

## Appendix 2-7 – Drehid Fire Prevention & Response Plan



# **Caulmert Limited**

Engineering, Environmental & Planning  
Consultancy Services

## **Drehid Waste Management Facility**

**Bord na Móna Plc**

## **Fire Prevention and Response Plan**

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**APPENDICES**

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## 1 INTRODUCTION

- 1.1.1 The Drehid Waste Management Facility is an integrated facility comprising an engineered residual landfill and an in-vessel composting facility within a larger Bord na Móna landholding, which comprises 2,544 hectares.
- 1.1.2 Drehid landfill operate under IED Licence W0201-03. The landfill currently accepts a maximum of 360,000 tonnes of waste per annum. In addition the composting facility at the site accepts a maximum of 25,000 tonnes per annum of biodegradable waste. In January 2018 the landfill acceptance tonnage will decrease to 120,000 tonnes per year.
- 1.1.3 It was recommended by the Environmental Protection Agency that the site prepare a Fire Prevention and Response Plan which would aim to outline the potential causes, prevention measures and response procedures in the unlikely event of a fire at the facility.
- 1.1.4 As there is no current guidance for fire prevention at landfill sites, this report has been written following consultation with the following guidance documents:
- ‘Guidance on Fire Risk Assessment for Non-Hazardous Waste Facilities’ Environmental Protection Agency 2016.
  - ‘Fire Safety at Non-Hazardous Waste Transfer Stations’ Environmental Protection Agency 2013.
  - SI 83 of 1999 European Communities (Equipment & Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 1999).

## 2 SITE LOCATION

- 2.1.1 The facility is located approximately 9km south of Enfield in County Kildare and is within the confines of the Bord na Móna owned Timahoe bog. The site encompasses a total area of approximately 179 hectares (ha), which includes the site access road, clay borrow area, landfill footprint, sand and gravel borrow area and associated infrastructure.
- 2.1.2 The landfill, when complete, will encompass approximately 39 ha. It will be developed in fifteen distinct phases, each having a duration of between 2 to 3 years.
- 2.1.3 The site is predominantly surrounded by agricultural land with no receptors within 500m of the site. The nearest receptor is located approximately 950m south west, and comprises a small building.
- 2.1.4 The River Cushaling is located 775m south of the landfill.
- 2.1.5 The site access road is located to the south of the landfill and meets the R403 in Killina Upper. Killina National School is located 3.2km south west of the landfill.
- 2.1.6 Prevailing winds are from the south west, therefore the receptors to the north east of the site are most likely to be impacted in the event of a fire.

### 3 WASTE ACTIVITIES

#### **Landfill**

- 3.1.1 Disposal (landfilling) of wastes takes place at the Drehid Landfill. Waste accepted for disposal is residual waste from household, commercial and industrial sources. All of the waste collectors that deliver the waste have systems in place whereby the recyclable fraction is either collected separately, or else separation is carried out at their recovery/transfer facilities. Wastes are delivered in Heavy Goods Vehicles (HGV) provided with the appropriate covers to prevent loss of load. Each vehicle first proceeds to the incoming weighbridge where it is weighed. The weighbridge operator and/or the Facility Manager may, at their own discretion, request the load to be tipped in the Waste Inspection Area to ensure it is suitable for acceptance.
- 3.1.2 The vehicles then proceed to the active fill area, where it is deposited under the direction of a banksman. The vehicles weigh out at the outgoing weighbridge and receive an individual weighbridge docket before exiting the site.
- 3.1.3 Waste is deposited close to and above the advancing tipping face. Site operatives inspect the deposited waste for items that are not acceptable under the Licence, such as tyres, gas bottles, batteries etc. These are removed and stored in appropriate areas for later removal from the site.
- 3.1.4 The deposited waste is then spread in shallow layers on the inclined surface and compacted. Steel-wheeled compactors operate on the gradient of the more shallow face, pushing and compacting thin layers of waste. Each day's waste input forms a 'block', which is compacted and covered. The following day a new 'block' of waste is deposited adjacent to this block. This allows areas that have been filled and are to be left for a period, to be progressively restored over the site life, minimising the areas of active waste deposition.
- 3.1.5 The landfill currently accepts up to 360,000 tonnes of waste per year. In January 2018 the waste acceptance tonnage will decrease to 120,000 tonnes per year in line with the sites IED licence.

#### **Landfill Gas Utilisation Plant**

- 3.1.6 Waste activities at the landfill gas plant include capture and utilisation of the landfill gas for the generation of electricity for supply to the national grid.
- 3.1.7 There is a 5.6MW landfill gas utilisation plant at the facility. This plant was commissioned in November 2013 and converts landfill gas into electricity for export to the national grid.
- 3.1.8 In 2015, a landfill gas cleaning plant was installed at Drehid. The plant is designed to remove hydrogen sulphide, other organo-sulphur compounds and siloxanes from the landfill gas stream thereby increasing gas engine availability by extending the engine service and overhaul intervals.

- 3.1.9 The landfill gas cleaning plant comprises three stages. The first stage involves the biological scrubbing of the gas stream to remove hydrogen sulphide. The second stage involves the chilling/dewatering of the landfill gas, reducing the gases corrosion potential in the engines and to condition the gas for the third stage of the process. This third stage of the process involves moving the gas through vessels which are filled with activated carbon in order to remove siloxanes. The presence of siloxanes in the landfill gas results in silica deposits in the engines' internal moving parts and components. The silica deposits are abrasive, leading to engine down time, and increased operating costs.

#### ***In Vessel Composting Plant***

- 3.1.10 Waste activities at the composting plant include the composting of bio waste for landfilling.
- 3.1.11 The Compost Plant comprises a waste reception area, 12 composting tunnels and 1 hygienisation unit, a screening area and product storage bay.
- 3.1.12 The composting plant can accept up to 25,000 tonnes of material per annum.

### **3.2 Waste types, quantities and properties of combustible and other hazardous materials on site**

#### ***Landfill***

- 3.2.1 Drehid landfill accepts residual wastes which have been pre-treated. The maximum annual intake of waste to the landfill is 360,000 tonnes.
- 3.2.2 A considerable portion of the wastes accepted to the site are comprised of combustible materials.
- 3.2.3 Landfill gas is produced as a result of the decomposition of the waste under anaerobic conditions. Methane present within the gas can either be flammable or explosive dependent upon concentrations.
- 3.2.4 Landfill gas is extracted from the waste mass and piped to the gas utilisation plant where it is either used to fuel gas generation engines or burnt within high temperature flares.
- 3.2.5 Flammable materials handled on site for maintenance and the licenced operation are diesel oil, and virgin and waste oils, lubricant and hydraulic oils for maintenance.

#### ***Landfill gas Utilisation Plant***

- 3.2.6 Landfill gas is used either to fuel gas generation engines or burnt within high temperature flares. Landfill Gas is not stored on site.
- 3.2.7 Other flammable materials handled on site for maintenance and the licenced operation are diesel oil, lubricants and hydraulic oils for maintenance.

***In-vessel composting facility***

- 3.2.8 The composting facility accepts 25,000 tonnes per annum of bio-waste for processing. Waste stored in the composting facility is separated by concrete walls to prevent the build-up of material.
- 3.2.9 The composting facility accepts fines that are predominantly formed of organic material, have a relatively high moisture content, and are considered to have a low combustibility.
- 3.2.10 Stockpiles in the composting facility are minimised and regularly removed to landfill.

