



Non-Technical Summary EPR/JP3925SN/P001

Glentham Anaerobic Digestion Plant

Glentham Green Energy Limited

Report No. CRM 0166 001 PE R 003 NTS



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Contents

1.0 Non-Technical Summary	3
1.1 Introduction	3
Environmental Setting	3
1.2 Sensitive Receptors	4
1.3 Proposed Permitted Activities	5
1.4 Regulated Activities	6
1.5 Waste Types and quantities	8
1.6 Facility Description	9
1.7 Planning Permission	10
1.8 Non-Permitted Activities	10
1.9 Point Source Emissions from the AD Facility	10
1.10 Management & Control	11
1.11 Environmental Risk Assessment	11
1.12 Operational Techniques and BAT Assessment	11
1.13 Monitoring	11
1.14 Closure & Decommissioning	12

Tables and Figures

Figure 1.2.1: Site Location	3
Table 1.3.1: Sensitive Receptors	4
Table 1.5.1: Regulated Activities	6
Table 1.5.1: Proposed Feedstocks and Annual Throughputs	9
Table 1.9.1: Point Source Emissions to Air	10
Table 1.9.2: Point Source Emissions to Surface Water	11

1.0 Non-Technical Summary

1.1 Introduction

1.1.1 This non-technical summary provides an overview of an application submitted to the Environment Agency (EA) for a Bespoke Environmental Permit reference EPR/JP3925SN/P001, for an Anaerobic Digestion (AD) Plant at Land off Barff Lane, Glentham, Market Rasen, LN8 2EY referred to as 'The Facility' throughout this document.

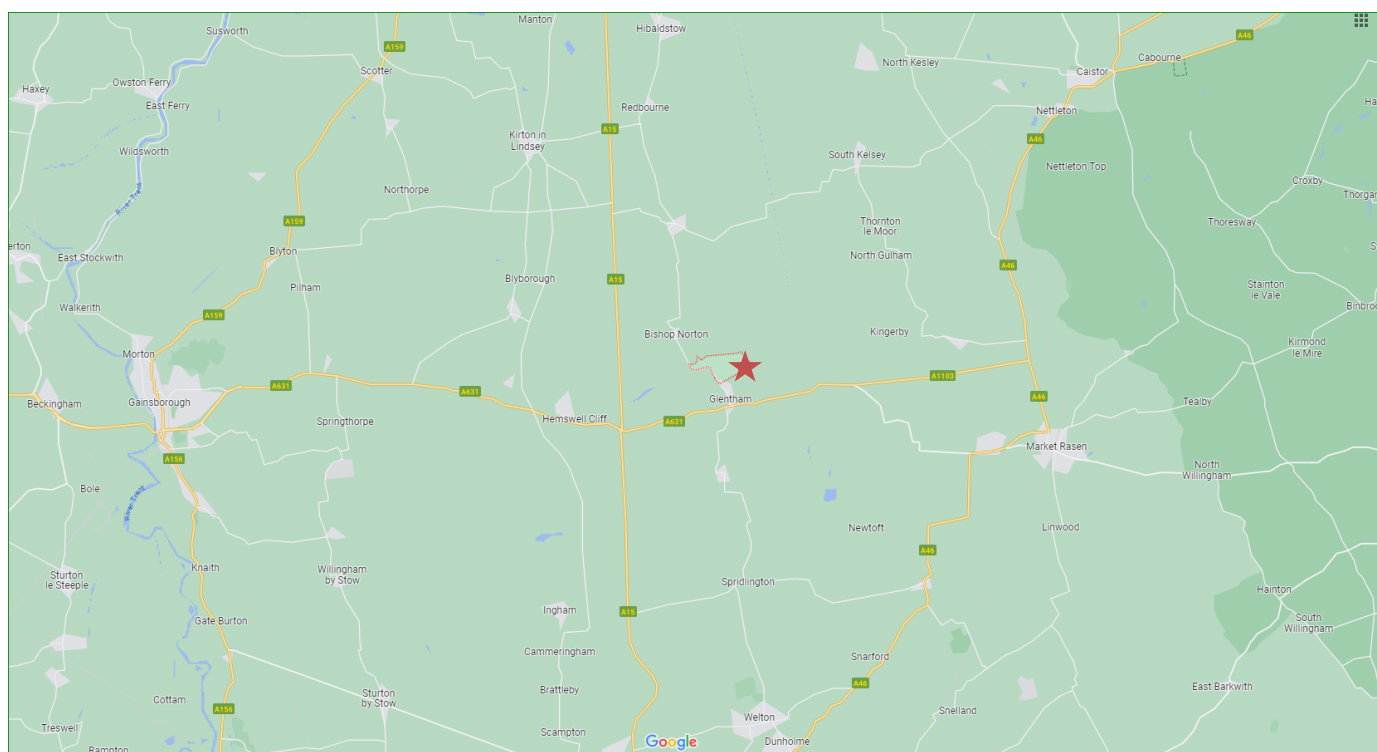
1.1.2 The Facility will be operated by Glentham Green Energy Limited ('The Operator') whose registered office is Nova North 11 Bressenden Place, The Argyll Club (Room 6.17), London, England, SW1E 5BY. The Company Number as registered on Companies House is 12873121

