



**APPLICATION FOR AN ENVIRONMENTAL PERMIT
UNDER THE ENVIRONMENTAL PERMITTING
(ENGLAND AND WALES) REGULATIONS 2016 (AS
AMENDED)**

**ENVIRONMENTAL PERMITTING TECHNICAL
REQUIREMENTS DOCUMENT**

centrica

**CENTRICA DISTRIBUTED GENERATION LIMITED,
PENCOED PEAKING POWER PLANT, LAND TO
THE NORTH OF FELINDRE ROAD, PENCOED,
BRIDGEND, SS 96841 81372**

**ECL Ref: CENT.31.02/EPTR
Date: January 2025
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LIST OF ABBREVIATIONS/ACRONYMS

ADM	Air Dispersion Modelling
BAT	Best Available Techniques
BRef	BAT Reference Document
Centrica	Centrica Distributed Generation Limited
CO	Carbon Monoxide
ECL	Environmental Compliance Limited
ELV	Emission Limit Value
EMS	Environmental Management System
EP	Environmental Permit
ERA	Environmental Risk Assessment
GP	Gas Peaker
IED	Industrial Emissions Directive
LCP	Large Combustion Plant
MCP	Medium Combustion Plant
MCPD	Medium Combustion Plant Directive
NIA	Noise Impact Assessment
NO₂	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NRW	Natural Resources Wales
NTS	Non-Technical Summary
PPMR	Planned Preventative Maintenance Regime
SCR	Site Condition Report
SG	Specified Generator
The Installation	Pencoed Peaking Power Plant

1. INTRODUCTION

1.1. Project Overview

1.1.1. This Application (and its associated supporting documentation) has been prepared on behalf of Centrica Distributed Generation Limited (“Centrica”) by Environmental Compliance Limited (“ECL”) and relates to the application for an Environmental Permit (“EP”) to operate nine new Medium Combustion Plant (“MCP”) and Specified Generators (“SG”) at Pencoed Peaking Power Plant (“the Installation”).

1.1.2. The power plant will comprise nine natural gas fuelled MCP/SGs (also referred to a gas peakers (“GPs”)) and associated infrastructure, with the emission points to air consisting of nine independent flues. Each GP is circa 10.39 MWth, with the combined maximum rated thermal input of all nine GPs approximately 93.5 MWth. The GPs will be containerised engines and located on a concrete plinth.

1.1.3. The purpose of the Installation is to generate electrical energy, which can be stored and fed to the National Grid, as and when required. Presently the site occupies greenfield land. The anticipated operational period of the scheme is 25 years, after which the equipment will be removed, and the site then used for other purposes.

1.1.4. Following discussions with Natural Resources Wales (“NRW”) via Pre-Application Advice, it is understood the site will be designated a Part A1 Installation and would be regulated under the Environmental Permitting (England and Wales) Regulations 2016 (as amended), Schedule 1, Part 2, Chapter 1, Section 1.1, Part A(1).

1.1.5. In addition to this Environmental Permitting Technical Requirements document, the following reports and accompanying information have been submitted to support the permit application:

- NRW application forms A, B2, B3 and F1;
- Non-Technical Summary (“NTS”);
- Environmental Risk Assessment (“ERA”) and supporting information;
- Air Dispersion Modelling (“ADM”) report;
- Site Condition Report (“SCR”); and
- Noise Impact Assessment (“NIA”).

1.2. Company Details

1.2.1. Details of the Company Directors are provided in Table 1.

Table 1: Director Details

First Name(s)	Last Name	Date of Birth	Position
John Thomas	Park	02/02/1974	Company Director
James Michael	Dickinson	12/06/1980	Company Director

2. ABOUT THE INSTALLATION

2.1. Installation Activities

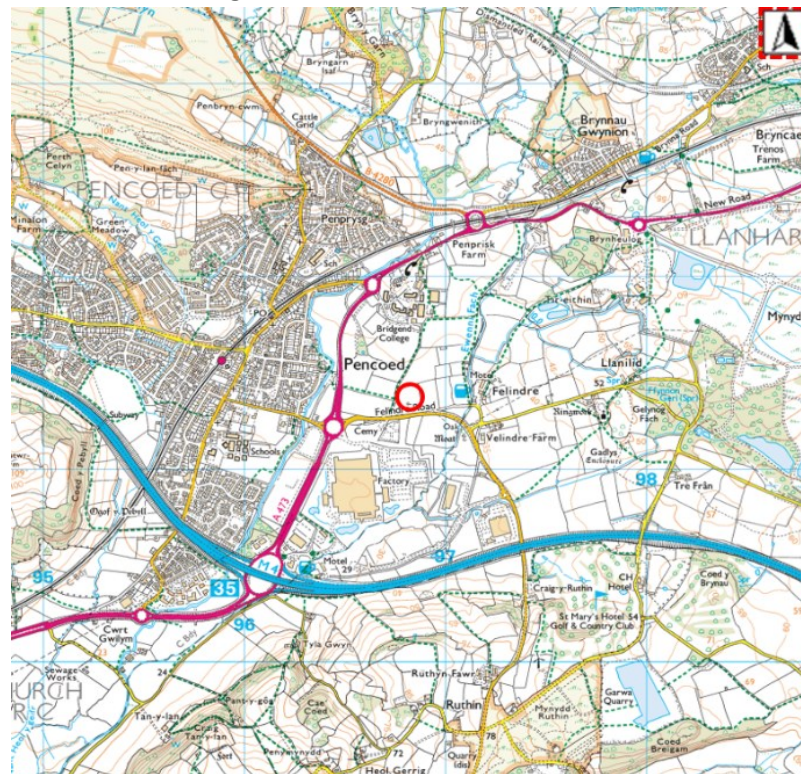
- 2.1.1. The proposed activity falls under the Environmental Permitting (England and Wales) Regulations 2016 (as amended), Schedule 1, Part 2, Chapter 1, Section 1.1, Part A(1)(a): *‘Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts.’*
- 2.1.2. It is stated, for the purpose of Part A(1): *‘where two or more appliances with an aggregate rated thermal input of 50 or more megawatts are operated on the same site by the same operator, those appliances must be treated as a single appliance with a rated thermal input of 50 or more megawatts.’*
- 2.1.3. In accordance with the definition of Large Combustion Plant (“LCP”) stated in Chapter III of the Industrial Emissions Directive (“IED”), as combustion plants with a rated thermal input below 15 MW should not be considered under aggregation rules, the proposed activity is covered by the Chapter II requirements of the IED and the Medium Combustion Plant Directive (“MCPD”).
- 2.1.4. The anticipated maximum annual operational hours of each appliance will be 1,500 hours.

2.2. Installation Location

- 2.2.1. The full site address is Pencoed Peaking Power Plant, Land to the north of Felindre Road, Pencoed, Bridgend, SS 96841 81372. The Installation is located within Bridgend County Borough Council.
- 2.2.2. Figure 1 demonstrates the indicative site location (encircled in red) within the wider site setting. The drawing showing the EP boundary (CENT.31.02/DW1)¹ may be found as part of the Site Layout Plan in Appendix I.

¹ This drawing has been submitted for illustrative purposes. An amended final version will be submitted as soon as the site have confirmed the site boundary and the access arrangements, pending feedback from the Local Planning Authority.

Figure 1: Indicative Site Location



- 2.2.3. The immediate surroundings include agricultural, commercial, and residential settings. The more populous residential area of Pen-coed is located approximately 0.56km to the west of the Installation and the small hamlet of Llandid is sited circa 0.61km to the east of the Installation.
- 2.2.4. The nearest major watercourses are the River Ewenny and Ewenny Fach, which are located approximately 0.42km and 0.29km to the west and east of the Installation, respectively. Other surface water bodies near the Installation include a series of streams and ponds. The A473 and M4 main road networks are located approximately 0.42km west and approximately 0.92km south, respectively, of the Installation.

2.3. Directly Associated Activities

- 2.3.1. There are no proposed directly associated activities.

3. ATMOSPHERIC DISPERSION MODELLING REPORT

3.1. Introduction

- 3.1.1. The ADM report (report reference: CENT.31.01/ADM, Issue 2, January 2024) undertaken for the Installation has been submitted in support of this application.
- 3.1.2. The findings of the ADM report demonstrated oxides of nitrogen (“NO_x”) and carbon monoxide (“CO”) process contributions, from the operation of the nine GPs, would not lead to any exceedances of the standards set for the protection of human or environmental health at the receptor locations assessed.

4. MANAGEMENT TECHNIQUES

4.1. Overview of the Centrica Management System Arrangements

4.1.1. Centrica currently possess an externally certified ISO 14001 Environmental Management System (“EMS”) for a number of their existing sites (a copy of the EMS certificate is provided in Appendix II). The EMS will be expanded to incorporate the Installation.

4.2. Overview of the Environmental Management System

4.2.1. The Installation’s EMS will address environmental aspects of the activities at the Installation. The EMS will be based on the requirements of the international EMS standard BS EN ISO 14001 and will adopt the Standard’s Plan, Do, Check, Act approach.

4.2.2. Documented procedures will be developed which will:

- ensure compliance with all relevant legislation;
- ensure compliance with the Environmental Permit;
- identify, assesses and minimises the risks of pollution arising from the Installation’s activities;
- comprise a range of written procedures that cover all aspects of the Installation’s activities;
- identify, sets, monitors and reviews environmental objectives and key performance indicators; and
- include a requirement to report annually on environmental performance, objectives, targets and future planned improvements.

4.2.3. The procedures will be proportionate to the scale of the Installation.

4.2.4. The Head of Large Asset Operations will have overall responsibility for the operation of the Installation and all environmental matters.

4.3. Details of the Environmental Management System

Plan

4.3.1. The planning element of the EMS will include:

- identification of environmental impacts and aspects associated with the Installation’s activities, and assessing their significance; including an assessment of the potential environmental risks posed by the work of contractors;
- identification and evaluation of relevant legal and other relevant requirements;
- identification of environmental objectives and targets that will be focussed on reducing the impact of the identified significant environmental aspects;
- a series of risk assessments to cover a range of issues, including site operations, maintenance, accidents, training, and records; and
- details of how Centrica ensure that any relevant standards, guidance, and codes of practice are met on an ongoing basis; and

- a Site Closure Plan to demonstrate how the Installation can be decommissioned in its current state to avoid any pollution risk and return the site of operation to a satisfactory state.

4.3.2. The outcomes of the above are:

- a comprehensive understanding of the potential and actual impacts of the permitted activities on the surrounding environment and people's health;
- the correct appropriate measures selected to manage environmental risks and prevent or minimise their effects so as not to cause pollution;
- a series of documented procedures covering all aspects of the Installation's activities; and
- a series of documented environmental objectives and targets, together with an action plan/development programme to ensure that these are met.

