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Medworth Energy from Waste Combined Heat and Power Facility Permit Application

Non-technical Summary

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Document Control

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Non-technical summary

Purpose of this report

This document supports the application by Medworth CHP Ltd (the 'Operator'), a wholly owned subsidiary of MVV Environment Limited ('MVV'), for an Environmental Permit to operate a Part A(1) installation for an Energy from Waste (EfW) Combined Heat and Power (CHP) Facility (the 'EfW CHP Facility') under the Environmental Permitting (England and Wales) Regulations 2016, as amended (EPR). It provides a non-technical summary of the proposed operations.

Site location

Name: Medworth Energy from Waste Combined Heat and Power Facility

Address: Algores Way
Wisbech
Cambridgeshire
PE13 2TQ

Grid reference: TF 45564 07955

The site forms part of a wider industrial estate centred on Algores Way. The location of the EfW CHP Facility is predominantly located on an area of land currently operated by Mick George Ltd as a waste and aggregates recycling facility and waste transfer station (WTS). The south-east section of the EfW CHP Facility Site is unoccupied scrubland owned by Fenland District Council. It is separated from the current WTS by an earth bund and trees.

The closest residential properties to the EfW CHP Facility site consist of isolated properties along New Bridge Lane. 9 and 10 New Bridge Lane are located approximately 30m to the west and south, respectively, of the EfW CHP Facility Site. The main residential areas and town centre of Wisbech lie beyond the industrial estate more than 1km to the north and the east.

Approximately 200m and 500m, respectively, to the north-east of the EfW CHP Facility Site, and within Algores Way industrial estate, Cambian Wisbech School occupies a unit along Anglia Way, and TBAP Unity Academy occupies a unit on Algores Way. Other notable schools within the wider area, but outside of Algores Way industrial estate, include the Thomas Clarkson Academy, approximately 750m to the north-east off Weasenham Lane.

The Nene Washes Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site is situated approximately 6.3km to the south-west of the site, whilst the Ouse Washes SAC/SPA/Ramsar site is located approximately 12.3km to the south-east. The River Nene Local Wildlife Site (LWS) is approximately 550m to the north-west.

Process description

The EfW CHP Facility will recover the energy contained within non-hazardous residual (i.e., non-recyclable) household, industrial and commercial waste to generate electricity for export to the local distribution network, and to provide steam to nearby heat consumers, subject to completion of final design and contractual negotiations.

The EfW CHP Facility is designed with a maximum operating capacity of 625,600 tonnes per annum and will contain two thermal treatment lines, each incorporating an advanced moving grate furnace, high pressure steam boiler, air pollution control (APC) plant, continuous emissions monitoring system (CEMS) and a discharging chimney.

Waste will be delivered from pre-approved suppliers in enclosed or covered waste collection vehicles. Systems will be in place to monitor and track waste deliveries, including the amount of waste deposited. The waste collection vehicles will deposit the waste in a watertight bunker in an enclosed tipping hall. Air within the tipping hall will be extracted through the furnaces to control odour and dust emissions.

Energy from the thermal treatment of waste will be recovered in the boilers in the form of high temperature, high pressure steam, which will be subsequently routed using insulated pipework to a common steam turbine generator for the generation of electricity. The EfW CHP Facility is designed to export up to 55MW_e of electricity to the national grid and local private wire electricity consumers, subject to suitable commercial arrangements being established.

The design of the steam turbine system will also allow for heat export to local heat consumers, in the form of medium pressure steam, subject to suitable commercial arrangements being established. Heat that cannot be recovered in the form of electricity or steam will be dissipated through an air cooled condenser.

Waste gases from the thermal treatment process will be routed through the APC plant to ensure emissions are compliant with relevant emission limit values, before being discharged through two 84m high chimneys.

The thermal treatment process will result in the production of solid residues, including incinerator bottom ash (IBA) and APC residues (APCr). Generation of these residues will be minimised through appropriate design and control of the combustion process to maximise burn-out of the waste on the grate, and by using an automated control system which optimises the dosing rates of reagents used in the APC plant based on the current level of emissions monitored by the CEMS, and based on the Operator's experience of operating similar sites in the UK and Germany. IBA will be sent off-site for recovery e.g., as a construction aggregate, whilst APCr will initially be sent off-site for disposal, although the Operator will continually review the viability of recovery options for APCr.

An emergency diesel generator will be used to provide emergency power to the EfW CHP Facility in the event of loss of off-site power and failure of island mode operation.

Managing the activities

MVV operates an Integrated Management System (IMS) certified to ISO 9001:2015 (quality management), ISO 14001:2015 (environmental management), ISO 45001:2018 (occupational health and safety

management) and ISO 50001:2018 (energy management). The management system covers operations at its headquarters in Mannheim and its existing operational EfW and biomass plants in Germany and the UK.

The scope of MVV's IMS certification will be extended to cover the Medworth EfW CHP Facility, including the receipt, handling and combustion of waste, and transfer of waste residues off-site. Where applicable, documented procedures will detail specifically how each of these activities will be managed and controlled for the EfW CHP Facility.

Emissions and monitoring

The thermal treatment of waste will generate flue gases containing a range of pollutants. These emissions will be controlled by effective process design, and control and optimisation of the combustion conditions. The residual emissions will be reduced to levels below the relevant emission limit values by the APC system prior to discharge to atmosphere. Techniques used to control emissions will include:

- Optimisation of the combustion process using an advanced control system to control emissions of oxides of nitrogen, carbon monoxide, volatile organic compounds, particulate matter and dioxins and furans.
- Selective non-catalytic reduction for control of oxides of nitrogen emissions.
- Dry scrubbing with hydrated lime and activated carbon for control of acid gases, mercury and dioxins and furans.
- Fabric filters for control of particulate matter and other metal emissions.
- Optimisation of boiler design to minimise dioxin and furan re-formation through rapid flue gas cooling and on-line and off-line boiler cleaning.

Emissions from the two chimneys will be continuously monitored using CEMS. Each chimney will have its own CEMS, with a third CEMS available on hot standby as a back-up should maintenance be required on the CEMS. The CEMS will be designed to comply with the Environment Agency's Monitoring Certification Scheme (MCERTS). Periodic extractive emissions tests will also be performed by an independent MCERTS accredited test team to validate the CEMS readings and to monitor emissions that are not required to be monitored continuously under the EPR, which implements the requirements of Directive 2010/75/EU (the Industrial Emissions Directive (IED)) and the waste incineration Best Available Technique Conclusions.

The EfW CHP Facility aims to re-use and recycle all process waters, such as that from periodic boiler blowdown or washdown (cleaning) operations. These process waters will be re-used in the IBA quenching system. However, during intermittent on-line maintenance, certain process effluent streams from the water treatment plant may need to be discharged to foul sewer. These effluents will be neutralised in a neutralisation tank, with the pH, temperature and volumetric flow rate of the discharge continuously monitored under the requirements of the trade effluent discharge consent with Anglian Water. Management procedures and controls will be in place to control fugitive emissions.

Impact assessment

Detailed impact assessments of emissions to air, odour, noise and flood risk have been completed to support the application. These assessments demonstrate that significant impacts are unlikely to occur as a result of the operation of the EfW CHP Facility. The air quality assessment was supported by a human health risk

assessment (HHRA) to investigate total bodily exposure to dioxins and furans, and dioxin-like polychlorinated biphenyls (PCBs). Under worst-case, pessimistic assumptions, the HHRA identifies that, for the maximally exposed individual, any potential health effects would not be significant.