

Swadlincote Energy Recovery Facility (SERF)

EMS Summary

on behalf of R&P Clean Power Limited

Application for Environmental Permit

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Appendices

Appendix 1 – Environmental Receptors Plan

Introductory Note

This document is a summary of the Environmental Management System (EMS) that will be in place at the Swadlincote Energy Recovery Facility. It has been produced in accordance with guidance provided in Part B2 of the Environmental Permit Application, to provide the information detailed in the Environment Agency (EA) guidance provided on the “Develop a management system: environmental permits”¹ page.

As such it is not a complete EMS, but an overview of the full EMS that will be in place after the commencement of operations. Some information is not included within the summary document, but it will be completed in the final version of the EMS when the Facility is operational.

¹<https://www.gov.uk/guidance/develop-a-management-system-environmental-permits>

1 EMS Summary

This EMS is intended to manage, support, and promote the operations undertaken by the Operator at the Swadlincote Energy Recovery Facility (SERF) (the 'Facility') in a manner which does not endanger human, health, harm the environment, cause nuisance, or adversely affect the surrounding environment in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (as amended).

This document is written with consideration of the environmental and waste regulatory documents and the environmental setting of the Facility.

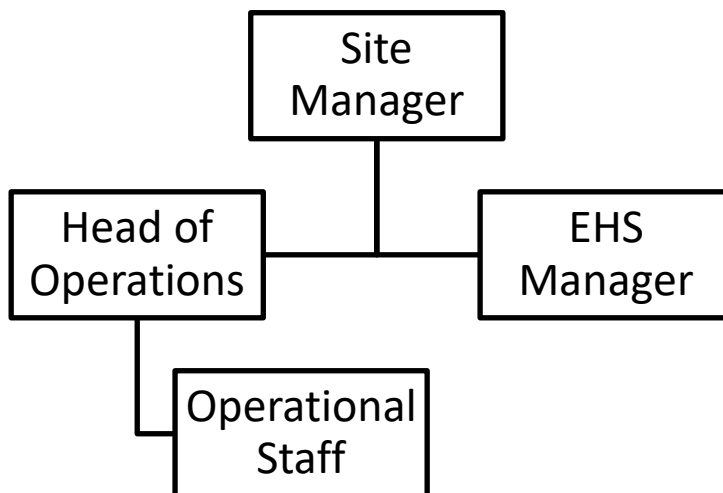
This EMS therefore identifies and minimises risks of pollution for the site including those arising from:

- Operations;
- Maintenance;
- Accidents and incidents;
- Non-conformances; and
- Those drawn to the attention of the operator by complaints.

1.1 Organisational Structure and Responsibilities

To ensure the effectiveness of the EMS, the responsibilities for the upkeep of the EMS documents and those that must undertake the activities specified within it, will be clearly defined.

1.1.1 Management Structure



1.1.2 Training

1.1.2.1 Employees

All employees will be made aware of the importance of the EMS and its role in protecting the environment and how pollution is prevented at the Facility. This will include environmental training for new starters.

Training and refresher training logs for all members of staff will be updated, maintained, and stored in the on-site office.

Staff who have specific responsibilities for procedures or plant with a potential environmental impact will receive regular adequate training in their role. They must have an awareness of the potential for harm to personnel and the environment from materials and equipment that they are responsible for.

1.1.2.2 Contractors

Contractors will be trained in relevant environmental management and emergency procedures before starting any contracted work on-site.

1.2 Management of Document and Records

It is important that records relating to the EMS are maintained and access provided to all those who are carrying out work on-site.

The Head of Operations will record any changes to the EMS documents accompanying procedures and plans in the EMS amendment record at the front of this document. When documents are updated, the Head of Operations will let the relevant staff know.

1.3 Auditing and Review

The EMS and accompanying procedures and plans will be subject to a review at least every four years, or if significant changes occur.

In the event an accident, incident or non-compliance is identified in an internal audit or external audit (i.e., conducted by the EA) the relevant sections of the EMS may be reviewed and amended in order to identify and eliminate the cause.

Activities on-site will be subject to internal audits on an annual basis to ensure the integration of the EMS and activities at the Facility.

2 Environmental Policy

The Operator recognises that concern for the environment should be an integral and fundamental part of the business. They are aware of the impact of day-to-day operations on the environment; the objective is to balance the need to achieve business aims with an effort towards sustainable environmental improvement, which can be measured and monitored on a regular basis.

Company management have specified responsibility for policy development, co-ordination, and evaluation of performance. The Environmental Policy will be maintained and upheld by the designated senior members of staff to meet commitment. Environmental aspects of processes and activities will be effectively managed in order to protect the health and safety of employees, customers, and the public, whilst contributing to the future wellbeing of the environment.

