

**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

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Date: 17<sup>th</sup> October 2013

Dear Mr Meaney,

**Re: Murphy Environmental Hollywood Ltd. (MEHL), EPA Ref. W0129-03  
RESPONSE TO 'ARTICLE 16' NOTICE RE. HYDROGEOLOGICAL INFORMATION**

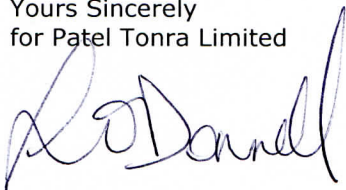
Please find report enclosed in response to notices in accordance with Article 16(1) of the Waste Management (Licensing) Regulations (EPA, 23<sup>rd</sup> March 2012 and 11<sup>th</sup> July 2012):

*Arup (Oct. 2013) MEHL Integrated Waste Management Facility. EPA Waste Licence Application W0129-03. Response to EPA Article 16: Groundwater*

The reply includes a revised non-technical summary (EIS and Waste Licence Application). The revised Waste Licence Application non-technical summary includes revised drawings; an updated drawing register is included (for version control purposes).

As per EPA requirements, one original plus two print copies are enclosed. In addition 16 No. CD-ROM copies are enclosed.

Yours Sincerely  
for Patel Tonra Limited



Louise O'Donnell  
Environmental Consultant  
On behalf of MEHL

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**MEHL  
Integrated Waste Management Facility**

**Application for a Waste Licence (W0129-03):  
REVISED NON-TECHNICAL SUMMARY**

**October 2013**

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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 17<sup>th</sup> December 2010) has been amended, in line with:

- A response submitted by MEHL to the Agency on 8<sup>th</sup> 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 response submitted by MEHL to the Agency on 7<sup>th</sup> June 2012 with respect to a notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations (dated 23<sup>rd</sup> March 2012).
- A response submitted by MEHL to the Agency on 17<sup>th</sup> October 2013 with respect to notices in accordance with Article 16(1) of the Waste Management (Licensing) Regulations (dated 23<sup>rd</sup> March 2012 and 11<sup>th</sup> July 2012); and any other pertinent updates to the Non-technical Summary at the time of writing.

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)<sup>1</sup> in Section I)
- A.m: Selected Waste Licence Application drawings to accompany the non-technical summary, to identify and describe the activity

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<sup>1</sup> Authored by Arup (December 2010)

## **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.
- A.b.2 The site is a former quarry from which limestone and shale was extracted. The facility is a fully operational inert<sup>2</sup> landfill regulated by the Environmental Protection Agency (EPA; also referred to as 'the Agency') under Waste Licence No. W0129-02 and Fingal County Council Planning Permission reference numbers F04A/0363 and F07A/0262. It provides a strategically located waste disposal facility for inert wastes and mildly contaminated soils. The facility is operated to the highest standards in environmental management and control.
- A.b.3 For the purpose of this application, the area of land in the ownership and control of MEHL is 54.4 hectares; of which the proposed planning application and EPA waste licence application covers 39.8 hectares.
- A.b.4 Please see attached the following drawings attached to this NTS:
- Site Location Map (Drawing Ref. WLA-04)
  - Existing Site Layout Drawing (Drawing Ref. WLA-02)
  - Proposed Site Layout Drawing (Drawing Ref. WLA-03)

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<sup>2</sup> 'Inert waste' means waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.

- A.b.5 A Planning Application and EIS for the proposed development were submitted to An Bord Pleanála on the 10<sup>th</sup> December 2010 (An Bord Pleanála Ref. 06F.PC0087). It is noted that the site falls within the functional area of Fingal County Council, and previous planning applications have been lodged with Fingal County Council. The Planning Authority for the purposes of this application is An Bord Pleanála, as the proposal is deemed 'Strategic Infrastructure' under the relevant planning legislation.
- A.b.6 Planning permission was granted by An Bord Pleanála on 16<sup>th</sup> June 2011 for the proposed integrated waste management facility (An Bord Pleanála Ref. 06F.PA0018), under section 37G of the Planning and Development Act, 2000.
- A.b.7 This Waste Licence Application was advertised in the Fingal Independent and the Irish Independent on 14<sup>th</sup> December 2010. A site notice was also erected at two locations on site. An extensive consultation exercise was conducted in relation to the proposed development, in advance of lodging planning and waste licence applications to An Bord Pleanála and the Agency, respectively.

### Proposed Activity

- A.b.8 MEHL proposes to develop an integrated waste management facility within the existing boundaries of its existing facility for the acceptance and landfilling of non-biodegradable<sup>3</sup> 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. 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,

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<sup>3</sup> 'Biodegradable waste' means any waste that is capable of undergoing anaerobic or aerobic decomposition, such as food and garden waste, and paper and paperboard. No such waste will be accepted at MEHL.

- 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.

A.b.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 2011***

- **D 1: Deposit into or on to land (e.g. including landfill, etc.):** This activity relates to the deposition of inert material.
- **D 5: Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.):** 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).
- **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.):** This activity relates to the proposed Solidification Plant, which will pre-treat (by means of a solidification process) certain hazardous wastes prior to landfilling.
- **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):** 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.

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**Licensed Waste Recovery Activities, in accordance with the Fourth Schedule of the Waste Management Acts 1996-2011**

- **R 4: Recycling/reclamation of metals and metal compounds:** This activity provides for the recovery of metal within wastes delivered to the facility.
- **R 5: Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials:** This activity includes the recovery of inert material for use in site development and site restoration works.
- **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):** 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.

A.b.10 It is proposed that the principal activity licensed under the current EPA Waste Licence will remain the same for the purpose of this Waste Licence Application, i.e. D 5, specially engineering landfill. The application proposes engineered landfill disposal capacity for non-biodegradable inert, non-hazardous and hazardous wastes. Third Schedule, D 9 (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.

A.b.11 The proposed facility has been identified as one which falls within the scope of the Industrial Emissions Directive (2010/75/EU).

### Maximum Annual Tonnage

A.b.12 The existing EPA licence for the facility, W0129-02, allows for the acceptance of a maximum of 500,000 tonnes of inert waste per annum. The current application seeks to maintain this upper limit of 500,000 tonnes per annum (total for all incoming waste types); however current projections indicate that the likely annual tonnage will be in the range of approximately 250,000 to 350,000 tonnes per annum.

- A.b.13 The retention of an upper threshold of 500,000 tonnes per annum, which is currently allowed under planning permission and EPA licence, would facilitate ‘unusual events’ within any given year, e.g. if there was a peak in the generation of contaminated soils in the country, due to intensive excavation/development works, which would require disposal in hazardous landfill, the MEHL strategic facility would have the capacity for such volumes (up to a maximum of 500,000 tonnes per annum), thereby avoiding the necessity for trans-frontier shipment of these materials. In addition, the retention of the currently licensed maximum annual input would act as security of capacity in the event that any issue might arise in the future, which could give rise to the need for immediate disposal of materials as a result of any accidental occurrence in the country through failure or natural disaster (materials arising from such an event would be demonstrated as meeting the facility’s Waste Acceptance Criteria prior to disposal at MEHL).
- A.b.14 As the proposed maximum tonnes per annum acceptable into the facility remains as per the existing EPA Licence W0129-02 (and planning permission), there will be no intensification of waste activity.

### Seveso II Directive

- A.b.15 The Seveso II Directive is an EU directive, which applies to thousands of industrial establishments where dangerous substances are present in quantities exceeding the thresholds in the directive. The related Irish regulations are the European Communities (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2000.
- A.b.16 MEHL has engaged with the Health & Safety Authority in relation to the proposed development; related correspondence was copied to the EPA in the MEHL ‘Article 16’ response dated 7<sup>th</sup> June 2012.
- A.b.17 The amount of flue gas treatment residues (from energy-from-waste facilities) to be stored at the MEHL site prior to solidification means that the facility qualifies as a lower tier Seveso site. Operators of such facilities are required to take all necessary measures to prevent the occurrence of major accidents and to limit the consequences of accidents for people and the environment. The regulations impose duties in respect of safety management systems, preparation of safety reports and emergency preparedness.



## **A.c NTS: Section C - Management of the Facility**

- A.c.1 Murphy Concrete Manufacturing Ltd. (MCM) began quarrying at the Hollywood site in 1975 (the site has operated as a quarry since the 1940s). In 2003, Murphy Environmental was established as a trading division of MCM Ltd., to serve as the waste management division of the company, with responsibility for all aspects of the management and operation of the landfill and compliance with the Waste Licence. *Murphy Environmental Hollywood Ltd.* (MEHL) was established on 1<sup>st</sup> October 2008 as a separate legal entity in the form of a limited company. On this date also, the EPA accepted the Transfer of Waste Licence W0129-02 from *Murphy Concrete Manufacturing Limited* to *Murphy Environmental Hollywood Limited*.
- A.c.2 In operating the site as an EPA-licensed inert landfill since 2002, the company has developed dedicated and efficient management and staffing structures. MEHL is cognisant of the significant transition in terms of operations, control and management skill that will be required to change from an inert site to an integrated waste management facility, which operates inert, non-hazardous and hazardous landfill cells. It is also recognised that staff resources at the Hollywood facility have become depleted in recent years, due to the economic downturn, and the collapse of the construction sector, in particular, which has impacted on business activity at the existing inert landfill (W0129-02).
- A.c.3 In the context of any new Waste Licence which may be issued by the EPA for an integrated waste management facility, MEHL recognises the requirement to re-build its staffing and management structures at the facility, to ensure the development and operation of an effective and compliant facility. To this end, MEHL will recruit additional staff with the requisite technical knowledge or qualifications to operate the facility and comply with the EPA Waste Licence. The facility's management team and operational staff will be competent on the basis of education, skills, training and experience. New staffing structures, as well as financial provision and related commitments, will be put in place by the licensee prior to the commencement of waste activities under any amended Waste Licence.
- A.c.4 It is estimated that the development of an integrated waste management facility at Hollywood would create 50 temporary construction jobs and 15 full-time, long-term additional positions.

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## Environmental Management System (EMS)

- A.c.5 MEHL has implemented an Environmental Management System (EMS) at the site to help manage its environmental matters and records. A documented EMS is required under the Waste Licence W0129-02; however, MEHL is going beyond these requirements and has developed the EMS in line with the international environmental standard, ISO14001:2004. The landfill at Hollywood was the first privately-operated landfill to achieve an ISO14001 certification. MEHL will extend its EMS and ISO14001 accreditation to include the scope of activities proposed for its integrated waste management facility.

## Hours of Operation

### ***Proposed hours of operation***

- A.c.6 The proposed hours of operation for the integrated waste management facility are as per those currently licensed under W0129-02:

Hours of Operation:            07:00 to 19:00 Monday to Friday  
   07:00 to 17:00 Saturday

- A.c.7 It is proposed that construction works may extend beyond these times for certain prescribed construction activities.

### ***Proposed hours of waste acceptance/handling***

- A.c.8 The proposed hours of waste acceptance for the integrated waste management facility are as per those currently licensed under W0129-02:

Waste Acceptance Hours:    08:00 to 18:00 Monday to Friday  
   07:00am to 16:00 Saturday  
   No waste acceptance on bank holidays.

### ***Proposed hours of construction and development works at the facility and timeframes***

- A.c.9 It is proposed that the hours of construction and development works at the integrated waste management facility be extended slightly beyond the proposed hours of operation to facilitate the specialist techniques applied to construct the hazardous landfill cells. The preferred contractor for this activity will transport plant and equipment from its base in Switzerland to the development site, and will include specialist staff and operations.



A.d.5 The site is covered by CCTV, with secure back-up of recorded data. New CCTV cameras will be installed at strategic locations across the site in line with the proposed integrated waste management facility.

### ***Designs for site roads***

A.d.6 The existing haul road through the central portion of the site will be developed to provide access to the proposed landfill cells. Secondary haul roads with access control will be constructed to ramp down into each of the cells. By having only one controlled access point to each cell, waste placement can be controlled.

### ***Design of hardstanding areas***

A.d.7 Hardstanding areas are in place at the site currently in accordance with the Waste Licence W0129-02. The site entrance, site office, garage and staff car park area are constructed on concrete hardstanding. These hardstanding areas will be retained.

A.d.8 It is proposed that the new facility control area (in line with the new facility entrance) will comprise concrete hardstanding, surrounding the administration building and providing a car parking area.

### ***Solidification Plant***

A.d.9 It is proposed that a solidification plant will be constructed at the facility, primarily for the pre-treatment of hazardous flue gas treatment (FGT) residues from waste-to-energy facilities, prior to their deposition at the hazardous landfill cells.

A.d.10 The level of the solidification plant will be screened by excavating the side slope and constructing the plant at a lower level than the administration building. A storage building for solidified material will be constructed directly beside the solidification plant, as will a bunded compound to store diesel for machinery and plant.

A.d.11 The design of the solidification plant has been developed with reference to similar plants in operation in Europe. The proposed design of the solidification plant is shown on drawing:

- Proposed Solidification Plant (Drawing Ref. WLA-09)

A.d.12 The design of the proposed solidification plant comprises the following key aspects:

- An enclosed process building with process area, storeroom, process control room and welfare facilities (showers, canteen, toilets, changing room, etc.) (floor area 398 m<sup>2</sup>)
- Process area which will house a mixing unit and weighing scales
- 4 x storage silos will be provided to store FGT residues awaiting solidification (4 x 78 m<sup>3</sup>)
- 1 x cement silo will be provided (1 x 78 m<sup>3</sup>)
- 2 x 30m<sup>3</sup> bunded acid tanks will be provided

#### **Storage Building (for solidified material)**

A.d.13 The storage building proposed will have a finished floor level of 119.25 m OD and a height of 9 metres. The maximum roof level of 128.25m OD Malin will match the access road level east of the building. The ridge level is below the surrounding ground levels and the building will be screened by the quarry lip. The storage building plans, elevations and sections are shown on Drawing WLA-10. The floor area of the storage building will be 1,285 m<sup>2</sup> with overall (external) dimensions of 31.26 m x 43.10 m x 9.00 m high.

- Proposed Storage Building drawing (Drawing Ref. WLA-10)

#### **Weighbridge**

A.d.14 It is proposed to install 2 No. new surface mounted weighbridges weighbridges at the facility control area, i.e. one 'in' weighbridge and one 'out' weighbridge.

#### **Wheelwash**

A.d.15 It is proposed to install two wheel washing units, which drivers will be required to pass through. Trucks will first pass through a bath wheel wash, constructed in reinforced concrete; water supplied to the wheelwash will be by means of a pressure main. The second wheelwash will be a spray-type wash with water recycling.

A.d.16 MEHL owns a roadsweeper, which is dedicated for use at the site.

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**Laboratory facilities**

- A.d.17 Floor space for laboratory facilities for the new integrated waste management facility is available within the solidification plant building (second floor); MEHL will develop on-site laboratory facilities if commercially viable.

