Drehid Waste Management Facility

IED Licence Application

Screening for Baseline Report

December 2018

Revision A

TOBIN CONSULTING ENGINEERS

Screening for Baseline Report

PROJECT: **Drehid Waste Management Facility IED Licence Application**

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Template rep 003
DCO 0084

DOCUMENT AMENDMENT RECORD

Client:	**Bord na Móna Plc.**
Project:	**Drehid Waste Management Facility IED Licence Application**
Title:	**Screening for Baseline Report**

PROJECT NUMBER: 10369				DOCUMENT REF: 10369-R-002			
A	Final	RH	14/12/18	JD	14/12/18	DG	14/12/18
D01	Draft Issue	RH	12/11/18	JD	16/11/18	DG	16/11/18
Revision	**Description & Rationale**	**Originated**	**Date**	**Checked**	**Date**	**Authorised**	**Date**
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1 INTRODUCTION

In accordance with the requirements of Article 22 of the Industrial Emissions Directive (IED) (2010/75EU), this Baseline Report has been prepared.

As per Article 22(2) of the Directive:

"Where the activity involves the use, production or release of relevant hazardous substances and having regard to the possibility of soil and groundwater contamination at the site of the installation, the operator shall prepare and submit to the competent authority a baseline report before starting operation of an installation or before a permit for an installation is updated for the first time after 7 January 2013".

The European Commission has adopted a Communication on the elaboration of baseline reports under Article 22(2) of the IED [1]. The European Commission Guidance has been followed in the preparation of this report.

1.1 EUROPEAN COMMISSION GUIDANCE

The EC guidance identifies key tasks that should be undertaken to both determine whether a baseline report needs to be produced for a particular situation and in order to produce the baseline report itself.

Eight stages have been identified in this process, covering the following main elements:

- Stages 1-3: to decide whether a baseline report is required;
- Stages 4-7: to determine how a baseline report has to be prepared; and
- Stage 8: to determine the content of the report.

These stages are outlined further in the guidance document (Table 5.1) which is reproduced in Table 1.1 below. This Baseline Report has been produced following each of the required stages from the guidance.

Table 1.1: Main Stages of Preparing the Baseline Report (from Table 5.1 in EC Guidance)

Stage	Activity	Objective
1	Identify which hazardous substances are used, produced or released at the installation and produce a list of these hazardous substances.	Determine whether or not hazardous substances are used, produced or released in view of deciding on the need to prepare and submit a baseline report.
2	Identify which of the hazardous substances from Stage 1 are 'relevant hazardous substances' (see Section 4.2 (of EC Guidance)). Discard those hazardous substances that are incapable of contaminating soil or groundwater. Justify and record the decisions taken to exclude certain hazardous substances.	To restrict further consideration to only the relevant hazardous substances in view of deciding on the need to prepare and submit a baseline report.
3	For each relevant hazardous substance brought forward from Stage 2, identify the actual	To identify which of the relevant hazardous substances represent a potential pollution risk at the site based on

[1] European Commission (EC), *Communication from the Commission – European Commission Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU on industrial emissions* (2006)

Stage	Activity	Objective
	possibility for soil or groundwater contamination at the site of the installation, including the probability of releases and their consequences, and taking particular account of: - the quantities of each hazardous substance or groups of similar hazardous substances concerned; - how and where hazardous substances are stored, used and to be transported around the installation; - where they pose a risk to be released; - In case of existing installations also the measures that have been adopted to ensure that it is impossible in practice that contamination of soil or groundwater takes place.	the likelihood of releases of such substances occurring. For these substances, information must be included in the baseline report.
4	Provide a site history. Consider available data and information: - In relation to the present use of the site, and on emissions of hazardous substances which have occurred and which may give rise to pollution. In particular, consider accidents or incidents, drips or spills from routine operations, changes in operational practice, site surfacing, changes in the hazardous substances used. - Previous uses of the site that may have resulted in the release of hazardous substances, be they the same as those used, produced or released by the existing installation, or different ones. Review of previous investigation reports may assist in compiling this data	Identify potential sources which may have resulted in the hazardous substances identified in Stage 3 being already present on the site of the installation.
5	Identify the site's environmental setting including: - Topography; - Geology; - Direction of groundwater flow; - Other potential migration pathways such as drains and service channels; - Environmental aspects (e.g. particular habitats, species, protected areas etc.); and	Determine where hazardous substances may go if released and where to look for them. Also identify the environmental media and receptors that are potentially at risk and where there are other activities in the area which release the same hazardous substances and may cause them to migrate onto the site.

