



Murphy Environmental Hollywood Ltd

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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
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Our Ref.: W0129-03/AI_Art16_210513a
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Date: 21st May 2013

Dear Mr. Meaney,

**Re.: Murphy Environmental Hollywood Ltd. (MEHL), EPA Ref. W0129-03
Response to Notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations**

We refer to the Agency's notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations on 11th July 2012. Please find enclosed the preliminary CRAMP, ELRA & Financial Provision which responds to queries relating to CRAMP, ELRA & Financial Provision (Item#5) of said letter.

The information contained herein is deemed not to impinge on the non-technical summary of the Waste Licence Application or EIS; no revisions to drawings arise from the information contained herein. The content of the electronic files on the accompanying CD-ROM is a true copy of the original.

If you have any further queries in relation to this matter please do not hesitate to contact us.

Yours sincerely,

Patricia Rooney
Director & General Manager, MEHL



Directors: Seamus Murphy (Managing Director), Patricia Rooney, Rory Murphy, Emma Murphy
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MEHL

**Preliminary ELRA, CRAMP and Financial
Provision for Proposed Integrated Waste
Management Facility (W0129-03)**

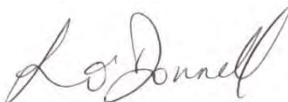
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Client Name:	MEHL
Client Address:	Hollywood Great, Nag's Head, Naul, Co. Dublin
Report Title:	Preliminary ELRA, CRAMP and Financial Provision for Proposed Integrated Waste Management Facility (W0129-03)
Project Code:	MU0120

Project Manager (Name):	Louise O'Donnell
Project Manager (Sign):	
Project Manager (Date):	15 th May 2013

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Approved by Project Director (Sign):	
Approved by Project Director (Date):	15 th May 2013

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Issue No.	Date	Status
01	15/05/2013	Final version. Issue to Client.

Notes/Comments:

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1.0 Introduction

1.1 About this Report

1.1.1 Patel Tonra Ltd., Environmental Solutions was commissioned by MEHL (Murphy Environmental Hollywood Limited) to assess the **company's obligations for a proposed integrated waste management facility at Hollywood Great, Nag's Head, Naul, Co. Dublin**, in relation to:

- Environmental Liability Risk Assessment (ELRA),
- Closure, Restoration and Aftercare Management Plan (CRAMP), and
- Financial Provision (FP)

1.1.2 The report was commissioned in January 2012 and a draft report was prepared. The EPA requested information relating to CRAMP and ELRA in an 'Article 16' notice in July 2012, as detailed in **Section 1.6**. This report has been updated to reflect the Article 16 notice.

1.1.3 The report is based on information pertaining to the proposed development set out in the planning and waste licence applications, and accompanying EIS. The report should be viewed as preliminary (in the context of a proposed development) and should be reviewed at the post-licensing/operational stage.

1.1.4 The approach adopted herein is based on EPA guidance currently in force¹.

1.1.5 Patel Tonra Ltd., Environmental Solutions prepared the EPA Waste Licence Application for the MEHL integrated waste management facility, and acted as project managers for the planning application and EIS process.

1.2 EPA Licence W0129-02

1.2.1 MEHL holds an EPA licence for the purpose of an inert landfill at Hollywood Great, **Nag's Head, Naul, Co. Dublin** (EPA Licence W0129-02). The site offers a strategically-located waste disposal facility for inert wastes and mildly contaminated soils.

1.2.2 The facility was first licensed by the EPA (as an inert landfill) in December 2002. The licensee was Murphy Concrete Manufacturing Ltd. Waste acceptance commenced in July 2003, following completion of the necessary infrastructural works.

1.2.3 W0129-02 was issued by the EPA in May 2008 to allow waste acceptance up to 500,000 tonnes per annum and to vary the landfill footprint of the facility (in line with the quarry footprint).

1.2.4 In October 2008, the licence transferred to **Murphy Environmental Hollywood Ltd.** (MEHL), following its establishment as a standalone limited company.

¹ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*

- 1.2.5 Under the terms of W0129-02, the licensee was required to complete and submit to the EPA assessments of (i) 'CRAMP' (Closure, Restoration & Aftercare Management Plan), (ii) ELRA (Environmental Liabilities Risk Assessment) and (iii) FP (Financial Provision). This report was completed in May 2010 (for the licence year 2009) on behalf of MEHL by Patel Tonra Ltd., Environmental Solutions.

1.3 EPA Licence Application W0129-03

- 1.3.1 MEHL made an application for a waste licence to the EPA in December 2010 to develop an integrated waste management facility within the existing boundaries of its existing facility for the landfilling of non-biodegradable inert, non-hazardous and hazardous wastes, including waste-to-energy residues. The proposed development will allow the former quarry to be restored to a natural landform.
- 1.3.2 The proposed development involves the construction of: a) specially engineered landfill cells for inert, non-hazardous and hazardous wastes; b) a solidification plant with associated storage tanks and silos; c) a storage building; d) an administration office building; e) new weighbridges; f) car parking; g) an ESB substation/switch room; h) internal haul routes; i) surface water ponds and leachate management facilities; j) a temporary viewing platform for visitors from which the geology of the quarry faces can be viewed, and k) ancillary site works and landscaping. A new facility entrance is also proposed from the County Road LP1080.

1.4 ELRA and CRAMP Requirements

Background

CRAMP = Closure, Restoration & Aftercare Management Plan
ELRA = Environmental Liabilities Risk Assessment
FP = Financial Provision

- 1.4.1 CRAMP, ELRA and FP are mutually dependent.²
- 1.4.2 Both the IPPC Directive which was transposed into law under the Protection of The Environment Act of 2003, and the Landfill Directive make reference to the requirements to ensure that closure is adequately addressed. The IPPC Directive states that "the necessary measures are taken upon definitive cessation of activities to avoid any pollution risk and return the site of the operation to a satisfactory state."³

CRAMP/ELRA: EPA Guidance

- 1.4.3 The EPA published *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision* in 2006. This guidance document presents a systematic approach to the assessment and management of Environmental Liabilities in order to comply with IPPC and Waste Licence conditions for Environmental Risk Assessment (ELRA), Residual Management Planning (RMP) and Financial Provision (FP).

² EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 8

³ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 17

- 1.4.4 A systematic step-wise approach is outlined in the EPA guidance document, as follows:
- Step 1: Initial Screening and Operational Risk Assessment
 - Step 2: Preparation of a Closure, Restoration and Aftercare Management Plan (CRAMP) for known Liabilities
 - Step 3: Environmental Liability Risk Assessment (ELRA) for unknown Liabilities
 - Step 4: Identification of Financial Provision (FP) and Instruments
- 1.4.5 The following ELRA risks must be included at a minimum (if applicable):
- Leaks from above ground and below ground storage tanks
 - Spillages from bund
 - Leaks from process and effluent bunds
 - Leaks from pipes
 - Fire and failure/overspill from fire water storage at the facility
 - Failures in landfill liner
 - Escapes of landfill gas
 - Tank overflows
 - Mobile tanker spills on site
 - Leaks from underground sumps

- 1.4.6 A closure plan should contain all of the following elements:⁴

Table 1.1: Closure Plan Requirements

Closure Plan Section	Section Contents
Introduction	<ul style="list-style-type: none"> ▪ Facility and Licence Details ▪ Facility Closure Scenarios Covered in the Plan
Site Evaluation	<ul style="list-style-type: none"> ▪ Facility Description & History – planning history EIS ▪ Facility Compliance Status ▪ Facility Processes and Activities ▪ Inventory of Site Buildings, Plant, Raw Materials and Wastes
Closure Considerations	<ul style="list-style-type: none"> ▪ Clean or Non Clean Closure Declaration ▪ Plant or Equipment Decontamination Requirements ▪ Plant Disposal or Recovery ▪ Waste Disposal or Recovery ▪ Soil or Spoil Removal

⁴ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Table 3.2, Page 20

Closure Plan Section	Section Contents
Criteria for Successful Closure	<ul style="list-style-type: none"> ▪ Addressing of Site Environmental Liabilities at Closure
Closure Plan Costing	<ul style="list-style-type: none"> ▪ Decontamination Costs ▪ Plant & Waste Disposal Costs ▪ On-going monitoring ▪ Facility Security and Staffing ▪ Other Costs
Closure Plan Update & Review	<ul style="list-style-type: none"> ▪ Proposed Frequency of Review ▪ Proposed Scope of Review
Closure Plan Implementation	<ul style="list-style-type: none"> ▪ EPA Notification ▪ Local or other Statutory Authority notifications ▪ Test Programme (If Applicable) ▪ Full or Partial Closure considerations
Closure Plan Validation	<ul style="list-style-type: none"> ▪ Closure Validation Audit ▪ Closure Validation Audit Report ▪ Closure Validation Certificate

CRAMP: Waste Licence W0129-02 Requirements

1.4.7

EPA Waste Licence W0129-02 states the following:

10.8 Closure, Restoration & Aftercare Management Plan (CRAMP)

10.8.1 The licensee shall prepare for agreement by the Agency, a fully detailed and costed plan for the closure, restoration and aftercare of the site or part thereof, including details of the final profile.