**Design and location of fuel storage areas**

- A.d.18 It is proposed to construct a new fuel storage location; a 7,500 litre diesel tank for site machinery will be stored in a bunded and roofed storage area, constructed adjacent to the solidification yard.

**Waste Quarantine Areas**

- A.d.19 A segregated quarantine area will be provided within the active hazardous cell to accommodate non-hazardous or hazardous waste that will require further testing.

**Waste Inspection Areas**

- A.d.20 An inspection platform is proposed at the administration building to inspect accessible loads.

**Traffic Control**

- A.d.21 New traffic control measures are required in line with the proposed new facility entrance. All incoming traffic will be required to stop at the weighbridge. Vehicles and visitors other than those delivering waste will be required to sign the 'Visitors' Book' and park in the designated parking areas. Staff will use the designated staff parking areas.
- A.d.22 Waste delivery vehicles will be weighed in at the weighbridge. It is recognised that a superior level of control is required to ensure that vehicles access the correct tipping area on site: (a) Active Waste Recovery Area; (b) Solidification Plant, (c) Active Hazardous Cell, (d) Active Non-hazardous Cell, (e) Active Inert Cell.
- A.d.23 A bespoke access control system will be developed to ensure that the correct tipping or discharge area is used. It is proposed that each of the tipping areas identified above are barrier-controlled. Following weighing in and inspection at the weighbridge, the driver will be assigned a device which permits access only to the designated tipping/discharge area. The banksman will do a final check of the material prior to discharge.

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**Surface Water Management**

- A.d.24 The primary aim of the proposed surface water management system for the integrated waste management facility is to avoid potential adverse impacts on the receiving watercourse in terms of water quality and flow. Runoff will be captured close to its source and released slowly into a local stream along the northern site boundary.
- A.d.25 Surface water runoff during construction will be contained within the void and this will be managed in the same way as it is currently being managed, which consists of pumping out to the settlement ponds as necessary.
- A.d.26 It is proposed to manage surface water by using a combination of elements including filter drains and swales, a wetland pond, a detention basin, and rainwater harvesting.

**Wetland System**

- A.d.27 The proposed wetland treatment system (in the north-east of the site) consists of a sedimentation basin prior to conveyance through the extended detention wetland, which is designed for water quality control and flow attenuation to protect the receiving water system from increased runoff, erosion and otherwise potential flooding.

**Foul Water Management**

- A.d.28 It is proposed to collect all foul water generated on the site by means of a separate foul sewer system. The effluent will be domestic type from toilet and canteen facilities. All effluent will be collected in a sealed underground pipework system and discharged to a domestic type treatment plant with treated effluent percolated to ground. The onsite wastewater packaged treatment plant and raised bed percolation will be located to the east of the administration building.

**Water supply**

- A.d.29 A new watermain is to be connected to existing watermain on the public road L01080.

**Electrical and Telecoms**

- A.d.30 The electrical and telecommunication infrastructure will be located in consultation with the relevant service provider. The construction of the new entrance and access road will require the undergrounding and diversion of overhead electrical lines within the landownership boundaries.

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**Lighting**

- A.d.31 The lighting proposal has been considered with regard to the rural nature of the site. The site lighting has been designed to meet the required safety standards for the site, while minimising overspill and excess lighting. It is proposed to install 1m high lighting bollards from the entrance, along the proposed access road as far as the solidification area. At the solidification plant and storage building 6m high lighting standards will be provided.

**Plant sheds, garages and equipment compound**

- A.d.32 A maintenance building is in place adjacent to the existing site entrance. It is proposed to retain this maintenance building until the final restoration phase. It is also proposed to construct a storage building for solidified material adjacent to the solidification plant.

**Site Accommodation**

- A.d.33 A site office is in place at the site in accordance with the current Waste Licence (W0129-02). It is proposed to relocate the site offices adjacent to a proposed new site entrance in the southeast of the site. The administration building will include reception area, offices, canteen, filing room, meeting room, showering and toilet facilities. The building will be a single storey building with flat roof. The proposed finished floor level is 129.95m OD and maximum roof level of 134m OD. The floor area of the building is 128 m<sup>2</sup> with overall dimensions 16.69m x 9.25m x 6.0m high. Ten car parking spaces will be provided near the administration building.

- A.d.34 Office accommodation and welfare facilities are also proposed to be located at the Solidification Plant. It is proposed to decommission the existing site office and archive unit once new facilities have been established at the facility control area.

**Fire Control System, including water supply**

- A.d.35 A fire control system is in place at the site in accordance with the current Waste Licence (W0129-02). A mains supply of water is available along road LP01090. Proposed new buildings will be subject to fire regulations and will be required to obtain a Fire Certificate. Appropriate fire safety systems and fire-fighting equipment will be installed.

**Civic Amenity facilities**

- A.d.36 There will be no civic amenity facilities provided on the site.



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**Other waste recovery infrastructure**

- A.d.37 Recovery infrastructure proposed includes provision for R 4, R 5 and R 13 of the Fourth Schedule of the Waste Management Acts 1996-2011 (as per existing licence), as follows:
- the recovery of metal within wastes delivered to the facility; recovered metals shall be dispatched onwards to appropriate reprocessing facilities.
  - the recovery of inert material for use in site development and site restoration works; this may involve the use of temporary crushers and screeners on site, as per existing and historic operations.
  - 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.

**Composting infrastructure**

- A.d.38 There will be no composting infrastructure on-site.

**Construction & Demolition waste infrastructure**

- A.d.39 As a previous quarry and existing inert landfill site, the facility has mobile and fixed crushing, screening, grading and conveyor equipment on site. It is proposed to retain this infrastructure for ongoing recovery activities.

**Incineration infrastructure**

- A.d.40 There will be no incineration infrastructure on-site.

**Any other infrastructure**

- A.d.41 Other infrastructure includes:
- Monitoring infrastructure, existing and proposed is described in Section **F**.
  - Leachate management infrastructure is described in Section **D**.
  - Following consultation with the Geological Survey of Ireland (GSI), MEHL has agreed to provide a viewing platform (close to the existing site entrance in the west of the site) from which the quarry faces can be viewed in a safe environment. MEHL will also provide an information panel relating to the geological features of interest in the site. These are recommended mitigation measures outlined in the *Geology* section of the EIS.

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- During specific phases of development, alternative natural or artificial ledges will be installed on the south-western side of the limestone cliff face as roosting or potential nest sites for peregrine falcons, as a recommended mitigation measure of the *Flora and Fauna* section of the EIS.

## Facility Operation

A.d.42 Unit operations at the site may be identified as:

1. Construction activities
2. Facility control area and related operations
3. Waste recovery activities
4. Solidification process (pre-treatment, prior to landfilling, for certain hazardous wastes)
5. Landfill operations: hazardous landfill cells
6. Landfill operations: non-hazardous landfill cells
7. Landfill operations: inert landfill cells
8. Ancillary activities, e.g. garaging and maintenance, leachate management, surface water management
9. Management of restored areas

### **Landfill Cells**

A.d.43 It is proposed to construct hazardous, non-hazardous and inert landfill cells (the approximate capacities are 1.6 million m<sup>3</sup> for hazardous cells, 1.3 million m<sup>3</sup> for non-hazardous cells and 0.7 million m<sup>3</sup> for inert cells). 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. The layout is shown on the attached site layout Drawing **WLA-03**.

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**Phasing**

- A.d.44 The proposed lifespan of the facility will be 25 years with construction, operation and restoration undertaken on a phased basis. Construction is expected to commence in as soon as practicable, in compliance with a licensing decision. The landfill will be constructed in four phases over a 25-year period. 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.
- A.d.45 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. As each phase is developed the leachate management and surface water management systems will be extended to connect new cells to the existing infrastructure.

**Final Restoration**

- A.d.46 The final restoration will comprise the demolition and recycling of the administration building, electrical substation, carparking 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.
- A.d.47 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.

**Liner System**

- A.d.48 The function of a lining system is to protect groundwater, surface water and soils by containing leachate within the landfill; preventing/controlling groundwater ingress and assisting in controlling landfill gas migration.

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**Inert Cell Liner**

- A.d.49 MEHL operates as an inert landfill under Waste Licence W0129-02. It is proposed to continue inert operations as part of the proposed integrated waste management facility. In relation to the liner, W0129-02 requires a base and side-wall lining system, comprising “...a mineral layer of a thickness of 1m with a hydraulic conductivity<sup>4</sup> less than  $1 \times 10^{-7}$  m/sec or similar with equivalent protection to the foregoing<sup>5</sup>”.
- A.d.50 Fill material sourced on-site was used to provide a level surface, upon which a clay lining was laid to a thickness of over 1m. The clay lining material (glacial overburden till) that overlies the bedrock formations was sourced on site.
- A.d.51 It is proposed that the inert lining system will be constructed as follows:
- **Waste** will be placed on top of:
  - **Barrier Layer** - A compacted clay layer of a minimum thickness of 1m with a hydraulic conductivity  $\leq 1.0 \times 10^{-7}$  m/s, or similar with equivalent protection; which is laid over:
  - **Formation** - Prepared existing ground

**Non-hazardous Cell Liner**

- A.d.52 For non-hazardous cells proposed as part of the integrated waste management facility, it is proposed that a composite clay and geo-membrane liner will be installed on both the base and side walls of the proposed non-hazardous cells.
- A.d.53 It is proposed that the non-hazardous lining system will be constructed as follows:
- **Waste** will be placed on top of:
  - **Filtration Layer** (geotextile), which is laid over:
  - **Leachate Collection Layer** - 500mm thick drainage stone layer incorporating a herringbone system of leachate collection pipework, which is laid over:
  - **Protection Layer** (geotextile), which is laid over:

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<sup>4</sup> 'hydraulic conductivity' describes the rate at which a fluid can move through a permeable medium

<sup>5</sup> As per Landfill Directive 1999/31/EC Annex 1

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- **Barrier Layer** - Min 2mm thick welded HDPE Geomembrane liner, which is laid over:
  - **Barrier Layer** - Compacted mineral layer equivalent to a 1m thick layer [NOTE] , which is laid over:
  - **Formation** - prepared existing ground

[NOTE: Beneath this barrier layer, an additional bentonite-enhanced soil (BES) mineral liner will be placed, as a mitigation measure recommended in the Hydrogeological Section of the Environmental Impact Assessment.]

### **Hazardous Cell Liner**

- A.d.54 In selecting a lining system for the proposed facility, a number of lining system solutions was considered to line the hazardous cells in line with the requirements of the Landfill Directive 99/31/EC. 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 (hereinafter referred to as 'DAC'), which is commonly used in Europe.
- A.d.55 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. A DAC lining system is engineered to provide complete containment rather than controlled seepage thus making it a more effective landfill barrier than the single, composite or multiple lining systems traditionally used.
- A.d.56 DAC systems are commonly used in Europe in rail, road, tunnel, dam and reservoir construction as well as landfills. Information from WALO UK (and parent WALO Bertschinger AG), one of the leading suppliers of DAC in Europe, indicates that 13 landfill cells in the UK have been lined with DAC. WALO have also lined a number of landfill sites in Europe principally in Switzerland, Germany and more recently in Italy, Spain and Poland.
- A.d.57 The proposed construction of hazardous waste cells will comprise the following components;
- **Waste** will be placed on top of:
  - **Filtration Layer** (geotextile), which is laid over:
  - **Leachate Collection Layer** - 500mm thick stone layer incorporating a herringbone system of leachate collection pipework, which is laid over:

- 
- **4 DAC Barrier Liners**, comprising: (i) Mastic Sealant, (ii) 80mm thick Dense Asphaltic Concrete, (iii) 60mm thick Asphaltic Binder Layer, (iv) 200mm thick Granular Stabilising Sub-base / Leak Detection Layer, which is laid over:
  - **Basal Barrier Layer** - Compacted mineral layer equivalent to a 500mm thick layer under the cell base and extended 3m up the sidewalls on, which is laid over:
  - **Formation** - prepared existing ground

### **Quality Control, Quality Assurance & Third-party Supervision**

- A.d.58 MEHL will employ suitably skilled and experience personnel for cell construction works, as well as independent third-party supervision and Construction Quality Assurance (CQA).

### **Leachate Management**

- A.d.59 Three leachate types will be generated on site from the inert, non-hazardous and hazardous waste cells. The leachate generated in the non-hazardous and hazardous cells will be pumped to dedicated holding tanks and will be reused or disposed off site. Current and established practice will be continued with regard to inert leachate management.
- A.d.60 It is proposed that leachate is used in the solidification process, as a replacement for process water. The balancing of the requirement for leachate in the solidification process with rainfall and storage, may, at times, require excess leachate to be tankered off-site to an EPA-licensed waste water treatment plant. Leachate recirculation within the cells is proposed to minimise the requirement for removal of leachate off-site.

### **Leachate from hazardous cells**

- A.d.61 The leachate collection will be achieved by constructing a 500mm thick layer of drainage stone with herringbone collection pipework placed above the liner. The fall of the basal liner will be towards a sump at the cell perimeter. The leachate in the sump will be pumped to a HDPE lined, concrete leachate holding tank. The collected leachate will be utilised in the solidification process, as described in the solidification section. The leachate will be used in place of process water, as commonly practised in Europe.

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**Leachate from non-hazardous cells**

- A.d.62 The management of the non-hazardous leachate will be the same as for the management of hazardous leachate mentioned above. As required, non-hazardous leachate may be disposed off-site to an EPA-licensed waste water treatment plant. The non-hazardous leachate will be stored in a HDPE- lined concrete tank beside the administration building.

**Landfill Gas Management**

- A.d.63 It is proposed that the integrated waste management facility will accept only non-biodegradable wastes, which will be subject to Waste Acceptance Criteria. There will, therefore, be no generation of landfill gases; landfill gas infrastructure is not proposed.

**Capping System**

- A.d.64 The capping systems will be designed to meet the requirements of the EPA Landfill Site Design Manual and comply with Best Available Techniques (BAT) and the Landfill Directive 1999/31/EC for inert, non-hazardous and hazardous landfill cells. The capping of the waste cells will be undertaken on a phased basis.

**A.e NTS: Section E - Emissions****Emissions to Atmosphere**

- A.e.1 In relation to solidification operations, all operations will be contained and enclosed. The ground floor area will allow for the unloading of two bulk tankers inside the building. The unloading process will be undertaken after closing the roller shutter doors, fixing an exhaust extractor to the bulk tanker and connecting to the manifold to pump material into the silos.
- A.e.2 The solidification plant will be fully enclosed with roller shutter doors and mechanical ventilation and filters preventing dust emissions. Silos will also be equipped with High Efficiency Particulate Abatement (HEPA) filters to prevent emissions.
- A.e.3 Bottom ash will be delivered to the facility in a dampened form and operational procedures will be employed to prevent the potential for dust-blow.
- A.e.4 No landfill gas will be generated at the facility.