Stage	Activity	Objective
	- Surrounding land use.	
6	Use the results of Stages 3 to 5 to describe the site, in particular demonstrating the location, type, extent and quantity of historic pollution and potential future emissions sources noting the strata and groundwater likely to be affected by those emissions – making links between sources of emissions, the pathways by which pollution may move and the receptors likely to be affected.	Identify the location, nature and extent of existing pollution on the site and to determine which strata and groundwater might be affected by such pollution. Compare with potential future emissions to see if areas are coincident.
7	If there is sufficient information to quantify the state of soil and groundwater pollution by relevant hazardous substances on the basis of Stages (1) to (6) then go directly to Stage 8. If insufficient information exists then intrusive investigation of the site will be required in order to gather such information. The details of such investigation should be clarified with the competent authority.	Collect additional information as necessary to allow a quantified assessment of soil and groundwater pollution by relevant hazardous substances.
8	Produce a baseline report for the installation that quantifies the state of soil and groundwater pollution by relevant hazardous substances.	Provide a baseline report in line with the IED.

The EC guidance document also provides the following direction on whether or not a baseline report is required:

- Where it is apparent that due to the quantities of the hazardous substances used, produced or released at the installation, or due to the soil and groundwater characteristics of the site there is no significant possibility for contamination of soil or groundwater, then a baseline report is not required;
- In case of existing installations, where measures are taken which make it impossible in practice that contamination of soil or groundwater occurs, a baseline report is also not required; and
- Where, as a result of this stage, it is considered that a baseline report is not required it is still expected that a record of such a decision, including the reasons for the decision, will be made by the operator and further assessed and held by the competent authority.

2 STAGES 1-3: TO DECIDE WHETHER A BASELINE REPORT IS REQUIRED

2.1 STAGE 1: IDENTIFYING THE HAZARDOUS SUBSTANCES THAT ARE CURRENTLY USED, PRODUCED OR RELEASED AT THE INSTALLATION

The list of hazardous materials that are currently used or proposed for use at the Drehid WMF are identified in Table 2.1 below along with the maximum quantity to be stored on site at any one time.

Table 2.1: Hazardous Materials to be stored at Drehid Facility

Material	Storage Location	Quantity
Engine, gear & hydraulic oil	Bunded Fuel Storage Area	1 m^3
Kerosene	Bunded Fuel Storage Area	7 m^3
Diesel	Bunded Fuel Storage Area	32 m^3
Chemical additive for ash solidification process	Ash Solidification Facility	10 m^3
Leachate treatment chemicals (32% w/v sodium hydroxide, 34% hydrochloric acid and 85% phosphoric acid)	Leachate Treatment Facility – Main Bunded Area	37.5 m^3
Sulphuric acid	Compost facility	10 m^3

Table 2.2 below is a list of the hazardous waste materials which will be either generated or imported to the facility.

Table 2.2: Hazardous Waste Materials to be stored at Drehid Facility

Waste	Storage Location	Quantity
Leachate from hazardous landfill	Ash Solidification Facility	200 m^3
Flue Gas Treatment Residue and Boiler Ash	Ash Solidification Facility	780 m^3
Hazardous waste including asbestos, contaminated soil, solidified ash residues, industrial wastes, sludges and filter cakes and heavy metal-containing wastes	Hazardous Waste Landfill	1,980,000 m^3 (at cessation of hazardous landfilling activity)

2.2 STAGE 2: IDENTIFYING THE RELEVANT HAZARDOUS SUBSTANCES

This stage of the process is required to determine the potential pollution risk of each hazardous substance by considering its chemical and physical properties.

