ul style="list-style-type: none"> During Phase 1 construction, peak traffic is expected, however operational traffic will be minimal due to considerable site reconfiguration during this period. As there will be no significant impact on climate, no mitigation measures are proposed. 	Negligible No significant impact predicted.
Noise and Vibration	<ul style="list-style-type: none"> Noise aspects during the construction phase will be managed in accordance with BS5228: Noise control on construction sites and the facility's waste licence. Hours during which site activities are likely to create high levels of noise or vibration will be limited All site access roads will be kept even so as to mitigate the potential for vibration from lorries. Plant with low inherent potential for generation of noise and/or vibration will be selected. Temporary barriers will be erected as necessary around noisy processes and items such as generators heavy mechanical plant or high duty compressors. Noisy / vibratory plant machinery will be kept as far away from sensitive properties as possible and vibration isolated support structures will be used where necessary. 	Slight Temporary slight increase in noise levels during the construction phase.
Landscape and Visual	<ul style="list-style-type: none"> Woodland planting is to be established to the east of the proposed solidification plant and car park area. This planting will be implemented during the initial construction phase and will serve to screen views of the site buildings from the east and long views from the LP01080 road to the south of the site and serve as an ecological habitat. 	Slight Short term moderate effects during construction phase

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<ul style="list-style-type: none"> • Scrub planting will be established around the proposed wetlands in the north east corner of the site to enhance the ecological benefits. • Retention of perimeter hedgerows and thickening where necessary, with the exception of the boundary adjoining the site entrance area where a small section will be removed to facilitate construction works and sightlines. A hedge will be reinstated at the proposed entrance and Hawthorn and Blackthorn scrub planting on the cutting. New hedgerow planting will be carried out along the LP01080. • Retention of existing trees. • Incorporation of an existing wetland area near the southern boundary of the site. 	
Flora and Fauna		
<ul style="list-style-type: none"> • Potential impact on aquatic environment and fisheries from run off • Disturbance of Peregrine Falcons 	<ul style="list-style-type: none"> • There will be no development works or any disturbance of original ground within 10m of the edge of the stream flowing along the northern boundary of the site. This will provide a 10m wide (minimum) riparian corridor or 'leave strip' which is very important to the protection of a local aquatic ecological integrity (and general biological diversity). • Section 173 of the Fisheries (Consolidation) Act 1959 will be adhered to in relation to the discharge of clean surface waters to the Ballough Stream system and any construction works associated with the proposed development must up no way impact on the passage of salmonids thereby contravening. • Installation of alternate nest ledges and/or artificial boxes for peregrine falcons at two to three locations. • Restriction of access above the nest cliffs using fencing and/or appropriate barriers. • Phasing of construction activity and collection of monitoring data on peregrine occupancy and breeding success. • Restriction on the installation of safety netting totally and/or spatially and temporally. 	<p>Slight Slight impact predicted.</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<ul style="list-style-type: none"> Enacting temporal restrictions to construction from 1st March to 31st July unless the breeding status of the peregrines is confirmed, to have failed or not be initiated or peregrines are not present during the breeding season. Implementing a buffer zone for protection of nesting peregrines from disturbance of 30 – 50m if essential works are required during the breeding season. Increase buffer if birds are found to be disturbed at this distance i.e. flushing or alarm-calling or decrease buffer if no reaction is noted and works are required. Advise staff and contractors of location of significant species and habitats prior to commencements of works through provision of maps and an induction talk on wildlife law and disturbance to birds. 	
Soils, Geology and Hydrogeology		
<ul style="list-style-type: none"> Regrading of roads and inert landfill cells. Geological Heritage Area 	<ul style="list-style-type: none"> Any earthworks required on site should be monitored and carried out in a controlled manner, ensuring traceability of soils at all times. Construct a viewing platform and allow limited access as per agreement with GSI. 	<p>Negligible No significant impact predicted</p>
Surface Water		
<ul style="list-style-type: none"> Rainwater runoff which could contain silt Control of foul sewage Uncontrolled release of concrete or concrete related runoff 	<ul style="list-style-type: none"> The Environmental Management Plan as per the waste licence will be updated. Use of settlement ponds, silt traps and bunds and minimising construction within watercourses. Management of excess material stockpiles to prevent siltation of watercourse systems through runoff during rainstorms will be undertaken. This may involve allowing the establishment of vegetation on the exposed soil and surrounding stockpiles with cut-off ditches to contain runoff. Covering with an impermeable material can also be utilised to prevent rainfall interacting with stockpile material. No material stockpiles will be located near watercourses. All watercourses that occur in or adjacent to areas of land that will be used for site compound/construction facilities which have the potential for silt run-off will be fenced off at a minimum distance of 5m with silt fences. In addition, measures will 	<p>Negligible No significant impact predicted</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<p>be implemented to ensure that silt laden or contaminated surface water runoff from the compound does not discharge directly to the watercourse.</p> <ul style="list-style-type: none"> • Surface water flowing onto the construction area will be minimised through the provision of berms and diversion channels. • All chemical and fuel fill points and hoses will be contained within bunded areas as per CIRIA C163. • Foul drainage from all temporary site offices and construction facilities that are not connected to the sites' waste water treatment facility (e.g. portable toilet facilities that may be required during construction) will be contained and disposed of in an appropriate manner to prevent pollution of rivers and local watercourses in accordance with the relevant statutory regulations. • Proper construction management procedures will be put in place to ensure no contamination of surface water or exposed groundwater from concreting and concrete related activities. • Protection measures will be put in place to ensure that all fuels used during the construction phase are appropriately handled, stored and disposed of. • Routine monitoring of water quality will be carried out at appropriate locations during construction as per the monitoring requirements of the waste licence. 	
<p>Archaeological, Architectural and Cultural Heritage</p> <ul style="list-style-type: none"> • Impact of ground disturbance on any potential archaeological material that may survive below the ground surface. • Geological Heritage Area 	<p>It is recommended that ground works in undisturbed ground at the new access road be monitored by a suitably qualified archaeologist, ideally under licence to the Department of the Environment, Heritage and Local Government.</p> <p>In the event that archaeological deposits are discovered all work in the vicinity of the discovered deposits must cease and contact be made with the National Monuments Section of the Department of the Environment, Heritage and Local Government on how best to proceed.</p> <ul style="list-style-type: none"> • Construct a viewing platform and allow limited access as per agreement with GSI. 	<p>Negligible</p> <p>There will be no significant impact on archaeological remains.</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
<p>Material Assets</p> <p>Construction phase will require:</p> <ul style="list-style-type: none"> • Extension to existing water supply. • Additional Fuel. 	<ul style="list-style-type: none"> • A potable water supply for use within the contractor's accommodation will be provided from the existing public water supply. • The contractor's fuel tanks will comprise double bunded tanks located in a secure position within the compound. 	<p>Negligible</p> <p>There will be no significant impact.</p>