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## Emissions to Surface Waters

- A.e.5 A number of discharge points to surface water for the proposed integrated waste management facility are proposed in the waste licence application. All surface water discharges will be controlled.

## Emissions to Sewers

- A.e.6 No emissions to sewer are proposed. It is proposed that any excess leachate generated, which is not reused on-site, will be tankered to an appropriate off-site facility.

## Emissions to Groundwater

- A.e.7 It is proposed to install an on-site effluent treatment system for wastewater from the proposed new office buildings/toilets, including percolation area.

### **Excavations below the water table**

- A.e.8 There have been previous excavations below the water table, which will be backfilled, such that the minimum cell formation level will be 104.5m above Ordnance Datum (OD) (as per the existing licence, W0129-02).

### **Waste disposal in, on and under the ground**

- A.e.9 Waste will be landfilled in specially engineered landfill cells. A full leachate containment and management system is proposed.

### **Discharge of clean surface water runoff from roads and hardstands into the ground**

- A.e.10 All surface water runoff from paved areas, car park, etc. will be filtered through a silt trap and oil interceptor prior to discharge.

### **Accidental spills**

- A.e.11 Potential spills such as fuel spills will be immediately managed by containment of liquids and excavation of contaminated materials. Fuel storage areas will be bunded, with spill kits dispersed around the site for use in an emergency.



## Noise Emissions

- A.e.12 The noise assessment completed as part of the EIS showed that the predicted noise levels at the nearest sensitive locations, due to emissions from the proposed development, are within the sites operational noise limits in all instances. A temporary slight increase in noise levels during the construction phase is predicted, for which the EIS specified a number of mitigation measures.

## Environmental Nuisances

- A.e.13 As the proposed facility will accept non-biodegradable waste only, the typical impacts which can be associated with municipal landfills such as landfill gas, odours, birds, litter and vermin will not be an issue in this case.
- A.e.14 The following dust mitigation measures will be undertaken:
- Water sprays will be used, as required, during dry or windy conditions.
  - Restricting operations during windy weather conditions.
  - Water sprays will be used, as required, to ensure that bottom ash does not dry out. Bottom ash will be quenched in the waste-to-energy facilities and will be delivered to site damp.
  - All vehicles will be required to use the wheelwash prior to exiting the facility.
  - Waste cells, particularly hazardous and non-hazardous cells, will be covered, as necessary.
  - The implementation of the dust mitigation measures will place particular emphasis on areas in proximity to sensitive receptors.

## A.f NTS: Section F - Control & Monitoring

- A.f.1 A quarterly monitoring regime is well established at the facility, under the terms of EPA Licence W0129-02. The Waste Licence application recommends locations and frequencies for monitoring of noise, dust, surface water, surface water discharge, leachate and groundwater.
- Proposed Monitoring Locations Drawing (Drawing Ref. WLA-27)

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## Treatment, Abatement and Control Systems

### **To Atmosphere**

- A.f.2 Potential fugitive dust, landfill gas, noise and VOC emissions were assessed and no treatment, abatement or control measures were considered necessary.
- A.f.3 All operations at the solidification plant will be contained and enclosed, with roller shutter doors and mechanical ventilation and filters preventing dust emissions. Silos will also be equipped with High Efficiency Particulate Abatement (HEPA) filters to prevent emissions.

### **To Surface Water**

- A.f.4 The drainage system proposed for managing surface water runoff from the proposed development will follow the principles of Sustainable Drainage Systems (SuDS) as detailed in Chapter 6 of Volume 3 Environmental Management, of the Greater Dublin Strategic Drainage Study (GSDSDS).

### **To Sewer**

- A.f.5 It is not proposed to discharge to sewer.

### **To Ground(water)**

- A.f.6 Waste will be landfilled in specially engineered landfill cells. A full leachate containment system is proposed.
- A.f.7 It is proposed to collect all foul water generated on the site (from kitchen, toilets and washing facilities) by means of a separate foul sewer system. Effluent will be discharged to a domestic type treatment plant with treated effluent percolated to ground. The onsite wastewater packaged treatment plant and raised bed percolation will be located to the east of the administration building.

## Air Monitoring and Sampling Points

- A.f.8 Proposed dust monitoring locations include the 4 No. existing monitoring locations as per W0129-02, plus an additional monitoring point (D6) on the eastern licence boundary.

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## Surface Water Monitoring and Sampling Points

- A.f.9 Proposed surface water (upstream and downstream) monitoring locations remain as per W0129-02. 5 No. surface water discharge (SWD) monitoring locations are proposed.

## Sewer Monitoring and Sampling Points

- A.f.10 No discharge to sewer is proposed; thus no monitoring is proposed.

## Groundwater Monitoring and Sampling Points

- A.f.11 Groundwater monitoring at existing and new groundwater monitoring boreholes is proposed, on a quarterly basis.

## Noise Monitoring and Sampling Points

- A.f.12 It is proposed to monitor noise at 4 No. specified noise monitoring locations.

## Meteorological Data Monitoring and Sampling Points

- A.f.13 It is proposed that a daily record of representative meteorological data will be obtained from the nearest weather station (Dublin Airport), as per existing arrangements under W0129-02.

## Leachate Monitoring and Sampling Points

- A.f.14 Leachate monitoring is proposed at 13 No. locations, i.e. at 6 No. locations within the hazardous cells, at 3 No. locations within the non-hazardous cells and at 4 No. locations within the inert cells.
- A.f.15 In addition to leachate monitoring within individual cells, it is proposed to install a leak detection system under the hazardous cell liner. 6 No. leak detection monitoring points are proposed. The leak detection system can be monitored on a regular basis by using a dip meter (the pipework diameter specified would also facility a CCTV survey (similar to that used in the drain services industry)).

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## Landfill Gas Monitoring and Sampling Points

- A.f.16 Non-biodegradable wastes only will be acceptable at the facility; therefore landfill gas will not be generated. No landfill gas monitoring points are proposed; however all leachate monitoring boreholes will be designed to also facilitate landfill gas monitoring.

## A.g NTS: Section G - Resources Use & Energy Efficiency

### Raw Materials and Product

#### **Material Balance**

- A.g.1 The material types and estimated quantities required to construct the proposed landfill have been estimated. Existing stockpiles of low permeability clays and subsoils on site will be used in the lining and capping systems. Granular and other liner construction materials required will be sourced off-site and imported.

#### **Raw Material Use**

- A.g.2 It is envisaged that the solidification process will use cement (or replacement binding materials, as appropriate), acid and water.

#### **Water Use**

- A.g.3 Mains water is currently piped onto site. A new watermain will supply potable water to the welfare facilities in the administration and solidification buildings. Rainwater will be harvested.

#### **Diesel Use**

- A.g.4 It is proposed to install a 7,500 litre diesel tank for site machinery, to be stored in a bunded and roofed storage building, adjacent to the solidification yard. The existing fuel storage area will be decommissioned when the new fuel storage area has been installed.

### Energy Efficiency

- A.g.5 A new electricity connection will be brought to the new site office/weighbridge, solidification plant and storage building. It is proposed to construct an ESB substation at the facility control area. MEHL will specify energy-efficient design, construction, plant and equipment at detailed design phase. Records of energy usage will continue to be maintained on site and reported to the EPA in the Annual Environmental Report (AER) in accordance with licence conditions.

## **A.h NTS: Section H - Materials Handling**

### **Waste Types**

- A.h.1 This proposal is for 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.
- A.h.2 The facility will not accept asbestos.
- A.h.3 The facility will not accept liquid or biodegradable wastes.
- A.h.4 It is proposed that the facility will accept residues from waste-to-energy (incineration) facilities; this includes Flue Gas Treatment (FGT) residues, Incinerator Bottom Ash (IBA) and boiler ash.
- A.h.5 It is also proposed to accept contaminated soils, sludges and residues, and other compatible wastes. Materials for recovery will be accepted, as per existing licensed activities (under W0129-02).
- A.h.6 The proposed integrated waste management facility at MEHL will be in the unique position of offering landfill disposal capability under all classes of landfill: inert, non-hazardous and hazardous. Incoming wastes will be subject to WAC (Waste Acceptance Criteria) control/testing and will be diverted to the appropriate class of landfill cell on that basis, in accordance with the conditions of the Waste Licence as applied or varied from time to time by EPA to address any changes in law or policy.
- Residues from Waste-to-Energy Facilities***
- A.h.7 In compiling the list of proposed waste types, MEHL was cognisant of the imminent commencement of operations at the Indaver waste-to-energy facility at Carranstown, Duleek, Co. Meath (EPA Licence W0167-01). There are a number of other waste-to-energy facilities pending nationally, at various stages of planning/development. Three primary residues will be produced by waste-to-energy facilities in Ireland: 'bottom ash', 'Flue Gas Treatment (FGT) residues' and 'boiler ash'. Based on international experience,

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FGT residues are generally classified as hazardous wastes, and bottom ash and boiler ash are non-hazardous wastes.

### Waste Quantities

- A.h.8 The existing EPA licence for the facility, W0129-02, allows for the acceptance of a maximum of 500,000 tonnes of inert waste per annum. The current application seeks to maintain this upper limit of 500,000 tonnes per annum (total for all incoming waste types); however current projections indicate that the likely annual tonnage will be in the range of approximately 250,000 to 350,000 tonnes per annum.
- A.h.9 As the proposed maximum tonnes per annum acceptable into the facility remains as per the existing EPA Licence W0129-02 (and planning permission), there will be no intensification of waste activity. Incoming waste tonnages are expected to be lower during Phase 1 of the project. Further details in relation to phasing are provided in Attachment D.2.

### Waste Acceptance Procedures

- A.h.10 Detailed Waste Acceptance Procedures (for inert waste) have been developed for Hollywood Landfill, in accordance with Waste Licence W0129-02 and Council Decision (2003/33/EC) Establishing Criteria and Procedures for the Acceptance of Waste at Landfills. Procedures have been agreed with the Agency (and subject to ISO14001:2004 auditing and inspection) and are reviewed on an annual basis.
- A.h.11 The application outlines the proposed waste acceptance framework for the integrated waste management facility.
- A.h.12 The Landfill Directive 1999 describes general principles for acceptance of waste at the various classes of landfill and requires testing of waste as follows:
- **Level 1: Basic Characterisation.** This constitutes a thorough determination, according to standardised analysis and behaviour-testing methods, of the short and long-term leaching behaviour and/or characteristic properties of the waste.
  - **Level 2: Compliance Testing.** This constitutes periodical testing by simpler standard analysis and behaviour-testing methods to determine whether a waste complies with permit condition and /or specific reference criteria. The tests focus on key variables and behaviour identified by basic characterisation.

- **Level 3: On-site verification:** This constitutes rapid check methods to confirm that a waste is the same as that which has been subjected to compliance testing and that which is described in any accompanying documents. It may consist of a visual and odour inspection of a load of waste before and after unloading at the landfill site.”

### **Council Decision 2003/33/EC**

- A.h.13 EU Council Decision of 19 December 2002 (2003/33/EC) *establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC* establishes the criteria and procedures for the acceptance of waste at landfills. The Annex lays down a uniform waste classification and acceptance procedure, and provides further detail on Basic Characterisation, Compliance Testing and On-site Verification, outlined above.

### **Waste Acceptance Criteria (WAC) Testing and Limit Values**

- A.h.14 MEHL has been a forerunner in Ireland in the development and application of the Waste Acceptance Criteria (WAC) testing regime for inert waste acceptance, and will draw on this experience for the WAC testing to be applied at the integrated waste management facility.

## **Waste Handling**

### **Waste recovery operations**

- A.h.15 The facility is currently licensed (under W0129-02) for Fourth Schedule, Classes 3, 4 and 13 activities, i.e. recycling or reclamation of metals and metal compounds; recycling or reclamation of other inorganic materials; and storage of waste intended for recovery. No change is proposed as part of this application (these activities are now referenced as R 4, R 5 and R 13 respectively).
- A.h.16 Mobile recovery equipment is used on site currently and it is intended to maintain this activity as part of the integrated waste management facility. Standard crushing, screening and grading technologies are used for the recovery of construction-type materials. Magnetic separation may be applied for recovery of metals.

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**Solidification of Flue Gas Treatment (FGT) residue**

- A.h.17 Cement solidification involves the mixing of wastes with cement (or alternative materials) and additives (to control the properties of the cement), and enough water to ensure that hydration reactions will take place to bind the cement. The wastes are thereby incorporated into the cement matrix.

**Bottom Ash Handling Procedures**

- A.h.18 Bottom ash will be subject to Waste Acceptance Criteria testing before arriving on site. Testing will determine the appropriate class of landfill for disposal.
- A.h.19 The phasing timeline for the MEHL integrated waste management facility indicates that non-hazardous landfill capacity will not be constructed at the facility until Phase 2 operations. During Phase 1, any incoming incinerator bottom ash received at the facility will be directed to the active hazardous landfill cell.
- A.h.20 Bottom ash will be transported in covered containers and deposited directly onto the cell floor. A detailed deposition plan for bottom ash will be developed and agreed with the Agency, to act as a comprehensive record of waste placement.
- A.h.21 International experience shows that bottom ash recovery options are technically feasible; however there are currently no provisions for reuse/recovery of bottom ash in Ireland, largely relating to market conditions and lack of economic or regulatory drivers. Recovery of bottom ash may be possible in the future and it is proposed that waste placement at MEHL is controlled and recorded in a manner which could facilitate its future extraction from the site. This principle is sometimes referred to as 'Design to Mine'.

**Proposed outline solidification procedure at MEHL**

- A.h.22 Flue gas treatment (FGT) residue will be delivered to the site in fully enclosed tankers only.
- A.h.23 The operational process around solidification includes:
- i. Unloading of FGT residue
  - ii. Weighing
  - iii. Mixing



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- iv. Discharging to IBC<sup>6</sup> bags
  - v. Labelling of each bag/block
  - vi. Conveying/transportation to the storage building
  - vii. Storage of solidified blocks/IBC bags
  - viii. Placement of solidified blocks/IBC bags to temporary storage area within landfill cell
  - ix. WAC testing
  - x. Placement of solidified blocks/IBC bags in landfill cell

### **Landfilling: Landfill Tipping Zones**

- A.h.24 MEHL has developed a bespoke and effective management tool for recording the location of waste placement under W0129-02, which is proposed to be employed and further developed for the proposed inert, non-hazardous and hazardous landfill cells going forward.

### **Waste Arisings**

- A.h.25 Any excess spoil generated as a result of proposed construction activities will be reused on site insofar as possible, stockpiled for restoration activities, or removed off-site to an appropriately permitted/licensed facility.
- A.h.26 General municipal-type waste and recyclables will be generated as a result of office and staff mess facilities. Only permitted/licensed waste collectors and facilities, with EPA pre-approval, will be used for removal off-site.
- A.h.27 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.