Table 2.3: Relevant Hazardous Substances

Waste	Physical Properties	Potential for Substance to cause Pollution of Soil or Groundwater
Engine, Gear & Hydraulic Oil	Liquid	Oils can infiltrate through permeable surfaces and are mobile in water courses.
Kerosene	Liquid	Kerosene can infiltrate through permeable surfaces and is mobile in water courses.
Diesel	Liquid	Diesel can infiltrate through permeable surfaces and is mobile in water courses.
Chemical additive for ash solidification process	Liquid	Chemical liquids can infiltrate through permeable surfaces and is mobile in water courses.
Leachate treatment chemicals (32% w/v sodium hydroxide, 34% hydrochloric acid and 85% phosphoric acid)	Liquid	Chemical liquids can infiltrate through permeable surfaces and is mobile in water courses.

Sulphuric acid	Liquid	Chemical liquids can infiltrate through permeable surfaces and is mobile in water courses.
Leachate from hazardous landfill	Liquid	Hazardous leachate can infiltrate through permeable surfaces and is mobile in water courses.
Flue Gas Treatment Residue (FGTR) and Boiler Ash	Solid	FGTR and boiler ash are solid substances and will not produce leachate prior to landfilling. Uncontrolled ash deposits on permeable surfaces could infiltrate to ground via rainfall and ash would also be mobile in surface water.
Hazardous waste including asbestos, contaminated soil, solidified ash residues, industrial wastes, sludges, filter cakes and heavy metal-containing wastes	Solid	Landfilled wastes will be solid and will not produce leachate prior to landfilling. Uncontrolled materials on permeable surfaces could infiltrate to ground via rainfall and contaminant particles in contaminated soils, industrial wastes, sludges, filter cakes and heavy metal-containing wastes would also be mobile in surface water. Asbestos waste is not harmful to soil or groundwater.

2.3 STAGE 3: ASSESSMENT OF THE SITE-SPECIFIC POLLUTION POSSIBILITY

This section brings forward the relevant substances identified in Stage 2 above which must be considered in the context of the site to determine whether circumstances exist which may result in the release of the substance in sufficient quantities to represent a pollution risk, either as a result of a single emission or as a result of accumulation from multiple emissions.

The guidance identifies circumstances under which emissions occur which may include accidents/incidents, routine operations or planned emissions. There are no planned emissions of hazardous substances or wastes from the Drehid facility.

A Hydrogeological Risk Assessment (HRA) was undertaken as part of the proposed development and is included in Appendix 6.8 to the EIAR. The LandSim model (v2.5.17) used was developed by Golder Associates/UK Environment Agency (EA) in England and Wales to provide probabilistic quantitative risk assessments of specific landfill site performance in relation to groundwater protection. The HRA has been carried out using conservative assumptions regarding the source, pathways and receptors. The LandSim Software and the UKEA's Contaminant Fluxes from Hydraulic Containment Landfills Worksheet (Version 1.0) have been used to estimate of the potential risks associated with the proposed site as they both use audited and verified model code that is widely accessible.

The LandSim model has been assessed in a stochastic manner and throughout this assessment the acceptable probability of an undesirable outcome occurring has been set at the 95%ile confidence level. In addition, the 95%ile is commonly selected as a reasonable worst case, against which it is acceptable to make decisions taking into account the assumptions and limitations of the modelling process.