1.1.3 The facility will process up to 41 070 tonnes per annum of non-waste energy crops and wastes, specifically maize, straw, chicken manure, potato waste, pig and cattle manure, to produce digestate and biogas which will be upgraded and injected into the national gas transmission grid. Rye may occasionally be utilised in place of maize.

Environmental Setting

1.1.4 Figure 1.2.1 below shows the location of the site, marked with a star.

Figure 1.2.1: Site Location



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1.1.5 The facility is located at:

Glentham Anaerobic Digestion Plant,
Barff Lane,
Glentham,
Market Rasen,
LN8 2EY

- 1.1.6 The site is approximately centred at National Grid Reference TF 00584 91928
- 1.1.7 The primary contact for the application is Steph Charnaud, Director of Permitting for Enzygo Limited who are employed to provide technical support to Glentham Green Energy Limited as part of the Environmental Permit application process.
- 1.1.8 The proposed Facility is to occupy an area of approximately 3.5ha in a predominately agricultural area, approximately 800m to the north east of Glentham. To the south of the proposed facility is an existing farm irrigation lagoon then Barff Lane. To the north lies an agricultural farm track and more arable farmland. To the east and west lie further arable agricultural fields.
- 1.1.9 The nearest residential property is approximately 706m to the South South West of the proposed facility.

1.2 Sensitive Receptors

- 1.2.1 The key receptors that have the potential to be impacted by the Facility are summarised in Tables 1.3.1 below. These receptors have been considered where appropriate within each risk assessment undertaken.

Table 1.3.1: Sensitive Receptors

Receptor	Type	Distance (m) from EfW	Direction
Undifferentiated secondary aquifer (superficial geology)	Hydrogeological	-	Onsite
Secondary A aquifer (bedrock geology)	Hydrogeological	-	Onsite
Drinking water safeguard zone (surface water)	Hydrological	-	Onsite
Nitrate vulnerable zone	Hydrological	-	Onsite
Irrigation lagoon	Agricultural	0	S
Unnamed drainage ditch	Hydrological	0	N
Agricultural fields	Agricultural	0	N, E, S, W
Seggimoor Beck	Hydrological	592	SE
Pond	Hydrological	674	W
Pond	Hydrological	688	WNW
Mellow's Beck	Hydrological	689	WNW
Closest residence to the facility off Prospect Lane	Residential	706	South South West
Glentham Farming Co	Residential/commercial	832m	South West
Closest residence at Glentham	Residential	836	South South West
Beck Farm Bungalow	Residential	938m	North North West

Receptor	Type	Distance (m) from EfW	Direction
The Bungalow	Residential	942	East
Low Place	Residential	948	North East
Glentham Sewage Treatment Plant	Commercial	1020	South South West
Norton Sandhayes Farmhouse	Residential	1270	North
The Chestnuts	Residential	1330	South
Glentham Grange Farmhouse	Residential	1350	South East
St Peters Church	Community	1360	South South West
Glentham Motors	Business	1500	South
Barff Farm PT Moore	Residential	1560	South
Glebe Farm House	Residential	1630	South South East
Allotments at Bishop Norton	Recreational	1800	North North West
Business Units at Barff Farm	Business	1830	South
White House Farm, Bishop Norton	Residential	1900	North North West
The Spinney	Residential	2001	North West