Implementation and Operation (Do)

4.3.3. This element will include:

- ensuring that EMS roles and responsibilities are clearly defined and documented, and that site staff are made aware of these;
- ensuring that the Installation is operated by suitably competent staff who have received the necessary training in all aspects of the plant's operation, including where contractors are used, ensuring that they are suitably competent; in this regard:
 - the skills and competencies necessary for key posts are documented; these key posts include contractors, those responsible for liaising with contractors and those purchasing equipment and materials,
 - training requirements are identified by means of a documented training needs analysis,
 - documented training records are kept and updated as required,
 - training specifically addressee's environmental awareness and environmental permit requirements, and
 - the requirement for ongoing/refresher training is identified;
- ensuring that there are site layout plans - including drainage plans - and that they are revised as required to reflect any changes at the Installation;
- ensuring that there are documented procedures covering internal and external communications;
- ensuring that there are procedures in place for staff and contractors to have access to the Installation's permit and management system requirements; with regard to contractors, ensuring that suitable instructions are provided with regard to protecting the environment whilst working on site;
- the establishment of a documented planned preventative maintenance regime ("PPMR") to ensure that all plant and site infrastructure are kept in suitable condition and operating effectively; this PPMR programme details what maintenance, tests and inspections need to be done and when; this also details the measures required to ensure continuing compliance with the permit conditions during maintenance/shutdown.

- The PPMR also:
 - identifies known or predictable malfunctions associated with the operations and the procedures, spare parts, tools and expertise required to deal with them,
 - includes a record of spare parts held, or details on where they can be sourced from, together with an assessment of how long they would take to obtain,
 - includes a defined procedure for identifying, reviewing and prioritising items of plant for which a preventative regime is appropriate,
 - includes equipment or plant whose failure could directly or indirectly lead to an impact on the environment or human health and 'non-productive' items,
 - ensure the necessary spare parts, tools, and competent staff are available prior to commencing maintenance;
- ensuring that there are documented procedures covering document control;
- ensuring that there are suitable documented record-keeping arrangements in place;
- ensuring that there are documented operational procedures and work instructions covering all aspects of the operation;
- ensuring that there are documented procedures that incorporate environmental issues into the control of process/equipment change, capital approval and purchasing policy;
- ensuring that there are documented procedures to address non-conformities/non-compliances and the associated corrective and preventative action; these will detail how any such non-conformities/non-compliances are reported to management and the means by which they are reported to NRW.
- ensuring that there is a documented procedure for dealing with complaints; this includes requirements to ensure that:
 - an appropriate person deals with the complaint,
 - the complaint is properly recorded,
 - the complaint is properly investigated,
 - any action necessary to deal with the cause of the complaint is recorded,
 - the impact of the activity causing the problem is minimised,
 - steps are taken to ensure that the problem is not repeated,
 - details of any justified complaints are reported to senior management,
 - that the complainant (or NRW, as appropriate) is responded to in writing,
 - if the complaint came via NRW, a suitable documented response is provided to NRW,
 - if the complaint has come from a neighbour or a member of the public, a suitable documented response is provided to the complainant, and, if the complaint is substantiated, a report is provided to NRW, and
 - the EMS is amended accordingly to reflect any changes;
- ensuring that there are documented procedures covering emergency preparedness and response; these will cover such incidents as major plant failures, significant spillages of potentially polluting substances, loss of mains electrical power etc.; these will be incorporated into an Accident Management

Plan; Centrica ensure that suitable measures are in place to communicate the Plan to all employees, management and contractors who work at the site; the Plan details:

- the arrangements for response to an emergency, including defining specific responsibilities,
 - the measures for dealing with the consequences of an incident,
 - communicating with NRW and other relevant regulatory bodies,
 - communicating with the Installation's neighbours and the local community,
 - the measures for investigating incidents (and near-misses), including identifying suitable corrective action and following up implementation of that action,
 - the measures for recording incidents (and near-misses),
 - the measures for reporting incidents (and near misses) to Senior Management, and
 - the measures for reporting incidents to NRW;
- ensuring that there are documented procedures for carrying out internal audits; these describe how to schedule, conduct, report and manage internal audits;
 - ensuring that there is a documented contingency plan in place that:
 - ensures compliance is maintained with all permit conditions and operating procedures during maintenance/shutdown at the Installation or elsewhere,
 - ensures that permitted storage limits are not exceeded and appropriate measures for waste storage and handling continue to be applied, and
 - includes ceasing the acceptance of waste unless a clearly defined method of recovery or disposal has been determined and sufficient permitted storage capacity is available.

4.3.4. The outcome of the above is evidence that day-to-day activities are taking place in accordance with the requirements of the EMS and the Installation's permit, specifically:

- that control measures and procedures are an integral part of the business operation;
- that the EMS is easy for staff to access, understand and use;
- that staff are suitably trained and competent to carry out procedures and control measures; and
- that the requirements of the EMS are effectively communicated to management, staff and contractors.

Check

4.3.5. This element includes:

- ensuring that all regulatory requirements in relation to monitoring and measurement are complied with, specifically:
 - the requirements relating to inspection and testing required under Environmental Permit and the associated procedures / work instructions,
 - the requirements relating to inspection and testing required under the

- applicable health and safety legislation and the associated procedures, the requirements relating to the control of all inspection, measuring and test equipment relating to environmental requirements;
- on-going evaluation of compliance with environmental legal requirements, policy requirements and objectives and targets. Evaluation includes annual review of the legal register, regular site inspections and internal audit procedures;
- ensuring that non-conformities are recorded, investigated and appropriate corrective action is taken by the due date;
- ensuring that the necessary compliance is maintained including reporting and record-keeping required under the Environmental Permit;
- ensuring that internal audits are carried out in accordance with the documented procedures and that any audit actions are followed up; and
- ensuring that the results of all audits are made available to Senior Management.

4.3.6. The outcomes of the above will be:

- that checks are carried out to ensure that the EMS is being implemented as intended; and
- the necessary preventative and corrective actions are undertaken to minimise non-compliances.

Review (Act)

4.3.7. This element will include:

- an annual management review of the EMS to ensure that it is appropriate, fully implemented and current;
- a management review of the EMS when:
 - there are changes on site (in activities and/or plant/equipment),
 - if there is an accident, complaint or breach of permit conditions.
- an annual review of both individual and organisational training needs;
- ensuring that all changes to the EMS are properly recorded;
- an assessment of whether the objectives, and any targets, have been met and reported;
- a review of the objectives and targets, and, where appropriate, any revisions to these so as to effect continual improvement.

4.3.8. The outcomes of the above will be:

- the EMS is kept up to date, and
- the EMS is continually improved.

5. EMISSIONS AND MONITORING

5.1. Point Source Emissions to Air

5.1.1. The proposed emission point arrangement for the Installation will be nine separate flues (one for each GP); this is shown on the Site Layout Plan in Appendix I.

5.1.2. Monitoring for the emissions to air arising from the nine proposed GPs will be carried out to MCERTS certification and accreditation, as outlined by the requirements in Table 2.

Table 2: Emissions Monitoring Requirements for the Proposed GPs

Parameter	Expected limit	Reference period	Monitoring standard or method
NO _x as NO ₂	95 mg/Nm ³ ^(a)	Periodic (average over one hour)	MCERTS BS EN 14792
CO	No limits defined		MCERTS BS EN 15058

Notes to Table 2

(a) As outlined in Table 2 of Part 2 of Annex II of the MCPD for new engines and gas turbines fuelled by natural gas. Monitoring requirements to be given at standard temperature and pressure (i.e., 273.15 K, 101.3 kPa) and 15% oxygen reference for engines and gas turbines.

5.1.3. NRW's Technical Guidance Note M1 (Monitoring) *Sampling requirements for stack emissions monitoring*² will be used to inform the periodic emissions monitoring surveys. The guidance describes the requirements for sample locations and facilities for measuring flow, particulates and gas concentrations of stack gas emissions.

5.1.4. The M1 Guidance states that for sampling gas concentrations, the access and facilities requirements are usually less demanding. When gas concentrations only are to be monitored, smaller access ports than those specified for particulates may be possible.

5.1.5. Consequently, as stack gas sampling only is required for the proposed Installation, it is considered acceptable to sample from a location close to each GP where the gases are well mixed (for example, a downstream location close to the combustion zone where it is assumed the gases will be homogenous).

5.1.6. Emissions monitoring for the nine GPs will therefore be carried out in accordance with the applicable guidance. Monitoring will also not take place during periods of start up or shut down and will be carried out at the frequency specified by NRW.

5.2. Emissions to Water

5.2.1. There are no proposed emissions to water.

² Available online via: <https://naturalresources.wales/media/2144/technical-guidance-note-m1-monitoring-sampling-requirements-for-stack-emission-monitoring-saesneg-yn-unig.pdf>, accessed February 2024

5.3. Emissions to Sewer

5.3.1. There are no proposed emissions to sewer.

5.4. Emissions to Land

5.4.1. There are no proposed emissions to land.

5.5. Fugitive Emissions to Air

5.5.1. There will be no proposed fugitive emissions to air. Please refer to the ERA (CENT.31.02/ERA) for detailed control measures.

5.6. Fugitive Emissions to Surface Water, Sewer and Groundwater

5.6.1. Fugitive releases to land and groundwater will be prevented by conducting all operations in areas sealed with an impervious barrier to prevent a pathway for migration to land and groundwater. Consequently, no further assessment has been undertaken. Please refer to the Environmental Risk Assessment (CENT.31.02/ERA) for detailed control measures.

5.7. Noise Emissions

5.7.1. The engines will be housed within purpose-built 200mm thick concrete enclosures. Furthermore, the exhausts from the engines along with inlet and outlet ventilation systems will be acoustically attenuated.

5.7.2. All plant and equipment are inspected and maintained as per manufacture specifications and operating manuals.

5.7.3. Additionally, all site personnel are trained in the identification and reporting of abnormal noise emissions.

5.7.4. A NIA has been undertaken for the Installation by inacoustic and a copy of their report has been provided as Appendix III (report reference: 24-600 Pencoed STOR, Bridgend - Noise Impact Assessment for Permitting). The assessment methodology contained in British Standard 4142:2014+A1:2019 *Method for rating and assessing industrial and commercial sound* has been used. The assessment identifies that the Installation will give rise to rating sound levels that do not exceed the measured background sound level in the area, thus giving rise to a 'Low Impact'.

6. RESOURCE EFFICIENCY

6.1. Raw Materials and Waste Production

6.1.1. As the proposed Installation will be fuelled solely by natural gas, the raw materials that will be used, and the subsequent waste, at the Installation will be limited to engine lubrication oil. This lubrication oil will be held on-site in two 110% bunded tanks - with one tank for the clean oil and one tank for the used oil; details of the tanks are found in Table 3.