The Water Framework Directive requires that technical precautions (i.e. appropriate landfill liner, capping layer, etc.) must be undertaken to prevent the discharge to groundwater of hazardous substances (formerly List I substances) and to ensure that any discharge of List II substances does not cause pollution and to limit the discharge of non-hazardous pollutants (List II substances). This means that the HRA must demonstrate that hazardous substances will not reach the groundwater aquifer at discernible concentrations at the compliance point and that non-hazardous pollutants will not be present at a compliance point above a level that may constitute pollution.

The compliance point in this case is the base of the subsoil material (bedrock aquifer prior to dilution in the aquifer) for hazardous substances (List I) and the River Cushaling tributary (Ref. 14_352), located west of the site for non-hazardous substances (List II). Input parameters are based on the proposed site design including engineered containment, phase areas, waste thickness, and leachate drainage and collection facilities. The 95%ile values are used as outputs from the model, which are representative of the reasonable worst-case performance of the landfill.

The LandSim modelling results indicate that, with the landfill designed and constructed as described in Chapter 3 of the EIAR, it is unlikely that any significant impact to groundwater will occur. There are no predicted exceedances of hazardous substances in the underlying aquifer prior to dilution.

For both the advective/dispersion and diffusive modelled scenarios, no breakthrough of hazardous substances (List I) is predicted during the theoretical managed lifetime of the site i.e. during the operational and post closure managed phases of the landfill (i.e. 60 and 100 years). Hazardous and non-hazardous substances do not exceed the relevant Environmental Assessment Limits (EALs) during the operational and post closure managed phases of the landfill.

Therefore, it is concluded that the storage of hazardous waste in the hazardous waste landfill will not result in the release of a hazardous substance to the groundwater environment and is not a pollution risk.

All areas where hazardous substances and wastes are currently stored or will be stored on construction of the proposed new infrastructure will comprise concrete hardstanding and run-off from these areas will be directed to the process water holding tank at the ash solidification facility for reuse in the solidification process. Concrete hardstanding areas will be constructed in accordance with the engineer's requirements to ensure an impermeable surface and will be maintained and inspected on a regular basis to identify any cracks or repairs required.

Concrete bunding will be designed and constructed as water retaining structures under industry codes, such as BS8007 *Code of Practice for design of concrete structures for retaining aqueous liquids* and in

accordance with EPA Guidance [2]. Bunded areas will be maintained and inspected on a regular basis in accordance with the new IED Licence conditions. Similarly, any existing bunding structures which will be retained are currently maintained and inspected on a regular basis in accordance with Condition 6.11 of the IED Licence (W0201-03) for the existing facility.

In addition, the facility is underlain with a naturally low permeability subsoil which will inhibit the movement of contaminants in the unlikely event that any should reach the underlying soil.

Proprietary grit interception traps and oil interceptors will be installed through which surface water run-off from non-hazardous areas within the site will be diverted. The outfall from the grit trap and oil interceptor will be discharged to surface water attenuation lagoons for further treatment. These lagoons are sized to provide adequate capacity for a 100-year storm event.

Overflow from these attenuation lagoons will be diverted through integrated constructed wetlands (ICWs) to provide an additional step in the treatment train, prior to discharge to a nearby bog drainage channel which in turn flows into the Cushaling River.

Engine, gear & hydraulic oil

The storage containers for engine, gear and hydraulic oil will be kept in a proprietary bunded container which will be stored on the concrete floor in the maintenance building. The bunded container will be subject to regular testing and inspection in accordance with the conditions of the IED Licence. The potential for release of oils from the containers during storage is unlikely as the bunded containers would have to fail and the concrete hardstanding would need to be in disrepair which would allow oils to reach the ground.

There is potential for leakage or spillage during deliveries/transfers or from active machinery at the facility. Any accidental leak/spillage from machinery on the landfill waste body would be contained within the landfill liner in the same way as leachate. All roads and machinery storage areas hard paved areas so any spillages would be directed towards the surface water drainage network which includes attenuation and monitoring to ensure that contaminants are not released to the Cushaling River.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from engine, gear and hydraulic oil.

