



NON-TECHNICAL SUMMARY

Fernbrook Bio Limited



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SITE DETAILS

Fernbrook Bio Limited

Rothwell Lodge AD Facility

Rothwell Lodge Farm

Rothwell Road

Kettering

Northamptonshire

NN16 8XF

OPERATOR DETAILS

Fernbrook Bio Limited

Rothwell Road

Kettering

Northamptonshire

NN16 8XF

PERMIT REFERENCE

EPR/EP3894SC

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APPENDICES

APPENDIX	TITLE
Appendix A	Combined Odour Abatement System Design
Appendix B	Gas to Grid Technical Information

1. INTRODUCTION

This document is the Non-Technical Summary (NTS) that accompanies the application for a Substantial Variation to the existing Bespoke Environmental Permit (EPR/EP3894SC) at Rothwell Lodge Anaerobic Digestion (AD) Facility, Rothwell Road, Kettering, Northamptonshire, NN16 8XF. The site is located at NGR SP 82389 80138.

The facility is listed in Schedule 1 of the Environmental Permitting (England and Wales) Regulations 2016 (as amended) and operates as an Installation (S5.4 A(1) (b) (i) Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day) and also in accordance with The Animal By-Products (Enforcement) (England) Regulations 2013 and PAS110:2014.

The AD Facility provides treatment of non-hazardous biological waste, with the resultant use of the biogas in a combined heat and power generation units. The electricity produced can be fed into the National Grid. The resultant whole digestate produced from biological treatment can be used as a replacement for artificial fertilisers.

This report summarises the proposed changes to the existing Environmental Permit and should be read in conjunction with the other supporting documents included within the application.

The application has been prepared by Wiser Environment Limited on behalf of the applicant and current permit holder Fernbrook Bio Limited.

2. APPLICATION

This application is for a Substantial Variation to the Environmental Permit (EPR/EP3894SC) and has been prepared under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) for an Installation.

The scope of this Application is defined by the need to ensure the permitted activities adopt processes that comply with the Best Available Techniques (BAT). Directly Associated Activities (DAAs) need to be amended to enable the installation of plant components to improve odour abatement. The operator also wants to future proof the site by increasing the annual throughput. The increase in throughput is necessary considering Government policy to make food waste collections mandatory in 2024 and the subsequent increase in demand for food waste treatment. The proposed increase in annual throughput will enable the installation of gas to grid infrastructure so the plant can inject biogas into the national gas grid, replacing fossil fuels.

The scope of the Application includes increasing the annual throughput from 49,000 to 100,000 tonnes; expansion of the reception building to include an additional feedstock line; replacement of the reception building odour abatement system with extraction and activated carbon filtration (Stack 2: 12m); additional tanks (pasteurisation system, four buffers, two digesters and one end storage); new odour abatement system for all other tanks and process areas; gas upgrading for grid injection and propane gas storage; adding CO₂ recovery as an indirect activity; and modifications to ancillary equipment and pipework. There are no proposed changes to the permitted area or waste types to be accepted at the facility.

2.1. Site Location

The Rothwell Lodge Anaerobic Digestion (AD) Facility covers an area of 2.33 hectares. It is located at NGR SP 82389 80138 lying approximately 600 m south of Rothwell, 1.1 km northwest of Thorpe Malsor, 1.3 km northeast of Loddington, and 1.5 km northeast of Orton.

Access to the site is gained directly from the westbound A14 (see Figure 1 below).



Figure 1 Aerial image of the site, showing the permit boundary in green

2.2. Environmental Setting

The environmental setting of the site can be summarised as follows and a more detailed site setting plan is shown in the Environmental Risk Assessment (ERA) (K114.1~11~001) within Section 07 of the application pack:

RECEPTOR	DESCRIPTION AND LOCATION
Humans and Property	<p>The site is located at Rothwell Lodge AD Facility, Rothwell Road, Kettering NN16 8XF, as displayed in Figure 1. National Grid Reference: SP 82389 80138. The site is approximately 600 m south of Rothwell town.</p> <p>The facility is bound to the north by the A14 road, residential land use and a filling/service station; the site is surrounded by agricultural land to the east, south and west. Rothwell Airstrip is located 62.5 m south of the site.</p>
Surface Water	<p>There are no surface water features located within 100 m of the site. However, Thorpe Malsor Reservoir is located approximately 500 m south of the site. Slade Brook is located approximately 500 m north of the site.</p>
Groundwater	<p>Superficial: no aquifer designations were identified within the Superficial Geology on site.</p> <p>Bedrock: Secondary A & Secondary (undifferentiated) aquifer designations.</p>
Designated Sites	<p>There are no designated conservation sites within 2 km of the site. Talby Meadows Local Nature Reserve (LNR) lies 2,680 m to the north. River Ise & Meadows Site of Special Scientific Interest (SSSI) is located 4.2 km northeast of the site. Birch Spinney and Mawsley Marsh SSSI is located 5.5 km south-southwest of the site. The facility is within a Nitrate Vulnerable Zone (NVZ) for surface water on the River Nene and the Thrapston Eutrophic Lake.</p>
Non-Statutory Designated Sites	<p>There is one Drinking Water Safeguard Zone (Surface Water) located on the River Nene, within the Lincolnshire and Northamptonshire areas.</p> <p>There are several Biodiversity Action Plan (BAP) sites within 2 km of the site. These areas consist of Deciduous Woodland (broadleaved) and Wood-Pasture and Parkland. The closest BAP site is adjacent to the A14 and lies approximately 190 m west of the site boundary.</p>
Geology	<p>Superficial Deposits: none identified.</p> <p>Bedrock Deposits: Northampton Sands Formation (ironstone) formed in the Jurassic Period.</p>
Flooding	<p>The Environment Agency identify the highest risk of flooding on site as 'Low' (<1 in 1000 chance of flooding in any given year) by the Risk of Flooding from Rivers and the Sea (RoFRaS) Flood rating. The site does not benefit from any Flood Defences or Flood Storage. The site is rated as 'limited potential' of flooding from groundwater sources.</p>

2.1. Increase Annual Throughput

To service the proposed gas to grid component, and future proof the site for increased demand in food waste treatment, it is necessary to increase the annual throughput from 49,000 to 100,000 tonnes. The increase in annual throughput requires additional processing and storage capacity. The proposed expansion to the waste reception building will increase the feedstock volume. The new pasteurisation system, buffer and digester tanks will increase the processing capacity and the new storage tank will ensure sufficient storage capacity.

2.2. Expand Reception Building & Replace Odour Abatement System

The reception building will be upgraded by replacing the odour abatement system with an extraction, dust filter and activated carbon filtration system (see Appendix A). At the same time, the reception building will be expanded and include an additional feedstock line.

The volume and flow rate of the extraction system will be equivalent to three air changes per hour of the reception building. A new point source emission will be established from the carbon filter outlet of both systems (Stack 2). This activity falls under AR11 air treatment.

An external maize feed line (non-waste) will also be incorporated to the plant and will remain segregated from the waste input process.

2.3. Additional Tanks & Sealed Cover on Storage Tank

To enhance the treatment capacity of the plant, four additional buffer tanks (550 m³ each), two additional digesters (5,092 m³ each) and a new pasteurisation system will also be installed. Each new tank will include a pressure relief valve (emergency point source emission to air). Each digester tank will include two new emergency point source emissions to air; one pressure relief valve and one bursting disc.

To provide additional storage, one new digestate storage tank will be installed (5,000 m³). The new storage tank will have a sealed roof installed to prevent fugitive emissions to atmosphere. The new storage tank will include a pressure relief valve (emergency point source emission to air).

2.4. AD Process Odour Abatement System

The buffer tanks will be subject to a separate pre-treatment biofilter before combining with extracted gases from other AD process areas (except the pasteurisation unit), then carbon filtration and discharge through the same emissions stack as the reception building system (Stack 2) (see Appendix A). The off gases from the pasteurisation unit will be redirected to the digesters.

2.5. Gas Upgrading & Grid Injection

This application also seeks to clarify the method of biogas export in DAA, 'gas upgrading (AR6)'. Biogas generated will be upgraded, scrubbed and exported directly as biomethane into the national gas grid rather than compressed onsite.

This includes the installation of additional plant which will allow the biogas generated to be upgraded and exported directly as biomethane into the national gas grid and an additional point source emission to air (Stack 1).

In switching from a CHP plant to a biomethane injection plant (sometimes called "Gas to Grid" or "G2G"), the front end of the plant remains the same. At the back, the biogas, comprising carbon dioxide (CO₂) and methane (CH₄), is scrubbed (or cleaned) in a containerised unit to remove the impurities, leaving biomethane which is injected into the national gas grid and used a replacement for fossil fuel-derived natural gas.

