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Consulting Engineers Limited

Replacement of Lakeside EfW

Lakeside EfW Ltd

Non-Technical Summary

ENGINEERING CONSULTING

Document approval

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1 Introduction

Lakeside Energy from Waste Limited (Lakeside EfW Ltd) is proposing to build a replacement Lakeside EfW Facility (the Facility) alongside a High Temperature Incinerator due to the proposed expansion of Heathrow Airport requiring the existing facilities to be demolished. The Facility will be located on a plot approximately 600m northwest of the existing Lakeside EfW and HTI facilities.

The Facility will comprise an Energy from Waste plant and associated infrastructure, which will be fuelled by incoming municipal (and some commercial & industrial) non-hazardous waste.

1.1 The Applicant

Lakeside EfW Ltd is a joint venture between Grundon Waste Management Limited and Viridor, two of the UK's leading recycling and waste management companies, and is the Applicant for the Facility. Lakeside EfW Ltd is registered in England (Company Number: 03861722) and has a registered address of Thames House, Oxford Road, Benson, Wallingford, Oxfordshire, OX10 6LX.

Lakeside EfW Ltd was responsible for the development of the original Lakeside EfW and HTI facilities, operational since 2010. Lakeside EfW has been recognised by the industry for contributing towards the green agenda, and it has won multiple awards.

1.2 The Site

The site is located south west of the M4's junction 4B, on a triangular patch of land bordered by the M4 to the north, M25 to the east and the A4 Colnbrook Bypass to the south. Colnbrook centre lies across the A4 on the opposite side. A sewage treatment works, operated by Thames Water, lies directly to the east of the proposed EfW location. Once operational, the Facility will be accessible via a new road off the A4 Colnbrook bypass, approximately 650 m west of the existing Lakeside Road junction.

The site is located on an area which was historically occupied by gravel pits and landfill sites. The land is now adopted green belt, currently comprising scrub and open grassland (to the north) with some grazing land to the south.

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

1.3 The Activities

The Facility will consist of a combination of Schedule 1 'Installation Activities' (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 with a nominal design capacity of 27.9 tonnes per hour.

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Directly associated activities		
Directly Associated Activities		The export of electricity to the National Grid and the 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 two waste incineration lines, waste reception hall, main thermal treatment process, turbine hall, on-site facilities for the treatment or storage of residues and wastewater, 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 Installation will be approximately 27.9 tonnes per line per hour of mixed non-hazardous wastes, with a net calorific value (NCV) of 10 MJ/kg. The Facility will have an estimated availability of around 7,884 hours (or 90%). Therefore, the plant will have a nominal design capacity of approximately 440,000 tonnes per annum.

To allow for variations in the NCV of the fuels being combusted, and for the plant operating for more than the predicted operating hours in a particular year, the facility will have a maximum processing capacity of approximately 489,000 tonnes per annum.