Table 3: Storage Tank Specifications

Tank Contents	Capacity (litres)	Internal Dimensions (L x W x H) (metres)	External Dimensions (L x W x H) (metres)
Clean Oil Storage Tank	10,000	2.6 x 1.9 x 1.95	3.45 x 2 x 2
Waste Oil Storage Tank	10,000	2.6 x 1.9 x 1.95	3.45 x 2 x 2

6.1.2. The material use and waste production are continually monitored, and performance evaluated as part of the EMS. The use of any raw materials with improved environmental profiles will be investigated and suitability for use considered annually.

6.2. Energy Efficiency and Sustainability Measures

6.2.1. Schedule 24 of the Environmental Permitting (England and Wales) Regulations 2016 (as amended), *Efficiency in heating and cooling energy: Energy Efficiency Directive*, states under sub-paragraph (1) of Section 2 (*Electricity generating installations*):

- (1) *“An application for the grant of an environmental permit under regulation 13(1) for a relevant installation which generates electricity must contain a cost-benefit analysis which assesses the cost and benefits of providing for the operation of the installation as a high-efficiency cogeneration installation.”*

However, sub-paragraphs (4) and (5) of Section 2 (*Electricity generating installations*) of Schedule 24 state:

- (4) *“The requirement for a cost-benefit analysis in sub-paragraph (1) or (3) does not apply to peak load and back-up electricity generating relevant installations for which the application for the grant or a variation of an environmental permit states that operation under 1,500 operating hours per year as a rolling average over a period of 5 years is planned.”*
- (5) *“In the case of a relevant installation to which sub-paragraph (4) applies, the regulator must ensure that, if an environmental permit is granted or varied, it includes conditions ensuring that the operating hours for the installation remain within that constraint.”*

-
- 6.2.2. As each of the nine GPs will only operate for up to 1,500 hours per year, a cost benefit analysis for the Installation is therefore not required.
- 6.2.3. As part of the equipment selection and design, energy efficiency has been considered, such as the use of energy efficient equipment, valves and controls for the reduction of heat losses.
- 6.2.4. The purpose of the Installation is to provide electrical power to the National Grid - the maximum export capacity will be 40MW (once the site auxiliary loads have been accounted for).
- 6.2.5. Moreover, as part of the Installation's EMS, ongoing energy performance will be monitored and assessed against targets in order to improve energy efficiency and minimise any losses.
- 6.2.6. In addition, Centrica have set a commitment to net zero across all its services by 2045 and reduce their carbon footprint by 40% by 2034.

7. BEST AVAILABLE TECHNIQUES ASSESSMENT

7.1. Sector Best Available Techniques

7.1.1. In addition to NRW and MCPD guidance, the Sector Best Available Techniques (“BAT”) must also be considered regarding the proposed Installation. There are several BAT Reference Documents (“Brefs”) which are relevant, and these are discussed in the following sections.

LCP Bref – Large Combustion Plant

7.1.2. The LCP Bref addresses combustion installations with a rated thermal input exceeding 50 MW, either in isolation or when factoring in the relevant aggregation rules. The scope includes the whole range of activities that may be found in European installations.

7.1.3. Further to pre-application discussions with NRW (see CENT.31.02/NRW Correspondence), whilst combustion plants with a rated thermal input below 15 MW should not be considered under aggregation rules (i.e., in accordance with the definition of LCP stated in Chapter III of the IED), in such instances NRW still use the principles of the LCP Bref as the technical standard in which they assess against. Consequently, this guidance will be used to help inform the EP application.

ENE Bref – Energy Efficiency

7.1.4. The ENE Bref addresses energy efficiency improvement in industrial installations by giving generic guidance on how to approach, assess, implement, and deal with energy efficiency related issues along with corresponding permit and supervising procedures. This Bref will cover the Installation activities involved.

7.2. Comparison with Indicative BAT

7.2.1. It is considered that the techniques that will be in use, in relation to the operation of the proposed GPs, will be appropriate and proportionate for the scale of the activities and the risks that are posed to the environment by these activities.

7.2.2. The BAT requirements have been taken from the LCP Bref and the ENE Bref. A demonstration of compliance with indicative BAT applicable to the operation of the proposed GPs has been extracted and is summarised in Table 4.

7.2.3. In relation to the assessment of BAT for emissions and monitoring, BAT conclusions for Large Combustion Plant from the LCP Bref have been considered and a summary is provided in Table 5.

7.2.4. The BAT energy efficiency techniques outlined in the LCP Bref have also been considered and a summary is provided in Table 6.

Table 4: Managing your Activities: General BAT Requirements

Section	Indicative BAT– extracted and summarised in relation to the proposed Installation	Section of EPTR Document
Environmental Management Systems (BAT 1 - Section 10.1.1 of the LCP Bref)	To improve the overall environmental performance, BAT is to implement and adhere to an EMS that incorporates the relevant features outlined in BAT 1 and identifies and manages relevant emissions arising from the operations.	Section 4 – Management Section 5 – Emissions and Monitoring

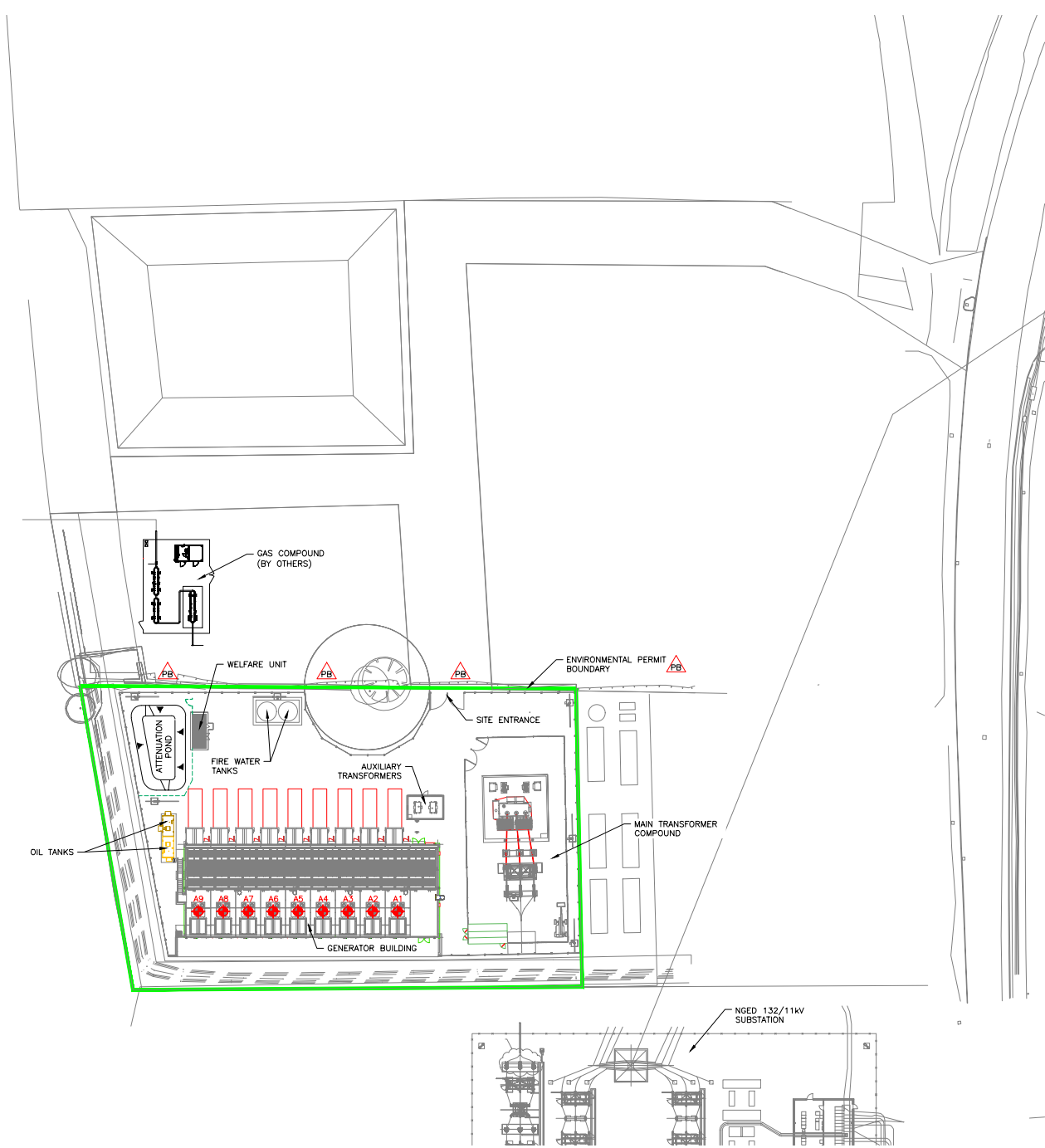
Table 5: Emissions BAT Requirements

Section	Indicative BAT– extracted and summarised in relation to the proposed Installation	Section of EPTR Document
NO _x and CO emissions (BAT 43 and BAT 44 of Section 10.4.1.2 of the LCP Bref and Section 10.8.3 of the LCP Bref)	<p>In order to prevent or reduce NO_x emissions to air from the combustion of natural gas in engines, BAT 43 is to use one or a combination of techniques, inclusive of the following:</p> <ul style="list-style-type: none"> • advanced control systems (air staging, for example (i.e., the creation of several combustion zones with varying oxygen contents in the combustion chamber)); • combustion optimisation (exhaust gas recirculation, for example); • lean-burn concept; and • selective catalytic reduction. <p>In order to prevent or reduce CO emissions to air from the combustion of natural gas, BAT 44 is to ensure optimised combustion and / or use oxidation catalysts.</p>	Section 4 – Management Section 5.1 – Point Source Emissions to Air

Table 6: Energy Efficiency BAT Requirements

Section	Indicative BAT – extracted and summarised in relation to the proposed Installation	Section of EPTR Document
Energy Efficiency (BAT 40 - Section 10.4.1.1 and 10.8.2 of the LCP Bref and Section 4.2 and 4.3 of the ENE Bref)	<p>To increase energy efficiency, energy efficiency techniques should include, but are not limited to:</p> <ul style="list-style-type: none"> • calculating energy consumption, assessing capabilities for energy recovery, the use of advanced control systems, combustion optimisation and monitoring and safeguarding the optimised situation for energy consumption. 	Section 6 Section 6.1 – Raw Materials and Waste Production Section 6.2 – Energy Efficiency and Sustainability Measures