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<sup>6</sup> IBC = intermediate bulk container; for the this purpose, it effectively means large bags

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## **A.i NTS: Section I - Existing Environment & Impact of the Facility**

### **Assessment of atmospheric emissions**

- A.i.1 The likely impact of the proposed MEHL development on air quality was assessed.
- A.i.2 The assessment of the impacts of the construction phase on air quality considered the impact of construction activities associated with the construction of the solidification plant, new entrance and other site infrastructure and landfilling activities and construction traffic. The assessment of the operational phase considered the impact on air quality of operational traffic, fugitive emissions and odour from landfilling.

#### ***Existing Environment***

- A.i.3 MEHL undertakes dust deposition monitoring biannually at four locations in accordance with the current Waste Licence.
- A.i.4 According to the 2009 Annual Environmental Report for the existing facility, dust deposition monitoring results were significantly below the licence limit during both monitoring rounds.
- A.i.5 Previously, under Waste Licence No. W0129-01, when quarrying activity was also underway at the site, MEHL was obliged to undertake dust deposition monitoring once per quarter. The overall exceedance rate for all dust deposition monitoring rounds was 4% with a compliance rate of 96% since operations at the site began in 2003.
- A.i.6 It is not proposed to accept any biodegradable waste materials. Hence the odour potential presented by, for example, municipal landfill facilities, will not occur at the MEHL facility.

#### ***Emissions from the MEHL Facility***

- A.i.7 During the construction phase, dust and traffic will be the main potential emissions to air. 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.
- A.i.8 The Contractor will compile a Dust Minimisation Plan which will be implemented. At all times, the procedures put in place will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, satisfactory procedures will be implemented by the Contractor to rectify the problem.

- A.i.9 The UK Highways Agency 'Design Manual for Roads and Bridges' states that if daily traffic flows change by less than 1,000 annual average daily traffic or Heavy Duty Vehicle (trucks) flows change by less than 200 annual average daily traffic, then the impact on air quality can be considered neutral. During the construction phase, no routes are predicted to achieve an increase in truck numbers of this significance.
- A.i.10 The main potential operational sources of emissions to air are operational site traffic, and fugitive emissions.
- A.i.11 It is only proposed to accept non-biodegradable material at the MEHL facility, therefore impacts associated with the generation of odours from the decomposition of organic materials will not arise.
- A.i.12 Hydrocarbon contaminated soils may have the potential to release fugitive odorous emissions. Operational control procedures will be implemented to ensure that such wastes are covered as appropriate to prevent potential odour emissions of this kind.
- A.i.13 Non-hazardous wastes will be transported in either enclosed containers or covered vehicles and deposited directly into the waste cell. The distance to the closest residential dwelling is approximately 85m from the proposed non-hazardous waste cell. No significant odour impact as a result of the landfilling of non-hazardous waste is therefore anticipated.
- A.i.14 Hazardous wastes will either be transported directly to the solidification plant or to the hazardous waste cells according to the waste type and characterisation. Hazardous waste in the form of flue gas treatment residues specified for pre-treatment in the solidification plant will be transported in fully enclosed tankers to the site and will be pumped via an enclosed system into a steel silo, inside an enclosed building. From the silo the residues will be pumped directly into the mixing unit. The residues will then be mixed, bagged, cured and deposited into the cell. There will be no odour potential from the flue gas treatment residues or the solidification process.
- A.i.15 Hazardous wastes which do not require pre-treatment in the solidification plant will be transported to the site in covered or fully enclosed containers, in accordance with regulatory requirements. The wastes will then be deposited directly onto the hazardous cell floor. The closest residential dwelling is located at a distance of approximately 284m from closest hazardous waste cell therefore no significant odour impact is anticipated.

- A.i.16 As both hazardous and non hazardous leachate will be stored in closed concrete tanks, no odour impact from the storage of leachate is likely to occur.

### Assessment of impacts of surface water discharges on the receiving waters

- A.i.17 As a consequence of compliance with the construction and operational mitigation measures there will be no significant negative effects to nearby surface watercourses or the downstream catchment arising from the proposed MEHL facility. At all times, the MEHL facility will be operated in accordance with the conditions as set out in the waste licence.
- A.i.18 The proposed development has been assessed in accordance with the requirements of the DEHLG/OPW<sup>7</sup> guidelines on 'The Planning System and Flood Risk Management' and it has been determined that the proposed development will neither create nor increase flood risk and is therefore deemed appropriate development in the context of flood risk.

### Assessment of impact on receiving sewer

- A.i.19 No discharge to sewer is proposed

### Assessment of impact to groundwater and soils

- A.i.20 An assessment of the potential impacts to the soils, geology and hydrogeology from the proposed development was undertaken for the site and the surrounding area. Potential impacts from the development were established and mitigation measures were developed. Due regard was had to guidance from the Geological Survey of Ireland, the Institute of Geologists of Ireland and the National Roads Authority.

### Existing Environment

- A.i.21 The existing environment was assessed from publically available literature, historic site specific information and the extensive field investigations carried out as part of this assessment.

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<sup>7</sup> DEHLG = Department of Environment, Heritage and Local Government. OPW = Office of Public Works

A.i.22 The existing baseline is summarised below:

- Bedrock beneath this former quarry site can be divided into an aquifer unit and an aquitard unit. An aquifer is a permeable layer of rock or soil that can both store and transmit water in significant quantities. An aquitard is a layer of rock or soil of low permeability that can store groundwater, but is only capable of transmitting water slowly between aquifers. Permeability is the ease with which water can pass through a material.
- The aquifer unit is classified by the GSI as a Locally Important Aquifer and the aquitard as a Poor Aquifer.
- The majority of the site is underlain by the aquitard. The aquifer outcrops in the southern part of the MEHL site and then dips to the north, where it is covered by at least 60 m of the aquitard strata in the northern parts of the site.
- The permeability of the aquifer unit is much higher than that of the aquitard. The aquitard confines or isolates the groundwater within the aquifer in some areas of the site.
- The faulting within the site is shown on the site specific geological map presented with the EIS. The understanding of the behaviour of the faulting has been refined with information from site investigation information gathered in 2013. The faulting passes through all the rock units found on the MEHL site.
- Groundwater in the Loughshinny Formation flows in a generally south easterly direction from the site. The flow in the Namurian deposits is driven by regional topography which varies across the site.
- The pumping test indicated that under stressed (pumping) conditions, that groundwater from the Namurian strata can enter the aquifer through the faults on the site.

A.i.23 The Bog of the Ring collection of groundwater wells to the north east of the site was highlighted by consultees as an important water supply. The MEHL site lies approximately 1 km outside the Source Protection Area for the Bog of the Ring and approximately 3km from the well locations. The source protection area is the area around a well, or wells, which has tighter controls on activities which can take place in it, in order to avoid contamination of the well or wells. As groundwater beneath the site is flowing to the south east away from the Bog of the Ring well-field it is not at risk from any potential contamination arising from the proposed development.

A.i.24 Additional geological/hydrogeological information was submitted to the Agency on 7<sup>th</sup> June 2012 in response to an 'Article 16' notice from the Agency. Amongst other things, this information stated that there is no potential for regional groundwater flow between the [MEHL] site and the Bog of the Ring pNHA<sup>8</sup> and water supply.

A.i.25 Geological Heritage Areas are designated as part of the Irish Geological Heritage Programme as part of a partnership with the Geological Survey of Ireland (GSI) and the Department of The Environment, Heritage and Local Government. The MEHL quarry has been designated a Geological Heritage Area.

### **Potential Impacts**

A.i.26 The main potential impacts to geology and hydrogeology from the proposed development are:

- Potential contamination of the aquifer and local wells - Potential contamination of the aquifer may arise from both general accidents such as leaking fuel containers kept on the site and from leaking leachate from the placement of the waste.
- Loss of the Geological Heritage Area. The MEHL quarry is to be back filled as part of its current planning permission and therefore the exposed quarry faces will eventually disappear in a 20 to 30 year period.

### **Proposed Mitigation Measures**

A.i.27 A number of mitigation measures have been developed and incorporated into the design of the proposed development.

A.i.28 To minimise the risk of aquifer contamination the placement of the waste with regard to the distribution of the aquifers on the site will be as follows:

- The inert and non-hazardous waste cells will be located in the part of the site underlain by the Locally Important Aquifer.
- The hazardous waste cell will be located in the part of the site underlain by the Poor Aquifer.

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<sup>8</sup> proposed National Heritage Area

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A.i.29 The following mitigation measures will be employed:

- All waste will be placed above the water table.
- The waste streams of inert, hazardous and non-hazardous waste will be segregated to ensure that hazardous waste cannot enter the inert or non-hazardous cells.
- The inert material will be placed in cells lined with low permeability clay 1 m thick which will be designed in line with EU regulations and EPA guidance.
- Non-hazardous waste cells will be lined with a 2 mm thick high density polyethylene liner and 1 m thick low permeability clay which will be designed in line with EU regulations and EPA guidelines.
- An additional 1 m of low permeability material will be placed beneath the liner of the cell for non hazardous waste to further enhance the natural protection
- A Dense Asphaltic Concrete liner will be constructed for the cells in which hazardous waste is to be placed. The liner will be designed to meet EU Landfill Directive requirements.
- Flue gas treatment residues will be solidified before being placed in the cells to lock in certain heavy metals.
- Temporary covers will be installed on the hazardous cells, as required, in order to minimise leachate generation. Temporary covers will be deployed during periods of heavy and/or prolonged rainfall.
- A leak detection system will be provided below the Dense Asphaltic Concrete liner to ensure that in the unlikely event of a leak, the leak will be detected early.
- As part of the waste licence conditions, groundwater will be monitored on site.

A.i.30 A detailed risk assessment was undertaken to quantify the potential risks to groundwater. For the purposes of the assessment, an imaginary receptor well was located down-gradient of the proposed MEHL facility on the MEHL land ownership boundary. The assessment demonstrated that when the proposed mitigation measures are put in place, water quality at the imaginary well would meet drinking water standard.

A.i.31 The MEHL quarry is to be backfilled as part of its current planning permission. However, given that the restoration of the MEHL facility will be phased over a 25-year timeframe, the rock outcrops in the quarry wall will remain exposed for maximum duration. Following consultation with the GSI, MEHL will:

- 
- provide a viewing platform from which the quarry faces can be viewed in a safe environment
  - provide an information panel to explain the geological features
  - maintain the exposures for as long as is practical and
  - allow for professional and/or student access where the necessary insurances are in place

### Ground and/or groundwater contamination

- A.i.32 There have been no known historical pollution incidents at the site and there is no evidence of contaminated ground or groundwater.

### Noise Impact

- A.i.33 A noise and vibration impact assessment of the proposed facility has been carried out.
- A.i.34 A noise survey was conducted in order to quantify the existing noise environment in the vicinity of the MEHL facility. Three measurement locations were selected. The first location was in the front garden of a residential property which borders the southeast of the facility. This property is now in the control of MEHL. The range of noise levels measured at this property is representative of the noise experienced at residential dwellings to the east of this location and immediately south. The second location was at the top of a laneway to a farm house located to the south west of the facility. This location was chosen to represent the noise levels at sensitive receptors to the west of the facility. And the final location was between two residential properties located to the north west of the site, representing noise levels at receptors along this boundary of the facility.
- A.i.35 The existing MEHL facility is currently operated in accordance with EPA waste licence (W0129-02). It is expected that the new waste licence will have the same noise limits as the current licence.
- A.i.36 The noise levels of each phase of development were predicted and are expected to be within the EPA waste licence limits.
- A.i.37 Traffic noise emissions were calculated from the traffic generation figures derived in Chapter 8 of the EIS and the predicted noise levels from construction and operational traffic are within the waste licence daytime limit of 55dB  $L_{Aeq, 1hr}$ .



- A.i.38 Noise emissions from operational plant items at the closest noise-sensitive property are expected to be insignificant. The increase in traffic noise levels for 2011 in the vicinity of the roads and junctions assessed surrounding the MEHL site is less than 1dB(A). This increase will not be perceptible.
- A.i.39 Mitigation measures will be implemented during the construction and operational works to ensure that noise from the facility will be within the waste licence limits, including:
- Limiting the hours during which site activities likely to create higher 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 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, and;
  - Placing of noisy plant machinery as far away from sensitive properties as permitted by site constraints.
  - The predicted noise levels at the nearest sensitive locations, due to emissions from the development, are within the sites operational noise limits in all instances and no significant impacts are expected.

### Assessment of Ecological Impacts & Mitigation Measures

- A.i.40 A flora and fauna impact assessment of the proposed development was carried out.
- A.i.41 There are no environmental designations pertaining to the site nor is the site likely to be designated in the future. There are four designated conservation areas within 10km of the site. However these sites are some distance away and direct impacts on these sites are unlikely to occur as a result of the proposed development.
- A.i.42 As there will be no discharge of contaminated waters from the landfill site into surface water network or seepage into groundwater system, there will be no direct or indirect impact on Rogerstown Estuary cSAC and SPA, which is the nearest designated conservation area located 7.5km to the east.

- 
- A.i.43 A survey of flora and fauna on the site was carried out by Natura Environmental Consultants on the MEHL site on 17 May 2010. A survey of peregrine falcon on the site was undertaken by R and D Avian Ecology over the summer of 2010.
- A.i.44 Two hare were observed on site. Other mammals not seen but likely to use the site include fox and rabbit. Otters occur on many Irish watercourses and are likely to occur along the stream on the northern site boundary as it is a tributary of a salmonid watercourse. The woodland edge along the stream would be suitable for badger and other small mammals, including rabbit and hedgehog.
- A.i.45 The following habitats were found on the site:
- Spoil and Bare Ground
  - Exposed Calcareous Rocks
  - Recolonising Bare Ground
  - Eroding Upland Streams
  - Mixed Broadleaved Woodland/Scrub
  - Artificial Lakes & Ponds
- A.i.46 During a site visit on 18th June 2010, a female falcon was recorded roosting on the southern perimeter of the quarry, whilst the male was observed roosting on the western quarry face. Both birds were observed from a vantage point within the quarry and no breeding behaviours and activity were recorded. A second site visit took place during the 29<sup>th</sup> June 2010 where a single adult peregrine was observed perched on the southern perimeter of the quarry, this bird took flight and flew south away from the quarry following 20 minutes of observation from the cliff top. No breeding behaviours or activity were recorded and no young peregrines were recorded.
- A.i.47 Overall, the MEHL site is evaluated to be of county ecological importance as per the National Roads Authority Ecological Evaluation Scheme due to the presence of peregrine falcon and the exposed limestone cliff face.
- A.i.48 The open water bodies on the site and exposed glacial material with vegetation, created as a result of previous quarrying activity have potential to significantly expand the local biodiversity over time.