1.3 Proposed Permitted Activities

- 1.3.1 Glentham Green Energy Limited is proposing to operate a Part A Installation Environmental Permit for the operation of an Anaerobic Digestion Facility with the resultant biogas being upgraded and injected into the grid via a network entry facility.
- 1.3.2 The feedstock to be processed at the Facility will be maize, straw, chicken manure, potato waste, straw farmyard manure and occasionally rye. The Facility will accept a maximum of 41,070 tonnes of feedstock per year. A bespoke installation application has been prepared to fully assess the risks posed by the activity and to consider the proposed activity against Best Available Techniques (BAT).
- 1.3.3 The Facility is also proposing to recover, treat and store CO₂ from the upgraded biogas. This activity will be undertaken utilising the Environment Agency's Regulatory Position Statement 255; Treating, Storing and using carbon dioxide from anaerobic digestion as the proposal is to utilise the CO₂ within the food and drink industry after testing.

1.4 Regulated Activities

1.4.1 The listed activities proposed within this permit application are in accordance with the Environmental Permitting (England and Wales) Regulations 2016 (as amended). Schedule 1 listed activities and Directly Associated Activities (DAAs) are summarised in Table 1.5.1 below.

Table 1.5.1: Regulated Activities

Activity	Description of Activity and WFD Annex I and Annex II operations	Limits of specified activity and waste types
Activity Listed in Schedule 1 of EPR		
Part A (1) Section 5.4 Part A(1) (b)(i) Anaerobic Digestion Plant – Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment is anaerobic digestion) involving one or more of the following activities, and excluding activities covered by Council Directive 91/271/EEC- (i) biological treatment	R13: Storage of wastes pending the operations numbered R1, R3 and D10. R3: Recycling or reclamation of organic substances that are not used as solvents.	From receipt of waste through to digestion and recovery of by-products (digestate). Total capacity of 41 070 tonnes per annum. Daily treatment capacity of 120 tonnes per day.
Directly Associated Activities		
DAA 1 Storage of waste pending recovery or disposal	R13: Storage of waste pending the operations numbered R1 and R3 (excluding the temporary storage, pending collection, on the site where it is produced).	From the receipt of waste to dispatch off site for recovery and/or disposal. Storage of waste in covered clamps on an impermeable surface with sealed drainage. Storage of liquid digestate. Storage of solid digestate.

Activity	Description of Activity and WFD Annex I and Annex II operations	Limits of specified activity and waste types
		Storage of dirty water from the process in dirty water lagoon prior to use in the AD process.
DAA 2 Physical treatment for the purpose of recycling	R3: Recycling or reclamation of organic substances which are not used as solvents	<p>From the receipt of waste to despatch for anaerobic digestion or despatch off site for recovery and/or disposal.</p> <p>Storage of waste in covered clamps on an impermeable surface with sealed drainage.</p> <p>Treatment of non-waste straw by crushing, wetting, chopping, maceration and extrusion prior to despatch into the anaerobic digestion process.</p>
DAA 3; Schedule 25a Natural gas combusted in 2no. combined heat and power (CHP) engine to produce heat and power	R1:- Use Principally as a fuel to generate energy	Combustion of natural gas in 2no combined heat and power (CHP) engines each with an aggregated thermal input of 3.495 MWth, with the release of combustion gasses.
DAA 5 Treating biogas and biomethane	<p>R13: Storage of waste pending the operations numbered R3 (excluding temporary storage, pending collection, on the site where it is produced)</p> <p>R3: Recycling/reclamation of organic substances which are not used as solvents</p>	From the receipt of biogas produced at the on-site anaerobic digestion process to upgrading and dispatch to the national gas grid
DAA 6 Emergency flare operation	D10: Incineration on land	<p>From the receipt of biogas produced at the on-site anaerobic digestion process to incineration with the release of combustion gas.</p> <p>Use of one auxiliary flare required for periods of breakdown or maintenance of the biogas upgrading plant or in the case of an emergency only</p>