**APPENDIX I
SITE LAYOUT PLAN**



NOTES

1. FOR LATEST DETAILS OF SITE LAYOUT REFER TO DRAWING No. C5359-GA-103.

LEGEND

-  EMISSION POINT
-  ENVIRONMENTAL PERMIT BOUNDARY

PRELIMINARY ISSUE


NOT FOR CONSTRUCTION
ISSUED FOR INFORMATION ONLY

PB	BOUNDARY REVISED	Lmc	N/A	JF	TA	10.01.25
PA	FOR INFORMATION	Lmc	N/A	IS	TA	12.12.24
REV	AMENDMENT	BY:	E.CHAKRABARTI	APP.	DATE	

KEY TO FIRST LETTER OF DRAWING ISSUE:
 'B' = AS-BUILT ISSUE FABRICATION/BUILD ONLY
 'X' = CONSTRUCTION ISSUE TO BE UNDERTAKEN AT
 'P' = PRELIMINARY ISSUE CONSTRUCTION ISSUE
 'T' = TENDER ISSUE



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TITLE	GENERAL SITE PLAN SHOWING ENVIRONMENTAL PERMIT BOUNDARY		
CLIENT	CENTRICA DISTRIBUTED GENERATION LIMITED		
SITE	PENCOED		
	PAPER SIZE: A1	SCALE: 1:400	DATE DRAWN: 09.12.24
DRAWN BY: L.MCGOWAN	ISSUE: PB	DRAWING NO. C5359-GA-006	

SITE PLAN

THIS ASSEMBLY OR PART MUST COMPLY WITH KOHLER SPECIFICATION *PEP-RML-001 RESTRICTED MATERIAL LIST*

APPENDIX II
ENVIRONMENTAL MANAGEMENT SYSTEM CERTIFICATE



MANAGEMENT SYSTEM CERTIFICATE

Certificate no.:
246955-2017-AE-GBR-UKAS

Initial certification date:
27 September 2017

Valid:
28 September 2023 – 27 September 2026

This is to certify that the management system of

Centrica Energy Assets

Centrica Brigg Power Station, Scawby Brook, Brigg, DN20 9LT, United Kingdom
and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard:
ISO 14001:2015

This certificate is valid for the following scope:

**The management and operation of power plants, battery and energy storage systems
within the Centrica Energy Assets portfolio.**

Place and date:
London, 21 July 2023

For the issuing office:
DNV - Business Assurance
4th Floor, Vivo Building, 30 Stamford Street,
London, SE1 9LQ, United Kingdom



0013



Doug Milne
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DNV Business Assurance UK Limited, 4th Floor, Vivo Building, 30 Stamford Street, London, SE1 9LQ, United Kingdom - TEL: +44(0) 203 816 4000.
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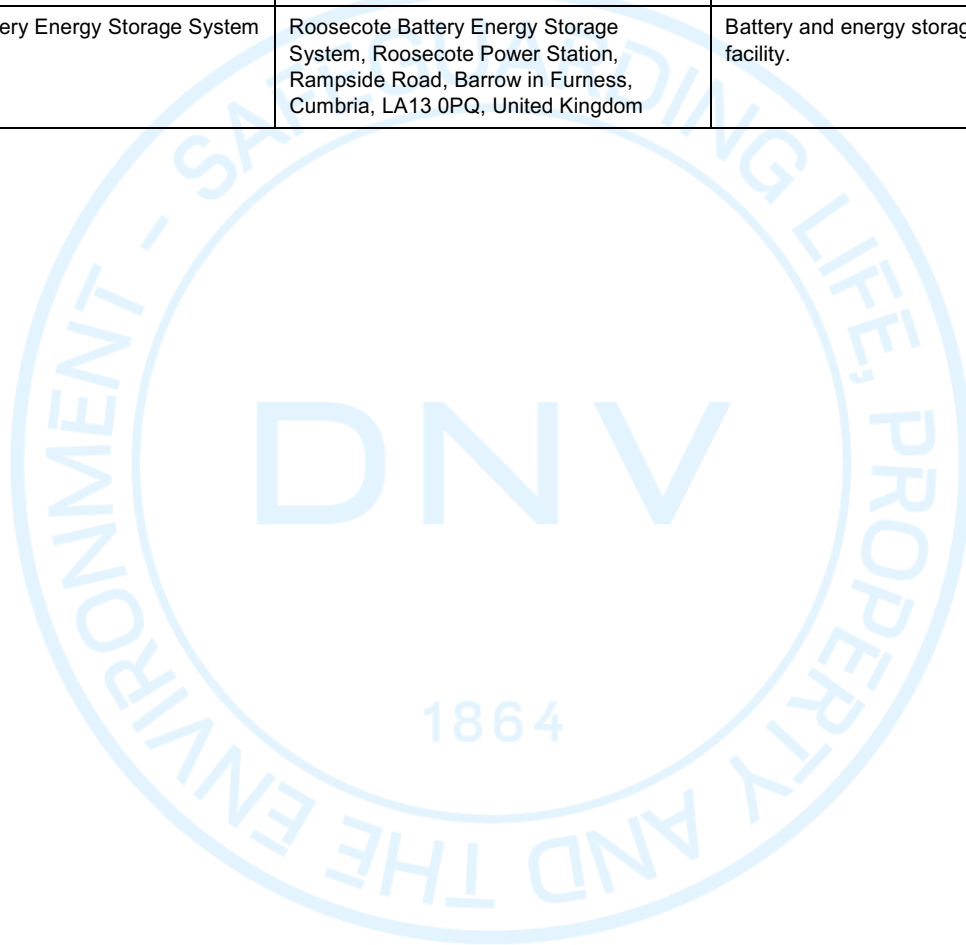
Certificate no.: 246955-2017-AE-GBR-UKAS
Place and date: London, 21 July 2023

Appendix to Certificate

Centrica Energy Assets

Locations included in the certification are as follows:

Site Name	Site Address	Site Scope
Centrica Energy Assets	Centrica Brigg Power Station, Scawby Brook, Brigg, DN20 9LT, United Kingdom	Power station.
Rosecote Battery Energy Storage System	Rosecote Battery Energy Storage System, Rosecote Power Station, Rampside Road, Barrow in Furness, Cumbria, LA13 0PQ, United Kingdom	Battery and energy storage systems facility.



Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

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**APPENDIX III
NOISE IMPACT ASSESSMENT**



Land North of Felindre Road – Peaking Power Generation
Plant, Pencoed

Noise Impact Assessment for NRW Permit Application

7th January 2025

inacoustic | **bristol**

Caswell Park, Caswell Lane, Clapton-in-Gordano, Bristol, BS20 7RT

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Version	Comments	Date	Authored By	Checked By	Project Number
1	Noise Impact Assessment for NRW	07/01/2025	Neil Morgan MSc MIOA	Victor Valeron BEng MSc MIOA	24-600

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The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. If additional information becomes available which may affect our comments, conclusions or recommendations, the author reserves the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to assess the impact of potential noise arising from a consented Peaking Power Generation Plant on Land North of Felindre Road, Pencoed.

This report details the existing background sound climate at the nearest noise-sensitive receptors, as well as the potential sound emissions associated with the Consented Development.

The assessment considers the potential noise generation from the plant associated with the Proposed Development, with respect to existing sound levels in the area. The assessment methodology contained in British Standard 4142:2014+A1:2019 *Method for rating and assessing industrial and commercial sound* has been used.

Accordingly, the following technical noise assessment has been produced to support an Environmental Permit Application to Natural Resources Wales (NRW), and is based upon environmental noise measurements undertaken at the site and a subsequent 3-dimensional noise modelling exercise.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- A sound monitoring survey was undertaken at a discrete location representative of the closest noise-sensitive receptors to the Site;
- A 3-dimensional noise modelling exercise, in order to quantify the potential noise generation of the consented site uses;
- An assessment of potential noise impacts with respect to the prevailing acoustic conditions at existing off-site receptors; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the Noise and Vibration Management: Environmental Permits¹, and BS4142:2014+A1:2019².

¹ Environment Agency, Scottish Environment Protection Agency (SEPA), Natural Resources Wales and Northern Ireland Environment Agency, 2021. Noise and Vibration Management: Environmental Permits.

² British Standards Institution, 2019. BS4142:2014+A1:2019: Method for Rating and Assessing Industrial and Commercial Sound.

2. ASSESSMENT FRAMEWORK

2.1. National Policy

2.1.1. Noise and Vibration Management: Environmental Permits

Environmental permits have conditions that require operators to control pollution; this includes controlling noise and vibration. The Environment Agency, Scottish Environment Protection Agency (SEPA), Natural Resources Wales and Northern Ireland Environment Agency have jointly released guidance to help holders and potential holders of permits apply for, vary, and comply with their permits. The guidance covers:

- how the respective environment agencies will assess noise from certain industrial processes;
- what the law says you must do to manage noise and vibration; and
- advice on how to manage noise – in particular, how to carry out a noise impact assessment and what operators should include in a noise management plan.

This guidance replaces these documents which have been withdrawn:

- Environment Agency Horizontal Guidance for Noise (H3) parts 1 and 2.

It involves determining the appropriate controls for industry to protect the environment through a single permitting process. To gain a Permit, Operators have to show that they have systematically developed proposals to apply the 'Best Available Techniques' (BAT) and meet certain other requirements, taking account of relevant local factors.

In terms of noise specifically, the use of BAT has to be considered and balanced within the wider context of other releases to different media (air, land and water) and taking issues such as usage of energy and raw materials into account. Noise cannot therefore be considered in isolation from other impacts on the environment.

The definition of pollution includes *"emissions which may be harmful to human health or the quality of the environment, cause offence to human senses or impair or interfere with amenities and other legitimate uses of the environment"*. BAT is therefore likely to be similar, in practice, to the requirements of the Statutory Nuisance legislation which requires the use of *"best practicable means"* to prevent or minimise noise nuisance. In the case of noise, *"offence to human senses"* may be judged by the likelihood of complaints. However, the lack of complaint should not necessarily imply the absence of a noise problem. In some cases, it may be possible, and desirable, to reduce noise emissions still further at reasonable costs and this may therefore be BAT for noise emissions.

Consequently, the aim of BAT should be to ensure that there is no reasonable cause for annoyance to persons beyond the installation boundary.

In summary, the aim of BAT should be to achieve the following:

- Underpinning of good practice, a basic level of which the operator should employ for the control of noise including adequate maintenance of any parts of plant or equipment whose deterioration may give rise to increases in noise. For example, this would include bearings, air handling plant, the building fabric as well as specific noise attenuation measures associated with plant, equipment or machinery;
- Noise levels should not be loud enough to give reasonable cause for annoyance for persons in the vicinity, which is a more appropriate environmental standard than that of Statutory

- Nuisance and is normally the aim of most planning or other conditions applied by Local Authorities; and
- Prevention of 'creeping background' (creeping ambient), which is the gradual increase in sound levels as industry expands and areas develop.

