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Consulting Engineers Limited

Portland Energy Recovery Facility

Powerfuel Portland Limited

Non-Technical Summary

ENGINEERING CONSULTING

Document approval

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1 Introduction

Powerfuel Portland Limited (Powerfuel) is proposing to build the Portland Energy Recovery Facility (the Facility) at a site within Portland Port on the Isle of Portland, Dorset. The Facility will incinerate refuse derived fuel (RDF) produced from domestic (municipal solid waste) and commercial & industrial (C&I) non-hazardous waste.

The Facility will be a single stream design and will treat up to approximately 202,000 tonnes per annum of non-hazardous, residual waste material, with a nominal capacity of 183,000 tonnes per annum. The Facility will generate approximately 15.2 MWe at the nominal design capacity.

1.1 The Applicant

Powerfuel Portland Limited is registered in England (Company Number: 11831492) and is the Applicant for the proposed development. Powerfuel Portland Limited's registered address is 2nd Floor Regis House, 45 King William Street, London, EC4R 9AN.

Powerfuel Portland is a local company with an office in Dorset.

1.2 The Site

The site is located on the north eastern coast of the Isle of Portland, approximately 600 m east of the village of Fortuneswell. The site lies within the port and is not publicly accessible. Vehicular access is from the west, through the main Portland harbour complex, via Castletown, Castel Road, Lerret Road and A354.

The site is bordered to the south west by Incline Road, which is a private road within the port that is actively used by port traffic, and a former railway embankment. Cliffs supporting grassland, scrub and woodland habitats lie to the south west of the embankment and rise steeply to approximately 125 m above ordnance datum (AOD). Her Majesty's Prison The Verne is approximately 430 m to the south west of the site at the top of the steep slope. The eastern site boundary is formed by the shingle shoreline and overland fuel pipes from Portland Bunkers, which are fuel bunkers in the nearby cliffs used for marine bunker fuel supply. Existing operational port development lies to the north and north west of the site.

Portland and its harbour were designated as HM Naval Base Portland in 1923. From 1958, Portland was home to Flag Officer Sea Training. During this time, the site was dominated by a weapons research establishment building in the south east, with other buildings dedicated to mechanical repair facilities for military vehicles. The naval base and two major weapons research establishments were closed in 1995/96 and Portland Port Ltd began the transformation of the harbour into a commercial port. The buildings on site have been demolished to create cargo storage space when they were not used by tenants. In 2016/17, the main road leading to Incline Hill was realigned along the base of the hill / scree, creating the open development area on site. The land has since been cleared and is regarded as 'brownfield' land.

A site location plan is presented in Appendix A of the Application.

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 (1) (b)	The incineration of non-hazardous waste in a waste incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour.
Directly Associated Activities		
Directly Associated Activities		The export of electricity to the National Grid and potential to export heat to local heat users.
Directly Associated Activities		Standby electrical generation to provide electrical power to the plant in the event of an interruption in the supply.
Directly Associated Activities		The receipt, storage and handling of non-hazardous waste prior to incineration.
Directly Associated Activities		The handling, storage and transfer of residues for transfer off-site.

The Facility includes a single waste incineration line, incoming waste reception facilities, main thermal treatment process, turbine hall, on-site facilities for the treatment or storage of residues and waste water, flue gas treatment, stack, boilers, devices and systems for controlling operation of the waste incineration plant and recording and monitoring conditions.

The nominal operating capacity of the Facilitywill be approximately 22.8 tonnes per line per hour of mixed non-hazardous wastes, with a nominal calorific value (NCV) of 11 MJ/kg. The Facility will have an estimated availability of around 8,000 hours. Therefore, the Facility will have a nominal design capacity of approximately 183,000 tonnes per annum.

To allow for variations in the net calorific value of the fuels being combusted, and for the Facility operating for more than the predicted 8,000 hours in a particular year, the Facility will have a maximum processing capacity of up to 202,000 tonnes per annum.