10.8.2 The plan shall be maintained and reviewed annually and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the prior agreement of the Agency.

10.9 The National Parks and Wildlife Service shall be consulted as part of the preparation of the CRAMP regarding the presence of peregrine falcon nests at the site. The Agency shall be notified of the outcome of this consultation.

10.10 The CRAMP shall include as a minimum, the following:

- A scope statement for the plan.
- The criteria, including those specified in this licence, which define the successful closure and restoration of the facility or part thereof, and which ensure minimum impact to the environment.
- A programme to achieve the stated criteria.
- Where relevant, a test programme to demonstrate the successful implementation of the plan.
- Details of any proposed or required aftercare supervision, monitoring, control, maintenance and reporting requirements for the restored facility.
- Details of the costings for the plan and the financial provisions to underwrite those costs.

10.11 A final validation report to include a certificate of completion for the CRAMP, for all or part of the site as necessary, shall be submitted to the Agency within three months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.

ELRA: Waste Licence W0129-02 Requirements

1.4.8 W0129-02 states the following in relation to ELRA:

Condition 12: Financial Charges and Provisions

12.2.1 The licensee shall as part of the AER provide an annual statement as to the measures taken or adopted at the site in relation to the prevention of environmental damage, and the financial provisions in place in relation to the underwriting of costs for remedial actions following anticipated events (including closure) or accidents/incidents, as may be associated with the carrying on of the activity.

12.2.2 The licensee shall arrange for the completion, by an independent and appropriately qualified consultant, of a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA), which addresses the liabilities from past and present activities. The assessment shall include those liabilities and costs identified in Condition 10 for execution of the CRAMP. A report on this assessment shall be submitted to the Agency for agreement within twelve months of date of grant of this licence. The ELRA shall be reviewed as necessary to reflect any significant change on site, and in any case every three years following initial agreement: review results are to be notified as part of the AER.

12.2.3 As part of the measures identified in Condition 12.2.1, the licensee shall, to the satisfaction of the Agency, make financial provision to cover any liabilities identified in Condition 12.2.2. The amount of indemnity held shall be reviewed and revised as necessary, but at least annually. Proof of renewal or revision of such financial indemnity shall be included in the annual 'statement of measures' report identified in Condition 12.2.1.

12.2.4 Unless otherwise agreed, any revision to that part of the indemnity dealing with restoration and aftercare liabilities (refer Condition 10.8.1) shall be computed using the following formula:

$$\text{Cost} = (\text{ECOST} \times \text{WPI}) + \text{CiCC}$$

Where:

cost = Revised restoration and aftercare cost.

ECOST = Existing restoration and aftercare cost.

WPI = Appropriate Wholesale Price Index [Capital Goods, Building & Construction (i.e. Materials & Wages) Index], as published by the Central Statistics Office, for the year since last closure calculation/revision.

CiCC = Change in compliance costs as a result of change in site conditions, changes in law, regulations, regulatory authority charges, or other significant changes.

1.5 Known and Unknown Liabilities

1.5.1

Environmental liabilities can be subdivided into two main types: known and unknown liabilities. The quantification and costing of these liabilities is conducted separately and different financial instruments are appropriate for each type of liability. **Table 1.2** outlines how these different liabilities are defined, quantified and should be provided for financially.⁵

Table 1.2: Outline of Environmental Liability Assessment

Liability Type	Definition	Quantification Method	Financial Instrument
Known Liability	Planned/anticipated liabilities associated with facility closure, restoration and aftercare management	Closure Restoration Aftercare Management Plan (CRAMP)	Cash based (Cash, Trust, Fund, Escrow, etc)
Unknown Liability	The risk of environmental liabilities occurring due to unexpected events (e.g. leaking chemical storage tank resulting in groundwater contamination)	Environmental Liability Risk Assessment (ELRA)	Risk transfer instruments (insurance, bonds etc) or combinations of these instruments

1.6 Article 16 Requirements

1.6.1

The EPA issued a notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations on 11th July 2012. Item #5 related to CRAMP, ELRA and financial provision, as follows:

5.1 In accordance with section 53(1) of the Waste Management Acts 1996 to 2011, please furnish particulars in respect of the ability of Murphy Environmental Hollywood Limited to meet the financial commitments or liabilities that will be entered into or incurred in carrying on the proposed activity and provide evidence that Murphy Environmental Hollywood Limited will be in a position to make financial provision that is adequate to discharge these financial commitments. Specifically:

- a. *Prepare a fully detailed and costed Closure, Restoration and Aftercare Management Plan (CRAMP) for the facility⁶, to include as a minimum the following:*
 - *A scope statement for the plan.*
 - *The criteria which define the successful closure and restoration of the facility or part thereof, and which ensure minimum impact to the environment.*
 - *A programme to achieve the stated criteria.*
 - *Where relevant, a test programme to demonstrate the successful implementation of the plan.*
 - *Details of the long-term supervision, monitoring, control, maintenance and reporting requirements for the restored facility.*

⁵ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 8

⁶ Addressed in **Chapter 3** of this report.

- *Details of the costings for the plan and the financial provisions to underwrite these costs.*
- b. *Prepare a fully detailed and costed Environmental Liabilities Risk Assessment (ELRA)⁷ which addresses the liabilities and potential liabilities from past and proposed activities, including those liabilities and costs identified in the CRAMP. The assessment should include consideration of potential liabilities as may arise from legal actions alleging the supply of pyrite-containing stone.⁸ Provide evidence that the assessment was prepared or reviewed, and was found to be complete and accurate, by an independent and appropriate qualified consultant or expert.⁹*
- c. *Provide a proposal for financial provision to cover any liabilities associated with the operation and identified in the ELRA¹⁰ (including closure, restoration and aftercare and unanticipated accidents, incidents and liabilities). Provide evidence that Murphy Environmental Hollywood Limited will be in a position to put such financial provision in place in the event that a waste licence is granted and prior to development works commencing.¹¹*

The preparation of the CRAMP and ELRA and evaluation of the amount and form of financial provision should have regard to Environmental Protection Agency guidance including Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006).¹²

5.2 Provide information on the mechanism for setting landfill gate fees such that the requirements of section 53A of the Waste Management Acts 1996 to 2011 are met.¹³

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⁷ Addressed in Chapter 4 of this report.

⁸ Murphy Environmental Hollywood Ltd. has never been involved in the supply of quarry materials; therefore this item is not considered relevant in the context of this report.

⁹ This report has been prepared by Patel Tonra Ltd., Environmental Solutions, using the prescribed EPA guidance, and using the methodology detailed in the report.

¹⁰ Addressed in **Chapter 5** of this report.

¹¹ Subject to agreement by the Agency, Financial Provision arrangements will be put in place, as outlined in **Chapter 5** of this report, which will be legally binding and will demonstrated to the satisfaction of the Agency as being in place prior to the acceptance of waste under the terms of any future Waste Licence W0129-03.

¹² The EPA guidance note, and methodology outlined therein, has been robustly referenced throughout this report.

¹³ Addressed in **Section 5.6** of this report.

2.0 Initial Screening and Operational Risk Assessment

2.1 Introduction

2.1.1 This section outlines the initial screening and operational risk assessment outlined in EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*

2.2 Complexity

2.2.1 The proposed integrated waste management facility makes provision for specially engineered landfill for hazardous, non-hazardous and inert wastes. This is deemed to be a 'G5' level of complexity¹⁴.

2.2.2 Operations to which a complexity level of 'G5' is assigned are deemed to be 'Category 3' risk, based on initial screening and operational risk assessment¹⁵.

2.2.3 The relevant steps of CRAMP, ELRA and FP for a Risk Category 3 facility have therefore been followed, in accordance with EPA guidance.

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¹⁴ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 11

¹⁵ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 12

3.0 CRAMP (Closure, Restoration, Aftercare Management Plan)

3.1 Scoping CRAMP

3.1.1 The proposed MEHL integrated waste facility is classified as Risk Category 3. During the operational lifetime of the landfill, restoration activities will be active on an ongoing and phased basis. The site will be subject to long-term monitoring in its aftercare phase.

3.1.2 Category 3 facilities, in accordance with EPA guidance, require a Closure Plan and a Restoration, Aftercare Management Plan. The requirements of both plans are addressed jointly in the CRAMP report.

