

ENVIRONMENTAL PERMIT APPLICATION

Bear Power

Non-Technical Summary

Prepared for: Urban Reserve (AssetCo) Limited

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DRAWINGS

BEA-01 Site Location Plan

BEA-02 Site Layout Plan

1.0 INTRODUCTION

SLR Consulting Ltd (SLR) has been instructed by Urban Reserve (AssetCo) Limited (Urban Reserve) to prepare an environmental permit (EP) application for Medium Combustion Plant (MCP) and a Specified Generator (SG) for a proposed electricity generation facility, to be located at land off Weighbridge Road, Deeside, Flintshire, Wales, CH5 2LL, hereafter referred to as 'the Site'.

This Non-Technical Summary (NTS) provides a summary of what is being applied for, the regulated facility and outlines the key technical standards and control measures that will be implemented at the Site as a result of the risk assessments.

In addition to this NTS, the EP application comprises the following documents:

- Section 2 - Application Forms;
- Section 3 – Air Emissions Risk Assessment; and
- Section 4 – Drawings.

1.1 Site Location

The application site is located within the Deeside Industrial Park, off Weighbridge Road, Deeside, Flintshire, Wales. It is on the northern edge of the industrial park at grid reference 331372, 371798.

There is a large warehouse immediately to the south west of the site and a car body shop to the north west of the site.

Approximately 20m to the east of the site is a small water drainage channel and then approximately 120m of grassland, trees and vegetation beyond which there is a solar farm. Further east and south east there are more warehouses and commercial units within the Deeside Industrial Park. Weighbridge Road lies approximately 175m to the north east of the site.

The site is located in a non-residential area, dominated by commercial and industrial uses. The nearest residential properties to the site are estimated to be over 1.5km away. The village of Puddington is located to the north of the site in England and to the south west of the site are the larger towns of Connah's Quay and Shotton.

The site location is shown on drawings reference BEA-01 in Appendix 01.

The site layout is illustrated on drawing BEA-02 in Appendix 01.

2.0 APPLICATION OVERVIEW

2.1 Regulated Activities

Bear Power is a small scale 5MWe output gas fired power station, comprising of 2 no. 2.5MWe natural gas engines. It is one of several similar AMP projects around the country referred to as Urban Reserve sites.

The plant's aggregated thermal input capacity is 11.93MWth. Each engine will operate for up to 8,760 hours per annum.

The facility therefore requires an EP by the Environmental Permitting (England and Wales) (Amendment) Regulations 2018 (EPR 2018).

2.1.1 Specified Generator

The plant comprises a 'Specified Generator' (SG) as defined in Schedule 25B of the EPR 2018. This is because the plant has a rated thermal input equal to or greater than 1MWth but less than 50MWth (11.93MWth) and the plant is used for the purpose of generating electricity.

The plant is classed as a Tranche B SG on the basis that its first operation is scheduled for October 2019 and does not benefit from a capacity market agreement from the 2014 or 2015 capacity market auctions. As such, it is required to obtain an EP prior to commencement of operations.

2.1.2 Medium Combustion Plant

In addition, the plant comprises a Medium Combustion Plant (MCP) as defined by Schedule 25A of the EPR 2018. This is because each engine has a rated thermal input equal to or greater than 1MWth but less than 50MWth (i.e. 5.96MWth).

The generators are classed as a 'new' MCP on the basis that their first operation will be post-20th December 2018. As a new MCP the plant must obtain an EP prior to commencement of operations.

3.0 APPLICATION CONTENTS

3.1 Application Forms

Application forms have been completed and are enclosed in Section 2 of the application.

3.2 Air Emissions Risk Assessment

An Air Emissions Risk Assessment (AERA) was undertaken by SLR (ref. 404.08071.00001/ADM February 2019).

The AERA assessed potential impacts of emissions from the Site using an advanced Air Dispersal Model (ADM) which concluded as follows:

- the effects of the proposed development on air quality in respect of national Air Quality Standards are 'not significant'; and
- the emissions from the plant are considered to have 'no likely significant effects' for European sites and 'no likely damage' for SSSI's.

The AERA report is enclosed in Section 3 of the application.

3.3 Drawings

The following drawing has been prepared for the Site:

- Drawing BEA-01 Site Location Plan; and
- Drawing BEA-02 Site Layout Plan.

The drawings are enclosed in Section 4 of the application.

3.4 Application Fee

On the basis of the application being classed as 'complex bespoke', an application fee of £8,894 has been determined in accordance with Natural Resource Wales' (NRW) Environmental Permitting Charging Scheme (2019)¹.

