TOUCAN ENVIRONMENT LIMITED

NON-TECHNICAL SUMMARY

Environmental Permit Application for a Bespoke Installation at

Protos Gas Generation Plant
Land off Ash Road
Elton
CH2 4RX

Prepared for

Baker Street Generation Limited
Registered Company: SC604763

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Version Control

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1	05/07/2023	Draft issued for client review.
2	25/07/2023	Second version issued – updates to sections 1, and 2.6
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Contents

1. Introduction

This non-technical summary has been prepared by Toucan Environment Limited on behalf of Baker Street Generation Limited (the Operator) in support of an environmental permit application for a bespoke installation at Protos Gas Generation Plant, Land off Ash Road, Elton, CH2 4RX (the Installation). Pre-application advice has been provided using the reference EPR/PP3540QS/A001.

The purpose of this document is to explain the installation, a gas fired electricity generation facility peaking plant with an aggregated net thermal input of 110MWth and output of 49.5MWe.

Other documents submitted with this application are:

- Application Forms: Part A, Part B2, Part B3 and Part F1
- Appendix A Site Plan
- Appendix B BAT Assessment
- Appendix C Nature and Heritage Conservation Screening Report
- Appendix D Site Condition Report
- Appendix E1 Air Quality Assessment
- Appendix E2 AQ Model Files
- Appendix F Flood Risk Assessment and Drainage Strategy
- Appendix G1 Noise Impact Assessment
- Appendix G2 Noise Model Files
- Appendix H List of Directors
- Appendix I Environmental Risk Assessment
- Appendix J List of Combustion Plant
- Appendix K Phase One Geoenvironmental Desk Study
- Appendix L Phase Two Geoenvironmental Report

2. Regulated Facility

This section summaries the equipment and operations of the proposed Installation.

2.1. Site Location

The Installation is located at SJ 46601 76109, on land off Ash Road, Elton, CH2 4RX. The Installation is sited on a 0.99ha plot with 0.118ha access road within the wider Protos development site, which covers around 134 acres of land to the east of Ellesmere Port, between the Manchester Ship Canal and the M56 Motorway.

The Installation is surrounded by commercial and industrial uses. Other permitted installations nearby include the Encirc glass factory (EPR/UP3935LR) and the CF Fertlisers Plant (EPR/JP3837KT).

2.2.Equipment

The Installation comprises 11 x Jenbacher JMS 624 GS-N.L engines and ancillary equipment. The engines will be powered by natural gas, each with 10MWth input and 4.5MWe output. Each engine will be housed inside a pre-fabricated concrete cell with an individual 12.0m high (from ground level) stack for exhaust emissions, forming 11 new emission points to air identified as A1-A11 in Appendix A Site Plan. The engines will use lean burn combustion principles to operate as a peaking plant for less than 1,500 hours per year as a rolling average over 5 years, with no single year exceeding 2250 hours.

The purpose of the Installation is to provide security of electricity supply by operating at times when there is a peak demand for electricity. The site is connected to the National Grid via the local distribution network and will operate when called upon to fill the gap in capacity for supply and demand of electricity. The Installation will be operated remotely and remain relatively unmanned.

The Environmental Permitting (England and Wales) Regulations 2016 state that “Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts” is a Part A(1) activity that requires an Environmental Permit. The aggregated total rated thermal input of the 11 engines is 110MWth. This application is therefore being made to the Environment Agency (EA) for an Environmental Permit to cover that activity and directly associated activities.

The individual engines have a thermal input of 10MWth. As this is larger than 1MWth and less than 50MWth, the engines must comply with the Medium Combustion Plant Directive (MCPD). NOx emissions from the engines will be below the emission limit value of 95mg/Nm3 and will be monitored in line with MCPD guidance. As the individual engine units are under 15MWth, they are exempt from Chapter III (Large Combustion Plant) of the Industrial Emissions Directive (IED).