**3.3 Managing the Common Causes of Fire**

- 3.3.1 ATEX Assessments have been carried out and suitable controls have been put in place. This includes the identification of areas where hazardous explosive atmospheres may occur and their classification into zones.
- 3.3.2 Areas classified into zones should be protected from sources of ignition. Equipment and protective systems intended to be used in zoned areas should be selected to meet the relevant requirements.
- 3.3.3 Where necessary, the entry points to areas classified into zones should be marked with a specified signage.
- 3.3.4 To prevent/reduce risk of arson, Drehid Landfill Site have security on site when the site is not operational, this encompasses all site operations including: the RO plant, the in-vessel composting facility and the landfill gas engine and flare.
- 3.3.5 Gates are locked shut when the facility is closed and the fencing is maintained and repaired as and when is necessary.
- 3.3.6 The welfare offices are also locked out of hours. The site has an alarm system that alerts authorized personnel, should there be an alarm activation.
- 3.3.7 The site is manned 24 hours a day, 365 days a year and is continually patrolled/monitored by a suitably qualified member of staff.
- 3.3.8 To further prevent the risk of fire only authorised personnel are permitted within the waste handling areas. Visitors to the site are made aware of the correct safety and fire prevention procedures to follow whilst visiting the site.
- 3.3.9 All contractors must have completed a site specific induction within the last 24 months as a minimum. The inductions cover issues such as smoking areas, site H&S signage and what to do in the event of any emergency. Drehid operate a no smoking policy.
- 3.3.10 To prevent/reduce the risk of fires caused from smoking there is a no smoking policy at all locations around the facility. No smoking signs are displayed around the site.



3.3.11 To prevent fires from vehicles on site, site vehicles undergo regular maintenance and daily checks to ensure they are in good working condition. This prevents fuel or lubricant leaks from site vehicles.

### **Landfill**

3.3.12 To prevent fires from incoming waste loads, waste acceptance procedures are in place (Appendix 1). All staff are trained to be vigilant and identify any incompatible non-conforming waste.

3.3.13 The site is routinely checked for the presence of potential landfill fire through visual inspection of the site and interpretation of monitoring results.

3.3.14 The gas monitoring programme includes monthly measurements of methane, carbon dioxide, oxygen and atmospheric pressure in wells located both outside and inside the waste body.

3.3.15 The wells are at 50m intervals around the landfill footprint and two per hectare within the cells.

3.3.16 A sub surface landfill fire operating procedure for Drehid Landfill is presented in Appendix 2.

3.3.17 The landfill is routinely checked for the presence of potential landfill fires through visual inspection of the site and interpretation of monitoring results. A hot spot may be suspected if a number of the following are observed during site inspection and monitoring:

- Substantial settlement over a short period of time;
- Smoke or smoulder emanating from the gas extraction system or landfill;
- Elevated levels of CO exceeding 100 ppm as indicated on hand-held IR instrument;
- Elevated levels of oxygen greatly exceeding 5%;
- Combustion residue in extraction wells or headers or
- Increase in gas temperatures in the extraction system/excessive temperatures.

3.3.18 If elevated CO readings are detected then this is to be verified by repeat monitoring following gas balance adjustments. If the CO remains elevated and one or more of the other factors are observed then it is suspected that a hot spot is present and the following procedure will typically be followed:

3.3.19 The waste mass in and around the hot spot needs to become anaerobic which can be achieved through closing all surrounding valves and wells to achieve positive pressure.

3.3.20 The waste mass in and around the hot spot may be cooled through injection of water or leachate into the waste through existing wells, or if necessary new wells.

- 3.3.21 The point at which oxygen enters into the waste mass will be identified and sealed. This will be achieved through location of all possible points and sealing using engineered clay, hydrated bentonite or membrane.
- 3.3.22 This basic procedure will be followed for all suspected fires. It will be adapted for each individual situation, and carried out together with carbon monoxide analysis and temperature recording appropriate to each occurrence.

#### ***Landfill Gas Utilisation Plant***

- 3.3.23 To prevent fires from equipment failure, regular inspection of plant and equipment is carried out, staff are trained to look for leaks and damages which may lead to the spillage of flammable liquids. Preventative measures also include regular maintenance of equipment on site.
- 3.3.24 ATEX Assessments have been carried out and suitable controls have been put in place.
- 3.3.25 The site is regularly monitored by patrolling site staff.

#### ***In Vessel Composting Facility***

- 3.3.26 Concrete walls separate stockpiles of unprocessed and processed materials within the composting facility and prevent the build-up of combustible materials and potential spread of fire.
- 3.3.27 Bio waste is discharged from delivery vehicles down into the reception area where they are then loaded into a hopper to begin the treatment process. Waste is normally removed from the reception area on the same day as delivery.
- 3.3.28 Waste is composted within separately contained tunnels that will also act to contain any fire outbreak during the composting process.
- 3.3.29 To prevent fires from equipment failure, regular inspection of plant and equipment is carried out, staff are trained to look for leaks and damages which may lead to the spillage of flammable liquids. Preventative measures also include regular maintenance of equipment on site.
- 3.3.30 In addition the in vessel composting tunnels are continually monitored to ensure temperatures of the compost are controlled.
- 3.3.31 Air flow within the tunnels can be controlled using the control panel to reduce the risk of a potential fire occurring within the waste piles.
- 3.3.32 The plant is regularly cleaned and maintained and includes all the machinery including the conveyor belts. Inspection of the plant occurs on a regular basis, the site is monitored at all times.

- 3.3.33 Fire risk is also minimised by practising good housekeeping techniques. As part of the EMS (Environmental Management System) Drehid has in place daily site checks completed visually by site staff. They are trained to watch for and identify any potential fires, i.e. smoke/steam.

### **3.4 Prevention of Self Combustion/Ignition**

#### ***Landfill***

- 3.4.1 The risk of incompatible wastes streams self-combusting has been minimised by waste acceptance procedures at the landfill.
- 3.4.2 Should any non-conforming items be identified staff are trained to follow the waste acceptance procedures and management procedures.
- 3.4.3 Monitoring is carried out at the landfill site and routinely checked for the presence of potential landfill fires through visual inspection of the site and interpretation of monitoring results.
- 3.4.4 A hot spot may be suspected if those outlined in section 3.3.17 are observed during site inspection and monitoring.
- 3.4.5 All staff are trained to be vigilant and identify any wastes that require segregation/removal off site.
- 3.4.6 Staff are trained to be vigilant for any incoming hot loads although considered to be low risk due to the origin of the wastes accepted. If any are identified the EMP will be actioned and the load will be isolated if practicable.
- 3.4.7 Temporary capping is laid on all non-operational cells to reduce emissions but also to help prevent oxygen ingress and so minimise the risk of self-combustion. On completion of a cell to final levels, permanent capping and restoration is carried out.
- 3.4.8 The landfill gas extraction is regularly monitored and managed to ensure that over extraction of the gas field is prevented whilst minimising emissions of landfill gas to air and controlling gas migration.
- 3.4.9 ATEX Assessments have been carried out and suitable controls have been put in place for all landfill gas and leachate management infrastructure on the landfill.

#### ***Landfill Gas Utilisation Plant***

- 3.4.10 To prevent fires/explosion, regular inspection of plant and equipment is carried out, staff are trained to look for leaks and damages which may lead to the spillage of flammable liquids. Preventative measures also include regular maintenance of equipment on site.
- 3.4.11 ATEX Assessments have been carried out and suitable controls have been put in place.