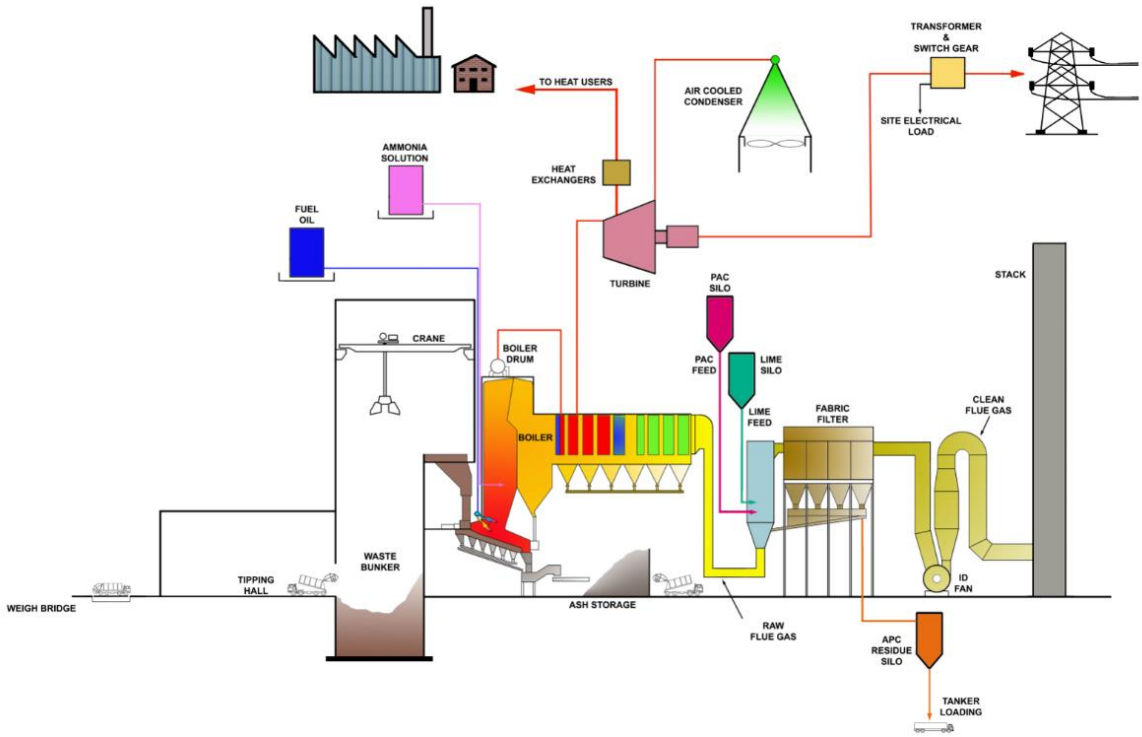
2 Details of the Proposed Facility

2.1 The Process

The Facility will include the following processes:

1. Waste will be delivered to the Facility as both baled waste and 'loose' refuse derived fuel (RDF).
2. The incoming waste will be stored either in the bale storage area or the waste bunker.
3. The baled waste will be regularly transferred to the waste bunker, via the crane which will transfer the baled waste from the bale storage area to a 'de-baler'.
4. The de-baled waste will then be conveyed to the waste bunker via a dedicated conveyor within the building.
5. Waste will be transferred from the waste bunker into the feed hopper of the waste incineration plant.
6. Emissions of nitrous oxides will be controlled by the injection of ammonia into the combustion chamber (with the reagent subject to detailed design).
7. Hot gases from the waste combustion will be passed through a boiler to raise steam. The steam will 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.
8. The combustion gases will be cleaned in a flue gas treatment plant. This will include the injection of carbon, primarily to control dioxin emissions, the injection of hydrated lime to control acid gas emissions, and the use of a fabric filter to remove dust.
9. The cleaned exhaust gases will be released to atmosphere via a stack of 90 m.

An indicative process diagram for the Facility is presented below:



2.2 Raw Materials and Feedstocks

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

- hydrated lime;
- activated carbon;
- NOx reagent (assumed to be ammonia);
- mains water;
- non-hazardous mixed waste;
- auxiliary fuel; and
- boiler 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 a stack of 90 m. Detailed air dispersion modelling of emissions from the stack has been undertaken. The assessment is presented within Appendix D of the Application.

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

Under normal operation, there will be no emissions of process effluent from the Facility discharged to sewer, and the only effluent discharge to sewer will be domestic effluents from welfare facilities. These will be pumped to an existing sewerage system, which in turn connects to the local sewer network.

Under 'normal operation' there will not be any trade effluent discharged to water from the Facility. Where practicable, waste waters generated from the process (such as from water treatment and boiler blowdown) will be re-used/recycled within the process, for example in the ash quench system. In the case of excess effluents being generated, such as the emptying of the boiler, effluent will be discharged to foul sewer in accordance with a Trade Effluent Consent, which will be secured from the Sewerage Undertaker (Wessex Water) prior to commencement of operations.

Surface water run-off from vehicle movement areas, roadways and building roofs will be collected in a surface water drainage system. The surface water drainage system will be fitted with a retention interceptor and swales, prior to the discharge point, to prevent discharge of oils and sediment collected from vehicle movement areas and roadways being released off-site. All surface water run-off will be discharged, via separate discharge points, to Balaclava Bay (east) and/or Portland Harbour.

An indicative water schematic diagram which shows the different flows of water and effluents within the Facility is presented in Appendix A.

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, ammonia, nitrogen oxides, 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 all 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 will be used to control operations and optimize the operation of the Facility.

2.5 Ground Conditions

A Site Condition Report (Appendix B of the application) has been developed which details the ground conditions at the time of submission of the EP application.

All chemicals will be stored in an appropriate manner to ensure appropriate containment and secondary and tertiary abatement measures.

All storage facilities for chemicals will include suitable secondary and, where appropriate, tertiary containment. 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. 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 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 minimise its impact upon the local environment.

A quantitative BAT Assessment has been completed for the Facility – refer to Appendix E of the Application. 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 for the abatement of oxides of nitrogen, potentially with a layer of catalyst to be installed in the flue from the bag filters and prior to release from the stack to act as a 'polisher';
- 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.

It is proposed that a Pre-Operational Condition is included within the EP which requires the details of the proposed NOx abatement system to be confirmed during detailed design.

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 then it will be sent to a suitably licensed hazardous waste landfill for disposal as a hazardous waste.

2.8 Management

The Facility will be designed and constructed following the latest international and national regulations, standards and guidance. This will incorporate risk management techniques such as hazard and operability (HAZOP) studies prior to construction and thorough commissioning and testing before facility takeover.

Powerfuel will ensure that continued Safety, Health and Environmental excellence will be ensured by employing the latest management best practice as outlined below.

As part of its ongoing commitment to sustainable and responsible development and to regulatory compliance, Powerfuel will develop a management structure and a site specific EMS. The EMS will form part of the facility's management system and will establishes an organisational structure, responsibilities, practices, procedures and resources for achieving, reviewing and maintaining the company's commitment to environmental protection.

Powerfuel regards the development of documented management systems to be of considerable importance and relevance to a waste treatment facility. It is an assurance to the local authority, regulator, neighbours, and others alike that the facility operation is undertaken in strict compliance with the regulations in force and with the management seeking continual improvements. It requires the company to work in a transparent way, to maintain and improve the confidence of regulators and neighbours, and to have a proactive approach to environmental improvement.

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