The Operator will provide the necessary training and support to all employees to ensure that they understand and are able to fulfil the relevant aspects of the Policy in their day-to-day work. The Policy will be publicly available. The Operator is committed to minimising the impact of operations on the environment by means of a programme of continuous improvement.

This includes measures such as:

- Complying or exceeding with all relevant environmental legislation.
- Minimising the production of waste on-site;
- Identifying environmental pollution risks and endeavouring to implement best practices, techniques, and due diligence to reduce the impact of the facility on the environment;
- Putting into practice energy efficiency objectives and measuring resource consumption to ensure that the Facility's permit conditions are met;
- Identifying areas for improving environmental performance, and implementing action and monitoring plans to ensure environmental targets are met;
- Periodically assessing environmental performance against the objectives established in this policy;
- Engagement with the management hierarchy to ensure environmental performance is acknowledged at Director level;
- Providing adequate resources to ensure that this policy is effectively implemented;
- Encouraging all persons working for and on behalf of the company to integrate sound environmental practices into their day-to-day activities through consultation, involvement, and training; and
- Communicating this policy to everyone in the company and making it available to the public and other interested parties.

To help achieve these objectives the Operator will work within defined processes, procedures and work instructions as described within the EMS.

As a company, it is recognised that they have a prime responsibility for upholding this environmental policy and are committed to continually improving environmental performance.

3 Site Infrastructure Plan

3.1 Site Infrastructure Plan

A scale site plan is shown in the General Layout Plan as part of the wider Environmental Permit application in Section IV as Figure 2.

This includes numbered components relating to the buildings and operations on the Facility.

3.2 Environmental Receptors Locations

A separate plan is provided to show the environmental receptors surrounding the Facility and their distance. This is provided in Appendix 1 to this report.

3.3 Site Drainage

The Facility's Drainage Plan is shown in the Site Drainage System as part of the wider Environmental Permit application in Section IV as Figure 4.

4 Operations Overview

4.1 Permitted Activities

4.1.1 Schedule 1 Activities

The Facility is defined as an 'Installation' in accordance with Schedule 1 Part 5.1 Part A (1) (b) of the Environmental Permitting Regulation 2016 (hereafter referred to as the 'Regulations').

The permitted activity is defined as "The Incineration of non-hazardous waste in an incineration plant or waste co-incineration plant with a capacity exceeding 3 tonnes per hour".

4.1.2 Directly Associated Activities

The Facility includes a number of Directly Associated Activities (DAA) which are set out below:

1. Storage of waste;
2. Process effluent treatment facilities; and
3. Electricity generation from the incineration of waste, operating a steam turbine.

4.2 Waste Acceptance, Storage, and Handling

The accepted wastes are defined with European Waste Catalogue (EWC) waste codes from the List of Wastes (LoW), the wastes are listed below, hereafter referred to as the 'fuel':

- 19 12 10 - Combustible Waste (Refuse Derived Fuel)
- 19 12 12 - Other Wastes (Including Mixtures of Materials) from Mechanical Treatment of Wastes other than those mentioned in 19 12 11
- 20 03 01 - Mixed Municipal Waste
- Other wastes listed in Table 1b of Form 3B

The fuel will be supplied to the Facility under contract by a third-party waste aggregator. The fuel will be brought to the Facility by tipper trucks and trucks with walking floors as well as ram-ejectors. The fuel will be directly deposited in the bunker. The bunker will have a capacity of approximately 8,500 m³.

The maximum storage time of fuel under normal operating conditions will be 4 to 5 days (depending on fuel density and NCV).

The annual throughput of fuel to the plant is estimated to be up to 230,000 tonnes per annum.

All fuel used in the process will be non-hazardous in nature. The fuel will be a Controlled Waste and will be accepted in accordance with procedures set out in Sector Guidance note (SGN 5.06). Detailed waste acceptance procedures are supplied in Appendix 10 Waste Management Plan of the wider Environmental Permit application.

The Facility will operate with waste fuel subject to classification checks undertaken by the third-party supplier to ensure all waste is non-hazardous. All vehicles must report to the weighbridge where the Operator will determine whether the vehicles are properly registered in the system and the nature of the consignment is consistent with the permit and the waste acceptance criteria. The fuel will be unloaded in the bunker unless drivers are instructed otherwise; the

Operator will carry out visual inspections of the consignments, either from the control room via CCTV during waste unloading or, when it is safe to do so, directly by a site operative when the trailer doors are opened prior to unloading. When required, visual inspections of consignments at the weighbridge may also be conducted (e.g. when the Operator has reasons to believe that the load may contain unacceptable waste or as part of random checks carried out under the fuel supply agreements' delivery protocols).