***In Vessel Composting Facility***

- 3.4.12 Concrete walls separate stockpiles of unprocessed and processed materials within the composting facility and prevent the build-up of combustible materials and reduce residence times to prevent self-combustion.
- 3.4.13 In-vessel composting tunnels are continually monitored to ensure temperatures of the compost are controlled.
- 3.4.14 Air flow within the tunnels can be controlled to reduce the risk of a potential fire occurring within the waste piles.
- 3.4.15 Staff undertake regular inspection of plant and equipment for leaks and damage to prevent spillage of flammable liquids.
- 3.4.16 Equipment is regularly checked and cleaned, including the screens and conveyor belts.

**3.5 Waste Storage*****Landfill***

- 3.5.1 In the landfill area waste is deposited straight into the fully contained engineered cells, the waste is compacted using a landfill compactor to increase density which minimises airspaces within the waste mass.
- 3.5.2 Vertical and horizontal gas extraction infrastructure is constructed as each landfill cell is filled to allow for gas extraction at the earliest opportunity, ideally within 6 weeks of waste placement.
- 3.5.3 Temporary capping is laid on all non-operational cells to reduce emissions but also to help prevent oxygen ingress and so minimise the risk of self-combustion. On completion of a cell to final levels, permanent capping and restoration is carried out.

***Landfill Gas Utilisation Plant***

- 3.5.4 Minimal amounts of waste are stored in the area of the gas utilisation area. Landfill gas is not stored prior to combustion.

***In Vessel Composting Facility***

- 3.5.5 Potentially combustible materials are stored appropriately within separate bays and materials are monitored to reduce the risk of fires starting and spreading.
- 3.5.6 Material is stored in concrete bays on impermeable pavement to prevent the build-up of material and potential fire.
- 3.5.7 Waste is brought into the reception area and loaded into the composting tunnels. Waste is not stored for any significant lengths of time.

### 3.6 Prevention of Fire Spreading

#### *Landfill*

- 3.6.1 The landfill is routinely checked for the presence of potential landfill fires through visual inspection of the site and interpretation of monitoring results as detailed in section 3.3 of this document.

#### *Landfill Gas Utilisation Plant*

- 3.6.2 Equipment regularly undergo inspection and maintenance checks.
- 3.6.3 The site is regularly monitored and patrolled to control and prevent the risks of fire spread.
- 3.6.4 Any fuels/oils/lubricants on site are contained to prevent the spread of fire.

#### *In Vessel Composting Facility*

- 3.6.5 Waste is separated and segregated to minimise the stockpile sizes, concrete walls separate stockpiles within the composting facility and prevent the build-up of combustible materials and potential spread of fire.
- 3.6.6 Automated systems control the temperature by air flow and monitor each tunnel. The 12 tunnels are physically separated which prevents the spread of fire if one were to break out in one of the tunnels.
- 3.6.7 The plant is regularly cleaned and maintained and includes all the machinery including the conveyor belts. Inspection of the plant occurs on a regular basis, the site is monitored at all times.

### 3.7 Quarantine Area

- 3.7.1 A quarantine area has been identified on the site layout plan 2887.DRE.FPP.01. This has been designed to be able to hold a minimum 50% of the largest stockpile of site material and has a separation distance in excess of 6m from the building and does not obstruct any exit routes.
- 3.7.2 In the event of a fire the mobile plant will be used to isolate the affected materials and/or containers provided it is safe to do so.

### 3.8 Fire Detection

- 3.8.1 On detection of smoke or fire, staff would first raise the alarm and evacuate the area. Depending on the severity of the issue a decision would be made as to whether site staff could deal with the incident or whether the Emergency Services would need to be called.
- 3.8.2 The Facility Manager and Deputy Manager are the designated Site Incident Controllers, with responsibility for assessing the scale of an incident and, alerting the fire service. This responsibility is defined in the Emergency Response Procedure.

- 3.8.3 All staff are trained to be vigilant and identify any incompatible non-conforming waste such as any gas bottles, drums, containers, with labels, i.e. flammable, corrosive, oxidising, and hazardous, etc.

#### ***Landfill***

- 3.8.4 The site is monitored by personnel 24 hours a day and therefore any potential surface fire would be detected quickly and the relevant people alerted.
- 3.8.5 In the event of smoke in the waste or on the surface of the landfill or a hot load of waste being noticed by either operational staff or after hour site supervision personnel, the emergency response procedure (Appendix 1) will be implemented, to minimise the risk of it spreading.
- 3.8.6 If a fire breaks out on the surface of the landfill it will be spotted by the staff patrolling the site.
- 3.8.7 Subsurface fires will be detected by in waste monitoring as detailed within the sub surface fire procedure.

#### ***Landfill Gas Utilisation Plant***

- 3.8.8 The landfill gas compound is monitored as part of the site monitoring by personnel 24 hours a day.
- 3.8.9 Designated staff will monitor the site at regular intervals during the working day, to detect signs of a fire.

#### ***In Vessel Composting Facility***

- 3.8.10 Fire detectors are located within the composting building to detect any fires that may arise.
- 3.8.11 The facility is monitored by control panels which are able to detect temperatures and any fire outbreak.
- 3.8.12 Fire detection equipment will be maintained, inspected and serviced in accordance with manufacturers' recommendations, by suitably competent persons.
- 3.8.13 A fire check will be carried out at the end of the working day. Details will be recorded on the daily check sheet (See Appendix 1).

### **3.9 Staff Fire Safety Training**

- 3.9.1 All staff, including part time staff will receive fire safety training to be provided by a competent person.
- 3.9.2 Induction training for new staff or contractors will include instructions on fire safety and what to do if a fire is discovered at the site. Details of training are recorded.

- 3.9.3 Staff receive regularly updated training to ensure that they remain familiar with fire precautions and actions to be taken in the event of a fire.
- 3.9.4 Training is given in accordance with procedures within the company's management system.

### **3.10 Firefighting Techniques**

- 3.10.1 In the event of a fire employees will follow the Fire Explosion Procedure (Appendix 1). Employees shall only attempt to fight a fire if it is safe to do so. If an employee cannot tackle a fire safely and effectively evacuation of all personnel is the primary priority.
- 3.10.2 Site staff are trained to extinguish small fires with appropriate hand held fire extinguishers. The site stores equipment such as fire extinguishers, protective clothing and pollution control equipment. These are stored at various points throughout the site.
- 3.10.3 In the event of an emergency call out, Fire Service tenders will bring water to the site. The volume of water varies depending on number of tenders or tankers. Normally approximately 6 fire tenders, each with 1.82m<sup>3</sup> capacity are dispatched to an incident at a facility such as this. Additional fire-fighting water would be obtained from the fire hydrant and the sites 4 no. surface water lagoons.
- 3.10.4 Safe access for fire and rescue services will be achieved by maintaining routes for fire engines and access points around the site perimeter.

#### ***Landfill***

- 3.10.5 All power to the area must first be isolated. Where possible a combination of water to cool the area and where necessary the use of an excavator to dig out the fire and use soils to remove oxygen from the hot area and minimise the risk of it spreading to any other flammable material whilst keeping a safe distance and remaining up wind.

