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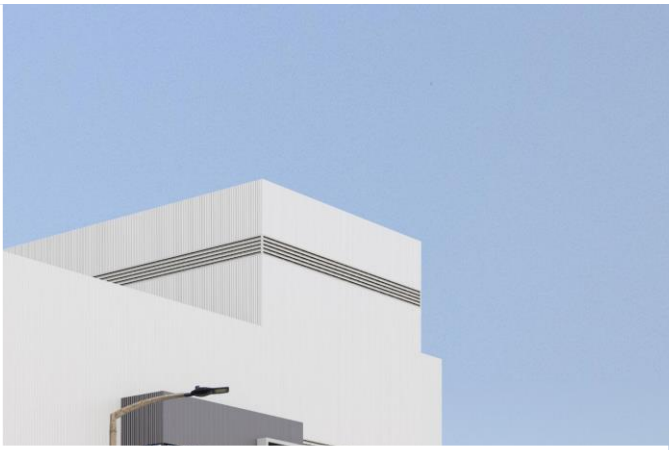

Doncaster Energy Recovery Facility

BH EnergyGap (Doncaster) Ltd

Non-technical Summary

ENGINEERING CONSULTING

Document approval

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00	24/07/2020	For Client	KLH	JRS
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1 Introduction

BH EnergyGap (Doncaster) Limited (BHEG) is applying for an Environmental Permit (EP) for the Doncaster Energy Recovery Facility (the 'Facility') to incinerate incoming residual waste fuel. The Facility will be located at Sandall Stones Road, Kirk Sandall, Doncaster.

1.1 The Applicant

The Facility is being developed by BHEG, a subsidiary company of BH EnergyGap and the special purpose vehicle responsible for the delivery of the project.

BH EnergyGap is a UK based business with significant experience in a wide range of commercial development projects, including recycling and energy from waste facilities. Their focus is on delivering projects which divert household and commercial waste from landfill, including harnessing residual waste to create renewable energy.

BH EnergyGap has previous experience in the development of Energy from Waste (EfW) plants including the 3R's Facility in Walsall.

BHEG is registered in England (Company Number: 09119504) and has a registered address of 6 Queen Street, Leeds, LS1 2TW.

1.2 The site

The Facility will be located at land off Sandall Stones Road in the Kirk Sandall industrial estate in Doncaster. The Facility will be located at an approximate National Grid Reference of SE 60707 07179, with the nearest postcode listed as DN2 4SF.

The site is bounded by a railway line on the west side, Sandall Stones Road to the east and other business premises to the north and south. Access to the Facility will be via Sandall Stones Road, which links to the A630 via Barnby Dun Road.

The Installation Boundary surrounding the site covers an area of approximately 1.5 hectares, with the site currently comprising tarmac hardstanding that is mostly unoccupied but has been utilised on occasion for the storage of finished plastic materials and HGV vehicle trailers.

The villages of Kirk Sandall and Edenthorpe lie to the northeast and southeast of the site respectively. The River Don and the River Dun Navigation run approximately 250 – 300 m to the west of the site.

A site location plan and Installation Boundary drawing are presented in Appendix A.

1.3 The activities

The Facility will consist of a single Schedule 1 'Installation Activity' (as defined in the Environmental Permitting Regulations) and Directly Associated Activities (DAAs).

Table 1-1: Environmental Permit Activities

Type of Activity	Schedule 1 Activity	Description of Activity
Installation	Section 5.1 Part A b)	The incineration of non-hazardous waste in a waste incineration plant with a nominal design capacity of 37.6 tonnes per hour

Type of Activity	Schedule 1 Activity	Description of Activity
Directly associated activities		
Directly Associated Activities		Waste reception, storage and handling facilities
Directly Associated Activities		Combustion and energy recovery processes including the export of electricity to the National Grid
Directly Associated Activities		Flue gas treatment
Directly Associated Activities		Residue storage and handling facilities
Directly Associated Activities		Standby electrical generation to provide electrical power to the plant in the event of an interruption in the supply.

The Facility will include the following key components: waste reception; waste storage; water, fuel oil and air supply systems; furnace; boiler; steam turbine/generator set; facilities for the treatment of exhaust gases; on-site facilities for treatment or storage of residues and waste water; flue with associated stack; and devices and systems for controlling combustion operations and recording and monitoring conditions.

The Facility will process approximately 301,000 tonnes per annum (at the design capacity of 37.6 tph with a design NCV of 11.5 MJ/kg and an availability of approximately 8,000 hours). This is represented by the design point on the firing diagram – refer to Appendix A.

Allowing for the full range of NCVs the Facility is designed to process (9 to 14 MJ/kg), the Facility will be capable of processing up to approximately 384,000 tonnes per annum of waste, assuming the Facility processed the lower range NCV waste for 8,000 hours per annum.

