Llay Power Plant

Decision Document

New bespoke permit

The application number is: **PAN-016681**
The Applicant / Operator is: **Biogas Technology Limited**
The Facility is located at: **Llay Power Plant, Llay Hall Farm, Llay, Wrexham, LL12 0PD**

We have decided to grant the permit for Llay Power Plant operated by Biogas Technology Limited.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Structure of this document

- Table of contents
- Key issues

Table of Contents

Contents

Key issues of the decision

1 Our decision

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the permit will ensure that a high level of protection is provided for the environment and human health.

This Application is to operate a regulated facility which is subject principally to the Environmental Permitting Regulations 2016 (EPR), Medium Combustion Plant Directive (MCPD) and Specified Generator (SG) regulations.

The permit contains many conditions taken from our standard Environmental Permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of EPR and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have considered the Application and accepted the details are sufficient and satisfactory to make the standard conditions appropriate. This document should be read in conjunction with the application and supporting information and permit.

2 How we reached our decision

2.1 Receipt of Application

The Application was accepted as duly made on **07/04/2022.** This means we considered it was in the correct form and contained sufficient information for us to begin our determination, but not that it necessarily contained all the information we would need to complete that determination.

The Applicant made no claim for commercial confidentiality. We have not received information in relation to the Application that appears to be confidential in relation to any party.

2.2 Requests for Further Information

In order for us to be able to consider the Application duly made, we needed more information. We requested further information relating to Form B3, Appendix 8 which requires all boxes to be completed as a requirement of the Medium Combustion Plant Directive. More information was also required relating to the Air Quality Assessment including EQS values used for sensitive human and ecological receptors, clarification on the calculations used to produce the Air Quality Assessment results also we requested a copy of the ISO14001 Certificate referred to in the Environmental Management Summary. Upon receipt of this information we were able to consider the application Duly Made.

A copy of the information notice and e-mails requesting further information were placed on our public register as were the responses when received.

3 The Legal Framework

The permit will be granted, under Regulation **13** of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- plant as described by Schedule 25A and Schedule 25B covering the Medium Combustion Plant Directive (MCPD) and Specified Generator (SG) regulations respectively;
- subject to aspects of the Well-Being of Future Generations (Wales) Act 2015 and the Environment (Wales) Act 2016 which also have to be addressed.

We address the legal requirements directly where relevant in the body of this document. NRW is satisfied that this decision is consistent with its general purpose of pursuing the sustainable management of natural resources (SMNR) in relation to Wales, and applying the principles of SMNR. In particular, NRW acknowledges that it is a principle of sustainable management to take action to prevent significant damage to ecosystems. We consider that, in granting the Permit a high level of protection will be delivered for the environment and human health through the operation of the Facility in accordance with the permit conditions. NRW is satisfied that this decision is compatible with its general purpose of pursuing the sustainable management of

natural resources in relation to Wales and applying the principles of sustainable management of natural resources.

Environment Wales Act 2016 – Biodiversity and resilience of ecosystems duty

Section 6 of the Environment Wales Act 2016 requires that we seek to maintain and enhance biodiversity in the exercise of our functions, and in so doing promote the resilience of ecosystems, in a manner that is consistent with the proper exercise of our functions. NRW is satisfied that in this case we have taken into account and had due regard to this duty in so far as it is consistent with the function of determining an application for an EPR permit.

4 The Facility

4.1 Description of the Facility and related issues

4.1.1 The permitted activities

The Facility is subject to the EPR because it carries out an activity as described in Schedule 25A and Schedule 25B of the EPR:

- One combined Tranche B Specified Generator/new Medium Combustion Plant aggregated to <50 MWth at a specified location
- One new Medium Combustion Plant aggregated to <50 MWth at a specified location

A Generator means any combustion plant generating electricity. The regulations use the term ‘specified generator’ to encompass both individual generators and multiple generators at the same location or site, operated by the same Operator and for the same purpose. The “same purpose” means that having a different function does not stop individual generators being treated as part of a specified generator, e.g. generators with a capacity market agreement or providing a balancing service whether they are under the same contract or not would be classed as operating for the “same purpose” as they generate electricity. Similarly generators with different fuels or technologies are also classed as operating for the “same purpose”.

The specified generator permit will apply to the site, rather than its constituent individual generators. All specified generators equal to or more than 1 MWth will also be Medium Combustion Plant (MCP) and must also meet the requirements of the MCP Directive.