The indicative requirements apply to both new and existing activities but it is more difficult to justify departures from them in the case of new activities.

Indeed, because the requirements for noise are likely to be strongly influenced by the local environmental conditions, new installations are expected to meet BAT from the outset and to demonstrate that noise reduction or prevention has been built into the process design. For most existing plant, especially where there are no existing noise limits, the focus is on good practice (BAT) and the need to ensure that there is no reasonable cause for annoyance. In assessing any noise impact, it is more normal to monitor existing levels and apply corrections and calculations, rather than rely on predictions.

The guidance refers to BS4142:2014+A1:2019 as the basis for the majority of noise impact assessments.

2.1.2. Planning Policy Wales

The Government's planning policies for Wales are contained in Planning Policy Wales (Edition 12, 7th February 2024). The policy provides overarching requirements for developments to adequately control noise pollution, to provide appropriate soundscapes and to incorporate good acoustic design.

The policy is supplemented by the Noise and Soundscape Action Plan 2018-2023, which provides more detailed guidance on planning for a new development, but does not set out specific assessment methods or criteria. The guidance in this document has been used to inform a qualitative assessment of the effect the proposed development could have on the local soundscape.

2.1.3. Technical Advice Note (Wales) 11

This note provides advice on how the planning system in Wales can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business.

It outlines some of the main considerations which local planning authorities should consider in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

2.2. Assessment Criteria

2.2.1. BS4142:2014+A1:2019

BS4142:2014+A1:2019 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014+A1:2019 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS4142:2014+A1:2019 states: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs"*. An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- *"Typically, the greater this difference, the greater the magnitude of the impact."*
- *"A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*
- *"A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."*
- *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

The periods associated with day or night, for the purposes of the Standard, are considered to be 07.00 to 23.00 and 23.00 to 07.00, respectively.

2.3. Relevant Planning Conditions

Although compliance with planning conditions is not strictly a permitting consideration, it is considered appropriate in aiding contextual understanding.

The Welsh Ministers' decision to grant planning permission for the scheme (re. qA1410114, dated 23rd July 2020) include the following noise-related Planning Condition imposed by Bridgend County Borough Council on Planning Application reference DNS/3213704:

7. The rating noise level arising from the development (including the application of any tonal penalty) when assessed in accordance with BS4142:2014+A1:2019 in free field conditions at any residential premises existing at the time of approval of planning permission for this development, shall not exceed:

Time Period	Noise Rating Level
Day (0700 to 2300 hours)	41dB LAeq, 1 hour
Night (2300- 0700 hours)	39dB LAeq, 15 mins

8. No development shall take place until the design details of the acoustic barrier referred to on page 9 and the specifications of the plant referred to in table 5 of section 5.1.1 of the Inacoustics Acoustic Report, dated 26th February 2020 (Version 4) have been submitted to and approved in writing by the Local Planning Authority. The design details of the barrier shall include a location plan of the barrier showing its exact position, overall length, height, mass, attenuation and construction details. The design details of the plant and barrier shall be accompanied by a Noise Assessment to demonstrate that the plant and barrier will achieve the level of attenuation used in the noise modelling data in the Inacoustics report dated 26th February 2020 and will achieve the noise rating levels specified in Condition 7 above when assessed in accordance with BS4142.

2.4. Relative Change in Ambient Noise Level

Although permitting applications consider BS4142 criteria in isolation, it is felt that the effects on ambient sound level are appropriate in aiding contextual understanding

The IEMA Guidelines³ define 'Noise Impact' as the difference in the acoustic environment before and after the implementation of the proposals, also known as the magnitude of change. In circumstances where a noise environment may be altered by addition or removal of a noise source, considered to be largely anonymous or within the prevailing acoustic character of an area, for example, changes to traffic quantum or patterns, it is normal to consider this relative change in ambient noise level. The assessment, therefore, considers this phenomenon to add context.

The impact scale adopted in this assessment is shown in Table 1 below, which relates to established human responses to noise, in line with 'Table 7-12 Effect Descriptors' of the IEMA Guidelines and set in the context of NPPG.

TABLE 1: IMPACT SCALE FOR COMPARISON OF FUTURE NOISE AGAINST EXISTING NOISE

Noise Level Change dB(A)	Subjective Response	Significance	NPPG Context
Less than 1.0	No perceptible	Negligible	NOEL
1.0 - 2.9	Barely perceptible	Minor impact	NOAEL
3.0 - 4.9	Noticeable	Moderate impact	LOAEL
5.0 - 9.9	Up to a doubling or halving of loudness	Substantial impact	SOAEL
10.0 or more	More than a doubling or halving of loudness	Major impact	UAEL

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the perception of loudness. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

³ Institute of Environmental Management & Assessment (IEMA), Version 1.2 (November 2014). Guidelines for Environmental Noise Impact Assessment

It is considered that the criteria specified in Table 1 provide a good indication as to the likely significance of changes in noise levels in this case and can be used to inform the context in which the sound occurs in order to assess the impact of noise from the proposed development.

3. SITE DESCRIPTION

3.1. Site and Surrounding Area

The Planned Development is on a parcel of land to the north of Felindre Road, Pencoed; to the east of the A473 and north of the M4 motorway.

The Planned Development area can be seen in Figure 1, below, outlined in red.

The ambient sound environment throughout the surrounding area was dominated by road traffic noise contributions from the nearby roads and gently flowing water in the nearby brook, that runs past the receptors.

The closest noise sensitive receptors (NSRs) to the site comprise the residential dwellings to the south-east and north-east, located approximately 240 metres and 210 metres, respectively.

FIGURE 1: PLANNED DEVELOPMENT SITE AND SURROUNDING AREA



3.2. Planned Development Overview

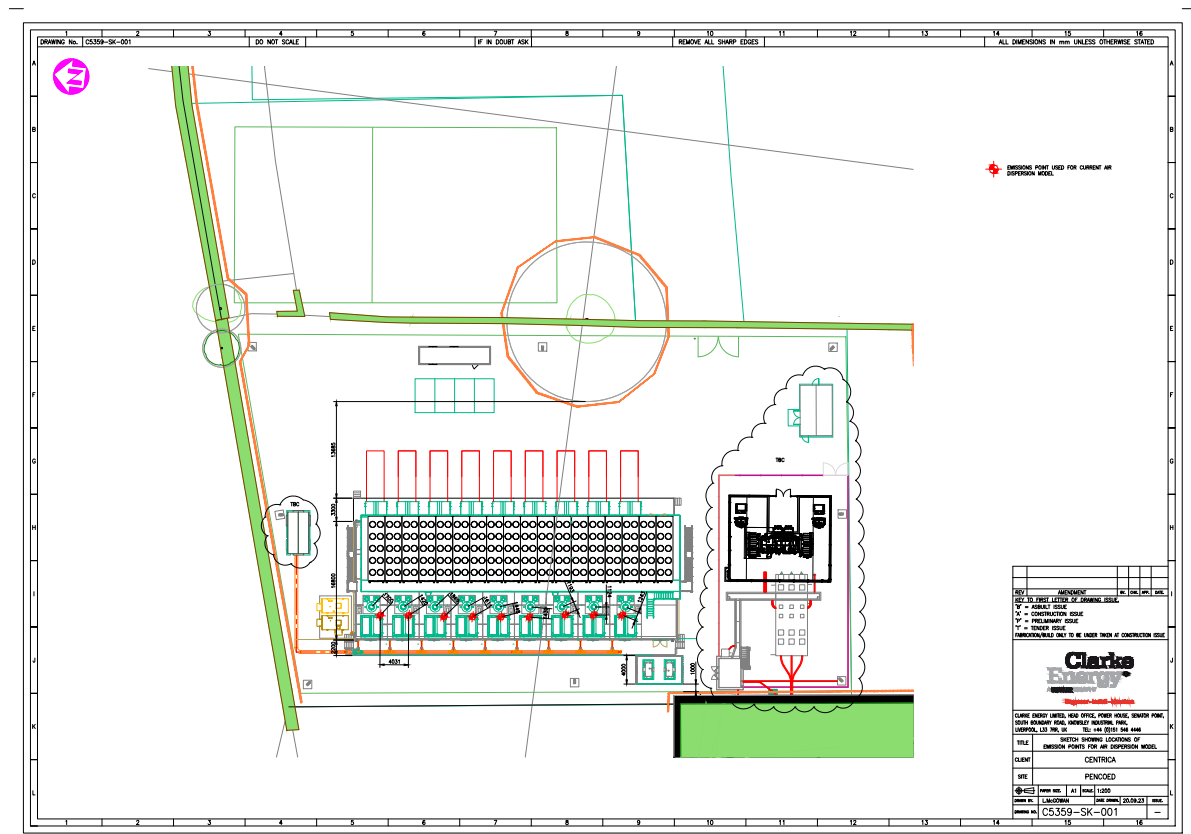
Peaking Power Generation Plant are designed to cover potential energy shortages, supplying electricity to the National Grid when necessary. As such, they have a short-term operational nature, and they are more likely to operate during peak load hours only, when the demand for electricity is higher, although they have potential to operate at any time.

The development comprises nine gas engine-driven electricity-generating sets to provide a total of 40.5MW export. The engines will be housed within purpose-built 200mm thick concrete enclosures.

In addition to the generator sets, other sources of sound include; the exhaust flues, ventilation inlets and outlets and air coolers (from hereon in collectively referred to as a 'genset'). The exhaust emissions from the engines along with inlet and outlet ventilation systems will be acoustically attenuated. Two dry-air cooler units per genset will serve as the cooling system of the engines and will be located on the roof of the concrete enclosure. A 132kV Transformer is also included as part of the scheme.

An overview of the site layout can be seen below in Figure 2.

FIGURE 2: DEVELOPMENT LAYOUT



3.3. Noise Generating Elements

The operations will comprise the operation of 9 No. gas-powered electricity generation sets, including air intakes, exhausts, flue stacks and cooling fans, plus a 132kV grid connection transformer, comprising the noise-generating elements summarised in Table 2.

TABLE 2: SUMMARY OF NOISE-GENERATING ELEMENTS

Description	Location	Operational Profile	Grid Coordinates	
			Easting	Northing
Gensets (Bank of 9No.)	External	On Demand - Frequent	296828	181415
Grid Connection Transformer	External	On Demand - Frequent	296380	181394

4. MEASUREMENT METHODOLOGY

4.1. General

The prevailing noise conditions in the area have been determined by an environmental noise survey conducted during both daytime and night-time periods between Wednesday 16th and Thursday 17th January 2019.

4.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445⁴.

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672⁵. A full inventory of this equipment is shown in Table 3 below.