2.3. Key technical standards

The following key technical standards have been used to design and operate the plant:

- Department for Environment Food & Rural Affairs (DEFRA) (February 2013): Industrial Emissions Directive EPR Guidance on Part A Installations
- EA (August 2022) Risk Assessments for your environmental permit
- EA (November 2022) Control and monitor emissions for your environmental permit
- EA (April 2023) Develop a management system: environmental permits
- European Commission JRC Science for Policy Report (2017): Best Available Techniques (BAT) Reference Document for Large Combustion Plant
- EA (August 2018) BAT guidance for >50MWth gas and liquid fuel combustion plant exporting electricity under commercial arrangements for <1500 hrs per annum (Working Draft)
- EA (March 2023) Medium Combustion Plant (MCP): Comply with emission limit values

- EA (December 2022) Monitoring stack emissions: measurement locations

2.4. Environmental Management System

The Operator will develop an Environmental Management System (EMS) to the requirements of the ISO14001 standard that will be submitted to the EA prior to commencement of operations.

The EMS will:

- identify systems and procedures for all processes involved with operations of the Installation to minimise risk of environmental pollution and harm to human health. This will include start up, shut down, normal operation, maintenance, accidents, incidents and non-conformances.
- be kept on site and be available for inspection at all times.
- apply to all staff, visitors and contractors to the Installation.
- ensure compliance with the Environmental Permit and other legislative requirements.
- contain clear instructions for emergency situations including responsibilities, actions and communication channels.
- have systems and procedures audited externally with contingency plans prepared for unexpected complications.
- be audited internally annually at a minimum or in the event of a change in operations or processes on site.

The internal audit will ensure operations and processes comply with the management system and other legislative requirements. Any preventative and or corrective actions required to further minimise the risk of breach or non-compliance will be identified, recorded and communicated to all relevant persons.

2.5. Key Control Measures

There are a number of key control measures used to operate the plant to ensure compliance, as listed below.

- Operated in accordance with an EMS designed in line with ISO14001 standards.
- Engines are remotely controlled allowing:
    - Performance to be constantly monitored.
    - air-fuel ratio can be controlled.
    - load to be actively and reactively controlled.
    - power to be metered.
    - engine speed managed.
    - voltage controlled.
- Implementation of a preventative maintenance schedule.
- Secondary containment will be installed on storage tanks for any potentially polluting substances.
- Waste will be managed in accordance with the waste hierarchy and only sent to appropriately licensed facilities.
- Emissions to air will be monitored periodically to ensure compliance with limits are achieved.
- Gas engines will be housed within sound mitigating containers.

2.6. Raw Materials

Natural Gas will be the primary raw material used as fuel for the Installation, delivered to the engines from the local distribution network via a gas kiosk on site. There will be no storage of natural gas on site. It is anticipated that around 130,000kWh of natural gas will be required for one hour of operation. This can be extrapolated to a maximum of 292.5GWh of natural gas used annually based on 2,250 operating hours.

Lubricating oil will be used in the engines and stored in an 8,000l double skinned tank sited within a concrete bund which will hold 110% of the capacity of the tank, constructed in accordance with CIRIA 736 guidance. Transfer of the oil from the tanks for use in the Installation will be carried out by trained operatives over hardstanding to minimise any potential environmental risk from spills in accordance with the procedure detailed in the Environmental Management System (EMS). Spill kits will be on site to provide a rapid response to any spillage via a procedure detailed in the EMS.

There will be no hazardous materials stored on site.

2.7. Waste

The Operator will aim to minimise waste as much as possible. The nature and quantity of all waste generated by the Installation will be recorded as per procedures detailed within the EMS.

Used lubricating oil will be the predominate waste stream generated on site and will be stored in a double skinned tank sited within a concrete bund, constructed in compliance with CIRIA 736 guidance.

There will also be a minimal amount of general waste produced by the operations and maintenance of the Installation. All waste will be managed in accordance with the waste hierarchy and only sent to appropriately licensed facilities.