Kerosene

Kerosene will be stored in a proprietary storage tank within a concrete bunded area and covered with a roof. The concrete bund will be subject to regular testing and inspection in accordance with the conditions of the IED Licence. The potential for release of kerosene to ground from the tank during storage is unlikely

[2] EPA, *IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities* (2004).

as the tank as well as the bunded area would have to fail and the concrete hardstanding would need to be in disrepair which would allow the kerosene to reach the ground.

There is potential for leakage or spillage during deliveries/transfers or from the kerosene boilers. The access road to the storage tank and the area surrounding the storage tank at the maintenance building will be hard paved areas so any spillages would be directed towards the surface water drainage network which includes attenuation and monitoring to ensure that contaminants are not released to the Cushaling River.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from kerosene.

Diesel

Diesel will be stored in a proprietary storage tank within a concrete bunded area and covered with a roof. The concrete bund will be subject to regular testing and inspection in accordance with the conditions of the IED Licence. The potential for release of diesel to ground from the tank during storage is unlikely as the tank as well as the bunded area would have to fail and the concrete hardstanding would need to be in disrepair which would allow the diesel to reach the ground.

There is potential for leakage or spillage during deliveries/transfers or from active machinery at the facility. Any accidental leak/spillage from machinery on the landfill waste body would be contained within the landfill liner in the same way as leachate. All roads and machinery storage areas hard paved areas so any spillages would be directed towards the surface water drainage network which includes attenuation and monitoring to ensure that contaminants are not released to the Cushaling River.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from diesel.

Chemical additive for ash solidification process

Chemical additives are required as part of the ash solidification process. The acid may either be imported to the site or it may be possible to reuse waste acid (sulphuric acid) from the on-site landfill gas treatment process. In either case, the acid will be stored in a concrete bunded storage tank at the ash solidification facility. The concrete bund will be subject to regular testing and inspection in accordance with the conditions of the IED Licence.

There is potential for leakage or spillage during deliveries or transfers of the acid from the storage tank to the mixing unit. The access road to the storage tank and the area surrounding the storage tank at the ash solidification facility will be hard paved areas so any spillages would be directed to the process water holding tank at the ash solidification facility for reuse in the solidification process.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from chemical additives stored at the ash solidification facility.

Leachate treatment chemicals

Chemicals required for leachate treatment (i.e. 32% w/v sodium hydroxide, 34% hydrochloric acid and 85% phosphoric acid) will be stored within a separate area of secondary containment, within the main bunded area of the leachate treatment facility. These chemicals will be contained within purpose-built tanks and all dosing arrangements will be in accordance with recognised industry practice.

There is potential for leakage or spillage during deliveries or transfers of the chemicals from the storage area to the relevant treatment tanks/areas. The entire treatment facility will be contained within a sealed and bunded area with secondary containment provided sufficient to contain 110% of the volume of the largest reactor, when full to the brim. The access road to the leachate treatment area will be hard paved areas so any spillages would be directed towards the surface water drainage network which includes attenuation and monitoring to ensure that contaminants are not released to the Cushaling River.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from treatment chemicals stored at the leachate treatment facility.

Similarly, any leaks from treatment tanks within the leachate treatment facility will be retained within the bunded area and it is considered that there is not a significant possibility for contamination of soil or groundwater from the leachate treatment facility.

Sulphuric Acid

Sulphuric acid is required for the ammonia scrubber at the compost facility and is currently stored in a double skinned storage tank at the compost facility. The concrete bund is subject to regular testing and inspection in accordance with the conditions of the IED Licence.

There is potential for leakage or spillage during deliveries to the storage tank. The access road to the storage tank and the area surrounding the storage tank at the compost facility are hard paved areas so any spillages would be directed to the surface water drainage network which includes attenuation and monitoring to ensure that contaminants are not released to the Cushaling River.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from sulphuric acid stored at the compost facility.