3.2 CRAMP Introduction

3.2.1 The outline contents of the Closure Plan and the Restoration and Aftercare Management Plan are detailed in the EPA Guidance Note¹⁶, as follows:

- Introduction
- Site Evaluation
- Restoration and Remediation Proposals
- Closure Considerations
- Criteria for Successful Closure
- CRAMP Update and Review
- CRAMP Implementation and Validation
- Aftercare Management
- CRAMP Costing

3.2.2 The report is prepared for MEHL, Hollywood Great, Nag's Head, Naul, Co. Dublin for a proposed integrated waste management facility. The application for the proposed development is subject to EPA assessment; EPA licence ref. W0129-03.

3.2.3 The Closure Plan is proposed on the basis of full restoration of the landfill site, decommissioning of plant and equipment and aftercare monitoring at the facility.

3.3 Site Evaluation

Facility Description and History

3.3.1 See **Sections 1.2** and **1.3**. A proposed site layout plan is attached as **Figure 1**.

Facility Compliance Status

3.3.2 The facility has a good record of compliance under W0129-02. There is no compliance history under W0129-03 as the application remains at assessment stage.

¹⁶ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Tables 3.2 and 3.3

- 3.3.3 In accordance with W0129-02, MEHL is required to conduct regular monitoring to ensure that no environmental impact is occurring as a result of site operations. All monitoring reports are submitted to the EPA, and summaries are publicly available at www.mehl.ie. Monitoring of the following is conducted: noise, dust, surface water, groundwater, leachate and meteorology.
- 3.3.4 To-date, environmental monitoring results have generally been in compliance with licence and regulatory requirements. There have been exceedances for some metals (e.g. manganese and arsenic), associated with the geology of the site. There is also some indication of background agricultural-type contamination present in the local waters. A full record of all monitoring results is retained on site by MEHL, in the form of a Monitoring Database, which is updated quarterly.
- 3.3.5 The monitoring programme for the integrated waste management facility will be updated in line with Waste Licence requirements.
- 3.3.6 MEHL has put in place an Environmental Management System (EMS) at the facility. The EMS is independently certified to ISO14001:2004 (since 2004). The EMS will be updated and extended to include the activities of the integrated waste management facility within its scope.

Facility Processes and Activities

- 3.3.7 MEHL proposes to develop an integrated waste management facility within the existing boundaries of its existing facility for the landfilling of non-biodegradable inert, non-hazardous and hazardous wastes, including waste-to-energy residues. The proposed development will allow the former quarry to be restored to a natural landform.
- 3.3.8 The design of the liner and capping systems for each landfill class varies according to international best practice and EPA guidance, and under the EU Landfill Directive 1999. The landfill cells are to be constructed from a minimum formation level of 102.5m within the existing quarried void. Higher ground levels surrounding the quarry void will screen the construction and landfill operations.
- 3.3.9 The following classes of activity are proposed for the MEHL integrated waste management facility application:

Licensed Waste Disposal Activities, in accordance with the Third Schedule of the Waste Management Acts 1996 to 2010

- **Class 1: Deposit on, in or under land (including landfill):** This activity relates to the deposition of inert material.
- **Class 5: Specially engineered landfill, including placement into lined discrete cells, which are capped and isolated from one another and the environment:** This is the principal activity. It is proposed that the facility will accept a range of non-biodegradable waste streams which fall within the following classes of landfill: landfill for hazardous waste, landfill for non-hazardous waste and landfill for inert waste, as specified under the EU Landfill Directive (1999).
- **Class 7: Physico-chemical treatment not referred to elsewhere in this Schedule which results in final compounds or mixtures which are disposed of by means of any activity referred to in paragraphs 1 to 5 or paragraphs 8 to 10 of this Schedule (including evaporation, drying and calcinations):** This activity relates to the proposed Solidification Plant, which will pre-treat (by means of a solidification process) certain hazardous wastes prior to landfilling.

- **Class 13: Storage prior to submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where the waste concerned is produced:** This activity includes temporary storage of incoming wastes pending Third Schedule, Class 7 activity; and the storage of unacceptable wastes in a designated area pending their dispatch to appropriate disposal facilities.

Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Acts 1996-2010

- **Class 3: Recycling or reclamation of metals and metal compounds:** This activity provides for the recovery of metal within wastes delivered to the facility.
- **Class 4: Recycling or reclamation of other inorganic materials:** This activity includes the recovery of inert material for use in site development and site restoration works.
- **Class 13: Storage of waste intended for submission to any activity referred to in a preceding paragraph of this Schedule, other than temporary storage, pending collection, on the premises where such waste is produced:** This activity includes the storage of wastes for recovery purposes at this facility (e.g. stockpiles of soil) and the temporary storage of materials (e.g. metals), pending their dispatch to appropriate off-site recovery facilities.

3.3.10 It is proposed that the principal activity licensed under W0129-02 will remain the same for the purpose of the proposed development, i.e. Class 5, specially engineering landfill. The application proposes engineered landfill disposal capacity for non-biodegradable inert, non-hazardous and hazardous wastes. Third Schedule, Class 7 (physico-chemical treatment) is proposed for the purpose of operation of a solidification plant on site – this is the only additional class of activity proposed, which is not already licensed under W0129-02.

Seveso II Directive

3.3.11 Calculations show that the total inventory of Flue Gas Treatment (FGT) residue (ash) proposed to be accepted/temporarily stored at the MEHL Solidification Plant process is sufficient to qualify as a lower tier site. A notification has been made to the Health & Safety Authority under the European Communities (Control of Major Accidents involving Dangerous Substances) Regulations 2006.

Potential Impact on Natura 2000 Sites

- 3.3.12 The Environmental Liability Directive (2004/35/CE) considers environmental damage to water, land and “*damage to protected species and natural habitats, which is any damage that has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species*”.
- 3.3.13 The EIS for the proposed integrated waste management facility at Hollywood included an Appropriate Assessment (Screening) under the European Communities (Natural Habitats) Regulations, 1997, as well as full Flora & Fauna studies under EIS requirements.
- 3.3.14 The EIS concludes that there will be no direct impacts on any designated areas for conservation, due to the distance (>2.5km) of the nearest designated conservation areas from the MEHL site.

- 3.3.15 The EIS notes the loss of habitat for peregrine falcon nesting and roosting; however it is noted that this impact is anticipated under existing operations, and as a direct result of the necessity to infill and restore the quarry. In this context, the loss of habitat has not been included in CRAMP costs.

Site Buildings

- 3.3.16 Proposed site buildings are as follows:
- Solidification plant
 - Storage building
 - Administration office building
 - ESB substation/switch room

Plant and Infrastructure

- 3.3.17 Proposed plant/infrastructure items are as follows:
- Specially engineered landfill cells for inert, non-hazardous and hazardous wastes
 - Storage tanks and silos (at solidification plant)
 - Weighbridges
 - Wheelwash
 - Car parking
 - New facility entrance
 - Internal haul routes
 - Services and lighting
 - Sewage and surface water drainage infrastructure
 - Surface water ponds and leachate management facilities
 - A temporary viewing platform for visitors from which the geology of the quarry faces can be viewed
 - Various vehicles, e.g. loaders, bulldozers, rollers

Raw Materials

- 3.3.18 It is envisaged that the solidification process will use cement (or replacement binding materials, as appropriate), acid and water. 1 No. cement silo will be provided at the solidification plant, with capacity of 78m³; equivalent to approximately 117 tonnes. 2 No. banded acid tanks will be provided at the solidification plant, with capacity of 2 x 30m³; equivalent to approximately 72 tonnes. Hydrochloric acid (HCl) is the preferred acid type.
- 3.3.19 It is proposed to install a 7,500 litre diesel tank for site machinery, to be stored in a banded and roofed storage building. It is proposed to construct this building adjacent to the solidification yard. The existing fuel storage area will be decommissioned when the new fuel storage area has been installed.

Wastes

- 3.3.20 Waste generation associated with operations of the proposed integrated waste management facility is anticipated to be minimal. General municipal-type waste and recyclables will be generated as a result of office and staff mess facilities.

Small volumes of non-acceptable waste/recyclables may be required to be removed off-site, comprising materials removed from incoming C&D-type waste. Only permitted/licensed waste collectors and facilities, with EPA pre-approval, will be used for removal off-site.

- 3.3.21 It is proposed that leachate generated on-site will be re-used within the solidification plant, with excess to be removed off-site to an appropriately licensed facility, as required.

3.4 Restoration and Remediation Proposals

- 3.4.1 The proposed development will effect the restoration of a worked-out quarry in keeping with the surrounding landscape, and in line with pre-quarrying levels. A phased restoration approach is proposed for the MEHL integrated waste management facility, which will allow the site to be restored progressively over the lifetime of the project. As part of the restoration process, as each cell is filled to required restoration levels, capping layers will be applied, in line with requirements for inert, non-hazardous and hazardous cells.