2 Details of the proposed Facility

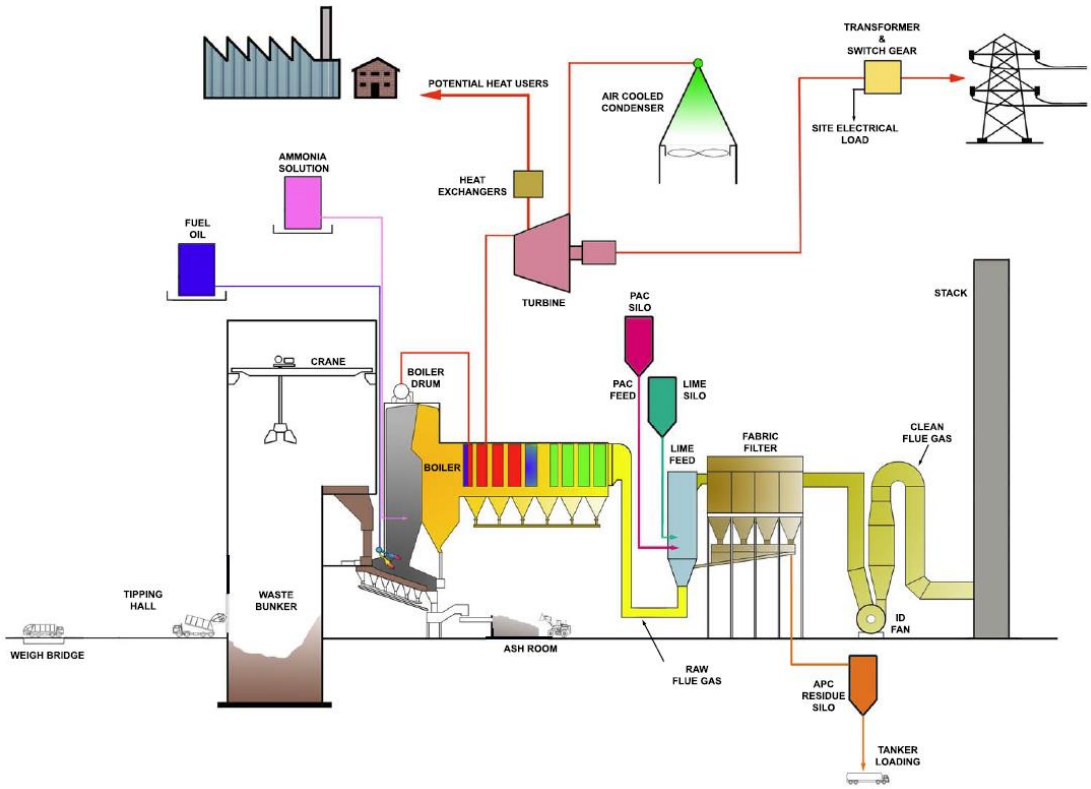
2.1 The process

The Facility will include the following processes:

1. Incoming waste will be delivered to the Facility and unloaded into the waste bunker.
2. Incoming waste would be transferred from the waste bunker into the feed hopper for the waste incineration plant.
3. Emissions of nitrous oxides would be controlled by the injection of ammonia solution into the combustion chamber.
4. Hot gases from the waste combustion would be passed through a boiler to raise steam. The steam would then be passed to a steam turbine to generate electricity for export to nearby users and the National Grid, with the potential to export heat to local heat users.
5. The combustion gases would be cleaned in a flue gas treatment plant. This would include the injection of carbon, primarily to control dioxin emissions, the injection of lime to control acid gas emissions, and the use of a fabric filter to remove dust.
6. The cleaned exhaust gases would be released to atmosphere via a stack of 85 m.

An indicative process diagram for the Facility is presented below.

Figure 1: Indicative Schematic of the Waste Incineration Process



2.2 Raw materials and feedstocks

The Facility will utilise a number of different chemicals and raw materials within the different power plant processes. The chemicals and raw materials used at the site will include, but not be limited to, the following:

- hydrated lime ($CaOH_2$);
- activated carbon;
- ammonia solution;
- mains water;
- non-hazardous mixed waste;
- auxiliary fuel; and
- water treatment chemicals.

These will be supplied to standard specifications offered by different suppliers. All chemicals will be handled in accordance with COSHH Regulations as part of the quality assurance procedures and full product data sheets will be available.

Periodic reviews of all materials used will be made in the light of new products and developments. Any significant change of material, where it may have an impact on the environment, will not be made without firstly assessing the impact and seeking approval from the Environment Agency (EA).

The Operator will maintain a detailed inventory of raw materials used and will have procedures for the regular review of developments in raw materials used.