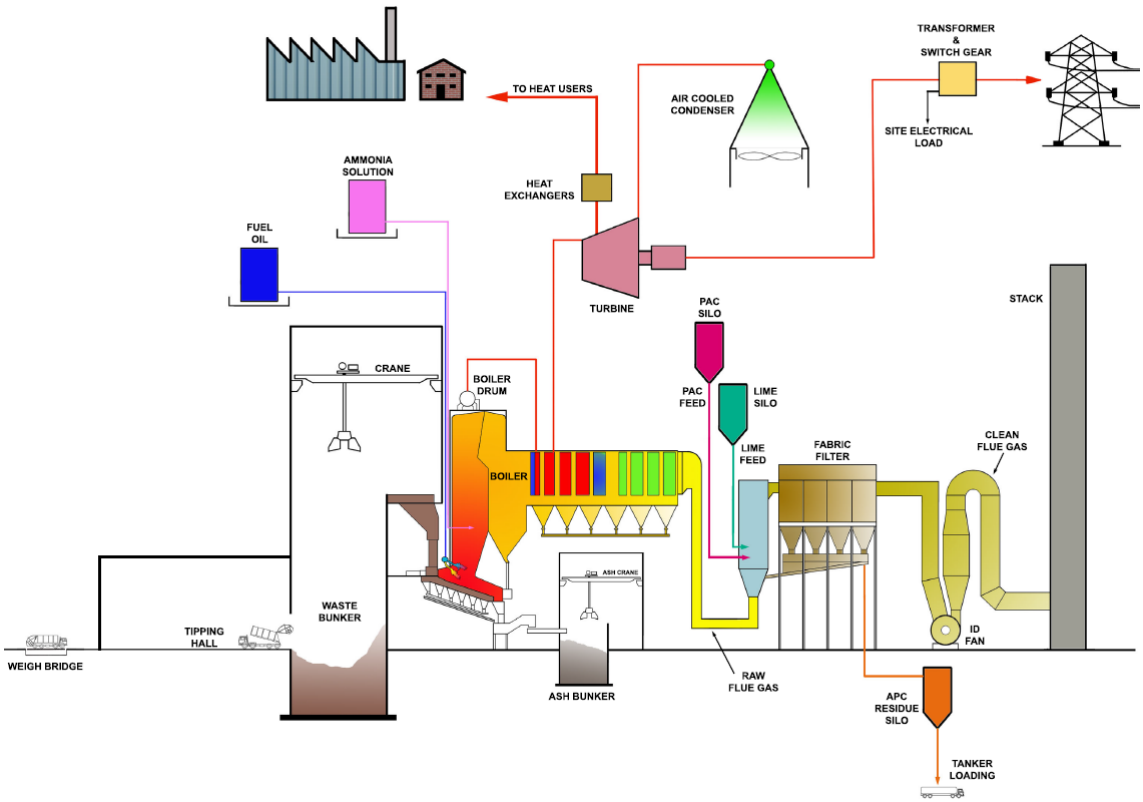
2 Details of the Proposed Facility

2.1 The Process

The Facility will include the following processes:

1. Waste will be delivered to the Facility and unloaded into the waste bunker.
2. 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 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 hydrated 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 two individual flues (one per line) within a common 55m windshield shared with the HTI facility.

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;
- ammonia;
- mains water;
- non-hazardous mixed waste;
- fuel oil; 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 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 discharged to atmosphere through two flues enclosed within a common 55 m windshield shared with the HTI facility. Detailed air dispersion modelling of emissions from the stack has been undertaken. The assessment is presented within Appendix E of the Application.

The Final Draft Waste incineration BREF was published by the European IPPC Bureau in December 2018. Formal adoption of the BREF is expected during the determination period of the proposed development.

As currently drafted, the BREF will introduce BAT-Associated Emission Limits (BAT-AELs) which are more stringent than the Emission Limit Values (ELVs) currently set out in the Industrial Emissions Directive (IED). It has been assumed that emissions from the Facility will comply with the BAT-AELs or lower in some cases, or the emission limits from Annex VI Part 3 of the Industrial Emissions Directive (IED) for waste incineration plants where BAT-AELs are not applicable. A full list of proposed ELVs is presented in Section 2.4.1 of the Supporting Information.

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 discharged, subject to formal approval, into Thames Water's manhole located in close proximity to the existing sewage treatment works to the east of the site.

Surface water run-off from buildings, roadways and carparks will be collected via the surface water drainage system. The surface water will pass through oil interceptors and silt traps prior to storage in two sub-surface attenuation tanks, before being discharged off-site into a diverted existing ditch to the north of the site boundary. The surface water drainage systems are split and are discharged into two separate discharge points along the ditch – shown as W1 and W2 in the emissions points drawing in Appendix A of the application. Additional ditches will be created along the western and southern boundaries to intercept and convey surface runoff into the existing northern drainage ditch.

Process effluents from water treatment and boiler blowdown will be re-used within the process – mainly in the ash quench system. In the event that there are excess effluents generated by the process, they will be discharged into the foul water drainage system, in accordance with a Trade Effluent Consent first obtained from Thames Water.

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 autmoatically 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, where appropriate, 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 minimize its impact upon the local environment.

A quantitative BAT Assessment has been completed for the Facility – refer to Appendix F 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;
- 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 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 HazOp studies prior to construction and thorough commissioning and testing before facility takeover.

Lakeside EfW Ltd 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, Lakeside EfW Ltd currently operate the existing Lakeside EfW facility in accordance with an integrated management system (IMS) which has been accredited to the BS EN ISO 14001, ISO 9001, ISO 50001 and OHSAS 18001 standards. Lakeside EfW Ltd propose that the existing management systems are transferred to the Facility.

The scope of ISO 14001 will include the receipt, handling and combustion of waste fuels and transfer of residues off-site. Lakeside EfW Ltd will develop a management structure and a site-specific EMS certified to ISO 14001.

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