Specified Generators are also divided into Tranche A and Tranche B sites, which will determine the relevant permitting date. A site is a Tranche A site if it meets the following criteria:

- It came into operation before 1 December 2016, or
- It is the subject of a capacity agreement arising from the 2014 or 2015 capacity auctions

A generator with a rated thermal input of less than 1MWth will be classed as Tranche A if:

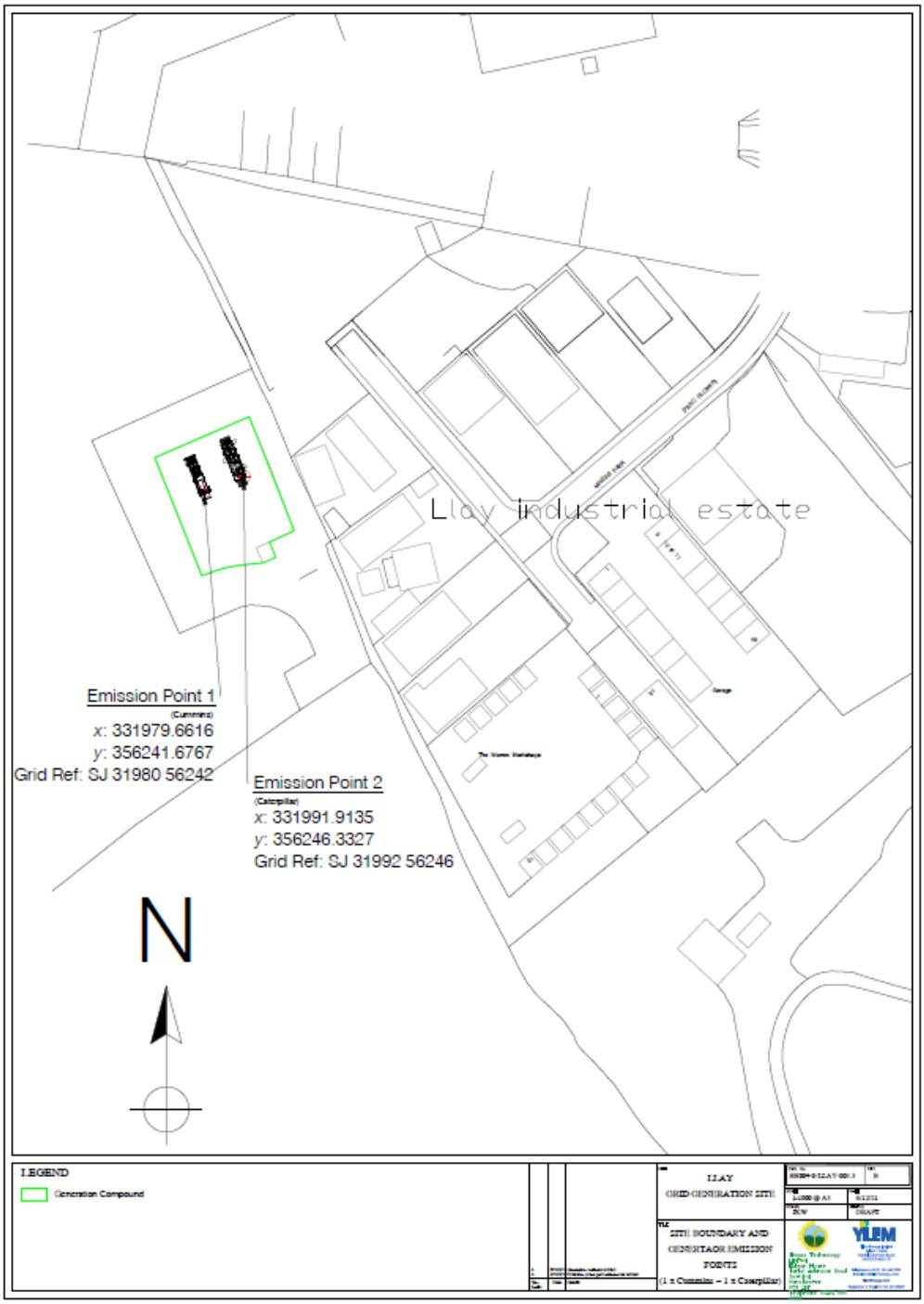
- It is the subject of a capacity agreement arising from the 2014, 2015 or 2016 capacity auctions, or
- A FiT preliminary accreditation application was received by OfGEM before 1 December 2017, or
- Is the subject of an agreement to provide balancing services entered into before 31 October 2017.

Tranche B generators are all those that are not Tranche A.

The plant is classed as a new medium combustion plant as put into operation after 20 December 2018. ‘Put into operation’ means the plant being fired up to its full load with its design fuel.