TABLE 3: INVENTORY OF SOUND MEASUREMENT EQUIPMENT

Measurement Position	Make, Model & Description	Serial Number
MP1	Rion NL-31 Sound Level Meter	00110027
	Rion NH-21 Preamplifier	00129
	Rion UC-53A Microphone	100496
	Cirrus CR:515 Acoustic Calibrator	72886

Measurement equipment used during the survey was field calibrated at the start and end of the measurement period, with the following results:

- Before: 94.1 dB After: 93.9 dB (@1kHz)

A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements.

The weather conditions during the survey were monitored locally and found to be as follows:

- Deployment (circa midday 16th January) - Dry and overcast/cloudy, 10°C, wind 4.5ms⁻¹ WSW
- Afternoon (circa 16:30 16th January) - Dry and overcast/cloudy, 6°C, wind 3.5ms⁻¹ WSW
- Evening (circa 20:00 16th January) - Dry and overcast/cloudy, 5°C, wind 4.0ms⁻¹ SW
- Early Night (circa 23:00 16th January) - Dry and overcast/cloudy, 4°C, wind 4.0ms⁻¹ WNW
- Night (circa 03:00 17th January) - Dry and overcast/cloudy, 3°C, wind 4.0ms⁻¹ WNW
- Early Morning (circa 06:00 17th January) - Dry and overcast/cloudy, 3°C, wind 4.0ms⁻¹ NW
- Morning (circa 10:00 17th January) - Dry and overcast/cloudy, 3°C, wind 4.0ms⁻¹ NNW

The microphone was fitted with a protective windshield for the measurement, which is described in Table 4, with an aerial photograph indicating its location shown in Figure 3.

⁴ British Standard 7445: 2003: *Description and measurement of environmental noise*. BSI.

⁵ British Standard 61672: 2013: *Electroacoustics. Sound level meters. Part 1 Specifications*. BSI.

TABLE 4: MEASUREMENT POSITION DESCRIPTION

Measurement Position	Description
MP1	An unattended daytime and night-time measurement of sound under free-field conditions, at a height of 1.5 metres above local ground level, on land adjacent to the southernmost of the closest noise-sensitive receptors to the site. The sound environment at this location was dominated by road traffic noise arising from vehicles on the surrounding roads; primarily the A473 and M4 motorway.

FIGURE 3: MEASUREMENT POSITION



4.3. Measurement Results Summary

The summarised results of the environmental noise measurements are presented in Table 5, with full time histories and statistical analyses presented under Appendix B. Values have been rounded to the nearest whole number.

TABLE 5: SUMMARY OF NOISE MEASUREMENT RESULTS

Measurement Position	Period	Noise Level, dB			
		L _{Aeq,T}	L _{A90}	L _{A10}	L _{Amax}
MP1	Daytime	53	46	55	63
	Night-Time	48	39	49	63

5. PREDICTIVE OPERATIONAL NOISE ASSESSMENT

5.1. Noise Modelling

5.1.1. Source Data

The sound pressure levels, associated with the Planned Development, based on manufacturer and vendor data, can be seen below in Table 6.

TABLE 6: SOUND PRESSURE LEVEL SOURCE DATA

Plant	Quantity	Sound Pressure Level @1m L _{PA} (dB)	Source Height - metres	Octave Band Sound Pressure Level @1m, Hz (dB)							
				63	125	250	500	1k	2k	4k	8k
Genset	9	123*	NA	97	103	101	96	95	94	96	97
Exhaust	9	74	12	91	81	72	68	64	61	65	67
Inlet	9	72	3	89	75	59	51	50	50	57	71
Outlet	9	75	7	87	79	63	51	50	49	50	75
Air Cooler	9	62	9	47	49	53	57	59	54	47	40
132 kV Tx	1	73	4	66	79	81	67	52	46	46	39

*denotes internal reverberant sound level

The gensets will each be housed within a concrete container with a wall thickness of 200mm and a predicted sound insulation performance of R_w 59 dB. The Sound Insulation Prediction calculation sheet is contained under Appendix C.

The combination of the internal reverberant sound level associated with the engine and sound reduction of the enclosure equates to a calculated noise level of 58.5 dB(A) at 1 metre from the radiating wall of the engine enclosure.

Confirmation from the selected plant manufacturers that the above noise levels can be achieved should always be sought prior to plant procurement.

5.1.2. Calculation Process

Calculations were carried out using Cadna/A, which undertakes its calculations in accordance with guidance given in ISO9613⁶, which considers a worst-case downwind propagation to all receptors.

⁶ ISO 9613-1:1993 and ISO 9613-2:1996: Acoustics - Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere and Part 2: General method of calculation

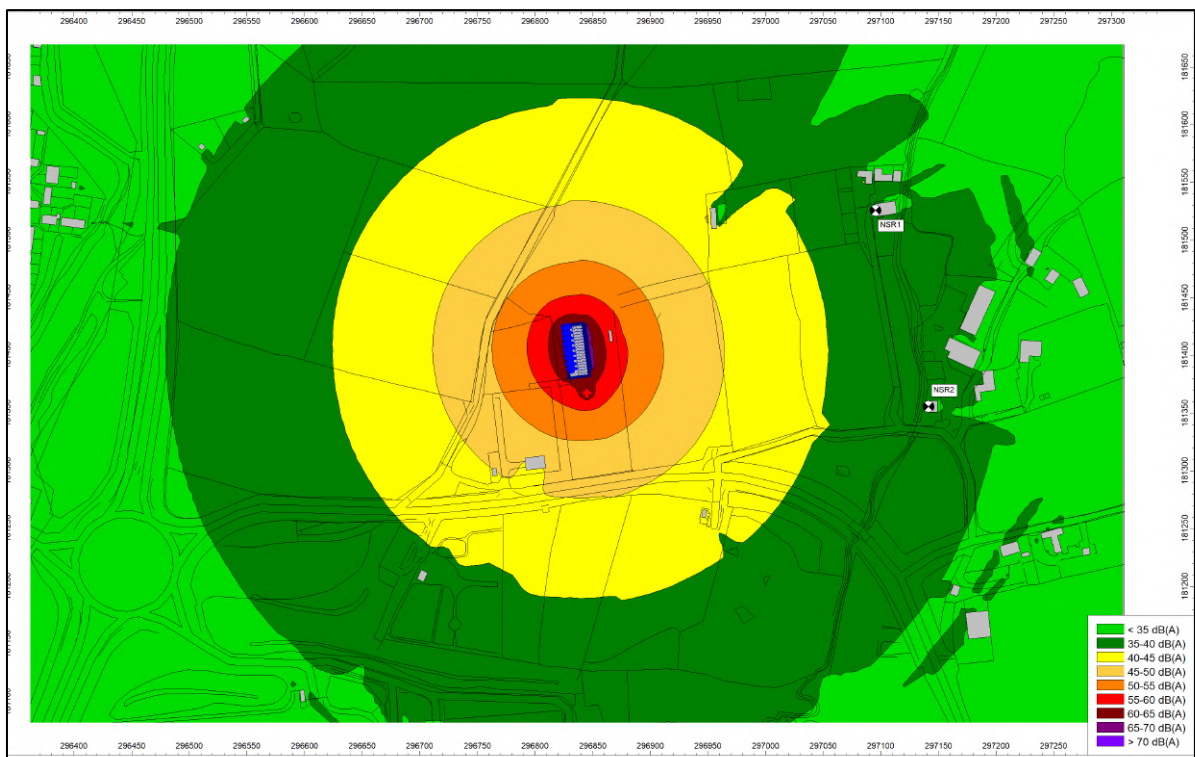
5.1.3. Model Assumptions

Given that the land between the Planned Development and nearest receptors is largely soft, the ground factor has been set to 0.8, within the calculation software, with 2 orders of reflection. Full octave frequency spectra have been used in the calculations. It has been assumed that all processes will occur simultaneously, representing a worst-case scenario.

5.1.4. Specific Sound Level Map

The sound map at 4m above ground, showing the specific sound level emissions from the Development can be seen in Figure 4.

FIGURE 4: SPECIFIC SOUND LEVEL MAP



5.1.5. Specific Sound Level Summary

A summary of the predicted specific sound level at the NSRs, based on the sound map shown in Figure 4 can be seen below in Table 7. Values have been rounded to the nearest whole number.

TABLE 7: PREDICTED SPECIFIC SOUND LEVEL SUMMARY

NSR	Specific Sound Level (dB)
1	37
2	37

5.2. Assessment

5.2.1. Rating Penalty Principle

Section 9 of BS4142:2014+A1:2019 describes how the rating sound level should be derived from the specific sound level, by determining a rating penalty. BS4142:2014+A1:2019 states:

“Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

- a) subjective method;*
- b) objective method for tonality;*
- c) reference method.”*

Given that the Proposed Development is not operational, the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014+A1:2019, which states:

“Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources.”

BS4142:2014+A1:2019 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

Tonality

A rating penalty of +2 dB is applicable for a tone which is *“just perceptible”*, +4 dB where a tone is *“clearly perceptible”*, and +6 dB where a tone is *“highly perceptible”*.

Impulsivity

A rating penalty of +3 dB is applicable for impulsivity which is *“just perceptible”*, +6 dB where it is *“clearly perceptible”*, and +9 dB where it is *“highly perceptible”*.

Intermittency

BS4142:2014+A1:2019 states that when the *“specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time ... if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.”*

Other Sound Characteristics

BS4142:2014+A1:2019 states that where *“the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.”*

5.2.2. Rating Penalty Assessment

Considering the content of Section 5.2.1, an assessment of the various sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, has been detailed in Table 8 below.

TABLE 8: RATING PENALTY ASSESSMENT

Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Discussion
STOR Plant	+2 dB	0 dB	0 dB	+0 dB	<p>The gensets will operate as demand requires, however, once operating, do not cycle on and off.</p> <p>The combination of plant does not give rise to readily discernible single tones or impulsive noises; however, low frequency tonality may be “just perceptible”, due to a low-frequency bias at source, but the residual acoustic environment will likely mask any significant tones.</p>

In summary, a rating penalty of +2 dB has been included in the assessment.

5.2.3. Uncertainty

BS4142:2014+A1:2019 requires that the level of uncertainty in the measured data and associated calculations is considered in the assessment. The Standard recommends that steps should be taken to reduce the level of uncertainty.

Measurement Uncertainty

BS4142:2014+A1:2019 states that measurement uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

- “ ...
- b) the complexity and level of variability of the residual acoustic environment;*
 - “ ...
 - d) the location(s) selected for taking the measurements;*
 - “ ...
 - g) the measurement time intervals;*
 - h) the range of times when the measurements have been taken;*
 - i) the range of suitable weather conditions during which measurements have been taken;*
 - “ ...
 - k) the level of rounding of each measurement recorded; and*
 - l) the instrumentation used.”*

Each of the measurement uncertainty factors outlined above have been considered and discussed in Table 9 below.