Leachate from hazardous landfill

The hazardous landfill liner will be built in accordance with EPA Landfill Site Design Manual[3] which provides an engineered barrier from the waste body to the underlying soil and groundwater. A bentonite

[3] EPA, *Landfill Manual – Landfill Site Design* (2000)

enhanced soil (BES) layer will be installed to achieve a permeability of less than or equal to 1 x 10^{-10} m/s. In addition, a HDPE liner will be installed over the BES layer for enhanced protection. The leachate collection system will be constructed to prevent build-up of leachate in the waste body and to transfer leachate to a process water holding tank at the ash solidification facility.

The hazardous landfill leachate will be stored in a concrete bunded storage tank at the ash solidification facility. The concrete bund will be subject to regular testing and inspection in accordance with the conditions of the IED Licence.

There is potential for leakage or spillage during transfer of the acid from the storage tank to the mixing unit. The area surrounding the storage tank at the ash solidification facility will be hard paved areas, so any spillages would be recirculated to the process water holding tank for use in the solidification process.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from hazardous leachate stored at the ash solidification facility.

Flue Gas Treatment Residue and Boiler Ash

Flue gas treatment residue and boiler ash waste will be received to the facility in powder form and transported in fully enclosed bulk silo trucks. The design and construction of the solidification building will be such that that the waste delivery vehicles will enter the solidification building to deliver the waste to the Ash Solidification Facility. Four waste receiving bays will be provided at the building to allow for unloading of four vehicles at a time. Within the waste receiving bay, the contents of the waste delivery vehicles will be pumped into the storage silos, by a fully enclosed piped system. Vents on the storage silos will have dust filters, to prevent escape of waste during the unloading process.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from flue gas treatment residue and boiler ash stored at the Ash Solidification Facility.

Hazardous waste including asbestos, contaminated soil, solidified ash residues, industrial wastes, sludges and filter cakes and heavy metal-containing wastes

Only solid hazardous waste materials will be accepted to the landfill. Upon arrival, the hazardous waste material (other than flue gas treatment residue and boiler ash), will be directed to the hazardous waste handling building or the hazardous waste storage and quarantine area. All waste for final disposal to the Hazardous Landfill will be transported internally by Bord na Móna dump trucks only. At no stage will the vehicles delivering hazardous waste to the facility enter the Hazardous Landfill itself.

The access road to the hazardous waste handling building and the hazardous waste storage and quarantine area will be hard paved areas, so any spillages would be directed to the process water holding tank at the ash solidification facility for reuse in the solidification process.

Therefore, it is considered that there is not a significant possibility for contamination of soil or groundwater from other solid hazardous waste materials received at the facility.

2.4 SUMMARY OF STAGES 1 - 3

In accordance with the EC Guidance, the above potential contaminants are not considered to present a risk of contamination of soil or groundwater on the basis of the storage procedures to be implemented including the use of storage tanks in bunded containment areas and hard paving surfaces which are diverted to a process water storage tank or the surface water drainage network. On this basis, the completion of Stages 4 – 8 are not required and a full Baseline Report is not required.

3 CONCLUSION

This Screening for Baseline Report has been carried out in accordance with EC Guidance concerning baseline reports under Article 22(2) of Directive 2010/75/EU (Industrial Emissions Directive).

Stages 1 to 3 of the guidance are set out in this report. A list of the hazardous materials that are currently used or proposed for use at the Drehid WMF are identified and it is determined whether circumstances exist which may result in the release of the substances in sufficient quantities to represent a pollution risk, either as a result of a single emission or as a result of accumulation from multiple emissions.

This Screening has determined that the substances identified are not considered to present a risk of contamination of soil or groundwater on the basis of the storage procedures to be implemented including the use of storage tanks in bunded containment areas and hard paving surfaces which are diverted to a process water storage or the surface water drainage network.

On this basis, the completion of Stages 4 – 8 are not required and a full Baseline Report is not required.

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