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- A.i.49 Mitigation measures as described below will be implemented to reduce the impact on flora and fauna of the development.
- A.i.50 There will be no permanent development works, other than the removal (in a controlled manner) of an existing temporary stockpile of soil, or any disturbance of existing ground within 10m of the edge of the stream flowing along the northern boundary of the site. This will preserve into the future a 10m wide (minimum) riparian corridor or 'leave strip' which is important to the protection of local aquatic ecological integrity and general biological diversity.
- A.i.51 Alternative natural or artificial ledges will be installed on the south-western side of the limestone cliff face as peregrine roosting or potential nest sites, as far away from the landfill construction as possible, to minimise any potential disturbance to peregrine.
- A.i.52 A constructed wetland system associated with the attenuation ponds will over time provide habitat to add to the local habitat and species diversity. A wetland area at the southern end of the site, which includes an open water body fringed with vegetation will be retained. This will help to increase local biodiversity.
- A.i.53 In the longer term, if monitoring results determine it necessary, the creation of an additional nest site away from the location of the MEHL site will be investigated in consultation with landowners and the National Parks and Wildlife Service. 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.
- A.i.54 A constructed wetland system associated with the attenuation ponds will, over time, provide wetland habitat and add to the local habitat and species diversity. Details of the constructed wetland system will be finalised at the detailed design stage in consultation with a suitably qualified wetland ecologist and the Board of Inland Fisheries Ireland.
- A.i.55 The construction and operation of the proposed MEHL integrated waste facility will not result in any additional direct loss of habitat. If considered necessary, following monitoring, the creation of an alternative peregrine nest site away from the quarry at a suitable location within 5km of the site will compensate for adverse impacts to this species.

- A.i.56 The retention of an existing wetland area near the southern boundary of the site into the MEHL site will add to the biodiversity of the site. The constructed wetland area will provide habitat for a range of wetland species over time.
- A.i.57 There will be no residual significant adverse impacts on the local surface watercourses or on the groundwater resource, provided the mitigation measures described in *EIS Chapter 14, Soils, Geology and Hydrogeology* and *EIS Chapter 15, Surface Water* are fully implemented and monitored. As a consequence, there will be no significant adverse impact on the Rogerstown Estuary cSAC/SPA located more than 7.5km to the east.

## **A.j NTS: Section J - Accident Prevention & Emergency Response**

### **Accident Prevention and Emergency Response**

- A.j.1 MEHL has developed an Emergency Response Procedure as part of its Environmental Management System, which is independently certified in compliance with the ISO14001:2004 standard. The accident and emergency procedures will be fully and appropriately reviewed for the purposes of the integrated waste management facility, to include a complete review of the Site Safety Statement, in line with legislative and other requirements.
- A.j.2 The existing Health & Safety training programme at MEHL will be extended to address requirements of operating the integrated waste management facility. Staff will be appropriately trained and qualified for the various elements of the operation. There will be ongoing and updated training, refresher programmes and extensive induction procedures for staff on site at all times, as well as routine and obligatory induction training for visitors regarding Health & Safety procedures for those who are necessarily visiting or entering the site.

### **Environmental Liabilities Risk Assessment**

- A.j.3 MEHL has completed an ELRA (Environmental Liabilities Risk Assessment) in line with the requirements of W0129-02 and EPA (2006) *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision*. 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. MEHL has invested significantly in its infrastructural, management and environmental management programmes to address potential risks. The ELRA was re-assessed to address ELRA issues

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associated with the proposed development (under W0129-03); a report was submitted to the Agency in May 2013.

### Potential points of contamination/areas most at risk

- A.j.4 The waste activities deemed to be potentially high risk are landfilling of hazardous waste and solidification operations.
- A.j.5 In relation to landfilling of hazardous waste, a superior lining system has been proposed for the hazardous waste cells. In addition, it is proposed to install a leak detection system under the hazardous cell liner. The leak detection system will demonstrate the ongoing integrity of the liner system during the lifetime of the facility, and in the aftercare phase. All liner systems proposed for the integrated waste management facility are in full compliance with the requirements of the EU Landfill Directive 1999.
- A.j.6 In relation to solidification operations, the plant has been designed with reference to best practice and European experience. It is designed as a fully enclosed system.

### Storage of raw materials, products and waste

- A.j.7 Cement and acid will be imported to the site as raw materials for the solidification process. The materials will be delivered in contained vehicles and discharged directly to a dedicated storage silo and bunded acid storage tank, respectively. From here, the materials will be used directly in the solidification process.
- A.j.8 Diesel will be stored in a bunded diesel storage tank.
- A.j.9 Leachate will be stored in HDPE<sup>9</sup>-lined, concrete leachate holding tanks.
- A.j.10 The proposed development is deemed to be a lower tier Seveso site based on the storage of Flue Gas Treatment residues on site.

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<sup>9</sup> HDPE = High-density polyethylene

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## Transport of material within the site

- A.j.11 Incoming waste delivery vehicles may be directed to the appropriate and access-controlled tipping area for recovery materials, inert landfill, non-hazardous landfill, solidification plant or hazardous landfill. Operational control procedures and wheel-washing procedures will be implemented for all vehicles using the facility.
- A.j.12 Design proposals make provision for conveying the IBC bags from the solidification plant to the adjacent storage building either at surface level by vehicle (e.g. forklift), or via an underground conveying system.

## Bunding, surface treatment, collection systems

- A.j.13 Bunded tanks are proposed for the diesel and acid storage tanks. Bunds will be designed with reference to appropriate EPA and quality assurance standards, and bund integrity tests will be completed as per EPA requirements (currently every three years).

## Spill/emergency containment

- A.j.14 The site is currently equipped with emergency spill kits. New emergency containment equipment will be installed to address potential spillage at the bunded fuel and acid storage areas.
- A.j.15 It is proposed to install emergency surface water shut-off valves prior to the discharge point from the wetland area in the north-east of the site, and at the detention basin outlet adjacent to the new facility control area in the south-east of the site.

## Possible contamination of ground, groundwater, or surface water from firewater run-off

- A.j.16 Although the risk of fire at the site will be low, the management of contaminated water arising from a fire has been included in the surface water management system.

## Out-of-hours Incident

- A.j.17 Emergency out-of-hours contact details will be provided on the site notice board. Duty staff will respond immediately to any incidents arising.

## **A.k NTS: Section K - Remediation, Decommissioning, Restoration and Aftercare**

### **Restoration**

- A.k.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.
- A.k.2 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.

### **Landscape Proposals**

- A.k.3 In order to minimise or reduce the potential visual impacts of the proposed development, the following mitigation measures are proposed (as part of the EIS) during the initial construction phase of the development:
- Screen planting to the east of the solidification plant, car park area and temporary storage compound
  - Retention and thickening of existing hedgerows
  - Scrub planting around the proposed wetlands in the north east of the site
  - Retention of existing trees
  - Progressive restoration
  - Low level bollard lighting along the entrance road to avoid light spillage on adjoining properties
  - Monitoring of planting
- A.k.4 The landscape and visual assessment completed for the EIS concluded that, following final restoration of the site, the residual landscape and visual impacts will be positive.

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**After-use**

- A.k.5 It is anticipated that future after-use will be for low-impact amenity, nature area, or related uses. It is possible that different after-use options may be applied to the different classes of landfill. 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).
- A.k.6 Consultation with local residents, statutory and other relevant bodies will be undertaken approaching the latter restoration phases at the facility in relation to after-use activities.

**Decommissioning**

- A.k.7 During the final restoration phase of the integrated waste management facility, Phase 4, when the hazardous cells have been completely filled, the solidification plant and storage building will no longer be required and will be decommissioned. The void remaining after removing the solidification plant will be lined as a non-hazardous cell (NH2), filled with non-hazardous waste and restored.
- A.k.8 The final restoration will comprise the decommissioning of the administration building, car-parking area and paved areas (in the south-east of the site). These areas will be graded, finished with topsoil and landscaped.
- A.k.9 The leachate and surface water collection infrastructure will be retained after the final restoration, as well as leachate monitoring wells, leak detection wells, leachate holding tanks and any other monitoring infrastructure to meet EPA requirements for aftercare and monitoring.

**Closure, Restoration and Aftercare Management Plan**

- A.k.10 Under the terms of the existing Waste Licence (W0129-02), MEHL has completed and submitted to the EPA assessments of (i) 'CRAMP' (Closure, Restoration & Aftercare Management Plan), (ii) ELRA (Environmental Liabilities Risk Assessment) and (iii) FP (Financial Provision). In addition, a report on ELRA, CRAMP and Financial Provision for the proposed integrated waste management facility (W0129-03) was submitted to the Agency in May 2013.



A.k.11 The preparation of the CRAMP and ELRA and evaluation of the amount and form of financial provision had due regard to Environmental Protection Agency guidance including *Guidance on Environmental Liability Risk Assessment, Residuals Management Plans and Financial Provision (2006)*.

A.k.12 As per existing arrangements, any future or amended Financial Provisions will be 'ring-fenced' to ensure access only by agreement with the EPA. Funds would be used to address ELRA/CRAMP issues arising during the operation/aftercare of the facility.

### Aftercare

A.k.13 MEHL will be responsible for the aftercare of the site up until the date when the Agency accepts the surrender of the Waste Licence.

A.k.14 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 below)

A.k.15 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

## **A.I NTS: Section L - Statutory Requirements**

### **Statutory Requirements**

- A.I.1 Section 40(4) of the Waste Management Acts 1996 to 2011 requires that the Agency shall not grant a waste licence unless it is satisfied that its requirements are met. Attachment L of the Waste Licence Application provides information to show that these criteria have been met in practice.
- A.I.2 The integrated waste management facility has been designed to meet and exceed the requirements of the EU Landfill Directive 1999, the EPA Landfill Manual: Landfill Site Design (2000), and BAT requirements. A superior lining system is proposed for the hazardous waste cells, i.e. Dense Asphaltic Concrete (DAC), which offers complete containment. A leak detection system is also proposed for the hazardous cell lining system.
- A.I.3 The solidification plant has been designed in line with best practice and European experience, and conforms with the European Commission Waste Treatment BREF.
- A.I.4 The facility will be managed and operated to mitigate against any potential environmental impacts. Environmental monitoring will continue (and intensify, as appropriate) for dust, surface water, groundwater, leachate and noise.
- A.I.5 The proposed development has been subject to full environmental impact assessment.
- A.I.6 The facility holds ISO14001:2004 accreditation, the international standard for Environmental Management Systems (EMS). This system ensures legal compliance with all relevant legislation. The EMS will be reviewed and updated to include waste activities as per the proposed integrated waste management facility.
- A.I.7 Full cognisance has been taken of the requirements of the Landfill Directive 1999 in facility design, monitoring requirements, facility operational issues, and related matters.
- A.I.8 Murphy Environmental Hollywood Ltd. (and its previous 'parent' company) has held an EPA licence at Hollywood since December 2002. The licence was issued to Murphy Concrete Manufacturing (MCM) Ltd. In 2003, Murphy Environmental was established as a trading division of MCM Ltd to serve as the waste management division of the company. In October 2008, Murphy Environmental Hollywood Ltd (MEHL) was established as a separate legal entity to manage the landfill activity at the Hollywood facility. EPA Licence W0129-02 transferred to MEHL on 1<sup>st</sup> October 2008. MEHL has

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proved to be a proactive licensee committed to best environmental practice, an excellent track-record with the Agency, and a company which conducts its operations in an open and transparent manner.

- A.I.9 Murphy Concrete Manufacturing Ltd. has a long history with the site, having taken over quarrying operations in 1975 (the site operated as a quarry from the late 1940s) Quarrying ceased at Hollywood at the end of 2007.
- A.I.10 MEHL is deemed to be a 'fit and proper' person to hold a waste licence.
- A.I.11 The company has no offences under the Waste Management Acts 1996 to 2011, the EPA Act 1992 and 2003, the Local Government (Water Pollution) Acts 1997 and 1990 or the Air Pollution Act 1987. All management staff are appropriately qualified and trained, with full support from the company Directors to operate the facility to the highest environmental standards.
- A.I.12 MEHL will meet any and all financial commitments or liabilities which may arise.
- A.I.13 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.
- A.I.14 The MEHL proposed integrated waste management facility applies the priority order waste hierarchy as follows:
- Prevention: Use appropriate materials for engineering works on site, thereby preventing waste
  - Preparing for re-use: Not relevant to proposed development
  - Recycling: Recover suitable materials and have consideration for possible recovery options in the future
  - 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
  - Disposal: Apply BAT for the safe and environmentally-sound landfilling of non-recoverable and non-combustible wastes and residues

- A.I.15 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.
- A.I.16 Residual waste landfill capacity is an integral part of the waste hierarchy and facilitates the development of modern and future waste management infrastructure.
- A.I.17 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). 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.
- A.I.18 The National Hazardous Waste Management Plan recommends a policy of moving towards national self sufficiency by seeking to minimise the export of hazardous waste. 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.
- A.I.19 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.

## **A.m Selected Waste Licence Application Drawings to Accompany the Non-technical Summary**

- A.m.1 Please find attached:
- Site Location Map (Drawing Ref. WLA-04)
  - Existing Site Layout Drawing (Drawing Ref. WLA-02) (Sheet 1)
  - Proposed Site Layout Drawing (Drawing Ref. WLA-03) (Sheet 1)
  - Proposed Solidification Plant (Drawing Ref. WLA-09) (Sheet 2)
  - Proposed Monitoring Locations Drawing (Drawing Ref. WLA-27)
  - Proposed Restoration Layout (Drawing Ref. WLA-15) (Sheet 1)

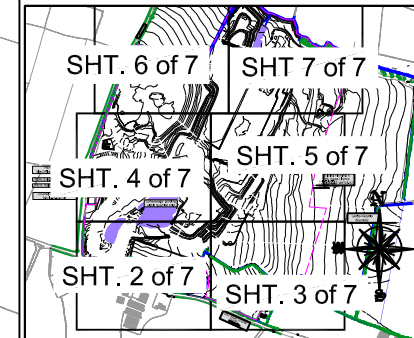
**WASTE LICENCE APPLICATION**

REPRODUCED IN ACCORDANCE WITH OSI LICENCE NO. EN 0004910

**GENERAL NOTES:**

ALL LEVELS RELATE TO MALIN HEAD ORDANCE DATUM.  
 ALL LEVELS TO BE CONFIRMED ON SITE BY MAIN CONTRACTOR PRIOR TO COMMENCEMENT.  
 DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.  
 DO NOT SCALE THIS DRAWING - USE FIGURED DIMENSIONS ONLY.