4.1.2 The Site

Llay Power Plant will be operated by Biogas Technology Limited which is an aggregated 8.7 MWth natural gas fired Peaking Plant located at Llay Hall Farm, Llay, Wrexham, LL12 0PD.



4.1.3 What the Facility does

The Site is operated as a Peaking Plant and is made up of two natural gas fired engines.

- Engine 1 Cummins QSK60G – 1.54 MWe output (approximately 3.6 MWth input),
- Engine 2 CAT 3520 – 2 MWe output (approximately 5.1 MWth input).

The engines together comprise a 'Specified Generator' used for the purpose of generating electricity. The Sites operational hours are determined by the grid balancing requirements. Given the variability of the operational hours it has been assumed that the generators will operate continuously therefore the facility is permitted to operate for a maximum of 8,760 hours per year.

4.1.4 Key Issues in the Determination

Our decision includes but is not limited to the following:

- Air quality – Oxides of Nitrogen (NO and NO2 expressed as NO2)
- Air quality – Carbon monoxide (CO)

This will be discussed separately in this decision document.

4.2 Operation of the Facility – general issues

4.2.1 Administrative issues

The Applicant is the sole Operator of the Facility. We are satisfied that the Applicant is the person who will have control over the operation of the Facility if the Permit were to be granted; and that the Applicant will be able to operate the Facility so as to comply with the conditions included in the Permit, if issued.

Relevant Convictions

NRW's COLINS Database has been checked to ensure that all relevant convictions have been declared. No relevant convictions were found. The operator satisfies the criteria in RGN 5 on Operator Competence.

Financial Provision

There is no known reason to consider that the operator will not be financially able to comply with the permit. The decision was taken in accordance with RGN 5 on Operator Competence.

4.2.2 Management

The Applicant has stated in the Application that they will implement an Environmental Management System (EMS) that will meet the requirements for an EMS in our "*How to comply with your environmental permit guidance*". The Applicant submitted a

summary of the EMS with their application. The applicant has submitted an EMS which is externally certified to ISO14001 under the company name of Ylem Energy Limited which own Biogas Technology Limited.

We are satisfied that appropriate management systems and management structures will be in place for this Facility, and that sufficient resources are available to the Operator to ensure compliance with all the Permit conditions.

4.2.3 Operating techniques

We have reviewed the operating techniques used by the Operator and compared these with the relevant guidance notes. The relevant guidance notes for this plant are:

- Technical Guidance Note (TGN) M5: Monitoring of stack emissions from medium combustion plants and specified generators

Monitoring of point source emissions to air will be carried out in line with the monitoring requirements contained within TGN M5 and will have MCERTS accreditation.

The operator has stated that they will implement the following quality assurance techniques and maintenance schedule, in order to for the generators to achieve and retain optimal performance. In order to enable each generator and the power plant in general to achieve and retain optimal performance in both efficiency and emissions, the plant will engage in the following best available operational management techniques:

- NOx emissions of the engines will not exceed 95 mg/Nm3 (at 15% O2 in dry gas at 0 °C, and 101.325 kPa), meeting the required Emission Limit Value for SG and MCP set by EPR.
- Monitoring and confirmation of compliance with the NO_x and CO Emission Limit Values will be undertaken within 4 months of the date of the permit issue or when the MCP is first put into operation whichever is later then every 3 years/annually thereafter.

We have reviewed the techniques used by the Operator and compared these with the relevant guidance notes. The proposed techniques are in line with benchmark techniques contained within the relevant guidance notes.

As a new Medium Combustion Plant, the site must adhere to the following operating techniques specific for MCP:

- Each MCP must be operated in accordance with the manufacturer's instruction and records must be made and retained to demonstrate this.
- The operator must keep periods of start-up and shut down of each MCP as short as possible.
- There must be no persistent emission of 'dark smoke' as defined in Section 3(1) of the Clean Air Act 1993.

As a Specified Generator, the site must adhere to the following operating techniques specific for Specified Generator:

- Each generator must be operated in accordance with the manufacturer's instructions and records must be made and retained to demonstrate this.
- The operator must keep periods of start-up and shut down of the generators as short as possible
- There must be no persistent emission of 'dark smoke' as defined in section 3(1) of the Clean Air Act 1993.
- Where secondary abatement is required to ensure compliance with the NOx ELV it must be met within 10 minutes from when the generator commences operation or within 20 minutes when the generator was a Tranche A and is now a Tranche B generator.
- The stack must be vertical and unimpeded by cowls or caps.