Landfill Cells

- 3.4.2 It is proposed to construct hazardous (1,735,500 m³), non-hazardous (1,324,000 m³) and inert (755,500 m³) landfill cells; see **Table 3.1**. The hazardous waste cells will be sited in the northern part of the existing quarry. The non-hazardous cell will be located in the southern part of the site and the inert cells to the west (Proposed Site Layout Drawings were included in Waste Licence Application as *PP-WLA-03-01*).

Table 3.1: Proposed Void Capacities

	Cell Ref.	Phase	Void Capacity (m ³)	Subtotal (m ³)
Hazardous	H1	1	327,000	1,735,500
	H2	2	652,000	
	H3	3	756,500	
Non-hazardous	NH1	2	1,070,000	1,324,000
	NH2	4	254,000	
Inert	IN1	1	853,000	755,500
	IN2	2	271,500	
	IN3	3	165,500	
	IN1	-	- 534,500 *	
TOTAL:				3,815,000

* 534,500m³ to be re-located to IN1 from existing inert waste cells on site

Phasing

- 3.4.3 The landfill will be constructed in four phases (the preliminary proposed phasing programme for the facility was detailed in Waste Licence Application in *Appendix D.2.2*: Proposed Phasing Layout Drawings were included in Waste Licence Application as *PP-WLA-14-01*; Proposed Site Restoration Drawings were included in Waste Licence Application as *PP-WLA-15-01*).
- 3.4.4 The actual phasing will depend on the volumes of appropriate waste generated over the lifespan of the project, which is influenced by a number of factors, including waste policy and economic conditions.

- 3.4.5 The hazardous cells will be constructed and restored over three phases. The construction works will be phased moving from the north to the south of the site. The final restoration of each hazardous cell will commence when filling is completed.

Final Restoration

- 3.4.6 The final restoration will comprise the demolition and recycling of the administration building, electrical substation, car-parking area, lighting standards and road pavement. During the final restoration, non-hazardous waste cell NH2 and inert waste cell IN1 will be capped and restored.
- 3.4.7 The maximum restored level will be 148m OD Malin near the existing entrance on the western boundary. Restoration levels will slope from the east and north of the highest point to match the surrounding ground levels and a typical slope of 1 in 10 is anticipated. It is proposed to restore the site to amenity / nature usage.
- 3.4.8 The position of both surface water drains and hedgerows on site mark the location of inert, non-hazardous and hazardous areas. This will assist with the identification of inert, non-hazardous and hazardous areas on site in addition to site survey records.
- 3.4.9 The leachate and surface water collection infrastructure will be retained after the final restoration. This infrastructure consists of leachate monitoring wells, leak detection wells, leachate holding tanks and any other monitoring infrastructure in order to meet EPA requirements for aftercare and monitoring.

3.5 Closure Considerations

Clean or Non-Clean Closure

- 3.5.1 The EPA defines 'clean' and 'non-clean' closure as follows:
- Clean Closure – upon cessation of operations and subsequent decommissioning at the facility, there are no remaining environmental liabilities
 - Non-Clean Closure – upon cessation of operations and subsequent decommissioning – there are remaining liabilities, which require a restoration and aftercare management plan
- 3.5.2 As the proposed activity includes the landfilling of hazardous wastes, upon cessation of operations, there will be remaining liabilities, which require a restoration and aftercare management plan, i.e. the 'non-clean' closure criteria apply.

Plant or Equipment Decontamination Requirements

- 3.5.3 The items which may be required to be decontaminated (i.e. plant which has been in direct contact with hazardous wastes on-site) upon closure are:
- Silos at the solidification plant (4 No.)
 - Acid tanks at the solidification plant (2 No.)
 - Mixing unit and hosing at the solidification plan

Plant Disposal or Recovery

- 3.5.4 Mobile plant will be sold. Fixed plant and buildings will be decommissioned/demolished and sold for reuse/recovered.

Waste Disposal or Recovery

- 3.5.5 Strict waste acceptance criteria will be applied during the lifetime of the facility to ensure that only conforming wastes are accepted at the facility.
- 3.5.6 No significant waste volumes are anticipated upon site closure. Any municipal-type waste will be removed off-site in accordance with legal and regulatory requirements.

Soil or Spoil Removal

- 3.5.7 It is not anticipated that soil/spoil will be generated at part of site closure activities. There will be no contaminated ground or spoil that requires specialist treatment on cessation of activities at the facility. No residual materials will remain.

3.6 Criteria for Successful Closure

- 3.6.1 MEHL has established the following criteria for the successful closure of the facility:
- The site has been restored in a manner fitting the surrounding landscape; final capping, grassing and planting has been completed across all areas
 - Site buildings and related services and infrastructure have been decommissioned/demolished, as appropriate, and materials have been moved off-site for recovery
 - All plant and equipment has been safely decontaminated or decommissioned and removed off-site, as appropriate
 - Site security measures are in place
 - Leachate and surface water collection infrastructure has been checked and verified and an aftercare maintenance programme agreed
 - Monitoring points have been checked and verified and an aftercare monitoring programme agreed
 - The Environmental Management System has been actively implemented during the closure period
 - All relevant site records, including monitoring data, have been managed appropriately retained in an off-site location
 - A Verification Audit / Certification has been independently completed on behalf of the operator and associated report submitted to the Agency
 - Financial provision has been updated and agreed with the Agency
 - CRAMP has been agreed formally with the Agency
 - Other notice parties (e.g. the neighbouring community, the local authority) are informed of CRAMP status

3.7 CRAMP Update and Review

- 3.7.1 It is proposed that the CRAMP will be reviewed in line with licence requirements (typically once per annum as part of the Annual Environmental Report).
- 3.7.2 Progress on restoration of cells shall be reported annually as part of the Annual Environmental Report.
- 3.7.3 CRAMP will be reviewed in the event of a significant amendment to site activities.
- 3.7.4 Drawdown of financial provision sums will be recorded as per **Section 5.5**.

3.8 CRAMP Implementation and Validation

- 3.8.1 CRAMP implementation will be on the following basis:
- CRAMP will be effected on an ongoing basis during the operational lifetime of the landfill, in line with the indicative phasing plan outlined in **Section 3.4**.
 - Closure activities upon cessation of waste activities and facility decommissioning at the facility's end-of-life
 - Implementation of the aftercare management programme

Phased Restoration during Operational Lifetime

- 3.8.2 MEHL proposes that ongoing/phased CRAMP activities during the operational lifetime of the landfill will be addressed under SEW¹⁷/CQA¹⁸ processes and procedures, as prescribed by an EPA Waste Licence.
- 3.8.3 In line with the requirements of W0129-02 (or as may amended by any future Waste Licence), this would mean that restoration of cells/sub-cells would be subject to the following:
- A proposal to restore an area is submitted to the Agency for its agreement at least two months in advance of the intended date of commencement of restoration works.
 - Restoration works are supervised by an appropriately qualified person, and that person, or persons, shall be present at all times during which relevant works are being undertaken.
 - Following the completion of restoration works, a Construction Quality Assurance validation will be completed. The validation report will include:
 - A description of the works
 - As-built drawings of the works
 - Records and results of all tests carried out
 - Drawings and sections showing the location of all samples and tests carried out
 - Name(s) of contractor(s)/individual(s) responsible for undertaking the restoration works

¹⁷ SEW = Specified Engineering Works

¹⁸ CQA = Construction Quality Assurance

- o Records of any problems and the remedial works carried out to resolve those problems
- o Any other information requested in writing by the Agency

3.8.4 It is proposed that draw-down of restoration funds (under Financial Provision) is also allayed to the SEW/COA model, as further discussed in **Section 5.5**.

CRAMP at the facility's end-of-life

3.8.5 Upon cessation of waste activities at the facility, decommissioning and demolition activities will be carried out, as detailed in the previous sections.

3.8.6 An independent verification audit will be completed to verify that all closure criteria have been adequately addressed and the closure phase will be agreed with the Agency. The independent audit will include a soil/groundwater investigation/verification by an appropriately-qualified and experienced hydrogeologist.

3.8.7 It is anticipated that the EPA will conduct its own post-closure audit of the facility also.

Implementation of the aftercare management phase

3.8.8 See **Section 3.9** below.

3.9 Aftercare Management

3.9.1 It is anticipated that future after-use will be for low-impact amenity, nature area, or related uses. The Fingal County Development Plan (2005-2011) states the Council's vision for this area: *"In recognition of the amenity potential of these areas, opportunities to increase public access will be sought"*.