2.3 Emissions

2.3.1 Emissions to air

Emissions from the Facility will be released from the stack. Detailed air dispersion modelling of emissions has been undertaken.

The Waste incineration BREF was published by the European IPPC Bureau on 3 December 2019. The Waste incineration BREF introduces BAT-Associated Emission Limits (BAT-AELs) for all 'new plants', i.e. those which are granted an environmental permit after the Waste incineration BREF is published; this includes the Facility. The emission limits proposed within this application are consistent with the BAT-AEL's stated in the Waste incineration BREF.

2.3.2 Emissions to water and sewer

There will not be any discharges of process effluent to water from the Facility.

Where practicable, process effluents will be re-used within the process. Excess amount of process effluent will require discharge; it is currently intended to discharge these to sewer in accordance with a Trade Effluent Consent to be obtained from the Sewerage Undertaker. However, if a Trade Effluent Consent cannot be secured, they will be tankered off-site for treatment at a suitably licensed waste management facility .

Surface water run-off from buildings, roadways and areas of hardstanding will be discharged, via silt traps and oil interceptors where appropriate, into the site surface water drainage system. The site surface water drainage system will drain to underground SUDS storage tanks of approximately 1,600m^3 capacity.

In addition to the SUDS attenuation outlined above, it is currently proposed to incorporate permeable paving in the parking bays of the main car park and overflow car park at the site. This will provide some additional attenuation and treatment of surface water runoff from cars.

It is currently proposed for the SUDS storage tanks to discharge, via an outfall flow control device, to a nearby storm sewer in Sandall Stones Road. The design of the drainage strategy is subject to detailed design of the Facility.

Domestic effluents from welfare facilities will be discharged to foul sewer.

2.4 Monitoring

There will be continuous monitoring of emissions to air of the flue gases from the Facility. The monitoring system will include monitoring of oxygen, carbon monoxide, hydrogen chloride, sulphur dioxide, nitrogen oxides, ammonia, VOCs, and particulates. Other pollutants will be monitored by spot measurements at regular intervals. All continuous emissions measurements will be recorded, and operators will be alerted if emissions to air approach the permitted limits. The results of emissions monitoring will be reported to the EA.

The Facility will utilise modern control systems, which incorporate the latest advances in control and instrumentation technology. These systems will optimise the operation of the Facility.

2.5 Ground conditions

A Site Condition Report has been developed which details the ground conditions within the installation boundary.

All chemicals will be stored in an appropriate manner to ensure appropriate containment and secondary and tertiary abatement measures where appropriate. The potential for accidents, and associated environmental impacts, is therefore limited.

Deliveries of all chemicals will be unloaded and transferred to suitable storage facilities. Areas and facilities for the storage of chemicals and liquid hazardous materials will be situated within secondary containment, such as bunds. Secondary containment facilities will have capacity to contain whichever is the greater of 110% of the tank capacity or 25% of the total volume of materials being stored, in case of failure of the storage systems.

Tanker off-loading of chemicals will take place within areas where the drainage is contained with the appropriate capacity to contain a spill during delivery.

Upon cessation of the operation of the Facility, a site closure plan will be implemented, and any pollution risks will be removed from the site. The ground will be returned to a ‘satisfactory state’.

2.6 Technology selection

The processes have been designed against the background of a detailed assessment of the prevailing environmental conditions at the site location, in order that the objectives of the Industrial Emissions Directive (IED) are met. Best Available Techniques will be employed at the Facility to minimize its impact upon the local environment.

A quantitative BAT Assessment has been completed for the Facility. This has demonstrated that the proposed techniques to be employed at the Facility will represent BAT in accordance with the relevant BAT guidance notes.

The following techniques are proposed to be employed at the Facility:

- SNCR with ammonia solution for the abatement of oxides of nitrogen;
- A moving grate for the combustion of waste;
- A dry system for the abatement of acid gases; and
- Lime to be used as a reagent for the abatement of acid gases.

2.7 Residues

The main solid residue streams arising from the Facility are:

1. Incinerator Bottom Ash (IBA); and
2. Air Pollution Control residues (APCr).

It is intended that the IBA from the Facility will be transferred to an off-site IBA processing facility. If a suitable recovery facility will not accept the residue, it may be transferred for disposal in an off-site non-hazardous landfill.

APCr is classified as hazardous and requires specialist disposal or treatment. It may be possible to send the residue to a waste treatment contractor, to be used to neutralise acids and similar materials. Using the residues in this way avoids the use of primary materials. If these options are not available, the APCr will be sent to a suitably licensed hazardous waste landfill for disposal as a hazardous waste.

2.8 Management

To ensure effective management of the Facility, BHEG will develop a documented management system that clearly defines the management structure for the Facility, as well as setting out the roles and responsibilities of all staff.

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