We have specified the operating techniques and the operator must use the operating techniques specified Tables S1.2 in the permit.

4.2.4 Energy efficiency

The total thermal rated input of the Site is less than 20 MWth, and is not required to meet Schedule 24 of the EPR, which implements the requirements of the EU Energy Efficiency Directive.

However, the Operator will take general measures to improve the energy efficiency as best possible, such as:

- best practices for optimising efficiency will be utilised within the design.
- dry air cooling will be used instead of wet cooled condensers, minimising visual impact (minimal potential for visible plumes) whilst maximising efficiency.
- parasitic load will be reduced by using high efficiency motors and drives.
- components are the ideal size for the proposed operation to ensure they are optimally utilised.
- hot surfaces will be insulated.
- regular maintenance will ensure plant is operating correctly and therefore as efficient as possible.

We are satisfied that the Applicant will ensure that energy is used as efficiently as possible.

5 Minimising the Facility's environmental impact

For this kind of regulated activity, the principal emissions are emissions to air. There are no permit conditions for water, land, odour or noise and BAT does apply but only for emissions to air.

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of air emissions from the Facility on human health and the environment and what measures we are requiring to ensure a high level of protection.

We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory. The assessment shows that, applying the conservative criteria in our guidance on Environmental Risk Assessment, all emissions may be categorised as environmentally insignificant.

We will discuss the operators risk assessment in more detail as follows:

5.1 Assessment of Impact on Air Quality

This section of the decision document deals primarily with the dispersion modelling of emissions to air from the stack(s) and its impact on local air quality.

The Applicant has assessed the Facility's potential emissions to air against the relevant air quality standards, and the potential impact upon human health. These assessments predict the potential effects on local air quality from the Facility's stack emission(s).

The air impact assessments, and the dispersion modelling has been based on the plant operating continuously (up to 8,760 hours per year) at the relevant long-term or short-term emission limit values, i.e. the maximum permitted emission rate.

The Site is not situated near or within 5 km of an Air Quality Management Area (AQMA) or has been identified to be in an area within the Clean Air Plan for Wales.

The air impact assessment included the assessment of the short-term and long-term emissions against the relevant critical level of the following pollutants: NOx. An assumption that 35% NOx to NO_2 conversion for the short-term assessment and 70% for the long-term assessment has been made, this is in accordance with NRW guidance.

A long-term critical level of 40 µg/m^3 (annual) and short-term critical level of 200 µg/m^3 (hourly) was assumed for NOx. At sensitive receptor locations the maximum predicted long-term PC was >1 % and the long-term PEC was <70 % of the long-term critical level. Therefore, in accordance with NRW guidance the long-term impacts from NOx can be considered as insignificant. At sensitive receptor locations the maximum predicted short-term PC was <10 % of the short-term critical level. Therefore, in accordance with NRW guidance the short-term impacts from NOx can be considered insignificant.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary. The way in which the Applicant used dispersion models, its selection of input data, to establish the robustness of the Applicant's air impact assessment. The output from the model has then been used to inform further assessment of health impacts.

Annual Oxides of Nitrogen (NOx) emissions

The applicant has modelled the process contributions (PC) and predicted environmental concentrations (PEC) at a number of sensitive receptor locations. The maximum annual PC at any modelled sensitive receptor is 0.67 µg m^3 representing 2 % of the Environmental Quality Standard (EQS) Limit Value for annual mean NO_2 concentrations (40 µg m^{-3}), therefore in accordance with NRW guidance it could not be screened out as insignificant at this stage as the PC is >1 % of the EQS. The maximum annual PEC at any modelled sensitive receptor is 26 % of the EQS therefore it can be screened out as lot likely to have a significant effect at this stage as the PEC is <70 % of the EQS.

Daily Oxides of Nitrogen (NOx) emissions

The applicant has modelled process contributions (PC) and predicted environmental concentrations (PEC) at a number of sensitive receptor locations. The maximum hourly PC at any modelled receptor is 45.72 µg m^3 representing 23 % of the EQS Limit Value for hourly mean NO_2 concentrations (200 µg m^{-3}), therefore in accordance with NRW guidance it could not be screened out as insignificant at this stage as the PC is >10 % of the EQS. The maximum daily PEC* at any modelled sensitive receptor is 25 % (* PC proportion of the Environmental Quality Standard minus twice the long-term background) of the EQS therefore it can be screened out as lot likely to have a significant effect at this stage as the PEC is <70 % of the EQS.