2.8. Energy Efficiency

The electrical efficiency of the Installation will be measured using the gas meter to monitor gas input and the electrical meter to monitor electrical output.

The equipment has been chosen to represent the best available technology for the proposed operations of the Installation. Although the plant is not subject to Chapter III of the IED due to being less than 15MWth individually, the BREF for LCP is deemed appropriate guidance. The BREF for LCP states the BAT-Associated Energy Efficiency Levels (BAT-AEEL) for the combustion of natural gas for new engines is 39.5-44%. The electrical efficiency of the Jenbacher engines is 45.3%, which exceeds the BAT-AEEL.

General measures for improving energy efficiency can be summarised 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.

2.9. Best Available Techniques (BAT) Assessment

A BAT Assessment has been completed and is presented in Appendix B BAT Assessment.

The report summarises the techniques utilised at the Installation against each of the applicable published BAT standards from the LCP BREF and the EA's working draft "BAT guidance for >50 MWth gas and liquid fuel combustion plant exporting electricity under commercial arrangements for <1500 hrs per annum".

The report finds the Installation to be compliant with all applicable LCP BREF BAT Conclusions and reasoning has been given for why this report considers any of the BAT Conclusions to be non-applicable.

Furthermore, the Installation exceeds the BAT requirements as detailed by the EA's working draft BAT guidance document. Through the use of primary abatement measures (advanced lean burn technology), the generators will meet the relevant ELV for NOx emissions set by the MCPD at 95mg/Nm^3 (15% O2). The nameplate efficiency of the Jenbacher engines is 45.3% which exceeds the efficiency threshold for new plant of 35.6%.

It is not considered that SCR would be an appropriate technology to utilise at the Installation due to the intended operational profile to provide balancing services for fewer than 1,500 hours per year on average.

3. Environmental Impact Assessment and Monitoring

This section summarises specialist reports commissioned to assess the environmental impact of the Installation and identifies ongoing monitoring requirements.

3.1. Receptors

The site is situated within Natural England's National Character Area number 60: Mersey Valley which states:

"Urban and industrial developments line the banks of the River Mersey. Industrial infrastructure is often prominent, with large-scale, highly visible development including chemical works and oil refineries. The Manchester Ship Canal links the estuary to the heart of Manchester, perpetuating the industrial development of the area. There is a dense communication network of major roads, railways, canals and transmission lines. The urban and suburban areas provide housing for those working in neighbouring conurbations, as well as in the industries of the Mersey Valley."

A Nature and Heritage Conservation Screening Report was requested at pre-application to identify any protected areas within screening distances for a habitats assessment and is presented in Appendix C1. The report identified:

Within 10km, there is 1 Special Protection Area (SPA) and 3 Ramsar sites:

- Mersery Estuary (SPA) (Ramsar)
- Midland Meres & Mosses Phase 1 (Ramsar)
- Midland Meres & Mosses Phase 2 (Ramsar)

Within 2km, there is 1 Site of Special Scientific Interest (SSSI) and 2 Local Wildlife Sites (LWS):

- Mersey Estuary (SSSI)
- Frodsham and Helsby and Ince Marshes (LWS)
- Station Road Railway Site (LWS)

Within 500m, there are 2 protected species records:

- European Eel migratory route
- European Water Vole

A habitats assessment will therefore be required.

3.2. Emissions to Land

There are no emissions to land from any of the regulated activities or DAAs.

The current status of the land is outlined within the Appendix D Site Condition Report. In order to minimise any future contamination risk, all operational areas on site will be covered in hardstanding.

3.3. Emissions to Air

There will be 11 new release points of emissions to air, produced by combustion of natural gas, via the 12m stacks on top of each engine container. The largest emissions in volume are water vapour (H_2O) and carbon dioxide (CO_2), with smaller amounts of other compounds, carbon monoxide (CO), nitrogen oxide (NO) and nitrogen dioxide (NO_2), expressed together as NO_X.