Activity	Description of Activity and WFD Annex I and Annex II operations	Limits of specified activity and waste types
DAA 7 Emergency Diesel Generator	Combustion of diesel within an emergency diesel generator	Combustion of diesel within one emergency generator with a thermal input of 432kWth. For use in an emergency <50 hours per annum.
DAA 7 Biogas Storage	R3: Recycling or reclamation of organic substances which are not used as solvents Storage of biogas produced by the on-site anaerobic digestion of permitted waste and non-waste maize, grass and rye silage.	From the receipt of biogas produced at the on-site anaerobic digestion process to despatch for use within the facility.
DAA 8 Biogas upgrading	R3: Recycling or reclamation of organic substances which are not used as solvents Cleaning, upgrading and compression of biogas using membrane separation technology and propane injection	From the receipt of biogas produced at the on-site to biomethane for compression and export to the grid. This includes return of off specification biogas for combustion to either the biogas holder or the emergency flare.
DAA 9 Raw material storage	Storage of raw materials including maize, and/or rye silage, straw lubrication oils, diesel, ferric chloride, ethyl glycol, propane, anti-foaming agent	From the receipt of raw materials to despatch for use within the facility.
DAA 10 Digestate Storage	Storage of liquid digestate in the onsite lagoon and of solid digestate	From the receipt of digestate produced from the on-site anaerobic digestion process to despatch for use off site. Storage of processed liquid digestate in a digestate lagoon.
DAA 11 Surface water collection and storage	Collection and storage of uncontaminated site surface rainwater	From the collection of uncontaminated roof and site surface water from non-operational areas only to reuse within the facility or discharge to the drainage ditch.
DAA 12	Collection and storage of process water in a dirty water lagoon	From the collection storage of effluent from the storage of feedstocks to re-use within the facility.

1.5 Waste Types and Quantities

1.5.1 The Facility will process up to 41,070 tonnes per annum of non-waste energy crops, specifically maize, straw, chicken manure, potato waste, straw based pig manure and agricultural manures, slurry and associated animal bedding, and rye.

Table 1.5.1: Proposed Feedstocks and Annual Throughputs

Feedstock	Quantity in Tonnes
Maize (or Rye when necessary)	11 800
Straw	10 970
Poultry Manure	12 700
Potato Waste	3000
Pig manure, cattle slurry and straw mixture	2600

1.5.2 The maize, rye and straw is grown on the arable land surrounding the proposed AD plant and is delivered to the clamps by agricultural vehicles.

1.5.3 The poultry, pig and cattle manure will be brought onto the proposed facility and stored within covered dedicated clamps before being inputted into the process.

1.5.4 The potato waste, from processed potatoes are currently fed to the cattle residing on the wider site. These peelings will instead be brought onto the proposed facility and stored within a covered dedicated clamp before being inputted into the AD process.

1.5.5 Normal Feedstock deliveries will be received at the site during the following restricted operational hours:

- 08:00 to 17:00 hours Monday to Sunday;
- The treatment of feedstock through the process and upgrading of biogas and injection into the grid will in general operate continuously 24 hours a day.

1.6 Facility Description

1.6.1 The proposed AD Facility will comprise of the following primary elements:

- Poultry manure and straw manure mix acceptance and storage within covered clamps;
- Potato waste acceptance and storage within covered clamps;
- Non waste maize/rye storage in sheeted a silage clamp;
- Preparation of baled straw by chopping, addition of water and extruding;
- Mixing of the feedstock materials in 2no Continuous-Stirred Tank Reactors (CSTR);
- Anaerobic digestion of the feedstock in 2no. Plug Flow Reactors (PFR);
- Separation of the solid and liquid fractions of the digestate via a screw press;
- Biogas collection, cleaning and compression;
- Biogas injection into the gas grid;
- Natural gas combustion in the 2no. CHP's;
- Emergency diesel generator;
- Recovery and compression of carbon dioxide; and;

- Digestate storage in a lagoon (liquid) or a bunker (solid).

1.7 Planning Permission

1.7.1 Planning Permission was originally obtained from West Lindsey District Council, planning reference 141381, on 14/10/2020 for an anaerobic digestion plant. However, the feedstocks originally applied for were non-wastes. A change in the feedstocks to include 50% waste feedstocks meant that planning permission had to be obtained from Lincolnshire County Council, which was granted on 5th September 2022, planning reference PL/0049/22.

1.8 Non-Permitted Activities

1.8.1 The operator is not proposing to undertake any activities at the site other than those which will be included within the Environmental Permit.