#### ***Landfill Gas Utilisation Plant***

- 3.10.6 Fire extinguishers are located around the gas compound, to be used by trained site staff in the event of a small fire.

#### ***In Vessel Composting Facility***

- 3.10.7 Sensors in the in vessel composting facility can detect fire and control airflow within the tunnels. In the event of a fire break air flow within the tunnels can be restricted to extinguish the fire.
- 3.10.8 Fire extinguishers are located around the site, outside the building and within the offices.

### **3.11 Water supplies**

- 3.11.1 Water for firefighting can be sourced from the large surface water lagoons located adjacent to the site offices, close to the in vessel composting facility and landfill gas utilisation plant.

3.11.2 The location of these lagoons is shown on drawing 2887.DRE.FPP.01.

### **3.12 Manging Fire water**

3.12.1 In the event of a fire it is conservatively assumed that all of the run-off firewater will enter the drainage system. There is an extensive man made drainage network across the Bord na Móna landholding and the site is divided into a number of discrete areas, referred to as 'peat fields' that are formed by the surface water drains.

3.12.2 Surface water is discharged from settlement ponds through an Integrated Constructed Wetland and from there into the bog drain at Monitoring Location SW6. The discharge from the sites 4 no. settlement lagoons will be isolated in the event of a fire in order to prevent any firewater from being discharged from the site. Before the water is discharged, if there has been a fire, the quality of this water will be monitored and discussions with the EPA will take place before discharge or potential tankering of the water.

### **3.13 Incident Management**

3.13.1 On site there will be a 'Fire and Emergency Information' box that contains a copy of the Fire Prevention Plan, Emergency Management Plan and Emergency Site Plan. These documents can be accessed by the emergency services. Site staff will be trained in all of these documents as part of their induction programme. Copies of these specific documents are held within the welfare cabin.

3.13.2 If the fire poses a potential risk to the adjacent bog land then Bord na Móna Fire Response (046 9733373) or the Bog Supervisors must be contacted immediately. The contact details are detailed on the Emergency Contact List.

3.13.3 Upon the detection of any fire during operating hours a member of staff will be positioned at the entrance of the site to direct emergency vehicles and to redirect incoming vehicles away from the site.

3.13.4 The nearest receptor is 950m away and any potential fire is not considered to have a significant impact on local receptors due to the isolated nature of this site.

3.13.5 In the event of a fire the fire/explosion procedure will be implemented (Appendix 1).

### **3.14 Post Fire Actions**

#### ***Landfill***

3.14.1 Precautionary flooding of wells in the immediate vicinity of any fire break out near gas wells will take place at the landfill.

3.14.2 Any contaminated fire waters collected after an incident will be stored where possible until disposal to an approved site can be agreed with the Environmental Protection Agency. This surface water can be pumped from the surface water pumping chamber by tanker for disposal off site if considered unsuitable for discharge to surface water.



- 3.14.1 If the affected material is considered hazardous, it is stored in a container and collected as soon as possible by a certified hazardous waste disposal contractor.
- 3.14.2 Any fire damaged waste will be characterised to enable determination of a suitable facility for recovery or disposal of the affected waste, which may include the following:
- Waste characterisation by visual sorting
  - Compositional analysis of the waste material
  - Waste acceptance criteria testing for landfill
- 3.14.3 Any notifiable incident will be reported to the health and safety authority.
- 3.14.4 The site supervisor will carry out an inspection of the site to ensure it is in a satisfactory condition before the site is allowed to reopen.
- 3.14.5 An investigation and risk assessment should be undertaken to assess the potential impact of the landfills engineering infrastructure (lining and capping membranes, gas and leachate collection pipework) and recommend remediation as deemed necessary.

#### ***In-Vessel Composting Facility***

- 3.14.6 Where a fire has taken place within the composting building, an inspection will be carried out to ensure the building is safe to enter. Where appropriate an engineer will be employed to undertake a structural survey. Damaged infrastructure or equipment should be inspected and where necessary repaired or replaced to ensure that the plant is safe to operate.
- 3.14.7 Any remaining waste affected by fire will be removed from site and the affected area will be cleaned, any debris will be placed into containers for appropriate disposal off site.
- 3.14.8 Operations will recommence when the area has been approved as safe to do so.

#### ***Landfill Gas Utilisation Plant***

- 3.14.9 Where a fire has taken place near or within the landfill gas utilisation plant, an inspection will be carried out by a suitably qualified person before operations recommence. Damaged infrastructure or equipment should be repaired or replaced to ensure that the plant is safe to operate.

### **3.15 Review of Firewater Risk Assessment and Fire Response Plan**

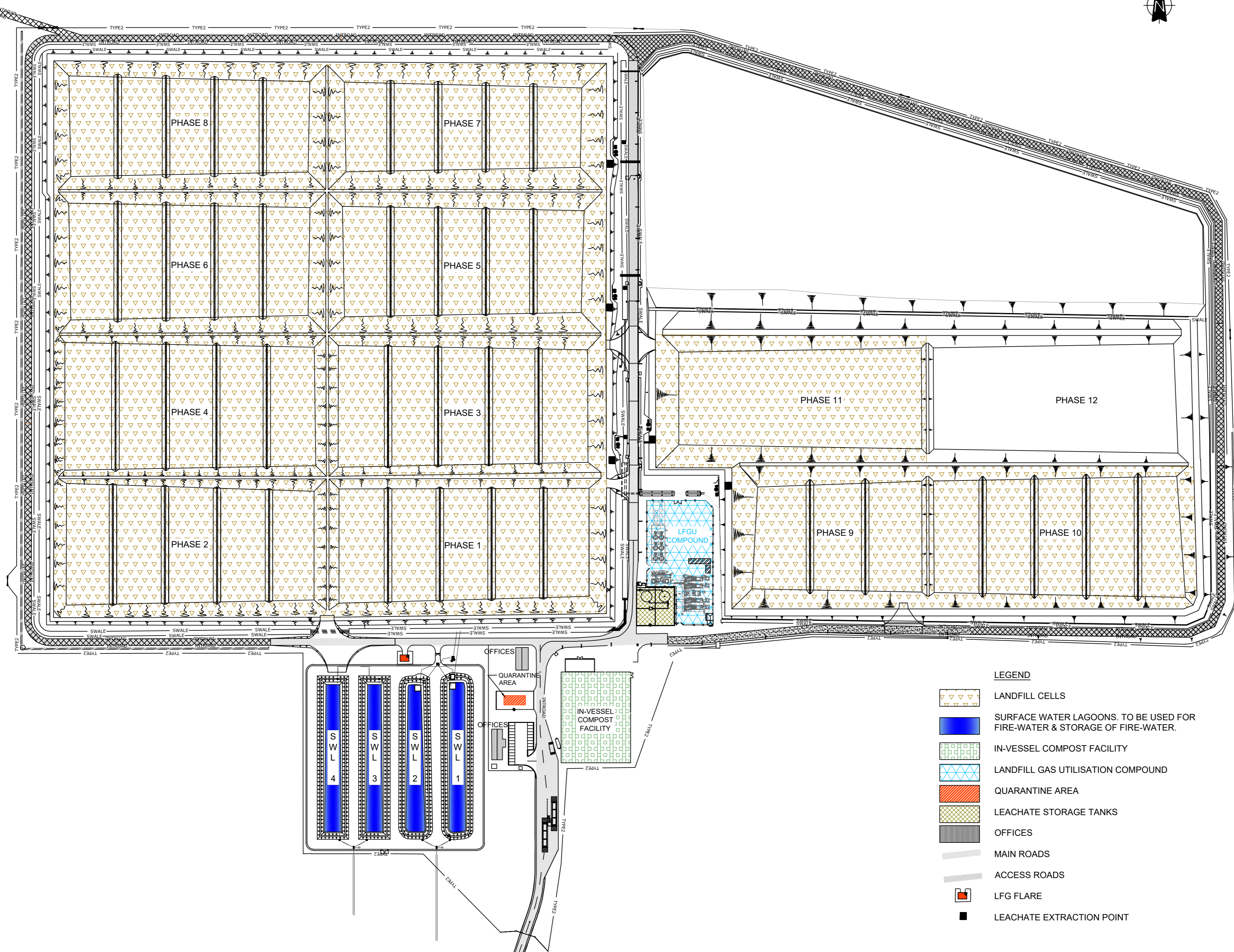
- 3.15.1 Following any significant fire event at the site an investigation of the incident will be undertaken and all procedures and plans will be reviewed.
- 3.15.2 Taking into consideration findings of the investigation, these procedures and plans may be amended to improve fire preventative measures and fire response measures in the future.