**KEY PLAN :-**



**LEGEND:-**

	Existing Landownership Boundary
	Existing Planning & EPA Waste Licence Boundary
	Existing Ground Level Contour
	Existing Spot Level
	Existing Surface Water
	Existing Public Watermain Sluice Valve
	Existing Public Watermain Hydrant
	Existing Road Sign
	Existing Telephone Pole
	Existing Electrical Pole & Overhead line
	Existing Electrical Duct & Access Chamber
	Existing Access Gate
	Existing Fence (Various Types)
	Existing Masonry Wall
	Existing Hedgerow
	Monitoring Borehole
	Leachate Monitoring Point
	Surface Water Discharge Point
	Surface Water Monitoring Point

01	WASTE LICENCE APPLICATION	10.12.10	4 Projects
ver.	amendment	date,	issued to.

Prepared For: Murphy Environmental Hollywood Ltd

Client: **MEHL INTEGRATED WASTE MANAGEMENT FACILITY**

Location: **HOLLYWOOD GREAT, NAG'S HEAD NAUL, CO. DUBLIN**

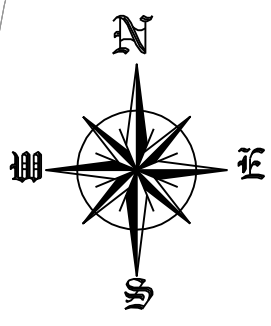
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Study Name: WLA	Version No.: 01	PP_WLA_02_01
Section:	Date: 10 Dec. 2010	
WYG Job Number: C007831	SCALE: A1(1:2000)/A3(1:4000)	
Created By: CF	Reviewed By: JD	Signed Off By: HB

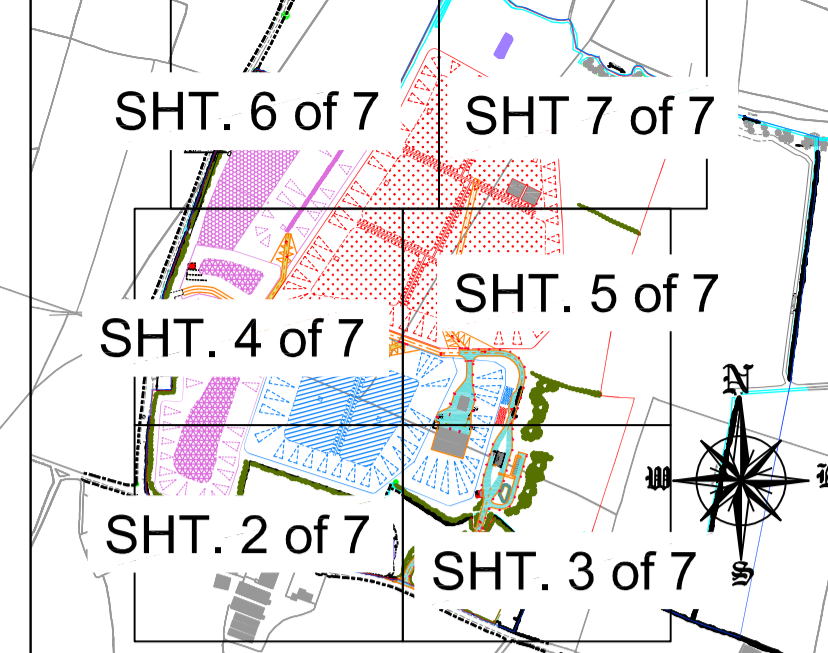
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WYG (Engineering) Ireland Ltd.



KEY PLAN :-

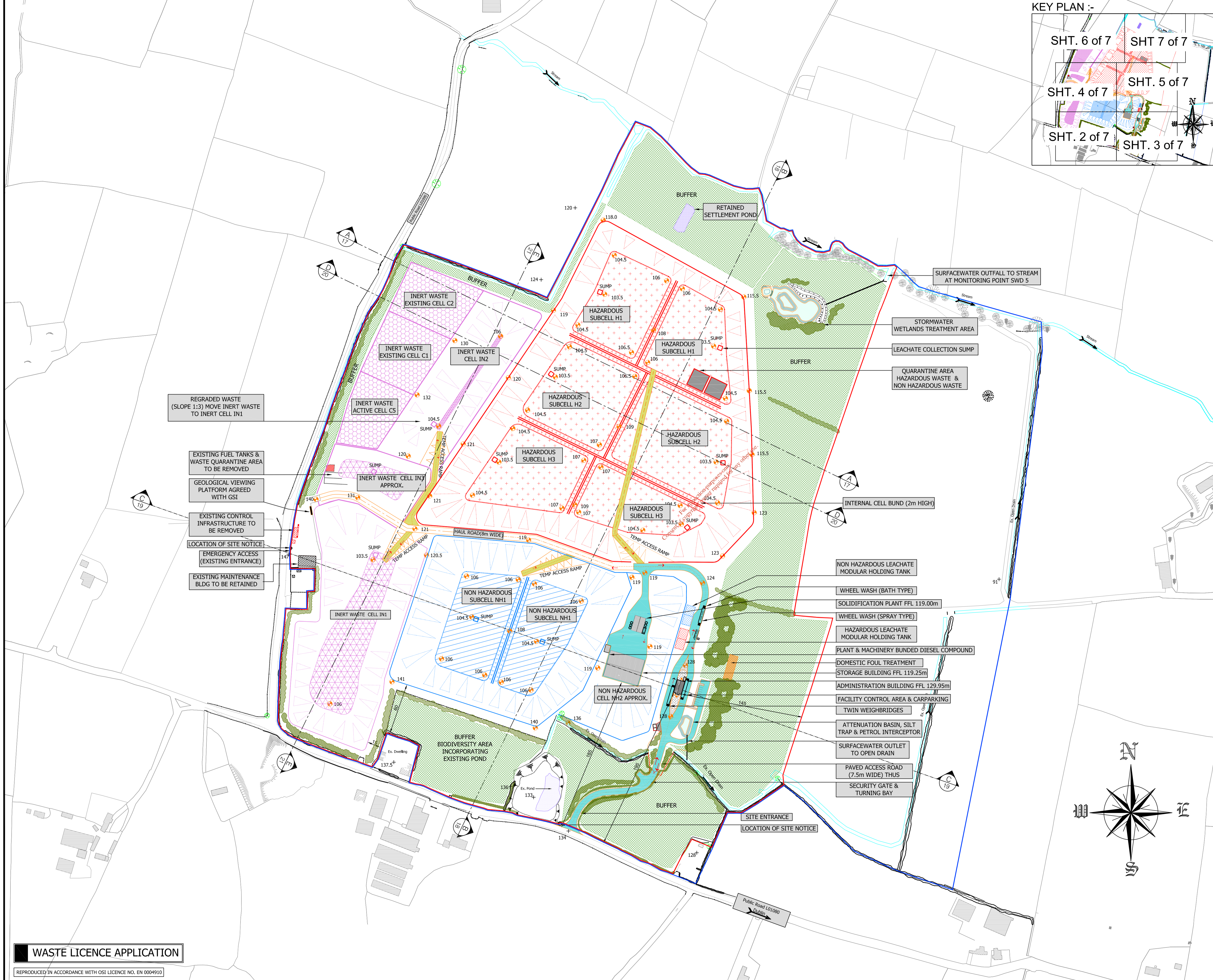


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 DO NOT SCALE THIS DRAWING - USE FIGURED DIMENSIONS ONLY.

LEGEND:-

	Ownership Boundary
	Proposed Planning & EPA Waste Licence Boundary
	Paved Hardstanding
	Location for Hazardous Cells
	Location for Non-Hazardous Cells
	Existing Inert Cells
	Location for Inert Cells
	Buffer Zone
	Traffic flow
	Embankment (Slope Direction)
	105.5 Level / Top of Liner
	-127 Existing Ground Level Contour
	+101.84 Existing Spot Level
	Existing Surface Water
	Existing Public Watermain Sluice Valve
	Hyd Existing Public Watermain Hydrant
	RS Existing Road Sign
	TP Existing Telephone Pole
	EP Existing Electrical Pole
	Existing Electrical Duct & Access Chamber
	Existing Access Gate
	Existing Fence (Various Types)
	Existing Masonary Wall
	Existing Hedgerow
	Leachate Drainage
	Surface Water Drainage



02	ARTICLE 16 RESPONSE	14.12.10	MEHL
01	WASTE LICENCE APPLICATION	10.12.10	4 Projects
ver.	amendment	date.	Issued to.

Prepared For: **Murphy Environmental Hollywood Ltd**

Client: **MEHL INTEGRATED WASTE MANAGEMENT FACILITY**

Location: **HOLLYWOOD GREAT, NAG'S HEAD, NAUL, CO. DUBLIN**

Title: **PROPOSED SITE LAYOUT (SHEET 1 OF 7)**

Project Name: PP	Drawing No.: 03	File Name:
Study Name: WLA	Version No.: 02	PP_WLA_03_02
Section:	Date: 10 Dec. 2010	
WYG Job Number: C007831	SCALE: A1(1:2000)/A3(1:4000)	
Created By: CF	Reviewed By: JD	Signed Off By: HB

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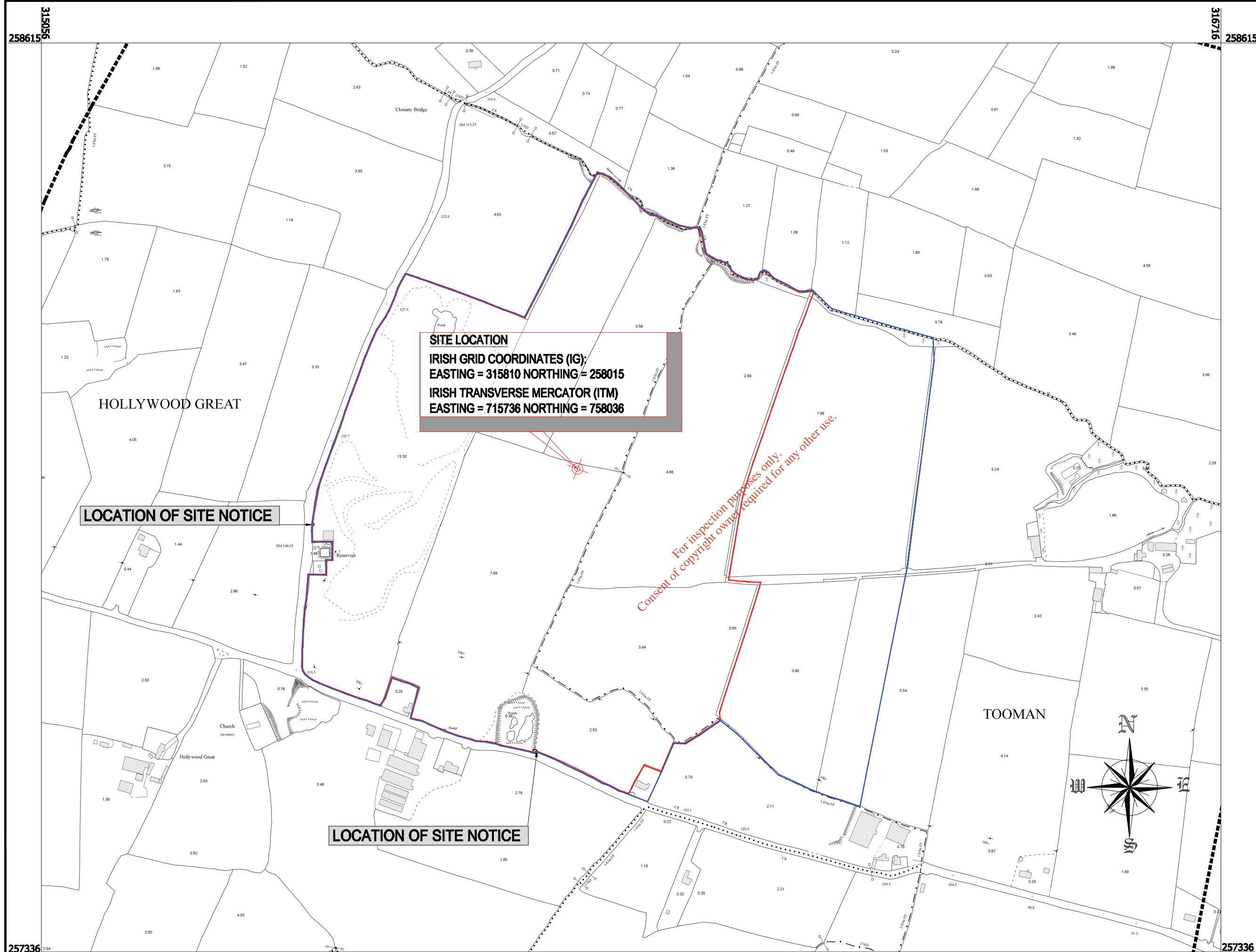


WYG (Engineering) Ireland Ltd.

WASTE LICENCE APPLICATION

REPRODUCED IN ACCORDANCE WITH OSI LICENCE NO. EN 0004910



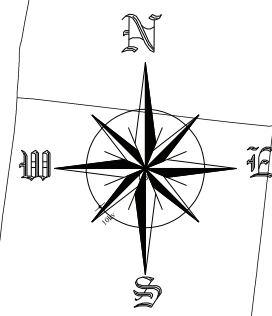


**SITE LOCATION**  
 IRISH GRID COORDINATES (IG):  
 EASTING = 315810 NORTHING = 258015  
 IRISH TRANSVERSE MERCATOR (ITM)  
 EASTING = 715736 NORTHING = 758036

LOCATION OF SITE NOTICE

LOCATION OF SITE NOTICE

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**GENERAL NOTES:**

DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.

DO NOT SCALE THIS DRAWING - USE FIGURED DIMENSIONS ONLY.