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Table 19.2 Operation Phase Mitigation

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
<ul style="list-style-type: none"> Facility Operation 	<ul style="list-style-type: none"> Facility will be subject to an EPA waste licence which licences and controls all site activities. The facility will operate in accordance with the licence conditions. The facility holds the ISO14001 standard for Environmental Management Systems (EMS). The facility is fully compliant with all its current planning permissions. 	
Generation of Waste	<ul style="list-style-type: none"> Wastes will be avoided, minimised or recycled where economically feasible. Waste generated on site will be source separated to facilitate recycling into dry mixed recyclable, biodegradable and residual waste fractions to contribute to achieving recycling targets set out in the Waste Management Plan for the Dublin Region 2005-2010. Quarantine areas will be provided within the hazardous cell which will be segregated for hazardous and non hazardous wastes. After characterisation and provided the waste has not become contaminated in any way it will be disposed of in the hazardous or non hazardous cells as appropriate to its characterisation, returned to source or delivered to an alternative licensed or permitted waste facility Any surplus leachate not required for the solidification process will be tankered off site to a suitable disposal facility. 	Negligible No significant impact predicted.
Human Beings	<ul style="list-style-type: none"> No mitigation measures required. 	Moderate Beneficial Improvement in local employment.

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
Roads and Traffic		
<ul style="list-style-type: none"> Operational traffic 	<ul style="list-style-type: none"> No proposed increase in the capacity, which is 500,000 tonnes per annum. Therefore there will be no increase in traffic levels on the local road network due to the proposed scheme. Therefore, no traffic mitigation measures are required for the proposed scheme as no impact is predicted. 	<p>Negligible No significant negative residual impacts</p>
Air Quality		
<ul style="list-style-type: none"> Dust and Emissions 	<ul style="list-style-type: none"> Dust monitoring will continue as per the existing waste licence or any revised waste licence issued by the Environmental Protection Agency. Waste cells, particularly hazardous and non-hazardous cells, will be covered daily as necessary in order to minimise fugitive dust emissions. Water sprays will be used, as required during dry or windy conditions. Bottom ash will be quenched in the facilities in which it arises and will be delivered to site damp. The implementation of the dust mitigation measures will place particular emphasis on areas in proximity to sensitive receptors. Routine walk-overs as part of the current and ongoing daily inspection undertaken by the facility management of the site will be carried out to ensure that any odour emissions with off-site nuisance potential are identified and measures taken to minimise odour, e.g. covering. 	<p>Negligible No significant impact predicted</p>
Climate		
<ul style="list-style-type: none"> Operation vehicles, generators etc., may give rise to CO₂ and N₂O emissions 	<ul style="list-style-type: none"> No proposed increase in the capacity, which is 500,000 tonnes per annum. Therefore there will be no increase in traffic levels on the local road network due to the proposed scheme. As there will be no significant impact on climate, no mitigation measures are proposed. 	<p>Negligible No significant impact predicted.</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
Noise and Vibration		
<ul style="list-style-type: none"> • Operation Plant and Equipment 	<ul style="list-style-type: none"> • Limiting the hours during which site activities are likely to create high levels of noise or vibration are permitted. • All site access roads will be kept even so as to mitigate the potential for vibration from lorries. • Selection of plant with low inherent potential for generation of noise and/ or vibration. • Erection of temporary barriers as necessary around noisy processes and items such as generators, heavy mechanical plant or high duty compressors. • Placing of noisy plant machinery as far away from sensitive properties as permitted by site constraints. 	<p>Negligible No significant impact predicted.</p>
Landscape and Visual		
	<ul style="list-style-type: none"> • New hedgerow planting will be carried out along the LP01080 and new access road where required. • Where there are gaps in the existing hedgerow on the western boundary these will be thickened to maximise screening from the County road to the west. Boundary hedges will also be thickened along the southern boundary. • Low level bollard lighting will be used along the entrance road to avoid light spillage on adjoining properties on the LP01080. • Progressive restoration of the site. 	<p>Moderate Beneficial The residual landscape and visual impacts will be positive after final restoration</p>