**Drawing**



**NOTE**

- DO NOT SCALE FROM THIS DRAWING, WORK FROM FIGURED DIMENSIONS ONLY. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
- NO DEVIATION FROM THE DETAILS SHOWN ON THIS DRAWING WILL BE ALLOWED WITHOUT THE PRIOR PERMISSION IN WRITING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.



**LEGEND**

- LANDFILL CELLS
- SURFACE WATER LAGOONS. TO BE USED FOR FIRE-WATER & STORAGE OF FIRE-WATER.
- IN-VESSEL COMPOST FACILITY
- LANDFILL GAS UTILISATION COMPOUND
- QUARANTINE AREA
- LEACHATE STORAGE TANKS
- OFFICES
- MAIN ROADS
- ACCESS ROADS
- LFG FLARE
- LEACHATE EXTRACTION POINT

A	QUARANTINE AREA MOVED	EJD	AS	AS	22.05.18
REV	MODIFICATIONS	BY	CH	AP	DATE

**O'CALLAGHAN MORAN ASSOCIATES**

PROJECT:  
**DREHID FIRE PREVENTION AND RESPONSE PLAN**

TITLE:  
**DREHID SITE PLAN**

DRAWN BY	DATE
RP	11.09.2017
REVIEWED BY	SCALE @ A2
AS	1:2000
AUTHORISED BY	ISSUE
AS	-
	REVISION
	A


DRAWING NUMBER  
**2887.DRE.FPP.01**

**Caulmert**  
engineering environmental planning

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Registered Office: Intec, Parc Menai, Bangor, Gwynedd, LL57 4FG Company Registered No: 06716319

**Appendix 1**  
**Management Procedures**

Environmental Manual	 <b>Drehid Waste Management Facility</b> Emergency Response Plan	Document: <b>EP 7.0</b>
Document Approved by:  <hr/> Landfill Manager		Revision: 3  Issue Date: 22/03/18  Page: Page 1 of 3 Control Points: Admin Building Tip Face Cabin Weighbridge Security Hut
<b>Title General Emergency Preparedness &amp; Response</b>		


**Purpose:** To identify the potential for, and to respond to, accidents and emergency situations, and to prevent and mitigate the environmental impacts that may be associated with them.

**Scope:** The Scope of this procedure is the application of the Environmental Emergency Response Plan

**References:** [EP 8.0 Environmental Incident Investigation and Reporting](#)  
[EP 7.0 Emergency Preparedness and Response](#)  
[EP 9.0 Non Conformance Procedure](#)  
[EP 10.0 Corrective and Preventive Action Procedure](#)  
[Emergency Plan](#)  
[Safety Statement](#)  
[EPL 7.1 Emergency Contact List](#)  
[Material Safety Data Sheets](#)

**Incident Contact List:**

<b>Emergency Contact List for Drehid Waste Management Facility</b>			
<b>Service / Agency</b>	<b>Address</b>	<b>Telephone Numbers</b>	<b>Fax / e-mail</b>
EPA Headquarters	Johnstown Castle Estate Wexford	053 9160600 1890 335599	053 9160699 info@epa.ie
Kildare Co. Council	Newbridge Road Naas Co. Kildare	045-873800	045-980240
Inland Fisheries Ireland	3044 Lake Drive, Citywest Business Campus, Dublin	01-8842600	01-8360060 info@fisheriesireland.ie

Environmental Manual	 <b>Drehid Waste Management Facility</b> Emergency Response Plan	Document:	<b>EP 7.0</b>
Document Approved by:  <hr/> Landfill Manager		Revision: 3  Issue Date: 22/03/18  Page: Page 2 of 3 Control Points: Admin Building Tip Face Cabin Weighbridge Security Hut	
<b>Title General Emergency Preparedness &amp; Response</b>			

**Procedure:**


1. An Emergency Plan is prepared and maintained by Drehid Waste Management Facility. This Plan details any emergency situation which could occur on site and the proposed response should this emergency occur. The Emergency Plan details procedures for the following occurrences:

Reference	Description
<a href="#">ERP 02</a>	<a href="#">Spill Clean-up Procedure</a>
<a href="#">ERP 03</a>	<a href="#">Fire / Explosion Procedure</a>
<a href="#">ERP 04</a>	<a href="#">Malicious Damage Procedure</a>
<a href="#">ERP 05</a>	<a href="#">Unforeseen Emergencies</a>

2. Should an emergency situation occur, the relevant response procedure documented within the Emergency Plan is implemented. Each procedure details the emergency situation, the proposed response should this emergency occur and the potential environmental impacts of this occurrence.
3. The Landfill Manager shall assume the role of Site Incident Controller, with responsibility for
  - (i) assessing the scale of the incident
  - (ii) informing emergency services
  - (iii) directing rescue and fire-fighting operations.


In the absence of the Landfill Manager the designated Environmental Officer shall assume the role of Site Incident Controller.

4. In an emergency situation the Landfill Manager shall be contacted immediately via the two way radio system. The weighbridge radio shall act as the main point of contact for the Landfill Manager.
5. Following an emergency, the Landfill Manager (or in his absence the designated Environmental Officer) shall record the details of the incident. Environmental Incident

Environmental Manual	 <b>Drehid Waste Management Facility</b> Emergency Response Plan	Document:	<b>EP 7.0</b>
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Landfill Manager	Issue Date: 22/03/18	Page: Page 3 of 3	Control Points: Admin Building Tip Face Cabin Weighbridge Security Hut
<b>Title General Emergency Preparedness &amp; Response</b>			

Investigation and Reporting Form EPF 8.1 shall be completed which is located within the procedure for Environmental Incident Investigation and Reporting (EMS Environmental Procedure EP 8.0). Following the environmental incident appropriate procedures shall be implemented accordingly i.e. Environmental Non-Conformance Procedures EP 9.0, Environmental Incident/Release Investigation and Reporting Procedures EP 8.0 and Environmental Corrective and Preventative Action Procedure EP 10.0.