The results indicate that all receptor locations within the study area there is unlikely to be an exceedance of the relevant air quality standards for annual and hourly NO_2 concentrations and can be considered not significant in line with NRW guidance.

Carbon monoxide (CO)

The applicant has modelled process contributions (PC) and predicted environmental concentrations (PEC) at a number of sensitive receptor locations. The maximum 8-hourly PC at any modelled receptor is 369.23 µg m^3 and represents 4 % of the EQS Limit Value for 8-hourly mean CO concentrations (10,000 µg m^{-3}), therefore in accordance with NRW guidance it could be screened out as insignificant at this stage as PC is <10 % of the EQS.

The results indicate that all receptor locations within the study area there is unlikely to be an exceedance of the relevant air quality standards for 8- hourly CO concentrations and can be considered insignificant in line with NRW guidance.

5.2 Impact on Habitats sites and SSSIs

The Facility is within the relevant screening distance criteria for protected conservation sites. A full assessment of the application and its potential to affect any of the sites has been carried out as part of the permit determination process. Natura 2000/Ramsar sites and SSSIs will be discussed in detail separately below.

5.3 Natura 2000/Ramsar sites

The following Natura 2000/Ramsar sites are located within 5 km of the installation:

- Ramsar Midland Meres & Mosses Phase 2 (Wales & England)

There has been pre-application discussion with NRW conservation/ecology team to highlight that the applicant had used a substitute site for the Ramsar Midland Meres & Mosses Phase 2 (Wales & England) in the absence of missing Critical Level and Critical Load data on APIS. This approach was accepted to be sound in the absence of missing APIS data, the Site Critical Levels and Load for the fen feature at Vicarage Moss SSSI was used to substitute which in turn corresponds with the Ramsar feature.

An OGN 200 Form 1 (Habitats Regulation Assessment) was not deemed necessary to be completed as the only Nature 2000/Ramsar Site that was expected to be impacted by the Installation has been substituted and by a SSSI. Instead, Vicarages Moss SSSI has been assessed within the Appendix 4 Assessment.

SSSI Assessment

The following Sites of Special Scientific Interest (SSSI) are located within 2 km of the installation:

- *SSSI Llay Bog*
- *SSSI Vicarage Moss – in the absence of APIS information on Ramsar Midland Mere & Mosses Phase 2 (Wales & England)*

An Appendix 4 Form was completed to assess the potential to affect the SSSI site, this is available to view on the public register. The assessment concluded the facility is not likely to damage any of the features of the SSSI site. A copy of this assessment can be found saved to the public register.

6 Setting ELVs and other Permit conditions

We have decided that emission limits should be set for the parameters listed in the permit. Emissions Limit Values (ELVs) are in line with those set out in the MCP Directive and EPR Schedule 25B Regulations.

6.1 Monitoring

We have decided that monitoring should be carried out for the parameters listed in Schedule 3 of the permit using the methods and to the frequencies specified in those tables. These monitoring requirements have been imposed in order to demonstrate compliance with the emissions limits in the permit, as per the ELV and monitoring frequency requirements specified within the MCP Directive and EPR Schedule 25B Regulations.

For a combined Tranche B Specified Generator/new Medium Combustion Plant, that is an engine fuelled on natural gas, the monitoring requirements are as follows:

Pollutant	**Type of Specified Generator**	**Fuel Type**	**Emission Limit Value (mg/Nm^3)**	**Monitoring Required**
NOx	Gas engine	Natural Gas	95*	Periodic – every 3 years
CO			No limit set	

*380 mg/Nm3 for dual fuel engines in gas mode.

Emission limit values are defined at a temperature of 273.15 K, a pressure of 101.3 kPa and after correction for the water vapour content of the waste gases and at a standardised O_2 content of 15 % for engines and gas turbines.

For emissions to air, the methods for continuous and periodic monitoring are in accordance with the Environment Agency's Technical Guidance Note M5 for monitoring of stack gas emissions from medium combustion plants and specified generators.

Based on the information in the Application and the requirements set in the conditions of the permit we are satisfied that the monitoring techniques, personnel and equipment employed by the Operator will have either MCERTS certification or MCERTS accreditation as appropriate.

6.2 Reporting

We have specified the reporting requirements in Schedule 4 of the Permit to ensure data is reported to enable timely review by Natural Resources Wales to ensure compliance with permit conditions.

7 MCPD/SG Charges and Subsistence Fees

The type of application regarding MCPD and SG will have an associated charge. The MCPD/SG application type and number of plant will also form the basis for ongoing subsistence fees. More information on this can be found in our charging scheme on our website.