**LEGEND:-**

	Ownership Boundary
	Proposed Planning & EPA Waste Licence Boundary

ITM CENTRE PT CO-ORDINATES  
 715736,758036

ORDNANCE SURVEY MAP SHEETS  
 1:2500

2720-A  
 REVISION DATE = 07-MAR-2007  
 SURVEY DATE = 01-MAY-1993  
 LEVELLED DATE = 31-DEC-1990

2719-B  
 REVISION DATE = 07-JUN-2007  
 SURVEY DATE = 01-JAN-1996  
 LEVELLED DATE = 31-DEC-1991

2719-D  
 REVISION DATE = 07-FEB-2007  
 SURVEY DATE = 01-SEP-1996  
 LEVELLED DATE = 31-DEC-1990

2720-C  
 REVISION DATE = 07-MAR-2007  
 SURVEY DATE = 01-JUN-1993  
 LEVELLED DATE = 31-DEC-1990

**WASTE LICENCE APPLICATION**

REPRODUCED IN ACCORDANCE WITH OSI LICENCE NO. EN 0004910

01	WASTE LICENCE APPLICATION	10.12.10	4 Projects
var.	amendment	date	issued to

Prepared For:

Client: **MEHL INTEGRATED WASTE MANAGEMENT FACILITY**

Location: **HOLLYWOOD GREAT, NAGS HEAD NAUL, CO. DUBLIN**

Title: **SITE LOCATION MAP SHEET 1 OF 2**

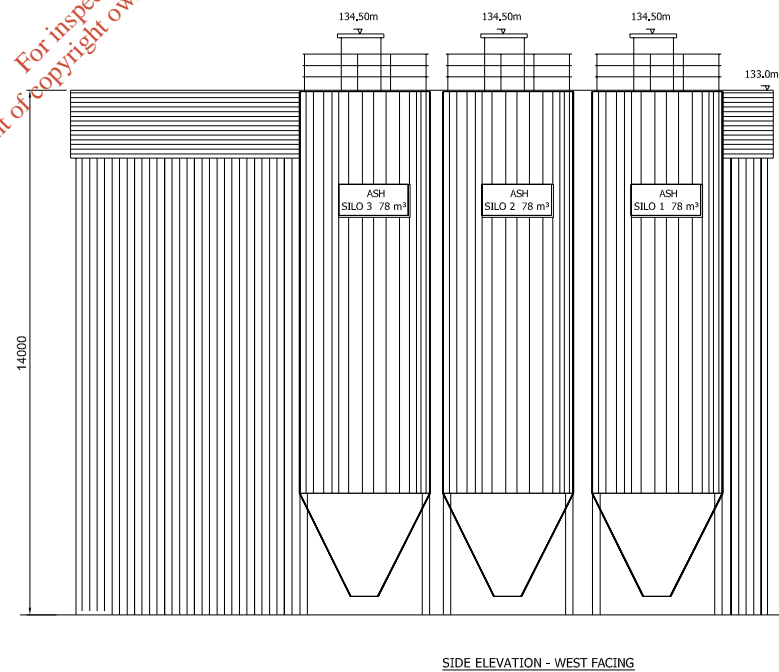
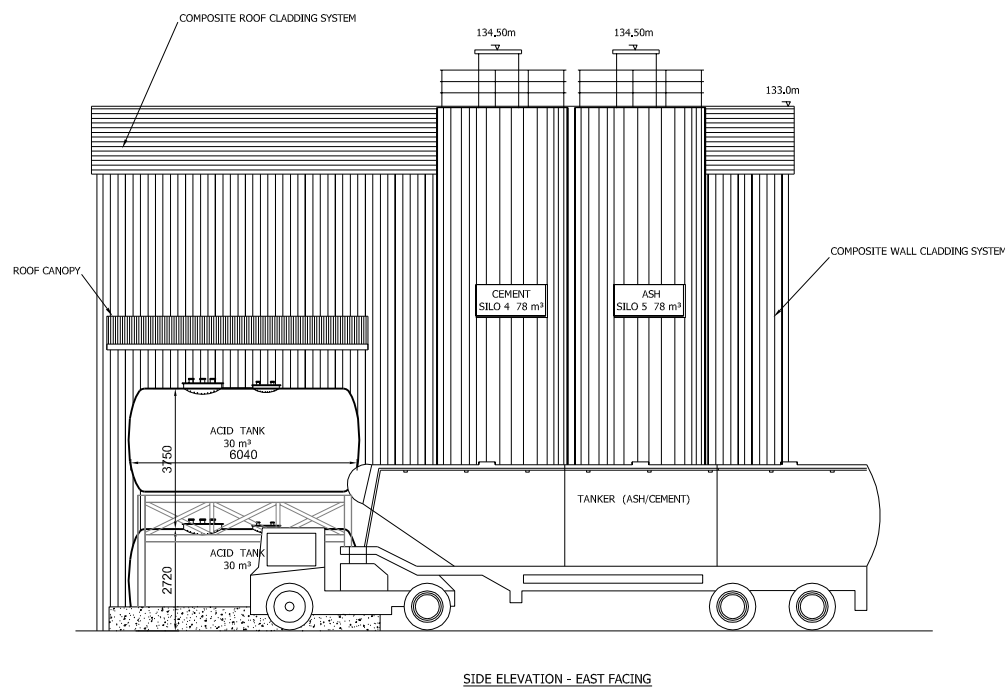
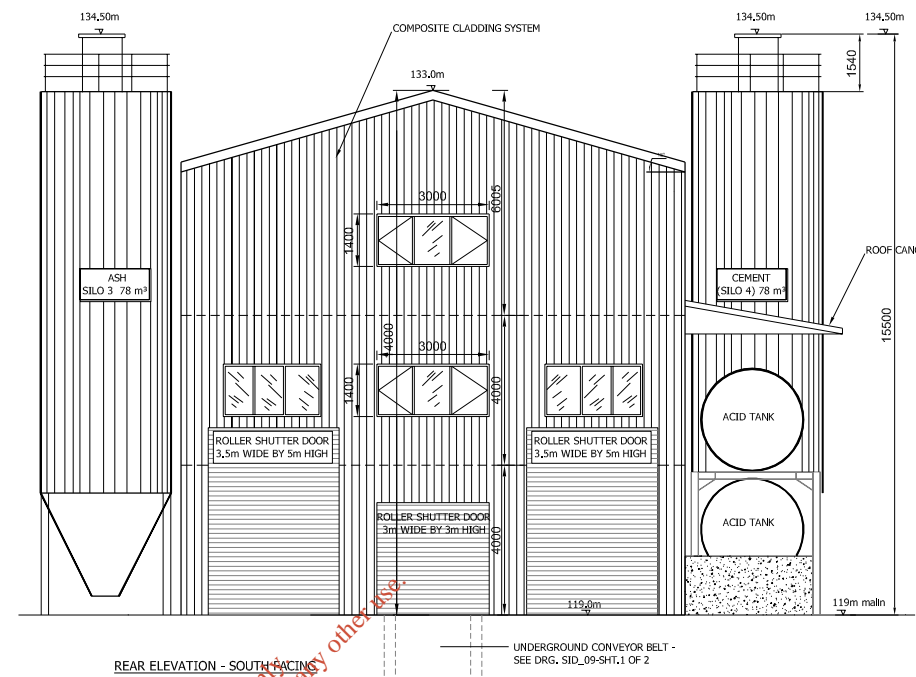
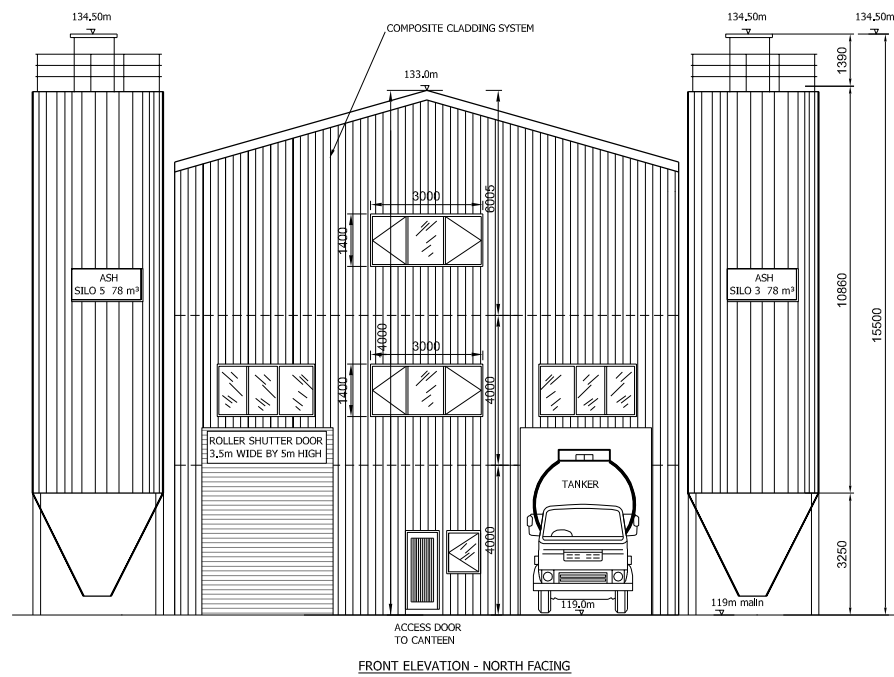
Project Name: PP	Drawing No.: 04	File Name:
Study Name: WLA	Version No.: 01	PP_WLA_04_01
Section:	Date: 10 Dec 2010	
WYG Job Number: C007831	SCALE: A1(1:2500)/A3(5000)	
Created By: CF	Reviewed By: JD	Signed Off By: HB

Prepared by:  
 Old Bridge House,  
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 Fax: (050) 617922  
 E-mail: athlone@wyg.ie

WYG (Engineering) Ireland Ltd.

**ARUP** **MAHARAN PLANNERS**  
 environmental solutions  
 Chartered Town Planning Consultants

SCALE 1:2500

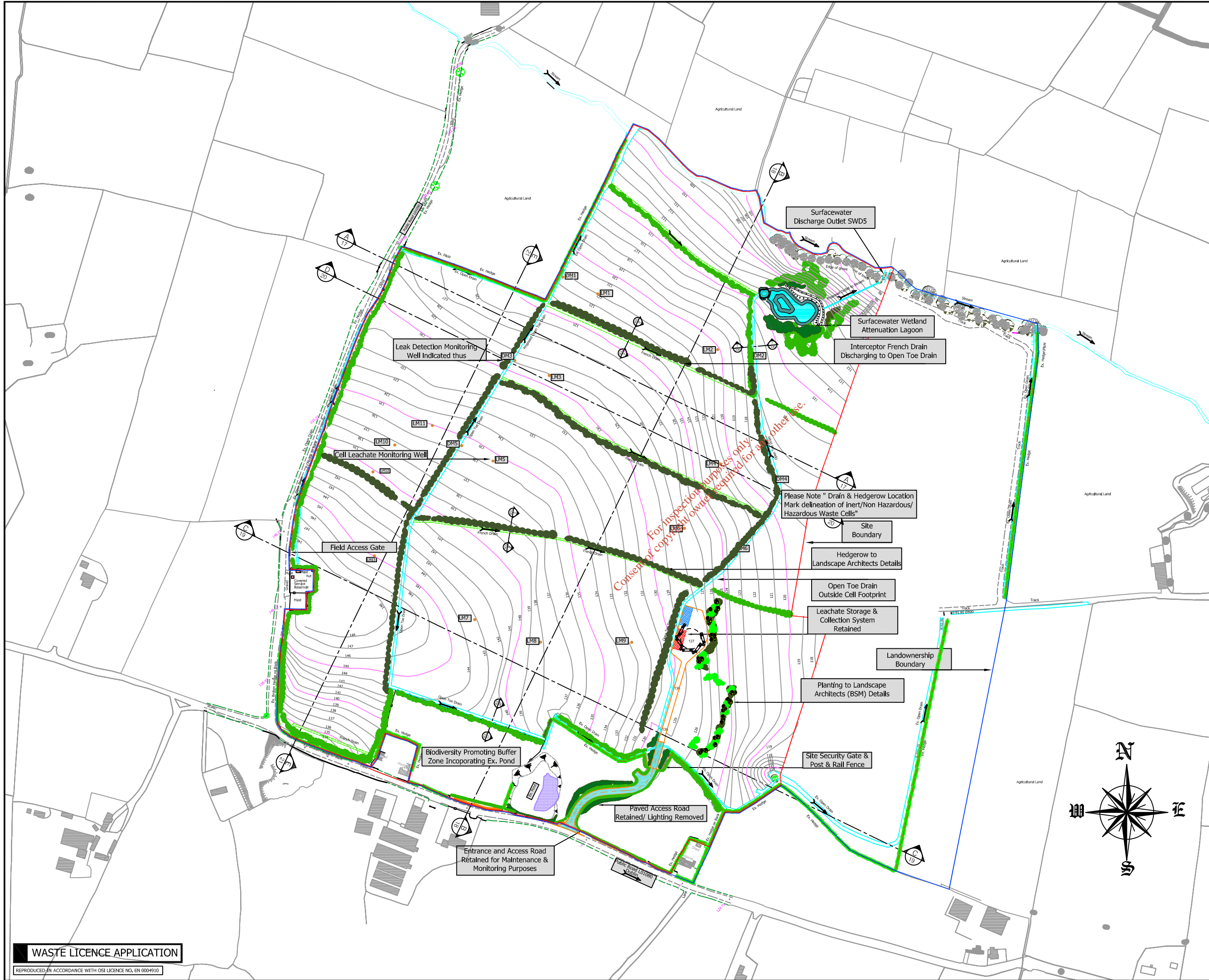


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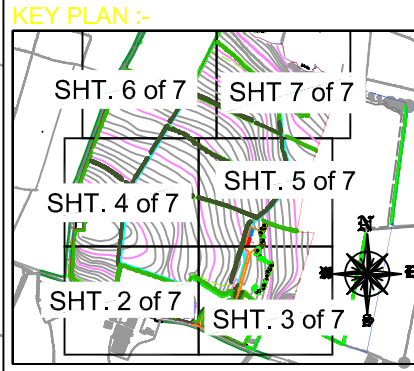
**GENERAL NOTES:**  
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01	WASTE LICENCE APPLICATION	10.12.10	4 Projects
ver.	amendment	date,	issued to,
Prepared For:			
Client:	Murphy Environmental Hollywood Ltd		
Project:	MEHL INTEGRATED WASTE MANAGEMENT FACILITY		
Location:	HOLLYWOOD GREAT, NAGS HEAD NAUL, CO. DUBLIN		
Title:	PROPOSED SOLIDIFICATION PLANT (Sheet 2 of 2)		
Project Name: PP	Drawing No.: 09	File Name:	
Study Name: WLA	Version No.: 01	PP_WLA_09_01	
Section:	Date: 10 Dec 2010		
WYG Job Number: C007831	SCALES: A1(1:100)/A3(1:200)		
Created By: CF	Reviewed By: JD	Signed Off By: HB	
Prepared by:			
Old Bridge House, Strand Street, Athlone, Co. Westmeath.	WYG (Engineering) Ireland Ltd.		
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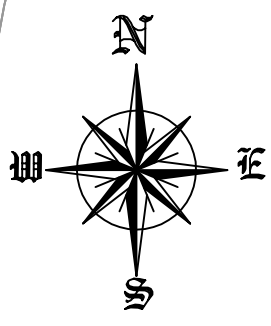