6. This procedure shall be reviewed by the Environmental Management team, annually or after the occurrence of an emergency situation. Additional procedures may be prepared as identified by environmental reviews/audits, environmental compliance monitoring reports, personnel during routine working hours or other communications which bring potential emergency situations to the attention of the Environmental Management Team.
7. The Landfill Manager shall notify the Environmental Protection Agency as soon as possible after the occurrence of an incident as per procedure EP 17.0 Reporting.
8. In the case of any incident which relates to discharges to water, the Landfill Manager shall notify the Local Authorities and Inland Fisheries Ireland as soon as practicable after the incident
9. On a weekly basis all emergency response equipment shall be checked to ensure it is provided in agreed quantities and in suitable working order. The dust suppression water bowser shall be checked on a daily basis to ensure that it is full of water.
10. In the case that an emergency situation arises outside the hours of operation, the security person shall immediately contact the designated person on call.

Emergency Response Plan	 <p style="text-align: center;"><b>Drehid Waste Management Facility</b></p> <p style="text-align: center;">Emergency Response Plan</p>	Document: <b>EP 07-ERP-03</b>
Document Approved by:  <hr/>  <hr/> Landfill Manager		Revision: 2  Issue Date: 22/3/2018  Page: Page 1 of 3
<b>Title Fire / Explosion Procedure</b>		

**Purpose:** A procedure to deal with fire/explosion emergencies is required for the following reasons:


- To protect Employees.
- To protect the Environment.
- To prevent fugitive emissions.

**Scope:** This procedure applies to Bord na Móna Drehid Waste Management Facility.


**Procedure:**

1. Employees shall only attempt to fight a fire if safe to do so. If an employee feels that they cannot tackle a fire safely and effectively, **EVACUATION OF ALL PERSONNEL IS THE PRIMARY PRIORITY.**
2. All buildings have been fitted with landfill gas monitoring facilities which detects for the presence of carbon dioxide and methane. In the event that landfill gas accumulates in a building the alarm shall activate.
3. The Landfill Manager or designated environmental officer shall evacuate the area in a calm, efficient manner. All staff and contractors shall be instructed to walk briskly to the designated evacuation point.
4. In the event of a fire/explosion occurring, the Landfill Manager shall complete a roll call to account for all employees and contractors that may be present on-site.
5. The Landfill Manager shall identify the location of the fire/explosion risk through dialogue with the individual who discovered the fire and shall take one of the following actions:
  - Determine whether the fire can be **SAFELY** isolated utilising the available fire fighting equipment
  - If the fire is not controlled with the fire fighting equipment available, the local fire brigade shall be notified immediately. Local fire, police and hospital telephone numbers are detailed on the Emergency Contact List. These details are with the weighbridge operator who should:
    - a. Dial 112 for emergency services



Emergency Response Plan	 <p><b>Drehid Waste Management Facility</b></p> <p>Emergency Response Plan</p>	Document: <b>EP 07-ERP-03</b>
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<b>Title Fire / Explosion Procedure</b>		

- b. Request emergency service
  - c. Give details of type of emergency and phone number in case call is inadvertently disconnected
  - d. Provide information requested by call recipient
  - e. Determine estimated time of arrival to site and communicate this information to the relevant member of ERT.
  - f. Hang up only when told to do so by call recipient
  - g. Fill out details required by emergency contact log as soon as it safe to do so.
6. If the fire poses a potential risk to the adjacent bogland then Bord na Mona Fire Response (046 9733373) or the Bog supervisors Gerry Mulligan must be contacted immediately. The contact details are detailed on the Emergency Contact List.
  7. Determine whether the explosion risk from gas build up within a building can be **SAFELY** eliminated by ventilation of the area.
  8. If the fire can be safely isolated, locate the nearest fire suppression system as appropriate; (Dry powder extinguishers for ABC fires [wood, paper, textiles, liquid fuels and gases] Foam extinguishers (or the dust suppression water bowser for larger fires) for AB fires [wood, paper, textiles and liquid fuels] Carbon Dioxide [liquid fuel fires and electrical equipment]. Only small, localised fires, should be extinguished in this manner.
  9. In the event of smoke in the waste or on the surface of the landfill or a hot load of waste being noticed by either operational staff or after hour site supervision personnel, the emergency response procedure will be implemented, to minimise the risk of it spreading. All power to the area must first be isolated. Where possible a combination of water to cool the area and where necessary the use of an excavator to dig out the fire and use inert soils to remove oxygen from the hot area and minimise the risk of it spreading to any other flammable material whilst keeping a safe distance and remaining up wind.
  10. Note the wind direction and any possible sources of ignition i.e. naked lights, machinery, electrical fittings, and combustible material and remove them from the area.
  11. Personnel shall not re-enter buildings unless the Landfill Manager/Fire Officer deems it safe to do so.

<b>Emergency Response Plan</b>		<b>Document: EP 07-ERP-03</b>
Document Approved by:  <hr/> Landfill Manager  <hr/>		Revision: 2  Issue Date: 22/3/2018  Page: Page 3 of 3
<b>Title Fire / Explosion Procedure</b>		

12. Once the fire has been extinguished or the explosion controlled on site personnel shall complete a clean-up operation as per [EP07-ERP-02](#) using the available resources.
  
13. Effected areas shall be checked thoroughly in order to ensure that the fire is quenched. If the affected material is considered hazardous, it is stored in a container and collected as soon as possible by a certified hazardous waste disposal contractor.
  
14. Following an emergency, the Landfill Manager, or other designated responsible person shall record details of the incident as per [EP 8.0 Incident Investigation Procedure](#)

<b>Operations Manual</b>	 <p style="font-size: 1.2em; margin: 0;"><b>BORD NA MÓNA</b></p> <p style="margin: 0;"><b>DREHID WASTE MANAGEMENT FACILITY</b></p> <p style="margin: 0; color: grey;">WORK INSTRUCTIONS MANUAL</p>	<b>Document: WIF 5.1</b>
Document Approved by		
Landfill Manager		<b>Revision: 1</b> <b>Page: 1 of 1</b> <b>Issued: 01/01/09</b>
<b>Title: Daily Site Inspection</b>		

Condition	Aspect	Mon	Tue	Wed	Thur	Fri	Sat	Comments
1.1	Security Fencing							
1.2	Wheelwash and weighbridge							
1.3	Litter netting around cell							
1.4	Litter and general tidiness of site & Environs.							
1.5	Roads Access and R403							
1.7	Working face is covered at close down							
1.8	Cover on Intermediate areas is in place							
1.9	Bird control							
2	Dust Control							
2.1	S/W Lagoon Discharge Colour /Odour							
2.4	Leachate at Holding Tanks Colour/ Odour							
2.5	Flare Running							
2.7	All pumps operational (G/W, Foul & S/W)							
2.8	Sampling sensors cleaned and working							
2.9	Fire Tanker Full							
3	Settlement lagoons by Cushing flowing							
3.1	Cushing Outlet flowing							
3.2	Fly Control							

	<b>Scale</b>		Gas Flare
<b>GD</b>	Good	Signed	% CH <sub>4</sub> =
<b>SAT</b>	Satisfactory (Give reason in comment box)	Date:	% O <sub>2</sub> =
<b>UNS</b>	Unsatisfactory (Give reason in comment box)		% CO <sub>2</sub> =
Note: This document must be completed every day. At the end of each week it must be left into the foreman for inspection.  Note: Any item found to be unsatisfactory must be reported to the Foreman once discovered.			Temp °C=
			Flow Rate =