TABLE 9: MEASUREMENT UNCERTAINTY FACTORS

Measurement Uncertainty Factor Reference	Discussion
b)	Residual acoustic environment is relatively constant, hence no correction for a complex residual acoustic environment.
d)	Measuring at the closest affected receptor to the site has enabled the determination of robust background sound levels.
g)	Measurement time intervals were set in accordance with BS4142:2014+A1:2019, hence no further correction needs to be made.
h)	Measurements were undertaken over a continuous, 24-hour diurnal and nocturnal time period.
i)	No periods of significant wind or precipitation were noted.
k)	Measured values were rounded to 0.1 dB, therefore rounding would not have had a significant impact on the overall typical background sound levels.
l)	The acoustic measurement equipment accorded with Type 1 specification of British Standard 61672, and were deployed with appropriate wind shields.

In summary, no uncertainty budget has been considered in the assessment, to account for measurement uncertainty.

Calculation Uncertainty

BS4142:2014+A1:2019 states that calculation uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

- “ ...
- b) uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels;*
 - c) uncertainty in the calculation method;*
 - d) simplifying the real situation to “fit” the model (user influence on modelling); and*
 - e) error in the calculation process.”*

Each of the calculation uncertainty factors outlined above have been considered and discussed in Table 10 below.

TABLE 10: CALCULATION UNCERTAINTY FACTORS

Calculation Uncertainty Factor Reference	Discussion
b)	Sound pressure levels have been supplied by the Vendor, and have been tailored specifically for this site.
c)	Calculations were undertaken in accordance with ISO 9613-2, which is considered a “ <i>validated method</i> ” by BS4142:2014+A1:2019.
d)	The real situation has not been simplified for the purposes of this assessment.
e)	ISO 9613-2 indicates that there is a ± 3 dB accuracy to the prediction method, therefore, an uncertainty factor of ± 1 dB is considered appropriate and proportional, given the separation distances involved.

The overall uncertainty is considered to be sufficiently small enough that it would not affect the conclusions of the assessment.

5.2.4. BS4142:2014+A1:2019 Assessment

The rating sound level, as calculated from the predicted specific sound level, has been assessed in accordance with BS4142:2014+A1:2019, at the closest NSRs.

The BS4142:2014+A1:2019 assessment at NSR1 and NSR2, during the day and night-time periods, can be seen in Table 11.

TABLE 11: BS4142 ASSESSMENT AT NSR1 AND NSR2

Results	Sound Level (dB)	Notes
Specific Sound Level	37	As shown in Table 7.
Rating Penalty	+2	As discussed in Table 8.
Rating Sound Level	39	-
Daytime Background Sound Level	46	As shown in Table 5.
Excess of Rating over Daytime Background Sound Level	-7	Daytime assessment indicates a “ Low Impact ”.
Night-time Background Sound Level	39	As shown in Table 5.
Excess of Rating over Night Time Background Sound Level	0	Night-time assessment indicates a “ Low Impact ”.

It can be seen that the Consented Development is predicted to have a rating sound level that does not exceed the prevailing background sound level in the area, which in BS4142:2014 terms represents a ‘*Low Impact*’.

5.3. Context

5.3.1. Effect on the Ambient Sound Environment – Residential Receptors

The results set out in Table 11 identify that the operation of the scheme, as proposed, can occur without adversely affecting the amenity of the closest residential receptors to the site. BS4142:2014+A1:2019, however, recognises the importance of the context in which a sound occurs when assessing impacts.

The effect of the Development on the relative change in ambient noise levels at the nearest residential receptors has also been assessed as part of the context, with reference to the IEMA guidelines outlined in Section 2.42.4.

TABLE 12: ASSESSMENT OF RELATIVE CHANGE IN SOUND LEVEL

Receptor	Period	Existing L _{Aeq} Ambient Sound Level, dB(A)	Sound from Development dB(A)	Cumulative Sound Level dB(A)	Change in Sound Level, dB	Significance
NSR1	Daytime	53.2	37.4	53.3	0.1	Negligible
	Night-time	48.4	37.4	48.7	0.3	Negligible
NSR2	Daytime	53.2	36.7	53.3	0.1	Negligible
	Night-time	48.4	36.7	48.7	0.3	Negligible

As can be seen, the operation of the Development is predicted to have a negligible impact on the prevailing ambient acoustic environment.

5.3.2. Compliance with Planning Conditions

This report presents a noise assessment reflecting the planned layout and plant technology.

The results presented in Table 11 identify that the operation of the scheme, as planned, will not exceed the rating sound level limits set out in Condition 7.

5.3.3. Best Available Technology

This report confirms that the environmental noise impact from the consented development can be suitably controlled by the chosen plant selection, with noise specifications as presented in Table 6, and the installation of a noise barrier is not deemed necessary, especially when most of the noise sources are located at height.

Consequently, the planned scheme is considered to demonstrate compliance with the Best Available Technology requirements of the Horizontal Guidance.

6. CONCLUSION

inacoustic has been commissioned to prepare a Noise Assessment potential noise arising from a consented Peaking Power Generation Plant on Land North of Felindre Road, Pencoed, for submission to Natural Resources Wales (NRW) as part of an Environmental Permit Application

The assessment considers the potential noise generation from the plant associated with the Consented Development, with respect to existing sound levels in the area.

The assessment methodology contained in British Standard 4142: 2014+A1:2019 *Method for rating and assessing industrial and commercial sound* has been used in conjunction with supplementary acoustic guidance.

The assessment identifies that the Consented Development will give rise to rating sound levels that do not exceed the measured background sound level in the area, thus giving rise to a 'Low Impact'.

The assessment also identifies that no significant change in ambient sound level at the nearest residential properties will be engendered as a result of the consented development in its proposed and assessed form.

When operated in the manner considered in this report, the Site is considered to be compliant with the requirements of the Noise and Vibration Management: Environmental Permits, demonstrating BAT where possible, as outlined in Section 6.

In light of the above, it is considered that this report provides sufficient information to the grant the Application for a Permit for the Site.

7. APPENDICES

7.1. Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log ₁₀ (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L _{eq,T}	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L _{max,T}	A noise level index defined as the maximum noise level during the period T. L _{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L _{90,T}	A noise level index. The noise level exceeded for 90% of the time over the period T. L ₉₀ can be considered to be the "average minimum" noise level and is often used to describe the background noise.
L _{10,T}	A noise level index. The noise level exceeded for 10% of the time over the period T. L ₁₀ can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 13: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10} , the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq} .

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1\text{hour}}$ dB and $L_{A90,15\text{mins}}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