¹ Natural Resources Wales, Our Charges <https://naturalresources.wales/about-us/what-we-do/how-we-regulate-you/our-charges/?lang=en>

4.0 TECHNICAL STANDARDS AND KEY CONTROL MEASURES

4.1 Technical Standards

Key technical standards laid out in the following documents govern the design and operation of the plant:

- NRW - Interim Medium Combustion Plant Guidance;
- NRW - Interim Specified Generator Guidance; and
- EA – M5 Monitoring of stack gas emissions from medium combustion plants and specified generators (Version 1, September 2018).

4.2 Key Control Measures

Key control measures that will be applied at the Site are as follows:

- Lean burn or enhanced lean burn will be employed as necessary to minimise NO_x emissions;
- Emissions to air will be discharged through individual stacks terminating at 7m (above ground level) to aid atmospheric dispersal;
- An engine control system is employed which allows Urban Reserve to:
 - monitor engine performance;
 - control air-fuel ratio;
 - actively and reactively control load;
 - meter power;
 - manage engine speed;
 - control voltage; and
 - remotely control the system.
- A preventative maintenance schedule will be implemented; and
- Emissions to air will be monitored periodically to ensure compliance with limits are achieved.

4.3 Compliance with NO_x ELV

4.3.1 NO_x Formation & Primary Control Measures

There are three ways in which NO_x may be formed during combustion:

- Thermal NO_x. Oxidation of nitrogen in air during combustion. Formation takes place significantly above 1300°C, with concentrations rising exponentially with temperature;
- Fuel NO_x. Oxidation of nitrogen in fuel during combustion; and
- Prompt NO_x. Reaction of atmospheric nitrogen with carbon and hydrogen radicals. Concentrations increase in proportion to temperature but are low when compared with thermal and fuel NO_x.

In terms of the potential for NO_x generation during the combustion of natural gas in spark ignition engines, the absence of any significant quantities of nitrogen in the fuel means that the formation routes are limited to 'thermal' and 'prompt'; with 'thermal' being the predominant contributor.

The generators will employ a lean burn combustion control system and delayed ignition timing which means that combustion takes place in conditions of excess air; the resulting reduction in combustion temperatures leading to a reduction in thermal NO_x formation.

The lean burn system will allow the generators to be monitored and tuned to ensure ongoing combustion efficiency and minimisation of NO_x formation.

4.3.2 Engine Maintenance

As a power generator, Urban Reserve adopts an operational philosophy aimed at optimising the reliability and performance of its assets. All of Urban Reserve's generating equipment is subject to rigorous maintenance and overhaul regimes in accordance with the laid down periodicities as depicted by the Original Equipment Manufacturer (OEM) Manufacturer. Maintenance operations will be conducted by Urban Reserve's OEM factory trained team of in-house engine technicians and engineers.

A 'state-of-the-art' 24/7 logistics centre uses the latest technology to optimise the use of its resources and the performance of its assets, to maintain environmental compliance, ensure the health and safety of its workforce and optimise generation. A SCADA system provides real time monitoring and control of site asset performance and operating parameters, and provides incident management information to prioritise and allow rapid response to any unscheduled events. With the help of these facilities, Urban Reserve closely tracks engine performance KPIs which form the basis for continued improvement efforts. All work activities are planned centrally and controlled using an asset management system. A team consisting of field service technicians manage day-to-day on-site tasks, supported by teams providing unscheduled breakdown cover, field overhauls, electrical, and controls and instrumentation (C&I) services.

4.3.3 Achievable NOx Emission Concentrations

The Department for Energy and Climate Change's *Developing Best Available Techniques for combustion plants operating in the balancing market document (2016)*, identifies that spark ignition gas engines (such as the SG) can readily comply with the 190mg/Nm³ NOx Emission Limit Value at 15% O₂ content with the use of lean burn or enhanced lean burn primary control measures.

5.0 CONCLUSIONS

The conclusion from the assessments undertaken for the application is that the Bear Power Site is not predicted to significantly impact local receptors and will provide a high level of protection to the environment as a whole.

There are predicted to be no non-compliances with the air quality aspects of any environmental quality standards that can be attributed to the operation of the SG. Furthermore, it is considered that due to the technology and fuel used, the SG can comply with the standard NO_x ELV.

Urban Reserve is fully committed to ensuring the highest standards are met and will undertake its activities in a manner consistent with best industrial practices and in accordance with the company's management system.

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