3.9.2 The length of the aftercare period will vary from site to site; however, the holder of a landfill waste licence will be responsible for the aftercare of the site up until the date when the Agency accepts the surrender of the waste licence as specified under section 48 of the Waste Management Act, 1996.¹⁹

3.9.3 Aftercare management of the integrated waste management facility once the lands have been restored, grassed and planted, as appropriate, will include:

- Maintenance of grassland, hedges and planted areas
- Leachate management
- Inspections and surveys of the drains, surface water management and land surface
- Maintenance of infrastructural installations, including pathways, access points and signposting, fencing and security
- Monitoring (detailed in **Section 3.9.7**)

¹⁹ EPA (1999) Landfill Manual: Landfill Restoration and Aftercare

- 3.9.4 The following pollution control systems will be maintained and protected during the aftercare period:
- the leachate management system
 - the landfill capping system including drainage system
 - surface water collection, storage and discharge systems
 - groundwater monitoring boreholes
 - leachate monitoring wells
 - hazardous cell leak detection points
 - surface water monitoring points
 - any other items required by the Agency
- 3.9.5 It is proposed that the aftercare programme at MEHL will be focused on a performance-based assessment of site conditions, i.e. using the aftercare monitoring programme to determine any potential facility-related environmental impacts. On the basis of favourable results of the aftercare the monitoring programme, it would be proposed to reduce the monitoring frequencies throughout the aftercare period, in line with after-care control and monitoring procedures specified by the Landfill Directive 1999.
- 3.9.6 The aftercare programme is proposed on the basis of:
- A five-year active aftercare management period, followed by: -
 - A five-year passive aftercare management period, followed by: -
 - Additional aftercare management period, as appropriate, depending on results of the performance assessment
- 3.9.7 Aftercare monitoring requirements will be agreed with the EPA as part of a final closure plan. The monitoring programme will be put forward on the basis of active, passive and additional aftercare phases outlined above. The monitoring programme should prove that no impact is occurring and, on that basis, the monitoring programme will be scaled back throughout the aftercare period. Monitoring will include:
- Meteorological
 - Groundwater levels
 - Groundwater composition
 - Leachate volume
 - Leachate composition
 - Surface water emissions – volume and composition
 - Topographical survey/reading of any settling behaviour of the level of the landfill body
- 3.9.8 It is proposed that annual meetings would be held between MEHL and all relevant interested parties, such as local community representatives, planning and local authorities, wildlife groups, etc. for 5 years post-closure, as a minimum. Depending on aftercare reporting and consultation with the Agency, this consultation period may be extended.

3.10 CRAMP Costing

- 3.10.1 The CRAMP has been costed on the basis of 'best estimates' available at the time of writing. Costs items are based on data/extrapolations included in the planning and licensing applications and accompanying EIS. Unit cost rates have been sourced from: (i) direct experience, (ii) published sources, or (iii) EPA information. The costing exercise should be viewed as preliminary (in the context of a proposed development) and should be reviewed at the post-licensing/operational stage.
- 3.10.2 CRAMP costing estimates²⁰ are included in **Appendix 1**.

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²⁰ The 'NaDWaF' report provides a Restoration and Aftercare Cost for a hazardous landfill of €1.5 million. EPA (2010) *Technical and Economic Aspects of developing a National Difficult Waste Facility (NaDWaF)*, Page 14

4.0 Environmental Liabilities Risk Assessment (ELRA)

4.1 Introduction

- 4.1.1 Environmental liability risk assessment (ELRA) considers the risk of unplanned events occurring during the operation of a facility that could result in unknown liabilities materialising.
- 4.1.2 As discussed in **Section 2.2**, the proposed MEHL integrated waste management facility (EPA application ref. W0129-03) is classified as a Category 3 facility; therefore the generic approach for Category 3 facilities, as outlined in *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision* has been followed.
- 4.1.3 The scope of the ELRA covers environmental risks associated with the proposed integrated waste management facility, which could potentially lead to environmental liability.

4.2 Risk Identification

- 4.2.1 ELRA risks were identified by Patel Tonra Ltd., Environmental Solutions, based on their detailed understanding of the project elements included in the proposed integrated waste management facility at MEHL. Subsequently, a risk management workshop was held with Patel Tonra Ltd., the General Manager and Facility Manager of MEHL (2nd February 2012).
- 4.2.2 Risks were identified on a process based approach, i.e. all proposed activities were examined in relation to potential environmental risks.

4.2 Risk Classification

- 4.2.1 Risk Classification Tables were applied, as per the EPA ELRA guidance document²¹. 'Occurrence' and 'Severity' were rated for each identified risk. 'Occurrence' is the probability of an event occurring. 'Severity' is the magnitude of impact if the event occurs.

4.3 Assessment of Risks

- 4.3.1 A Risk Register was prepared, on the basis of the severity and occurrence ratings. The Risk Register is included in **Appendix 2**.
- 4.3.2 Risks were tabulated in a Risk Matrix, as per **Appendix 3**. The Risk Matrix shows that there are no risks in the red zone requiring priority attention. There are no risks in the yellow/amber zone (these would indicate risks that require mitigation or management action. All risks are located in the light green zone, indicating a need for continuing awareness and monitoring on a regular basis.

²¹ EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 29

4.4 Risk Prevention/Mitigation

- 4.4.1 In assigning the 'occurrence' rating, due regard was given to mitigation measures/operational controls outlined in the EIS and Waste Licence Application. 'Severity' was assigned on a worst-case basis.

4.5 Risk Management Programme

- 4.5.1 Risks/potential environmental impacts have been identified and mitigation measures proposed in the EIS/Waste Licence Application for the proposed integrated waste management facility. A risk management programme will be further explored at the post-licensing stage, and in line with MEHL's Environmental Management System.

4.6 Quantification of Unknown Environmental Liabilities

- 4.6.1 A preliminary ELRA financial model is included in **Appendix 4**.
- 4.6.2 The ELRA has been costed on the basis of 'best estimates' available at the time of writing. Costs items are based on data/extrapolations included in the planning and licensing applications and accompanying EIS. Unit cost rates have been sourced from: (i) direct experience, (ii) published sources, or (iii) EPA information. The costing exercise should be viewed as preliminary (in the context of a proposed development) and should be reviewed at the post-licensing/operational stage.
- 4.6.3 The financial model is based on the application of a median probability and median cost range to each risk, as detailed in the EPA Guidance.

4.7 Review of Risk Assessment

- 4.7.1 It is proposed that the ELRA will be reviewed and updated in its entirety every 5 years, or sooner, if required.
- 4.7.2 ELRA will be reviewed in the event of a significant amendment to site activities.
- 4.7.3 The ELRA status shall be reported annually as part of the Annual Environmental Report.

5.0 Financial Provision (FP)

5.1 Introduction

5.1.1 The main objective of Financial Provision²² is to ensure that sufficient financial resources are available to cover:

- Known environmental liabilities that will arise at the time of facility closure;
- Known environmental liabilities that are associated with the aftercare and maintenance of the facility until such time as the facility is considered to no longer pose a risk to the environment;
- Unknown environmental liabilities that may occur during the operating life of the facility.

5.1.2 Financial provision encompasses two aspects:

- Quantifying the financial amount of the environmental liabilities (known and unknown)
- Selecting appropriate financial instrument(s) to underwrite the liabilities.

5.2 Calculation of FP

5.2.1 The amount of financial provision required for the proposed MEHL integrated waste management facility (EPA application ref. W0129-03) has been determined using the CRAMP and ELRA assessment protocol outlined in this document.

5.2.2 **Appendix 5** summarises the financial provisions proposed for known and unknown liabilities relating to the proposed development.

5.3 Mechanism for FP

5.3.1 A licence holder is required to make adequate financial provision to cover the known and unknown costs associated with the operation of a facility, any potential liabilities that may arise and the cost of CRAMP during and after the cessation of operations at the facility.

5.3.2 There is a recognised vulnerability in making proper provision for ELRA and CRAMP where funds are held in an account or accounts owned and controlled by the licence holder company. Similarly there is a vulnerability in proposing insurance and or bonds to be acquired by the licence holder company for the purpose of addressing environmental liabilities or CRAMP as these instruments are useful only as long as the licence holder can maintain the premiums and or bond purchase and in the event that this ability was compromised in any way then the provisions themselves become compromised.

²² EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*, Page 37

5.3.3 MEHL proposes that provision should be made in a manner that tracks at all times the monetary value of said risks or CRAMP requirements and is retained in a manner which protects these funds from any third party access²³. The proposed FP model seeks to:

1. Ensure such risks as described above are avoided.
2. Permit the funds to be retained well beyond the lifetime of the facility and/or the licence holder company for the on-going management and aftercare of the facility as long as is deemed appropriate.
3. Ensure that no matter the ultimate fate of the licence holder the money is beyond the reach of any potential creditors.
4. Give the EPA a direct oversight of the management and implementation of the funds over and above any statutory authority.

Proposed FP Model/Vehicle

5.3.4 In the absence of a prescriptive approach by the Agency in relation to the Financial Provision (FP) vehicle, MEHL hereby sets out a proposed approach for consideration and agreement with the Agency. Legal and contractual details will be addressed and implemented prior to the commencement of waste acceptance under any amended Waste Licence W0129-03.