7.2. Appendix B – Sound Measurement Results

FIGURE 5: MEASURED TIME HISTORY – MP1

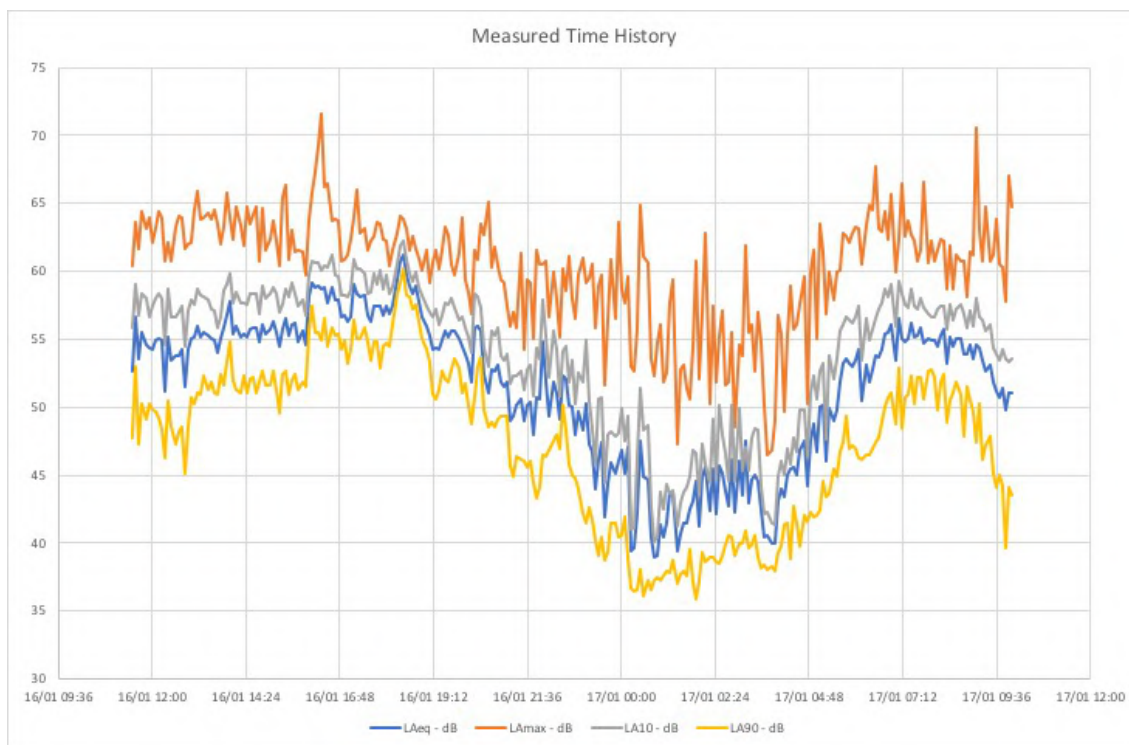


FIGURE 6: STATISTICAL ANALYSIS OF LA90 BACKGROUND – DAYTIME - MP1

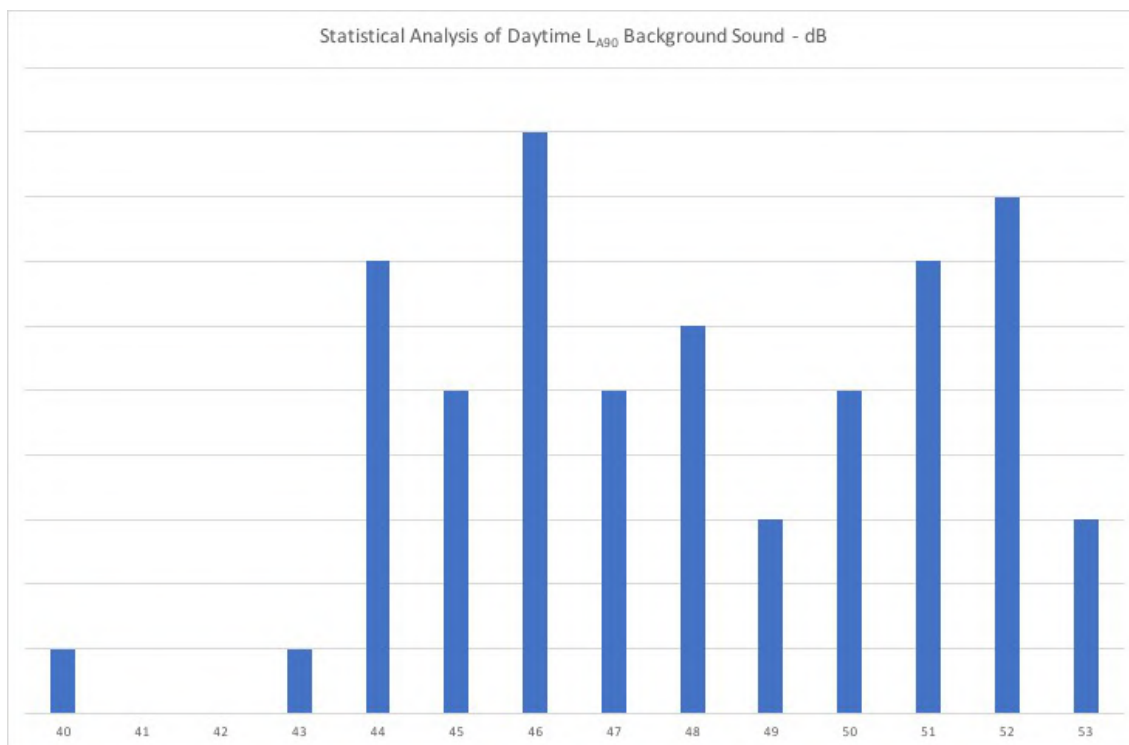
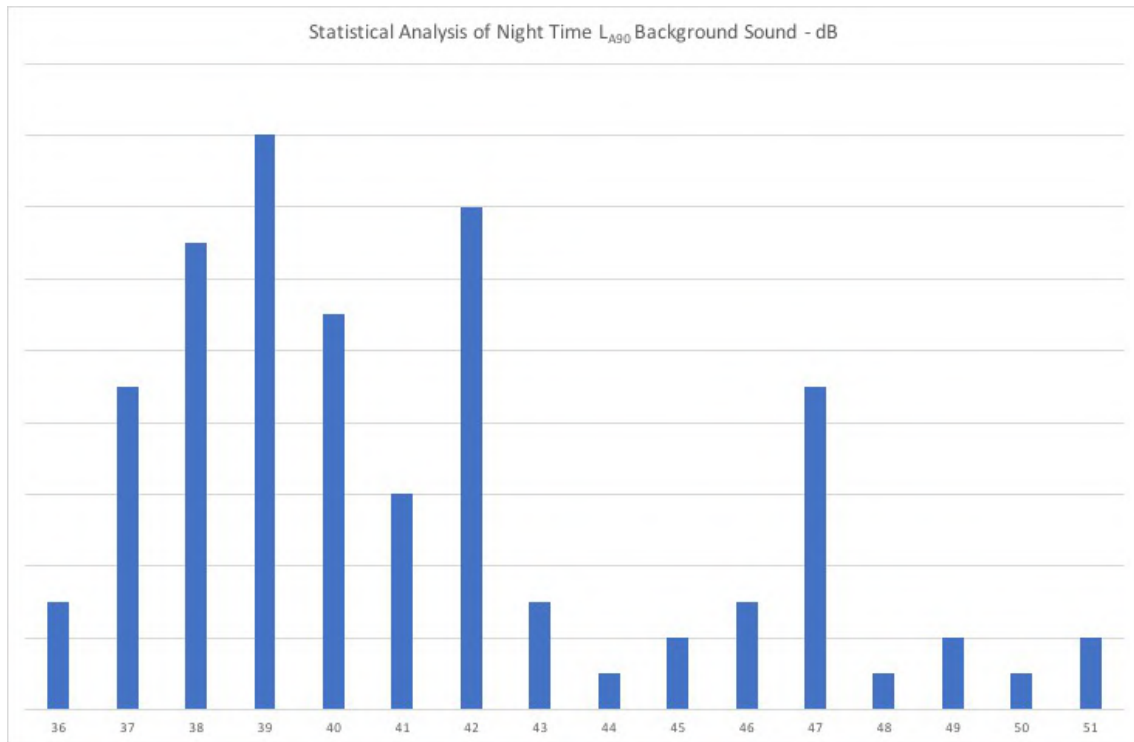



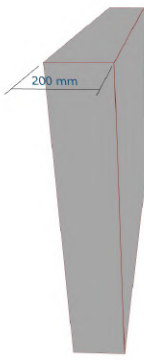
FIGURE 7: STATISTICAL ANALYSIS OF L_{A90} BACKGROUND – NIGHT-TIME – MP1



7.3. Appendix C – Sound Insulation Prediction Sheet

Sound Insulation Prediction (v9.0.24)
 Program copyright Marshall Day Acoustics 2017
 Margin of error is generally within $R_w \pm 3$ dB
 - Key No. 6511
 Job Name:
 Job No.: Initials:lewis
 Date:19/10/2023
 File Name:insul





R_w 59 dB
 C -2 dB
 Ctr -5 dB

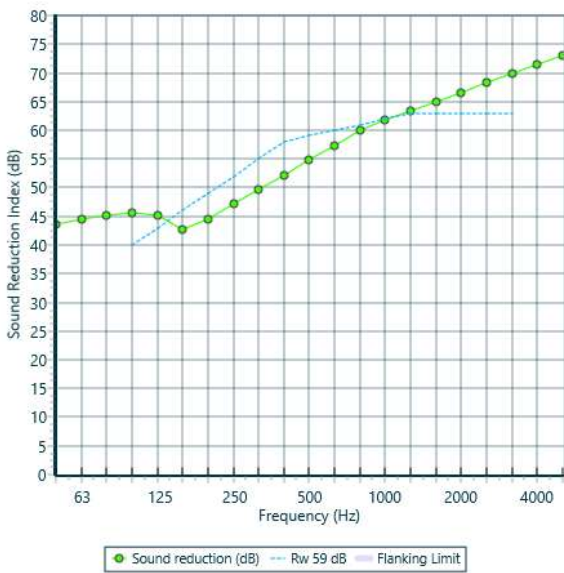
Notes:

Panel Size = 2.7 m x 4.0 m
 Partition surface mass = 468 kg/m²

System description

Panel 1 : 1 x 200 mm Concrete

freq.(Hz)	R(dB)	R(dB)
50	44	
63	44	44
80	45	
100	46	
125	45	44
160	43	
200	45	
250	47	47
315	50	
400	52	
500	55	54
630	57	
800	60	
1000	62	61
1250	63	
1600	65	
2000	67	66
2500	68	
3150	70	
4000	71	71
5000	73	



7.4. Appendix D – Qualifications etc

The company is directed and led by Antony Best BSc (Hons) MIOA, Neil Morgan MSc MIOA and Victor Valeron BEng MSc MIOA, who have a combined experience of over 45 years in the acoustic industry; covering a range of project types and assessment scenarios, including numerous submissions to the Environment Agency.

Neil Morgan MSc MIOA produced this report, and it was reviewed by Victor Valeron BEng MSc MIOA.

Professional Qualifications for Neil Morgan

- MSc in Applied Acoustics from the University of Derby
- Institute of Acoustics Post Graduate Diploma in Acoustics and Noise Control, Institute of Acoustics, University of the West of England
- BSc (Hons) in Surveying for Resource Development from the University of Glamorgan
- Corporate Member of the Institute of Acoustics (MIOA)

Professional Experience for Neil Morgan

- 2017 to Present inacoustic (Director)
- 2013 to 2017 MLM Acoustics (Technical Director)
- 2009 to 2013 Innovate Acoustics (Associate Director)
- 2007 to 2009 SLR Consulting (Senior Consultant)
- 2006 to 2007 Grontmij (Senior Engineer)
- 1996 to 2006 Capita Symonds (Various Positions)


Professional Qualifications for Victor Valeron

- MSc in Architectural and Environmental Acoustics from La Salle Ramon Llull University
- Corporate Member of the Institute of Acoustics

Professional Experience for Victor Valeron

- 2021 to Present inacoustic (Technical Director)
- 2020 to 2021 Sweco (Principal Acoustic Consultant)
- 2014 to 2020 MLM Group (Principal Acoustic Consultant)
- 2012 to 2014 Innovate Acoustics (Senior Acoustic Consultant)
- 2009 to 2012 i2A Acoustic & Audiovisual Engineering
- 2007 to 2009 Notson Acustica
- 2006 to 2007 Audioscan

7.5. Appendix E – Calibration Certificates

<p>CERTIFICATE OF CALIBRATION</p> <p>ISSUED BY: CALIBRATION MAINTENANCE & REPAIR LTD</p> <p>DATE OF ISSUE: 20 September 2018 CERTIFICATE NUMBER: 180453</p>	<p>BS EN ISO 9001:2015 APPROVED BY LRQA</p> <p>CERT No 10045223</p>
 <p>Home Farm Industrial Park Norwich Road Marsham Norfolk NR10 5PQ Tel: +44 1603 279557 Fax: +44 1603 278008</p>	<p style="text-align: center;">Page 1 of 3</p> <p>Approved Signatory</p> <p>Electronically Authorised Document</p> <p><input type="checkbox"/> P K CLARK <input type="checkbox"/> R J WADE <input type="checkbox"/> M A FROST <input checked="" type="checkbox"/> M S PARDOE</p>

<u>Customer</u>	INACOUSTIC
<u>Order No</u>	NL13CAL
<u>Equipment Description</u>	SOUND LEVEL METER
<u>Manufacturer</u>	RION CO LTD
<u>Model</u>	NL-31
<u>Serial No</u>	00110027
<u>Ident No</u>	NOT KNOWN
<u>Date Of Calibration</u>	20 SEPTEMBER 2018

INSTRUMENT CONDITION

<u>Adjustments Made</u>	YES
<u>Repairs Made</u>	NO

ENVIRONMENT

The instrument was placed in the laboratory environment for a minimum period of 4 hours and was operated prior to calibration.

Measurements were made in ambient conditions of 22°C ± 3°C and 45% ± 15% RH.

PROCEDURE

Measurements were performed in accordance with the in house laboratory procedure 5970 All equipment used has been calibrated/verified against measurement standards or reference equipment traceable to International or National Measurement Standards as specified in our control procedure WI64

The results attached to this certificate refer to measurements made at the time of test and not to the instrument's ability to maintain calibration.

The attached results are a true record of the levels required to return the instrument to the original stated manufacturer's specification and accuracy where known.

inacoustic | **bristol**

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