Flora and Fauna		
<ul style="list-style-type: none"> • Increase local Biodiversity 	<ul style="list-style-type: none"> • Any habitats on the MEHL site which will not be disturbed by the proposed development works will be left as they are, to recolonise naturally. This will increase local biodiversity over time as they become vegetated and provide habitat for a range of fauna also. 	<p>Moderate Beneficial Enhance local biodiversity</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<ul style="list-style-type: none"> A proposed wetland system in the north east of the site will, over time, provide wetland habitat and add to the local habitat and species diversity. An existing wetland area at the southern end of the site, which includes an open water body fringed with vegetation will be retained and will help to increase local biodiversity. 	
<ul style="list-style-type: none"> Potential contamination of aquatic environment 	<ul style="list-style-type: none"> On-site attenuation ponds will allow for the settlement of fine/particulate materials. Ongoing monitoring to ensure no contaminating discharges to groundwater or surface water. Contingency plan in case of emergency. 	<p>Negligible No significant impact predicted</p>
<ul style="list-style-type: none"> Disturbance of peregrine falcon 	<ul style="list-style-type: none"> If monitoring results determine it necessary, the creation of an additional nest site away from the location of the MEHL site be investigated in consultation with landowners and the NPWS. This additional site could be located in another quarry or on a man-made structure such as a church/cathedral. Prior to the selection of an alternative nest site location, further monitoring of the peregrine within nearby quarries will be required to better understand their distribution and breeding behaviour. This will help inform the selection of the best locations for alternative peregrine breeding sites. 	<p>Negligible No significant impact predicted</p>
Soils, Geology and Hydrogeology		
<ul style="list-style-type: none"> Geological Heritage Area Use of site deposits Potential for waste to act as a barrier to groundwater flow Potential groundwater contamination. 	<ul style="list-style-type: none"> Construct a viewing platform and allow limited access as per agreement with GSI. On-site deposits of boulder clay, with naturally low permeability, has been tested and will be used to form the clay liner and build the engineered inert landfill cells. Employing engineered liners in line with EU legislation and best practice. Employ a leak detection system within the DAC lining system. The formation level for the construction of the liners will be set above the piezometric head of the water table. 	<p>Negligible No significant impact predicted</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<ul style="list-style-type: none"> • No hazardous waste will be placed on the Loughshinny formation. Only inert or non hazardous waste will be placed in this area. • An engineered material will be placed beneath the non-hazardous liner to enhance the protection for the aquifer. • In order to minimise leachate generation from the flue gas treatment residues, the waste will be solidified prior to being placed in the cells. • To further minimise leachate generation, a temporary cover system will be designed and used to reduce the amount of time the waste is exposed to the elements. • Separate leachate collection systems will be installed in the different classes of waste cells. Leachate collected from the hazardous cells will be re-used in the solidification plant further reducing the possibility of surface and groundwater contamination. • Waste types will be segregated to ensure that hazardous or non-hazardous material does not enter the inert cells. • As part of the waste licence conditions, an Environmental Monitoring Plan will be developed for the site to monitor groundwater. 	
<p>Surface Water</p> <ul style="list-style-type: none"> • Runoff which could contain silt and/or contaminants. 	<ul style="list-style-type: none"> • The surface water from the new entrance and main access road will be collected in french drains located in the road margins and discharged to ground. Any surplus surface water will discharge into the open drain south of the administration building. • It is proposed to manage surface water on site by using a combination of SuDS elements consisting of filter drains and swales, a wetland pond, a detention basin, and rainwater harvesting. This will be in compliance with the objectives and policies of the GSDS. The filter drain and swale will allow pollutant removal through filtration prior to discharging to the attenuation feature. The proposed wetland treatment system will form an integral part in offsetting both the hydraulic and water quality impacts of the proposed development. 	<p>Negligible No significant impact predicted</p>