4.3 Fuel Loading Procedures

The fuel in the bunker will be handled by an overhead crane that automatically spreads out and mixes the fuel, improving its homogeneity and optimising the space for pit replenishment. The overhead crane and grab are also used to load the boiler feed hopper. The operation of the overhead crane is fully automated via a Programmable Logic Controller (PLC) system, though it may be manually controlled if required.

From the hopper the fuel falls onto the feeder table and is pushed onto a reciprocating combustion grate by hydraulically driven rams. Fuel throughput at full capacity (100% MCR) will be 23.2 tonnes per hour (assuming fuel with an NCV of 10.5 MJ/kg).

4.4 Combustion Process

The combustion process will use diesel oil fired auxiliary burners for start-up. Primary and secondary air to the combustion process will be provided by electric fans.

The gas temperature in the combustion chamber is maintained by the DCS by adjusting the flow of primary and secondary air; this aids the control of thermal NO_x created due to high temperatures in the chamber.

In addition, the Facility is equipped with a Selective Non-Catalytic Reduction system that can dose an aqueous solution of urea at 40% to reduce fuel NO_x.

4.5 Energy Recovery

4.5.1 Electricity Generation

The combustion gases will enter the boiler, where they will transfer the heat to the vaporisation of boiler water. The steam is "superheated" via the exchanger in the boiler to a temperature in excess of 400°C, and the superheated steam is then delivered to the steam turbine for electrical power production.

Steam enters the turbine through a hydraulic emergency stop valve, and the rate of flow into the turbine is controlled via a hydraulic throttle valve.

The gross electricity generation is 20.5 MW, with a gross electrical efficiency of 30.3%. The net efficiency (taking into account the parasitic load of the plant, other auxiliary consumptions, and electrical losses) is 18.5 MWe, an equivalent net electrical efficiency of 27.3%.

The electricity produced at 33kV is connected to the electricity substation, as per the Connection Agreement with National Grid Electricity Distribution. Power produced at 33kV is used to meet the parasitic load of the plant.

A back-up diesel generator will be available to provide power to shut-down the plant in safety

operation mode in an emergency scenario. This will be switched on once a week to run for approximately 5-10 minutes, as part of routine maintenance procedures.

4.5.2 Condensing System

Steam from the steam turbine exhaust flows into the main steam duct to the air-cooled condenser. The steam is condensed inside a heat exchanger using air as the cooling medium. The cooling air is forced through the heat exchanger by axial fans, driven by electric motors and speed reducing gearboxes.

Condensate is collected by gravity into the condensate tank, from where it is pumped to the deaerator to be recycled to the steam boiler to begin a new cycle.

4.6 Gas Cleaning

The exhaust gas pass through a system for the reduction of nitrogen oxides (NO_x) via a Selective Non- Catalytic Reduction (SNCR) system in which a water-based urea solution is injected into the exhaust gas stream to prohibit the formation of NO_x.

At the boiler exit, exhaust gases from the fuel combustion are mixed with lime and activated carbon in the vertical reaction tower. Following this process, exhaust gases are sent to a dust separator system that consists of filter bags to ensure the emissions comply with the limits specified in the Waste Incineration BREF and the Industrial Emissions Directive (IED).

4.7 Emissions to Air

Exhaust gases are discharged through a stack, with a height of 60m. A fully redundant Continuous Emission Monitoring System (CEMS) is installed on the chimney to ensure compliance with the emission limits set out in the Waste Incineration Best Available Techniques (BAT) Reference Document, and the limits specified by the Industrial Emissions Directive (IED) limits at the point of discharge.

4.8 Planned Preventative Inspection and Maintenance

The Facility will adhere to a Planned Preventative Inspection and Maintenance Programme, which will include the Facility infrastructure, machinery, and combustion plant.

4.9 Incidents and Non-Conformances

All incidents and non-conformances will be recorded in the on-site diary. The EA will be notified in the event of any non-conformances with the Facility's Environmental Permit.

5 Emissions and Monitoring

5.1 Point source emissions to air

The point source emissions to air will be monitored in accordance with a Continuous Emissions Monitoring Scheme (CEMS) with redundancy. The CEMS will be composed of a continuous analyser, certified to measure gaseous pollutants. All components, including the data acquisition software will be MCERTs certified.

5.2 Emissions to Water

5.2.1 Process Water

There will be no emission of process effluent from the Facility under normal operation. Excess process waters arising from boiler blowdown, the demineralisation unit and the cleaning/drainage of equipment and surfaces will be collected in a wastewater pit and re-used in the Facility's bottom ash quenching system. Any excess process effluents will be tankered off site under a suitable waste collection contract. No process effluent will be discharged to surface water or sewer.