<b>Operations Manual</b>	 <p data-bbox="667 277 1335 341"><b>DREHID WASTE MANAGEMENT FACILITY</b> WORK INSTRUCTIONS MANUAL</p>	<b>Document:</b> WIF 5.1
<p data-bbox="192 150 427 177">Document Approved by</p>  <p data-bbox="210 277 365 300">Landfill Manager</p> <hr data-bbox="143 352 465 355"/>		<p data-bbox="1518 245 1682 268"><b>Revision:</b> 1</p> <p data-bbox="1518 277 1727 300"><b>Page:</b> 2 of 1</p> <p data-bbox="1518 309 1749 331"><b>Issued:</b> 01/01/09</p>
<b>Title: Daily Site Inspection</b>		



DREHID WASTE MANAGEMENT FACILITY

Revision: 2  
 Page: 1 of 2  
 Issued: 26/06/2012

Title: Weekly Site Inspection

Item	Aspect	Good	Satisfactory	Unsatisfactory	Comments
1.0	Surface Water Gullies (Check for blockages/structural damage)				
2.0	Silt / Grit Trap				
3.0	Waste Water Percolation Chamber				
4.0	Spill Kits (1-4)				
5.0	Pest Control (Birds, Flies, Rodents, Bait Boxes)				
6.0	Mud (entire site)				
7.0	Litter (entire site)				
8.0	Dust (entire site)				
9.0	Odour (entire site)				
10.0	Diesel Tanks Area (Check structure, liquid levels)				
11.0	Housekeeping				
	Yard / Car park				
	Factory /W shop/ General				
12.0	Welfare Facilities				
	Toilets/ Washing Facilities/ Drying rooms				
	Office Area				
	Canteen (s)				
13.0	PPE.				
	All staff & Contractors				

Signed: \_\_\_\_\_  
 Date: \_\_\_\_\_

Note: This document must be completed at the end of each week. Once completed it must be left into the foreman (on the day of completion) for inspection.

Note: Any item found to be unsatisfactory must be reported to the Foreman immediately.



## DREHID WASTE MANAGEMENT FACILITY

Revision: 2  
Page: 2 of 2  
Issued: 26/06/2012

## Title: Weekly Site Inspection

Item	Aspect	Good	Satisfactory	Unsatisfactory	Comments	Action Date
14.0	Plant & Equipment					
	Safety Motion Alarms					
	Beacons					
	Emergency stops.					
15.0	Fire					
	Fire Alarm / Fire Register					
	Fire extinguishers					
	Fire Hoses / pump					
	Smoking on site.					
16.0	First Aid					
	First boxes / Seals / Contents					
17.0	Site Safety Signage					
	Traffic Management.					
	Safety Alerts/ warnings etc					
	Plant & Equipment signage					
18.0	Site Security					
	Access & Egress – Check Gates					
	Site Boundary - Fencing					
	Weighbridge Barriers					
19.0	Lagoons/ Borrow Pit					
	Edge protection/ Fencing / Security					
	Lifebuoys					
	General Condition					
20.0	Contractors					
	Inductions					
	Housekeeping					

## **Appendix 2**

### **Sub Surface Fire Procedure**

Registered Office: Parc Menai, Bangor, Gwynedd, LL57 4FG

**Tel:** 01248 672666

**Fax:** 01248 672601

**Email:** [contact@caulmert.com](mailto:contact@caulmert.com)

**Web:** [www.caulmert.com](http://www.caulmert.com)

<b>Procedures Manual</b>	 <p><b>Drehid Waste Management Facility</b> Environmental Procedures Manual</p>	Document: <b>EP 27.0</b>
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Landfill Operations Manager		Issue Date: 04/10/17
		Page: Page 1 of 8
<b>Title</b>		
<b>Sub-Surface/Surface Landfill Fire</b>		

## 1.0 GENERAL

Fires in capped and uncapped areas are generally caused by the ingress of oxygen into the waste mass. The waste degradation process turns from anaerobic to aerobic generating more heat, which can result in spontaneous combustion. Fires can occur close to the surface or be deep seated:

- Generally, a surface fire is the result of air ingress from atmosphere on an uncapped flank or infrastructure leak (e.g. well seal failure). They are relatively straightforward to deal with and affect a small area.
- Deep seated fires can be the result of long term air ingress into the waste or compressed air leaks. Because they are more difficult to access they have longer term effects and require a larger area of the gas extraction system to be isolated in order to manage the return to normal conditions.

The Drehid Waste Management Facility is an integrated facility comprising an engineered residual landfill and an in-vessel composting facility as part of a larger Bord na Móna landholding, which comprises 2,544 hectares.

Drehid landfill operate under IED Licence W0201-03. The landfill accepts a maximum of 360,000 tonnes of waste per annum. In addition, the composting facility at the site accepts a maximum of 25,000 tonnes per annum of biodegradable waste. In January 2018 the landfill acceptance tonnage will decrease to 120,000 tonnes per year.

The facility is located approximately 9km south of Enfield in County Kildare and is within the confines of the Bord Na Móna owned Timahoe bog. The site encompasses a total area of approximately 179 hectares (ha), which includes the site access road, clay borrow area, landfill footprint, sand and gravel borrow area and associated infrastructure.

The site is predominantly surrounded by agricultural land with no receptors within 500m of the site. The nearest receptor is located approximately 950m south west, and comprises a small building. The River Cushaling is located 775m south of the landfill.

The site access road is located to the south of the landfill and meets the R403 in Killina Upper. Killina National School is located 3.2km south west of the landfill.



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<b>Sub-Surface/Surface Landfill Fire</b>			

## 2.0 SCOPE

The aim of this procedure is to provide guidance to operations personnel on appropriate action to be taken in the event of a sub-surface fire, in order to return the waste mass to normal anaerobic conditions and active extraction with no evidence of the pre/post cursors of sub-surface fire activity. Surface fires are also covered within this procedure.

## 3.0 RESPONSIBILITY

It is the responsibility of the HSQE department to:

- Assess the Health, Safety, Environmental and Quality risks associated with hot spot events and develop suitable controls;
- Develop a method statement to communicate this information to the appropriate personnel to ensure duty holders are competent;

Landfill Gas Manager is responsible for:

- Liaising with the landfill operator and the landfill gas technician to ensure that the landfill operator is aware of and satisfied with the implementation of this procedure;
- Providing adequate resource to assist the gas technician to complete the process, as defined in this procedure;
- Being aware of the contents of any Industry Code of Practice on Management and Prevention of Sub-Surface fires.

Landfill Gas Technicians (or contractors) are responsible for:

- Ensuring that this procedure is followed should a hot spot scenario occur;
- Carrying out monitoring in line with the monitoring and fire remediation strategy;
- Reporting progress to the Landfill Gas Manager.

## 4.0 INDICATORS OF SUB-SURFACE FIRES

### Visual Signs

- Smoke issuing from gas wells, leachate chambers or fissures.

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<b>Title</b>	<b>Sub-Surface/Surface Landfill Fire</b>
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- Substantial settlement over a short period of time (a void is created by fire and the cap settles).
- Hot or melted gas wells.
- Smell of damp bonfires.

**Monitoring Indicators**

- Low methane and carbon dioxide and elevated oxygen in wells that previously contain high methane and carbon dioxide. Low methane and carbon dioxide alone should not be taken, as an indication alone.
- Elevated carbon monoxide concentrations recorded.
- Elevated temperatures.