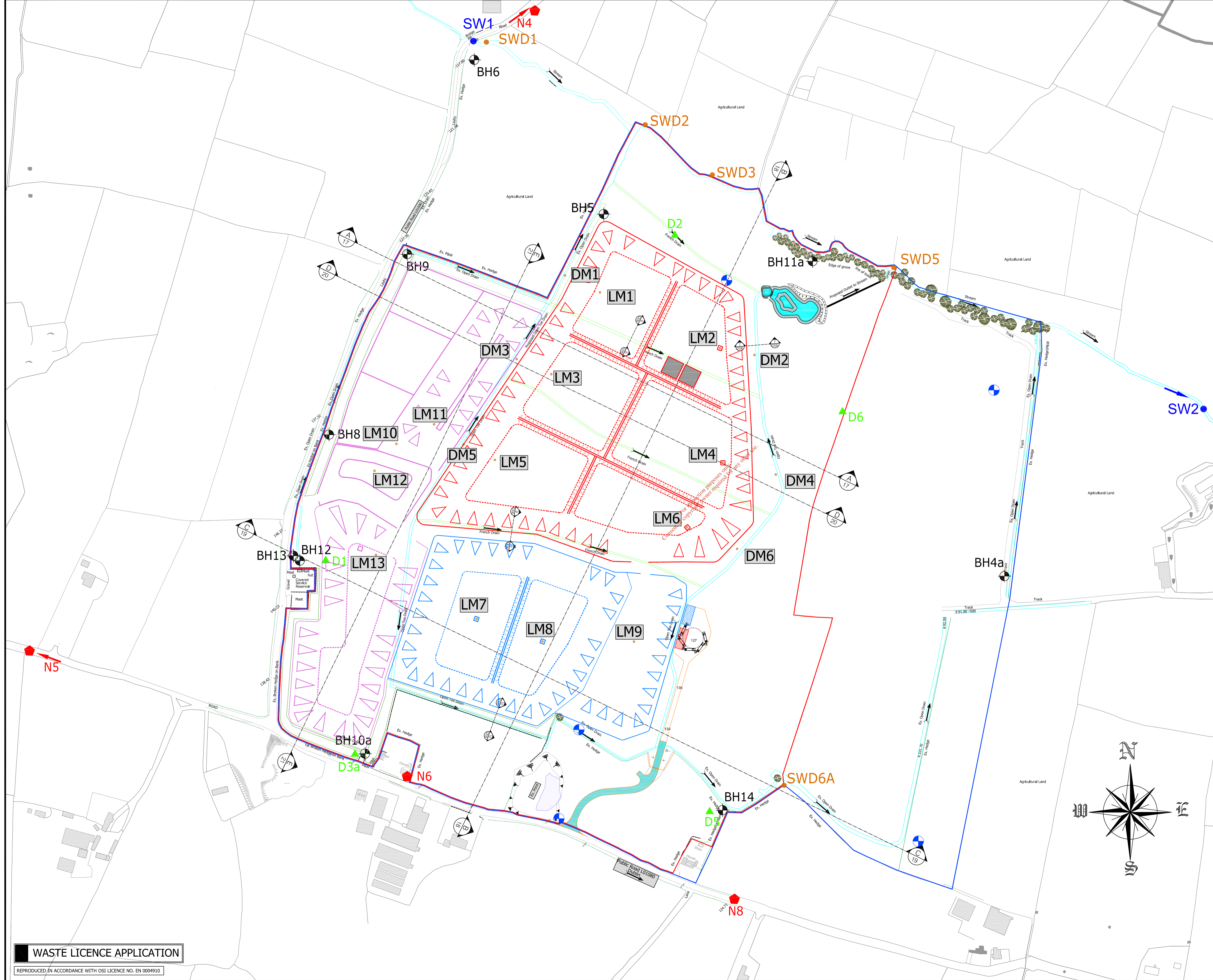
**LEGEND:-**

	Ownership Boundary
	Proposed Planning & EPA Waste Licence Boundary
	Embankment (Slope Direction)
	105.5 Proposed Level / Top of Liner
	127 Existing Ground Level Contour
	+101.84 Existing Spot Level
	Existing Surface Water
	Existing Electrical Duct & Access Chamber
	Existing Access Gate
	Existing Fence (Various Types)
	Existing Masonary Wall
	DM7 Hazardous Leak Detection Monitoring Well
	LM8 Cell Leachate Monitoring Well

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01	WASTE LICENCE APPLICATION	10.12.10	4 Projects
ver.	amendment	date,	issued to,
Prepared For:			
Client:	Murphy Environmental Hollywood Ltd		
Project:	MEHL INTEGRATED WASTE MANAGEMENT FACILITY		
Location:	HOLLYWOOD GREAT, NAGS HEAD NAUL. CO. DUBLIN		
Title:	PROPOSED RESTORATION LAYOUT (SHEET 1 OF 7)		
Project Name:	PP	Drawing No.:	15
Study Name:	WLA	Version No.:	01
Section:		Date:	10 Dec. 2010
WYG Job Number:	C007831	SCALE:	A1(1:2000)/A3(1:4000)
Created By:	CF	Reviewed By:	JD
Prepared by:	Signed Off By: HB		
Old Bridge House, Strand Street, Athlone, Co. Westmeath. Tel: (090) 6474264 Fax: (090) 6478422 E-mail: athlone@wyg.ie			





**GENERAL NOTES:**  
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 DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT DRAWINGS.  
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**LEGEND:-**

	Ownership Boundary
	Proposed Planning & EPA Waste Licence Boundary
	Embankment (Slope Direction)
	Proposed Level / Top of Liner
	Existing Ground Level Contour
	Existing Spot Level
	Existing Surface Water
	Existing Electrical Duct & Access Chamber
	Existing Access Gate
	Existing Fence (Various Types)
	Existing Masonary Wall
	DM6 Hazardous Leak Detection Monitoring Well
	LM8 Cell Leachate Monitoring Well
	BH monitoring borehole
	N noise monitoring location
	D dust monitoring location
	SWD surface water discharge point
	SW surface water monitoring location
	proposed additional groundwater monitoring location

02	ARTICLE 16 RESPONSE	14.12.10	MEHL
01	WASTE LICENCE APPLICATION	10.12.10	4 Projects
ver.	amendment	date.	issued to.

Prepared For: **Murphy Environmental Hollywood Ltd**

Client: **MEHL INTEGRATED WASTE MANAGEMENT FACILITY**

Location: **HOLLYWOOD GREAT, NAGS HEAD NAUL. CO. DUBLIN**

Title: **PROPOSED MONITORING LOCATIONS**

Project Name: PP	Drawing No. : 15	File Name:
Study Name: WLA	Version No. : 02	PP_WLA_27_02
Section: -	Date: 10 Dec. 2010	
WYG Job Number: C007831	SCALE: A1(1:2000)/A3(1:4000)	
Created By: CF	Reviewed By: JD	Signed Off By: HB

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**WYG (Engineering) Ireland Ltd.**

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# MEHL Integrated Waste Management Facility: Application for an EPA Waste Licence (W0129-03)

## List of Drawings

**Please note: drawings are provided at A3 size, as per EPA requirements.  
Drawings are available at A1 size on request.**

	Version No.
Drawing WLA-01: Ownership Plan	01
Drawing WLA-02: Existing Site Layout (Sheets 1 to 7)	01
Drawing WLA-03: Proposed Site Layout (Sheets 1 to 7)	02
Drawing WLA-04: Site Location Map (Sheets 1 to 2)	01
Drawing WLA-05: Proposed Services Plan (Sheets 1 to 2)	01
Drawing WLA-06: Proposed Access Entrance Layout	01
Drawing WLA-07: Proposed Access Road Layout and Longitudinal Section	01
Drawing WLA-08: Proposed Control Area Layout	01
Drawing WLA-09: Proposed Solidification Plant (Sheets 1 to 2)	01
Drawing WLA-10: Proposed Storage Building (Sheets 1 to 3)	01
Drawing WLA-11: Surface Water Sewer Sections (Sheets 1 to 3)	01
Drawing WLA-12: Proposed External Lighting Layout	01
Drawing WLA-13: New Office and Administration Building	01
Drawing WLA-14: Proposed Phasing Layout (Sheets 1 to 5)	01
Drawing WLA-15: Proposed Restoration Layout (Sheets 1 to 7)	01
Drawing WLA-16: Proposed Restoration Sections and Details	01
Drawing WLA-17: Site Cross Section A-A	01
Drawing WLA-18: Site Cross Section B-B	01

# MEHL Integrated Waste Management Facility: Application for an EPA Waste Licence (W0129-03)

## List of Drawings

	Version No.
Drawing WLA-19: Site Cross Section C-C	01
Drawing WLA-20: Site Cross Section D-D	01
Drawing WLA-21: Site Cross Section E-E	01
Drawing WLA-22: Typical Liner Details Site Section A-A	02
Drawing WLA-23: Typical Liner Details Site Section B-B	02
Drawing WLA-23A: Phasing of H1 Tie-in to Non-hazardous Cell	01
Drawing WLA-24: Leachate Sewer Sections (Sheets 1 to 2)	01
Drawing WLA-25: Monitoring Locations as per W0129-02	01
Drawing WLA-26: Foul Sewer Longitudinal Sections	01
Drawing WLA-27: Proposed Monitoring Locations	02
Drawing WLA-28: Phase 1 Restoration Landscape Proposals	01
Drawing WLA-29: Phase 2 Restoration Landscape Proposals	01
Drawing WLA-30: Phase 3 Restoration Landscape Proposals	01
Drawing WLA-31: Phase 4 Restoration Landscape Proposals	01
Drawing WLA-32: Landscape Masterplan	01

**MEHL**  
**Integrated Waste Management Facility**  
**Environmental Impact Statement (EIS)**

**NON-TECHNICAL SUMMARY –**  
**REVISED PART 16:**  
**SOILS, GEOLOGY AND HYDROGEOLOGY**

**OCT. 2013**

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# 1 Soils, Geology and Hydrogeology

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An assessment of the potential impacts to the soils, geology and hydrogeology from the proposed development was undertaken for the site and the surrounding area. Potential impacts from the development were established and mitigation measures were developed. Due regard was had to guidance from the Geological Survey of Ireland, the Institute of Geologists of Ireland and the National Roads Authority.

## Existing Environment

The existing environment was assessed from publically available literature, historic site specific information and the extensive field investigations carried out as part of this assessment.

The existing baseline is summarised below:

- Bedrock beneath this former quarry site can be divided into an aquifer unit and an aquitard unit. An aquifer is a permeable layer of rock or soil that can both store and transmit water in significant quantities. An aquitard is a layer of rock or soil of low permeability that can store groundwater, but is only capable of transmitting water slowly between aquifers. Permeability is the ease with which water can pass through a material.
- The aquifer unit is classified by the GSI as a Locally Important Aquifer and the aquitard as a Poor Aquifer.
- The majority of the site is underlain by the aquitard. The aquifer outcrops in the southern part of the MEHL site and then dips to the north, where it is covered by at least 60 m of the aquitard strata in the northern parts of the site.
- The permeability of the aquifer unit is much higher than that of the aquitard. The aquitard confines or isolates the groundwater within the aquifer in some areas of the site.
- The faulting within the site is shown on the site specific geological map presented with the EIS. The understanding of the behaviour of the faulting has been refined with information from site investigation information gathered in 2013. The faulting passes through all the rock units found on the MEHL site.
- Groundwater in the Loughshinny Formation flows in a generally south easterly direction from the site. The flow in the Namurian deposits is driven by regional topography which varies across the site.
- The pumping test indicated that under stressed (pumping) conditions, that groundwater from the Namurian strata can enter the aquifer through the faults on the site.

The Bog of the Ring collection of groundwater wells to the north east of the site was highlighted by consultees as an important water supply. The MEHL site lies approximately 1 km outside the Source Protection Area for the Bog of the Ring and approximately 3km from the well locations. The source protection area is the area around a well, or wells, which has tighter controls on activities which can take place in it,

in order to avoid contamination of the well or wells. As groundwater beneath the site is flowing to the south east away from the Bog of the Ring well-field it is not at risk from any potential contamination arising from the proposed development.

Geological Heritage Areas are designated as part of the Irish Geological Heritage Programme as part of a partnership with the Geological Survey of Ireland (GSI) and the Department of The Environment, Heritage and Local Government. The MEHL quarry has been designated a Geological Heritage Area.

## Potential Impacts

The main potential impacts to geology and hydrogeology from the proposed development are:

- Potential contamination of the aquifer and local wells  
Potential contamination of the aquifer may arise from both general accidents such as leaking fuel containers kept on the site and from leaking leachate from the placement of the waste.
- Loss of the Geological Heritage Area  
The MEHL quarry is to be back filled as part of its current planning permission and therefore the exposed quarry faces will eventually disappear in a 20 to 30 year period.

## Proposed Mitigation Measures

A number of mitigation measures have been developed and incorporated into the design of the proposed development.

To minimise the risk of aquifer contamination the placement of the waste with regard to the distribution of the aquifers on the site will be as follows:

- The inert and non-hazardous waste cells will be located in the part of the site underlain by the Locally Important Aquifer
- The hazardous waste cell will be located in the part of the site underlain by the poor aquifer

The following mitigation measures will be employed:

- All waste will be placed above the water table.
- The waste streams of inert, hazardous and non-hazardous waste will be segregated to ensure that hazardous waste cannot enter the inert or non-hazardous cells.
- The inert material will be placed in cells lined with low permeability clay 1 m thick which will be designed in line with EU regulations and EPA guidance.
- Non-hazardous waste cells will be lined with a 2 mm thick high density polyethylene liner and 1 m thick low permeability clay which will be designed in line with EU regulations and EPA guidelines.
- An additional 1 m of low permeability material will be placed beneath the liner of the cell for non hazardous waste to further enhance the natural protection

- A Dense Asphaltic Concrete liner will be constructed for the cells in which hazardous waste is to be placed. The liner will be designed to meet EU Landfill Directive requirements.
- Flue gas treatment residues will be solidified before being placed in the cells to lock in certain heavy metals.
- Temporary covers will be installed on the hazardous cells, as required, in order to minimise leachate generation.
- A leak detection system will be provided below the Dense Asphaltic Concrete liner to ensure that in the unlikely event of a leak, the leak will be detected early.
- As part of the waste licence conditions, groundwater will be monitored on site.

A detailed risk assessment was undertaken to quantify the potential risks to groundwater. For the purposes of the assessment, an imaginary receptor well was located down-gradient of the proposed MEHL facility on the MEHL land ownership boundary. The assessment demonstrated that when the proposed mitigation measures are put in place, water quality at the imaginary well would meet drinking water standard.

The MEHL quarry is to be back filled as part of its current planning permission. However, given that the restoration of the MEHL facility will be phased over a 25-year timeframe, the rock outcrops in the quarry wall will remain exposed for maximum duration. Following consultation with the GSI, MEHL will:

- provide a viewing platform from which the quarry faces can be viewed in a safe environment
- provide an information panel to explain the geological features
- maintain the exposures for as long as is practical and
- allow for professional and/or student access where the necessary insurances are in place.