A new gas pipeline is proposed to link the plant to the national gas grid, the connection is located to the north of the permit boundary. The pipeline will leave the site and pass underneath the A14 road using one of the existing underpasses.

The following additional infrastructure is to be added:

- Four gas scrubbing columns;
- Gas clean-up container;
- Compressor unit;
- Distribution kiosk;
- Six propane gas tanks; and
- Grid entry unit.

A detailed *Site Layout Plan* (DRG001) and *Elevations Drawing* (DRG003) are provided in Section 05 of the application pack. These drawings illustrate the proposed gas upgrading and scrubbing plant to be installed but the precise location within the existing Permit Boundary is yet to be finalised. For illustration purposes, the preliminary site layout is shown by *Piping Plan* (222-022-LG-ANSI-01-c). The above infrastructure will all be installed upon an impermeable surface (concrete) and benefit from a sealed drainage system.

Further technical information and an example layout of the biogas upgrading unit and process is provided in Appendix B.

2.6. Carbon Dioxide Recovery

A new DAA is proposed to be added to the permit to allow for the specific recovery of carbon dioxide (CO₂) during the biogas upgrading process. This highly valued by-product would be compressed onsite and stored in bulk vessels pending transport to other industrial users. This would form a new activity reference (AR12).

2.7. Modifications to Ancillary Equipment & Pipework

The proposed variations to the permitted activities, as detailed above in Sections 2.3 to 2.7, require the installation of, and modifications to, ancillary equipment and pipework in the plant. This includes, pipework, mixing and transfer pumps, sealed covers on tanks and ducting to redirect gasses to both the odour abatement systems from new and existing tanks and buildings.

3. PERMITTED OPERATIONS

The Environmental Permit (EPR/EP3894SC) allows the acceptance, storage and treatment of non-hazardous biological waste. The Permit also allows heat and electrical power supply, gas upgrading and emergency flare activities from the burning of biogas.

The permitted inputs to the site are limited to those waste types and quantities for anaerobic digestion, outlined in Table S2.2 of the Environmental Permit.

3.1. Waste Acceptance

Deliveries of organic liquid, sludge and solid feedstock are received from a variety of agricultural, commercial and industrial sources. The homogenised feedstock is stored in Buffer tanks. Feedstocks must comply with those raw materials outlined in Table S2.1 and permitted waste types and quantities outlined in Table S2.2 in the Environmental Permit (EPR/EP3894SC).

The waste is visually inspected upon arrival to site to ensure that it conforms to the description in the documentation supplied by the producer. As a minimum, information to be supplied with the paperwork will be the address/location of source site; identity of the producer; the physical appearance of the waste; the amount of waste being imported; and an identifiable List of Wastes. The waste acceptance procedure is detailed in the Management Plan (K114.1~09~006) in Section 04 of the application pack.

3.2. Waste Processing

The facility provides anaerobic digestion of organic wastes from a variety of agricultural, commercial and industrial sources. The process involves the breakdown of organic material by bacteria in the absence of oxygen; this provides both a volume and mass reduction of the input materials whilst liberating 'biogas' (methane & carbon dioxide) which is used as a fuel to produce heat energy for use in the process and generates power which is sent to the National Grid.

The resultant nutrient rich whole digestate is produced to be compliant with PAS 110:2014 and the Quality Protocol for Anaerobic Digestate (ADQP) and used as an organic replacement for artificial fertilisers.

3.3. Site Management

The operator, Fernbrook Bio Limited, shall manage and operate the activities:

- a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints;
- b) using sufficient competent persons and resources, and
- c) with records demonstrating compliance.

Any person having duties that are or may be affected by the matters set out in the Environmental Permit (EPR/EP3894SC) shall have access to a copy of it.

The operator shall comply with the requirements of an approved competence scheme.

4. RISK ASSESSMENT & MANAGEMENT

An Environmental Risk Assessment (ERA) (K114.1~11~001) is included in Section 07 of the application pack. The ERA details the key management measures for the protection of the environment, with regards to emissions to surface water, groundwater, air, land, noise, and odour.

The site is operated by Fernbrook Bio Limited, a Management Plan (MP) (K114.1~09~006) has been developed and is included within in Section 04 of the application pack to reflect and control site operations, environmental management, emissions and monitoring. The MP defines operational and maintenance procedures and details requirements in the event of an accident or incident.



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