An air quality assessment was carried out by Isopleth (Appendix E1 Air Quality Assessment) using the AERMOD 11 dispersion model (Appendix E2 AQ Model Files). As a worst-case, emissions from each of the stacks have been assumed to occur for 2250 hours per year when comparing against long term air

quality limits and the entire year when comparing against short term limits. Actual operational hours are likely to be significantly lower.

All impacts, human and ecological, are predicted to be below limit values at locations where the Air Quality Directive states that they must be applied. When applying the theoretical worst case assumptions (i.e. that each of the engines is operating for 2250 hours per year) it can be seen that there is no realistic potential for a breach of the air quality objectives at any location.

The annual average critical level or nutrient nitrogen critical loads are not at risk as a result of the operation of the Installation.

In summary, it can be concluded that the predicted short term and long term PECs at the sensitive human and ecological receptors are within acceptable limits. The Installation is therefore unlikely to cause an exceedance of an EAL (or upper critical load / level).

Emissions to air will be monitored in line with the requirements for “New MCP” less than or equal to 20MWth. The sampling locations for monitoring will be accessed from the roof access via a port enabling measurements to be taken directly from the stack in line EN 15259. Monitoring to confirm initial compliance will be undertaken within 4 months of the permit being issued or the start date of operation, whichever is the latest. During the lifetime of the permit, periodic monitoring will be undertaken at least every 3 years. Monitoring will be undertaken by a UKAS accredited testing body in accordance with MCERTS.

3.4.Emissions to Water

There are no emissions to water from the regulated activity or DAAs. The Operator will be responsible for the ongoing management and maintenance of the uncontaminated surface water management system. A Flood Risk Assessment (FRA) has been carried out by Amber Planning (Appendix F Flood Risk Assessment and Drainage Strategy).

A scoping exercise was completed which considers all potential flood risks, each of which have been fully assessed as part of the FRA, with flood mitigation measures proposed to ensure that identified flood risks can be reduced to an acceptable level throughout the development lifetime, accounting for climate change predictions.

Residual risks associated with flood defence failure and extreme return period storm events have been assessed, with the flood risk concluded to be practicably low throughout the anticipated development lifetime, accounting for on-site flood mitigation and management measures. This would be further ameliorated by strategic flood defence improvements, proposed as part of local planning policy to ensure the current standard of protection is maintained over time.

The surface water attenuation requirements for the facility have been assessed using the WinDes Micro Drainage software package for return period rainfall events up to and including 100 years, taking account of existing runoff rates and climate change consideration at 25% and with a total storage of 405m^3 proposed. Gravitational discharge to local watercourses is proposed at controlled (*greenfield*) rates.

All drainage networks have been designed to account for industry best practice with regards system capacity, with safety factors accounted for within the surface water storage calculations to allow for successive rainfall events, fluctuations in flow and flood level, climate change sensitivity and losses in efficiency associated with siltation.

It is duly presented that the provision of a formal surface water management system, which incorporates on-site attenuation and water quality treatment, will ensure that potential detrimental impacts to flood risk and water quality are suitably mitigated throughout the anticipated development lifetime.

3.5.Noise Emissions

Noise emissions are produced from the engines during operation, so a noise impact assessment has been completed by Philip Dunbavin Acoustics (Appendix G1 Noise Impact Assessment). The noise model and monitoring data has been included with this submission within Appendix G2 Noise Model Files.

An assessment of the noise emissions from the proposed units has been undertaken and compared with the guidelines contained within BS4142:2014 *"Methods for rating and assessing industrial and commercial sound".*

The assessment indicates that the development will not result in an adverse impact at the nearest noise sensitive receivers in accordance with the recommendation described within BS4142:2014.

3.6.Amenity and Accident Risk

An amenity and accident risk assessment is presented in Appendix I and will be managed by the Operator's EMS.

4. Conclusion

This information summarised within this report finds that Protos Gas Generation Plant is not predicted to significantly impact local receptors or the environment.