5.3.5 MEHL proposes that a legal instrument is set up **to be known as 'H.E.R.A.L.D. Ltd.'** (Hollywood Environmental, Restoration and Liabilities Depository Co. Ltd.)²⁴. **The purpose of 'H.E.R.A.L.D. Ltd.' is to act** as a vehicle to receive, retain and where appropriate distribute funds for the purpose of addressing known or as yet unknown liabilities, purchase of insurances and/or bonds and the accumulation of cash funds to address financial requirements identified through the CRAMP and ELRA models [when required] as revised from time to time in accordance with EPA instructions and the conditions of the licence. MEHL proposes that such a vehicle would be managed by nominated parties representing the licence holder and the EPA or such other authority as may be nominated or described as the authority responsible for the control and monitoring of the said licence.

5.3.6 **'H.E.R.A.L.D. Ltd.'** would receive funds from the licence holder into its hands for the sole and exclusive purpose of discharging costs, fees, premiums and expenses associated with the ELRA and/or CRAMP provisions appropriate to this licence [if granted]. **'H.E.R.A.L.D. Ltd.'** would remain impenetrable from the licence holder or other third parties who might otherwise claim a vested interest in the licence **holder's assets and seek to secure a lien on said funds on that basis. MEHL would effectively be settling an invoice monthly between itself and the 'vehicle company'** for the purchase of financial provision under CRAMP and/or ELRA.

5.3.7 The memorandum and articles of association of **'H.E.R.A.L.D. Ltd.'** would be prescriptive and constrain very specifically the purpose of the vehicle such that it could only operate to achieve the objectives set out above. The Memorandum and Articles of association would be constructed in such a manner as to allow for the routine rotation of the Board of Directors with an agreed balance of representation nominated by both the licence holder and the EPA. Suitably qualified persons would be asked to take the places on the Board of Directors to discharge the obligations of the Board which would be described in the licence, all laws relevant to a company under the Companies Acts, the Waste Management Acts and the other Laws of Ireland and the EU as amended from time to time and also in the memorandum and articles of association of **'H.E.R.A.L.D. Ltd.'**

²³ Parties including the licence holder who might seek to access these funds for purposes other than addressing the ELRA or CRAMP liabilities

²⁴ Subject to agreement/company registration.

- 5.3.8 Having considered the alternate options (such as a purpose trust) the proposed approach of establishing a purpose vehicle company, limited by guarantee, is considered to be an effective, efficient and cost-neutral option.

5.4 Draw-down of FP

- 5.4.1 It shall be agreed that the EPA is the sole consent authority for authorising draw-down of CRAMP funds.
- 5.4.2 MEHL proposes that drawdown of financial provision sums during the operational lifetime of the landfill will be aligned with SEW²⁵/CQA²⁶ processes and procedures (detailed in **Section 3.8**), as follows:
- **Proposed restoration works and outline costings** - A proposal to restore an area ('SEW proposal') is submitted to the Agency for its agreement at least two months in advance of the intended date of commencement of restoration works. This is accompanied by an outline costing of the proposed works for the Agency's agreement²⁷.
 - **Restoration works** - Restoration works will be completed and supervised by an appropriately qualified person, and that person, or persons, shall be present at all times during which relevant works are being undertaken.
 - **CQA Stage and drawdown of funds** - Following the completion of restoration works, a Construction Quality Assurance validation will be completed and made available for inspection by the Agency. Expenditure validation records for that phase of the restoration works will be made available for inspection by the Agency and it is proposed that a signed agreement will issue from the Agency for drawdown of funds²⁸.
 - **Records of Financial Provision drawdown** - The licensee will maintain a model to note and record details of proposals made to EPA in relation to restoration works, dates of EPA approvals and actual draw-down details (dates and amounts).

5.5 S.53(A) Requirements re. setting of Landfill Gate Fees

- 5.5.1 The Landfill Directive and Section 53(A) of the Waste Management Act, 1996 (as amended) requires that the price charged for disposal of waste in a landfill must not be less than the total costs necessary for the three purposes set out in Section 53(A)(4).²⁹ These are:
- the costs incurred by the operator in the acquisition or development, or both (as the case may be), of the facility,
 - the costs of operating the facility during the relevant period (including the costs of making any financial provision under section 53), and

²⁵ SEW = Specified Engineering Works

²⁶ CQA = Construction Quality Assurance

²⁷ It is proposed that standardised pro-forma documents be drawn up, which address any appropriate legal requirements.

²⁸ It is proposed that standardised pro-forma documents be drawn up, which address any appropriate legal requirements.

²⁹ www.epa.ie (Apr. 2013)

- the estimated costs, during a period of not less than 30 years or such greater period as may be prescribed, of the closure, restoration, remediation or aftercare of the facility.

5.5.2 The licensee will ensure that the long-term aftercare of the facility (*inter alia*) will be considered and will be reflected in the charging structure during the operation of the facility.

5.5.3 MEHL will apply the **EPA's bespoke landfill gate fees** financial model for determining and reporting to the EPA compliance with Section 53(A).³⁰ The model will be completed and reported to the Agency prior to the acceptance of waste under any future revised Waste Licence W0129-03, and annually thereafter.

5.5.4 As W0129-03 proposals make provision for the acceptance of waste under three separate classes of landfill (inert, non-hazardous and hazardous), variable gate fees will apply, in line with the costs associated with the management and aftercare of different waste types.

5.5.5 It is noted that charging relates to the period of time from the date of commencement of waste disposal in the landfill to the predicted date of cessation of waste disposal in the landfill; but that costs include acquisition, development, closure, restoration, remediation and aftercare costs.³¹ Details and records pertaining to costs, budgets and estimates will be fully documented by MEHL and independently verified, where necessary, in line with business and financial planning and management requirements.

5.5.6 In accordance with the EPA financial model, consideration of revenue and costs will include the following items (for example):³²

- Operating costs:
 - Staff
 - Monitoring and control
 - Administrative costs
 - Resources (electricity and fuel)
 - Data management and reporting
- Acquisition and development costs:
 - Land, roads, weighbridge, wheelwash, fencing, buildings, carpark
 - Drainage, interceptors, settlement ponds/lagoons, oil separators
 - Plant, machinery, vehicles
 - Monitoring infrastructure
 - Leachate tanks
 - Services (surface water, foul water, watermain, power)
 - Bunded oil storage
 - Waste quarantine area
 - Traffic management barriers
 - CCTV

³⁰ The relevant returns have already been made by MEHL under the requirements of W0129-02.

³¹ EPA (2013) S.53(A) Financial Model 2013

³² EPA (2012) Landfill gate fee workshop (EPA presentation of 1st March 2012)

- Alarms
- Spill control equipment
- Lighting
- Cell construction/development costs
 - Excavation and replacement of soft materials
 - Grading to formation levels
 - Embankments
 - Basal liner system
 - Leachate collection layer
 - Side slope risers
 - Capping costs - incurred & future
 - Leachate costs - incurred & future to close
- Restoration and aftercare costs:
- Leachate cost post closure
- Aftercare
- Monitoring
- Security

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Appendix 1: Preliminary CRAMP Costing Estimates

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MEHL Proposed Integrated Waste Management Facility
EPA Waste Licence Application W0129-03
Closure Costs (Preliminary Assessment)

#	Item	Estimated Cost (median)
1	Plant removal	€ 5,000
2	Decontamination	€ 23,520
3	Waste Disposal/recovery - Leachate pumping and tankering	€ 1,889,918
4	Demolition/decommissioning	€ 50,689
5	Environmental Monitoring - Aftercare Years 1-5	€ 60,000
5.1	Environmental Monitoring - Aftercare Year 5 onwards	€ 100,000
6	Verification Audit / Certification & Report to EPA	€ 50,000
7	Other items	
7.1	- Capping and drainage: hazardous	€ 2,103,825
7.2	- Capping and drainage: non-hazardous	€ 1,232,400
7.3	- Capping and drainage: inert	€ -
7.4	- Landscaping/planting and grass seed	€ 25,000
7.5	- General ongoing maintenance and aftercare, Aftercare Years 1-5	€ 40,000
7.6	- General ongoing maintenance and aftercare, Aftercare Year 5 onwards	€ 75,000
	Subtotal	€ 5,580,352
	Contingency	€ 558,035
	Total (excl. VAT)	€ 6,138,387

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Appendix 2: Risk Register

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**MEHL Proposed Integrated Waste Management Facility
EPA Waste Licence Application W0129-03**

Risk Register (Preliminary Assessment)

Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Occurrence Rating	Severity Rating	Risk Score
				[Note d]	[Note e]	
W0129-03 Risk#01	Construction activities	Release of polluting substance	Surface water pollution	1	3	3
W0129-03 Risk#02	Construction activities	Release of polluting substance	Groundwater pollution	1	4	4
W0129-03 Risk#03	Construction activities	Release of polluting substance	Soil pollution	1	3	3
W0129-03 Risk#04	Site office/weighbridge	Fuel spillage	Surface water pollution	1	3	3
W0129-03 Risk#05	Site office/weighbridge	Fuel spillage	Groundwater pollution	1	4	4
W0129-03 Risk#06	Site office/weighbridge	Fuel spillage	Soil pollution	1	3	3
W0129-03 Risk#07	Site office/weighbridge	Hazardous waste spillage	Surface water pollution	1	3	3
W0129-03 Risk#08	Site office/weighbridge	Hazardous waste spillage	Groundwater pollution	1	4	4
W0129-03 Risk#09	Site office/weighbridge	Hazardous waste spillage	Soil pollution	1	3	3
W0129-03 Risk#10	Site office/weighbridge	Firewater (office)	Surface water pollution	1	3	3
W0129-03 Risk#11	Site office/weighbridge	Firewater (office)	Groundwater pollution	1	4	4
W0129-03 Risk#12	Site office/weighbridge	Firewater (office)	Soil pollution	1	3	3
W0129-03 Risk#13	Solidification process (pre-treatment, prior to landfilling, for certain hazardous wastes)	Hazardous waste spillage	Surface water pollution	1	3	3
W0129-03 Risk#14	Solidification process (pre-treatment, prior to landfilling, for certain hazardous wastes)	Hazardous waste spillage	Groundwater pollution	1	4	4
W0129-03 Risk#15	Solidification process (pre-treatment, prior to landfilling, for certain hazardous wastes)	Hazardous waste spillage	Soil pollution	1	3	3
W0129-03 Risk#16	Landfill operations: hazardous landfill cells	Failure of cell liner/leachate release	Surface water pollution	1	3	3
W0129-03 Risk#17	Landfill operations: hazardous landfill cells	Failure of cell liner/leachate release	Groundwater pollution	1	4	4
W0129-03 Risk#18	Landfill operations: hazardous landfill cells	Failure of cell liner/leachate release	Soil pollution	1	3	3
W0129-03 Risk#19	Landfill operations: non-hazardous landfill cells	Failure of cell liner/leachate contamination of local waters	Surface water pollution	1	3	3
W0129-03 Risk#20	Landfill operations: non-hazardous landfill cells	Failure of cell liner/leachate contamination of local waters	Groundwater pollution	1	4	4
W0129-03 Risk#21	Landfill operations: non-hazardous landfill cells	Failure of cell liner/leachate contamination of local waters	Soil pollution	1	3	3
W0129-03 Risk#22	Landfill operations: inert landfill cells	Failure of cell liner/leachate contamination of local waters	Surface water pollution	1	3	3
W0129-03 Risk#23	Landfill operations: inert landfill cells	Failure of cell liner/leachate contamination of local waters	Groundwater pollution	1	4	4
W0129-03 Risk#24	Landfill operations: inert landfill cells	Failure of cell liner/leachate contamination of local waters	Soil pollution	1	3	3
W0129-03 Risk#25	Leachate management	Rupture of leachate holding tank	Surface water pollution	1	3	3

**MEHL Proposed Integrated Waste Management Facility
EPA Waste Licence Application W0129-03**

Risk Register (Preliminary Assessment)

Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Occurrence Rating	Severity Rating	Risk Score
				[Note d]	[Note e]	
W0129-03 Risk#26	Leachate management	Rupture of leachate holding tank	Groundwater pollution	1	4	4
W0129-03 Risk#27	Leachate management	Rupture of leachate holding tank	Soil pollution	1	3	3
W0129-03 Risk#28	Surface water management	Uncontrolled release of polluting substance	Surface water pollution	1	3	3
W0129-03 Risk#29	Surface water management	Uncontrolled release of polluting substance	Groundwater pollution	1	4	4
W0129-03 Risk#30	Surface water management	Uncontrolled release of polluting substance	Soil pollution	1	3	3
W0129-03 Risk#31	Wastewater management	Failure of on-site foul treatment	Surface water pollution	1	4	4
W0129-03 Risk#32	Wastewater management	Failure of on-site foul treatment	Groundwater pollution	1	4	4
W0129-03 Risk#33	Wastewater management	Failure of on-site foul treatment	Soil pollution	1	3	3
W0129-03 Risk#34	Fuel storage (located at Solidification Plant)	Tank/Bund failure/ leaks	Surface water pollution	1	3	3
W0129-03 Risk#35	Fuel storage (located at Solidification Plant)	Tank/Bund failure/ leaks	Groundwater pollution	1	4	4
W0129-03 Risk#36	Fuel storage (located at Solidification Plant)	Tank/Bund failure/ leaks	Soil pollution	1	3	3
W0129-03 Risk#37	Garaging and maintenance	Fuel/polluting substance spillage	Surface water pollution	1	3	3
W0129-03 Risk#38	Garaging and maintenance	Fuel/polluting substance spillage	Groundwater pollution	1	4	4
W0129-03 Risk#39	Garaging and maintenance	Fuel/polluting substance spillage	Soil pollution	1	3	3
W0129-03 Risk#40	Acid storage	Tank failure/ spillages/ leaks	Surface water pollution	1	3	3
W0129-03 Risk#41	Acid storage	Tank failure/ spillages/ leaks	Groundwater pollution	1	3	3
W0129-03 Risk#42	Acid storage	Tank failure/ spillages/ leaks	Soil pollution	1	3	3

Note d: Rating	Category	Description
1	Very Low	Very low chance (0-5%) of hazard occurring in 30 yr period
2	Low	Low chance (5-10%) of hazard occurring in 30 yr period
3	Medium	Medium chance (10-20%) of hazard occurring in 30 yr period
4	High	High chance (20-50%) of hazard occurring in 30 yr period
5	Very High	Greater than 50% chance of hazard occurring in 30 yr period

Note e: Rating	Category	Description
1	Trivial	No damage or negligible change to the environment
2	Minor	Minor impact/localised or nuisance
3	Moderate	Moderate damage to environment
4	Major	Severe damage to local environment
5	Massive	Massive damage to a large area, irreversible in medium term

Appendix 3: Risk Matrix

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**MEHL Proposed Integrated Waste Management Facility
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Risk Matrix (Preliminary Assessment)

			Risk ID (W0129-03 Risk#XY)				
Occurrence	V. High	5					
	High	4					
	Medium	3					
	Low	2					
	V. Low	1			#01, #03, #04, #06, #07, #09, #10, #12, #13, #15, #16, #18, #19, #21, #22, #24, #25, #27, #28, #30, #33, #34, #36, #37, #39, #40, #41, #41, #42	#02, #05, #08, #11, #14, #17, #20, #23, #26, #29, #31, #32, #35, #38	
			Trivial	Minor	Moderate	Major	Massive
			1	2	3	4	5
			Severity				

Appendix 4: Preliminary ELRA Financial Model

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**MEHL Proposed Integrated Waste Management Facility
EPA Waste Licence Application W0129-03**

Environmental Liabilities Risk Assessment (ELRA) (Preliminary Assessment)

Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Likelihood of Occurrence Range (%)	Occurrence Rating	Severity Rating	Cost Range		Median Probability	Median Cost Range	Most Likely Scenario Cost
							Min	Max			
							[Note c]	[Note d]			
W0129-03 Risk#01	Construction activities	Release of polluting substance	Surface water pollution	0-5	1	3	€361	€4,333	2.5%	€ 2,347	€ 59
W0129-03 Risk#02	Construction activities	Release of polluting substance	Groundwater pollution	0-5	1	4	€361	€4,333	2.5%	€ 2,347	€ 59
W0129-03 Risk#03	Construction activities	Release of polluting substance	Soil pollution	0-5	1	3	€3,305	€5,508	2.5%	€ 4,407	€ 110
W0129-03 Risk#04	Site office/weighbridge	Fuel spillage	Surface water pollution	0-5	1	3	€36	€433	2.5%	€ 235	€ 6
W0129-03 Risk#05	Site office/weighbridge	Fuel spillage	Groundwater pollution	0-5	1	4	€36	€433	2.5%	€ 235	€ 6
W0129-03 Risk#06	Site office/weighbridge	Fuel spillage	Soil pollution	0-5	1	3	€330	€551	2.5%	€ 441	€ 11
W0129-03 Risk#07	Site office/weighbridge	Hazardous waste spillage	Surface water pollution	0-5	1	3	€22	€3,305	2.5%	€ 1,663	€ 42
W0129-03 Risk#08	Site office/weighbridge	Hazardous waste spillage	Groundwater pollution	0-5	1	4	€44	€6,610	2.5%	€ 3,327	€ 83
W0129-03 Risk#09	Site office/weighbridge	Hazardous waste spillage	Soil pollution	0-5	1	3	€13,220	€22,033	2.5%	€ 17,626	€ 441
W0129-03 Risk#10	Site office/weighbridge	Firewater (office)	Surface water pollution	0-5	1	3	€1,102	€165,248	2.5%	€ 83,175	€ 2,079
W0129-03 Risk#11	Site office/weighbridge	Firewater (office)	Groundwater pollution	0-5	1	4	€3,608	€43,329	2.5%	€ 23,469	€ 587
W0129-03 Risk#12	Site office/weighbridge	Firewater (office)	Soil pollution	0-5	1	3	€16,525	€27,541	2.5%	€ 22,033	€ 551
W0129-03 Risk#13	Solidification process (pre-treatment, prior to landfilling, for certain hazardous wastes)	Hazardous waste spillage	Surface water pollution	0-5	1	3	€172	€25,779	2.5%	€ 12,975	€ 324
W0129-03 Risk#14	Solidification process (pre-treatment, prior to landfilling, for certain hazardous wastes)	Hazardous waste spillage	Groundwater pollution	0-5	1	4	€344	€51,557	2.5%	€ 25,951	€ 649
W0129-03 Risk#15	Solidification process (pre-treatment, prior to landfilling, for certain hazardous wastes)	Hazardous waste spillage	Soil pollution	0-5	1	3	€103,115	€171,858	2.5%	€ 137,487	€ 3,437
W0129-03 Risk#16	Landfill operations: hazardous landfill cells	Failure of cell liner/leachate release	Surface water pollution	0-5	1	3	€354,577	€16,237,701	2.5%	€ 8,296,139	€ 207,403
W0129-03 Risk#17	Landfill operations: hazardous landfill cells	Failure of cell liner/leachate release	Groundwater pollution	0-5	1	4	€354,577	€16,237,701	2.5%	€ 8,296,139	€ 207,403