1.8.2 The carbon capture will be covered using RPS 255 as mentioned above.

1.9 Point Source Emissions from the AD Facility

1.9.1 There are 5 main point source emissions to air at the Facility plus pressure relief valves which only operate during emergencies. These are listed in Table 1.9.1 below.

Table 1.9.1: Point Source Emissions to Air

Air Emission Point Reference	Source of Emission	Emissions
A1	Natural gas fired CHP Engine	NO _x , CO
A2	Natural gas fired CHP Engine	NO _x , CO
A3	Emissions from the Emergency High-Temperature Flare Stack	CO, CO ₂ , NO _x , SO ₂ , VOCs
A4	CO ₂ Recovery Plant/Biogas Upgrading Plant	CH ₄ , CO ₂ , H ₂ S
A5	Emergency Diesel Generator	NO _x , SO _x , PM
Vents	Buffer Tank Vent CO ₂ dryer purge vent CO ₂ storage tank vent CO ₂ purge gas vent Biogas storage dome vent	CO ₂ , H ₂ S, NH ₄ , N ₂ , VOCs including methane

1.9.2 Collection and storage of uncontaminated site surface rainwater will be discharged to the surface water lagoon and used for the anaerobic digestion process. Should the surface water lagoon become overwhelmed the clean surface water shall be discharged into the drainage ditch.

1.9.3 Leachate from the silage clamps along with condensate and potentially contaminated water from the bund will be stored in the dirty water lagoon and reused in the process.

1.9.4 There are 2no. point source emissions to water comprising of clear surface water from the following sources:

- Clean surface water storage lagoon
- Site Interceptor

Table 1.9.2: Point Source Emissions to Surface Water

Surface Water Emission Point Reference	Source of Emission	Emissions
SW1	Surface water lagoon	Clean surface water
SW2	Site interceptor	Clean surface water

1.10 Management & Control

1.10.1 The approach to permitting and regulation relies heavily upon the use of Environmental Management Systems (EMS) as a driver for the Operator to ensure environmental compliance and improvement during operations. In England and Wales, under the Environmental Permitting Regime, modern regulation is fundamentally driven by applying a risk-based approach to activities, where operators are encouraged to implement suitable management systems with which to operate, and to implement self-regulation and reporting. If an operator holds a permit under the Environmental Permitting (England & Wales) Regulations 2016 (as amended) the operator is required to have an Environmental Management System in place.

1.10.2 Glenthams Green Energy Limited will develop and implement their own management system considering the relevant legal requirements, quality and safety standards and environmental elements that the facility needs to identify and comply with in order to carry out safe and environmentally sound operations.

1.11 Environmental Risk Assessment

1.11.1 An Environmental Risk Assessment has been completed to support this Permit Application to assess the environmental impacts of the operation. The assessments undertaken have followed guidance specified within the Environment Agency’s Risk assessments for your environmental permit, updated November 2023 and Risk assessments for specific activities.

1.11.2 The risk assessments have concluded that the proposed activities will not result in an unacceptable impact on nearby sensitive receptors. The Environmental Risk Assessment is provided, with reference CRM 0166 001 PE R 005 for this Permit Variation Application.

1.11.3 The Environment Agency also requires a standalone Odour Management Plan to be prepared and submitted as part of any Permit application for an Anaerobic Digestion Facility. A site-specific Odour Management Plan is provided in this application, reference CRM 0166 001 PE R 008.

1.12 Operational Techniques and BAT Assessment

1.12.1 Details contained within the Operations Techniques and Monitoring Plan (CRM.0166.001.PE.R.006) describe operations and pollution prevention techniques and demonstrate evidence of Best Available Techniques (BAT).

1.13 Monitoring

1.13.1 The Environmental Permit will stipulate the required monitoring schedule for the Facility. Anticipated monitoring requirements for all point source emissions and process monitoring are considered within the Operations Techniques and Monitoring Plan (CRM.0166.001.PE.R.006).

1.14 Closure & Decommissioning

- 1.14.1 If activities cease on site and decommissioning is required, a detailed 'Closure plan' will be submitted to the Environment Agency and other regulatory bodies as appropriate. This will include details of how the Facility will be dismantled, and how wastes produced from dismantling will be either recycled/reused or where appropriate disposed of. Finally, the site will be restored to its pre-operational condition.