5.2.2 Surface Water

The Facility is to be served by a new stormwater network which includes use of Sustainable Drainage Systems (SuDS).

Surface water runoff from the proposed buildings and infrastructure will be collected and transferred via private storm networks towards a series of attenuation features. Prior to release into any attenuation features, runoff will first drain through a series of pollution control measures (i.e., trapped gullies, manholes with catch pits etc). The attenuation features will include a combination of belowground tank storage, together with above-ground Sustainable Drainage Systems (SuDS), each sized to accommodate up to the 100-year return period storm, including 40% allowance for climate change.

The proposed SuDS will include freeboard allowances to assist in the mitigation of exceedance rainfall events. The proposed SuDS will be designed in accordance with CIRIA C753 The SuDS Manual to maximise treatment potential and to ensure the cumulative 'SuDS Mitigation Indices' exceed the 'Pollution Hazard Index' for residential developments, so that adequate treatment is being provided. Attenuated runoff from the Facility will utilise a new stormwater outfall to the downstream watercourse which naturally receives flows from the catchment.

5.2.3 Foul Water Drainage

Foul waters arising from domestic water use will drain to a new private package treatment plant. Treated flows will discharge to the proposed swale and wetland area which can provide further polishing ahead of outfall to the downstream watercourse. The final discharge of treated foul waters will be in accordance with the general binding rules for small sewage discharges with effect from 2 October 2023. This is shown as point S1 in Figure 3 Point Source Emissions to Air and Water, provided as part of the Environmental Permit application.

5.3 Complaints

A procedure for managing complaints will be included in the full EMS.

6 Accident Management Plan

The Operator will maintain and implement an Accident Management Plan which will identify the necessary actions to be followed in the event of an accident. The Accident Management Plan is included as a separate document to the application.

6.1 *In the Event of an Accident*

In the event of an accident which has the potential to cause a risk to the environment, the Operator will:

- Follow the Accident Management Plan;
- In the short-term, find out why the accident happened and take action to stop it happening again;
- In the long-term, review the Accident Management Plan and the accompanying risk assessment; and
- Inform the EA of the outcome of the review and the measures identified to prevent a reoccurrence.

6.2 *Accidents and Incident Reporting*

Whenever an accident, incident or non-conformance occurs it must be recorded on the accident record form, which is stored in the Control Room located at the on-site offices. The incident must also be notified to the EA as well as any other appropriate bodies.

Each accident, incident and non-conformance record will be given a unique reference number and will be kept with the accident records.

6.3 *Accident Risk Assessment Management Plan Review*

The Operator will review and record any changes to the Accident Management Plan at least every four years, or as soon as practicable after an accident (whichever is the earliest) and make any appropriate changes to the plan identified by the review.

7 A Changing Climate

The Facility's Accident Management Plan (AMP) includes risks that could occur due to a changing climate, e.g., flooding, or extreme weather. In addition, the Facility will implement Contingency Plans upon operation of the Facility, which will outline the actions to be taken in these extreme scenarios.

A Climate Change Risk Assessment has been completed as part of the Environmental Permit application, this takes into account how operations may be affected by changes in weather and climate over time.

8 Information and Notifications

8.1 Records

All records made as part of the EMS and Permit shall be:

- Legible;
- Made as soon as reasonably practicable;
- If amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- Be retained, unless otherwise agreed in writing by the EA, for at least six years from the date when records were made, or in the case of the following records until permit surrender:
 - Off-site environmental effects; and
 - Matters which affect the condition of the land and groundwater.

All records, plans and the EMS are required to be maintained in accordance with the conditions of the Environmental Permit and shall be kept on-site.

8.2 Reporting

All reports and notifications required by the Environmental Permit will be sent to the EA using the relevant contact details.

Full monitoring and reporting requirements of the Environmental Permit will be included in the full EMS upon issue of the Environmental Permit.

8.3 Notifications

The Operator will notify the EA without delay following the detection of:

- Any malfunction, breakdown or failure of equipment or techniques, accidents or fugitive emissions which has caused, is causing, or may cause significant pollution;
- The breach of a limit specified by the Environmental Permit; or
- Any significant adverse environmental effects.

Written confirmation of actual or potential pollution incidents and breaches of emission limits shall be submitted to the EA within 24 hours of detection.

Where the EA has requested in writing that it shall be notified when the Operator is to undertake monitoring and/or pot sampling, the operator shall inform the EA when the relevant monitoring is to take place. The Operator shall provide this information to the EA at least 14 days before the date that the monitoring is scheduled to be undertaken.

Swadlincote Energy Recovery Facility – EMS Summary

Appendices

Appendix 1 – Environmental Receptors Plan