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**MEHL Proposed Integrated Waste Management Facility
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Environmental Liabilities Risk Assessment (ELRA) (Preliminary Assessment)

Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Likelihood of Occurrence Range (%) [Note c]	Occurrence Rating [Note d]	Severity Rating [Note e]	Cost Range		Median Probability [Median of D]	Median Cost Range [Median of G]	Most Likely Scenario Cost [H x I]
							Min	Max			
W0129-03 Risk#18	Landfill operations: hazardous landfill cells	Failure of cell liner/leachate release	Soil pollution	0-5	1	3	€1,623,770	€2,706,284	2.5%	€ 2,165,027	€ 54,126
W0129-03 Risk#19	Landfill operations: non-hazardous landfill cells	Failure of cell liner/leachate contamination of local waters	Surface water pollution	0-5	1	3	€107,693	€4,931,750	2.5%	€ 2,519,721	€ 62,993
W0129-03 Risk#20	Landfill operations: non-hazardous landfill cells	Failure of cell liner/leachate contamination of local waters	Groundwater pollution	0-5	1	4	€107,693	€4,931,750	2.5%	€ 2,519,721	€ 62,993
W0129-03 Risk#21	Landfill operations: non-hazardous landfill cells	Failure of cell liner/leachate contamination of local waters	Soil pollution	0-5	1	3	€493,175	€821,958	2.5%	€ 657,567	€ 16,439
W0129-03 Risk#22	Landfill operations: inert landfill cells	Failure of cell liner/leachate contamination of local waters	Surface water pollution	0-5	1	3	€48,536	€2,222,671	2.5%	€ 1,135,603	€ 28,390
W0129-03 Risk#23	Landfill operations: inert landfill cells	Failure of cell liner/leachate contamination of local waters	Groundwater pollution	0-5	1	4	€48,536	€2,222,671	2.5%	€ 1,135,603	€ 28,390
W0129-03 Risk#24	Landfill operations: inert landfill cells	Failure of cell liner/leachate contamination of local waters	Soil pollution	0-5	1	3	€222,267	€370,445	2.5%	€ 296,356	€ 7,409
W0129-03 Risk#25	Leachate management	Rupture of leachate holding tank	Surface water pollution	0-5	1	3	€1,801	€82,459	2.5%	€ 42,130	€ 1,053
W0129-03 Risk#26	Leachate management	Rupture of leachate holding tank	Groundwater pollution	0-5	1	4	€3,601	€164,918	2.5%	€ 84,259	€ 2,106
W0129-03 Risk#27	Leachate management	Rupture of leachate holding tank	Soil pollution	0-5	1	3	€329,835	€549,726	2.5%	€ 439,781	€ 10,995
W0129-03 Risk#28	Surface water management	Uncontrolled release of polluting substance	Surface water pollution	0-5	1	3	€329,164	€15,073,941	2.5%	€ 7,701,553	€ 192,539
W0129-03 Risk#29	Surface water management	Uncontrolled release of polluting substance	Groundwater pollution	0-5	1	4	€329,164	€15,073,941	2.5%	€ 7,701,553	€ 192,539
W0129-03 Risk#30	Surface water management	Uncontrolled release of polluting substance	Soil pollution	0-5	1	3	€0	€0	2.5%	€ -	€ -
W0129-03 Risk#31	Wastewater management	Failure of on-site foul treatment	Surface water pollution	0-5	1	4	€108	€4,957	2.5%	€ 2,533	€ 63
W0129-03 Risk#32	Wastewater management	Failure of on-site foul treatment	Groundwater pollution	0-5	1	4	€2,165	€99,149	2.5%	€ 50,657	€ 1,266
W0129-03 Risk#33	Wastewater management	Failure of on-site foul treatment	Soil pollution	0-5	1	3	€19,830	€33,050	2.5%	€ 26,440	€ 661
W0129-03 Risk#34	Fuel storage (located at Solidification Plant)	Tank/Bund failure/ leaks	Surface water pollution	0-5	1	3	€14	€162	2.5%	€ 88	€ 2

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**MEHL Proposed Integrated Waste Management Facility
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Environmental Liabilities Risk Assessment (ELRA) (Preliminary Assessment)

Risk ID	Activity/Process	Potential Environmental Risk	Potential Environmental Impact	Likelihood of Occurrence Range (%) [Note c]	Occurrence Rating [Note d]	Severity Rating [Note e]	Cost Range		Median Probability [Median of D]	Median Cost Range [Median of G]	Most Likely Scenario Cost [H x I]
							Min	Max			
W0129-03 Risk#35	Fuel storage (located at Solidification Plant)	Tank/Bund failure/ leaks	Groundwater pollution	0-5	1	4	€27	€325	2.5%	€ 176	€ 4
W0129-03 Risk#36	Fuel storage (located at Solidification Plant)	Tank/Bund failure/ leaks	Soil pollution	0-5	1	3	€2,479	€4,131	2.5%	€ 3,305	€ 83
W0129-03 Risk#37	Garaging and maintenance	Fuel/polluting substance spillage	Surface water pollution	0-5	1	3	€18	€217	2.5%	€ 117	€ 3
W0129-03 Risk#38	Garaging and maintenance	Fuel/polluting substance spillage	Groundwater pollution	0-5	1	4	€36	€433	2.5%	€ 235	€ 6
W0129-03 Risk#39	Garaging and maintenance	Fuel/polluting substance spillage	Soil pollution	0-5	1	3	€3,305	€5,508	2.5%	€ 4,407	€ 110
W0129-03 Risk#40	Acid storage	Tank failure/ spillages/ leaks	Surface water pollution	0-5	1	3	€33	€4,957	2.5%	€ 2,495	€ 62
W0129-03 Risk#41	Acid storage	Tank failure/ spillages/ leaks	Groundwater pollution	0-5	1	3	€66	€9,915	2.5%	€ 4,990	€ 125
W0129-03 Risk#42	Acid storage	Tank failure/ spillages/ leaks	Soil pollution	0-5	1	3	€19,830	€33,050	2.5%	€ 26,440	€ 661
TOTAL										€ 1,086,269	

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Note d:			Note c:
Rating	Category	Description	Likelihood of Occurrence (%)
1	Very Low	Very low chance (0-5%) of hazard	0-5
2	Low	Low chance (5-10%) of hazard or	5-10
3	Medium	Medium chance (10-20%) of hazard	10-20
4	High	High chance (20-50%) of hazard	20-50
5	Very High	Greater than 50% chance of hazard	>50

Note e:			Cost of Remediation
Rating	Category	Description	
1	Trivial	No damage or negligible change to	€ A
2	Minor	Minor impact/localised or nuisance	€ B
3	Moderate	Moderate damage to environment	€ C
4	Major	Severe damage to local environment	€ D
5	Massive	Massive damage to a large area,	€ E

Appendix 5: Preliminary Financial Provision Calculations

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**MEHL Proposed Integrated Waste Management Facility
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Summary Financial Provision (Preliminary Assessment)

Liability Type	Amount	Financial Instrument
Known Liability – Closure, Restoration and Aftercare Management	€6,138,387	Cash-based deposit/trust fund/Escrow (accessible by EPA and by MEHL only with EPA consent)
Unknown Liability (ELRA)	€1,086,269	Bonds/insurance
TOTAL	€7,224,656	

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