**Carbon Monoxide Monitoring**

- Routine monitoring of carbon monoxide concentrations takes place using a Geotechnical Instruments portable gas analyser or LMSx gas analyser. The limitation of this instrument needs to be acknowledged. The instrument has electrochemical cells that measure H<sub>2</sub>S and CO. The cells are known to suffer from cross gas effect. For example the presence of hydrogen sulphide or hydrogen in the gas can influence the CO reading. A hydrogen sulphide filter can be fitted to the instrument.

The typical accuracy of the GA2000 instrument CO reading is stated as +/- 10%. It is assumed that this is without any cross gas effect.

- Samples should therefore be taken for laboratory analysis to confirm any elevated results obtained using portable instruments.
- The following carbon monoxide indicators have been taken from work done in Canada and the USA.

**Table 1**

Carbon Monoxide Concentration ppm	Indication
1ppm to 200ppm	No underground combustion taking place
200ppm to 500ppm	Potential smouldering in vicinity further investigation required

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**Title** **Sub-Surface/Surface Landfill Fire**

500 to 100ppm	Fire likely further investigation required
>1000ppm	Active underground fire

**Temperature Monitoring**

- During the initial aerobic degradation phase temperatures within waste may be as high as 80 to 90°C. Once methogenesis is established temperature within the waste range from 30 to 50° in the case of deep sites temperatures may reach 60°C.
- Where elevated CO concentrations are recorded temperatures in gas wells and leachate chambers in the affected areas will be checked.

**Table 2**

Temperature °C	Indication
30 to 50°C	Normal background temperatures during methogenesis
50 to 100°C	Above typical background may be aerobic further investigation required
Greater than 100°	Unusually hot further investigation required

**Routine Monitoring**

- CO concentrations will be monitored on a monthly basis using a portable instrument either a GA2000 or a LMSx. Any CO in excess of 100ppm will be treated as suspicious and should be investigated further and a sample should be taken for laboratory analysis.
- If the readings in the wells are confirmed as elevated then the Emergency Procedure in the Emergency Action Plan should be instigated.

**5.0 FOLLOW UP MONITORING**

Once the fire has been extinguished the area should be checked visually on a daily basis for any signs of smouldering. The CO concentrations of any leachate chambers or wells in the vicinity of the fire should be checked using a portable instrument.

- If elevated concentrations are recorded then the result should be confirmed with a second instrument and a sample taken for laboratory analysis.

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<b>Title</b>	<b>Sub-Surface/Surface Landfill Fire</b>
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- If the results of the laboratory CO monitoring indicate the presence of combustion follow the Procedure for Sub-Surface landfill Fires and inform CLP who will instigate their Landfill Fire Action Plan.
- Each quarter laboratory samples should be taken from a random selection of gas wells to confirm the results obtained with the portable instrument.

<b>6.0</b>	<b>CONTROL METHODS</b>
------------	------------------------

A monitoring and fire remediation strategy will be developed, based on:

- the particular fire characteristics – location, depth, size etc;
- the site location and site/cell design;
- limitations – migration issues, leachate levels.

**Prevention**

- In areas where active extraction is taking place point sources of oxygen ingress such as leachate chambers should be sealed.
- Any breaches identified in the cap will be remediated.
- The gas extraction system should be operated to minimise air ingress, this is particularly important in areas where the final cap has not been placed.
- Routine monitoring of CO concentrations in the gas wells should take place.

**Emergency Procedures**

- The person discovering the suspected fire should notify immediately the Site Operations Manager or in his absence the Site Supervisor, and the Environmental Compliance Officer.
- Environmental Compliance Officer or in their absence the Operations Manager should inform the Environmental Protection Agency as soon as practical and advise them of the actions to be taken.
- Where a fire is suspected the gas wells in the affected area should be turned off to minimise the ingress of oxygen. This should result in the oxygen being depleted smothering the fire.

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<b>Title</b>		
<b>Sub-Surface/Surface Landfill Fire</b>		

- If the fire is in a vent or leachate chamber in an area where no extraction is taking place then the vent or chamber should be capped with clay like material.
- If the suspected fire has not been discovered through the routine monitoring of CO, then CO concentrations should be monitored in the affected area using a portable instrument, referring to the trigger levels in Table 1. If CO concentrations are found to be elevated then the CO reading should be confirmed with a second instrument. If the readings are still elevated then a sample should be taken for laboratory analysis.
- Where elevated CO concentrations are recorded temperatures in gas wells and leachate chambers in the affected areas should be checked and compared to the trigger levels outlined in Table 1.
- Any point sources of oxygen ingress shall be sealed. Dependant on the point being sealed this may be a fabricated seal or clay like material.
- Monitoring of CO concentrations should take place on a daily basis. There is potential that a void may be created and risk assessments should be undertaken prior to the monitoring taking place.
- Gas wells should not be turned back on in the affected area until CO concentrations and temperatures have returned to normal. This should be by agreement of the following parties.
  - Operations Manager
  - Environmental Manager

## 7.0 LONGER TERM MANAGEMENT

Sub-surface fires may take some time to be brought under control. Following the initial action of cutting off the oxygen supply the following may be considered in consultation with the Environmental Protection Agency;

- Dig out waste away from the seat of the fire and infill with clay like material to prevent fire from spreading to other areas.
- Let leachate level in affected area rise to douse fire.
- Introduce leachate to affected wells to douse fire.
- Where fires are shallow then infra-red may be used to monitor the fire.

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## 8.0 FIRES ON SITE

- No material will be burned inside the boundaries of the landfill. Any outbreak of fire will be regarded as an emergency and immediate action will be taken to extinguish it.
- If required, the Incident Manager should dial **112** or **999** and advise the operator that the fire brigade is required at:

Drehid Waste Management Facility  
Killina Upper,  
Carbury,  
Co. Kildare,  
Postcode: W91 RC82

- If a spare person is available they should be equipped with hi-vis jacket and dispatched to the site entrance to direct the emergency services. This should not be the weighbridge clerk as they will be required to co-ordinate radio and telephone communication.
- The following should be informed as soon as practical.

Line Management  
Health & Safety Advisor  
Environmental Protection Agency

Refer to Emergency contact list for up to date numbers.

- The Incident Manager should consider alternative operational areas for waste acceptance if adequate resources are available. If alternative operational areas are not available or if adequate resources are not available to continue tipping operations and deal with the incident customers should be informed that the site is closed until further notice, as soon as practical.
- Firefighting equipment such as appropriate extinguishers will be provided in the landfill reception compound.
- Fires on the surface of the landfill will be smothered using inert material or other suitable substances or doused using surface water, mains water or leachate.

<b>Procedures Manual</b>	 <p><b>Drehid Waste Management Facility</b> Environmental Procedures Manual</p>	<b>Document:</b> EP 27.0
Document Approved by:  <hr/> Landfill Operations Manager		Revision: 0  Issue Date: 04/10/17  Page: Page 8 of 8

<b>Title</b>	<b>Sub-Surface/Surface Landfill Fire</b>
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- Fire beneath the surface of the landfill will be surcharged with clay rich material minimise gaseous emissions and the influx of oxygen.
- The gas extraction system in the affected area will be shut off. The area will be checked at frequent intervals and if necessary the fire will be isolated by excavating a deep trench around the location and backfilling with clay rich material.
- A record of any fires together with remedial measure will be made in the site diary.