Source / Scale of Effect	Control and Mitigation	Residual Impacts, Significance Level, Environmental Consequence
	<ul style="list-style-type: none"> Water quality monitoring shall be implemented as per the monitoring requirements of the EPA waste licence to ensure that the operation of the MEHL facility does not have an adverse effect on water quality. 	
Material Assets		
<ul style="list-style-type: none"> Community Gain 	<ul style="list-style-type: none"> MEHL proposes to pay contributions into a community gain fund allied to the tonnage and waste classification of materials taken into the site which are either non-hazardous or hazardous in nature. The amount of that contribution will be consistent with other similar community gain models in existence. 	Moderate/Significant Beneficial
<ul style="list-style-type: none"> Property Values 	<ul style="list-style-type: none"> The facility will accept only non-biodegradable waste. Consequently the typical potential nuisances impacts associated with municipal waste landfills will not arise. No controls or mitigation measures required. 	Negligible No significant impact predicted
<ul style="list-style-type: none"> Future increased consumption of potable water, power, fuel, etc. 	<ul style="list-style-type: none"> Use of utilities, resources and assets will be in accordance with good practice in energy and resource conservation, and efficiency. Energy efficient power systems will be employed and water conservation measures will be implemented. It is intended to collect rainwater for use in the process, to reduce the consumption of potable water. On-site deposits of boulder clay, with naturally low permeability, will be tested and may be used to form the clay liner and build the engineered inert landfill cells if it has the appropriate properties. 	Slight Increased consumption of energy and water resources



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APPENDIX 5:

Revised non-technical summary for the Waste Licence Application

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Attachment A: Non-technical Summary (NTS)

A.a NTS: Contents

A.a.1 The original non-technical summary (NTS) submitted with the Waste Licence Application (submitted to the Agency on 17th December 2010) has been amended, in line with a response submitted by MEHL to the Agency on 8th August 2011 with respect to a notice in accordance with Article 1(2)(b)(ii) of the Waste Management (Licensing) Regulations 2004 (as amended).

A.a.2 This NTS comprises the following:

- A.a: Contents
- A.b to A.l: Non-technical summary of each section of the Waste Licence Application (includes relevant extracts from the Environmental Impact Statement (EIS)¹ in Section I)
- A.m: Selected Waste Licence Application drawings to accompany the non-technical summary, to identify and describe the activity

A.b NTS: Section B - General

A.b.1 This Waste Licence application is being made by Murphy Environmental Hollywood Limited (MEHL) for an integrated waste management facility at its site at Hollywood Great, Nag's Head, Naul, Co. Dublin (National Grid Reference National Grid Reference E315810, N258015), approximately 32km north of Dublin City Centre. The site is bounded to the west and south by local primary roads LP01090 and LP01080. The regional road, R108, runs in a north-south direction approximately 1km west of the site. The M1 runs in a north-south direction, approximately 2.5km east of the site.

¹ Authored by Arup (December 2010)