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MONCKTON ENERGY LIMITED

Monckton Gas Peaking Scheme

Air Quality Assessment – Addendum Report

October 2017

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WWardell Armstrong LLP
City Quadrant, 11 Waterloo Square, Newcastle upon Tyne, NE1 4DP, United Kingdom
Telephone: +44 (0)191 232 0943 Facsimile: +44 (0)191 261 1572 www.wardell-armstrong.com

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MONCKTON ENERGY LIMITED

Monckton Gas Peaking Scheme

Air Quality Assessment – Addendum Report

October 2017

PREPARED BY:

Ishita Shah	Senior Environmental Scientist

APPROVED BY:

C M Dawson	Technical Director

CONTENTS

TABLES

DRAWINGS

Drawing SP-01 Rev.C Site Layout

Drawing -02 Rev.A Peaking Plant Plan and Elevation Detail

1 INTRODUCTION

1.1.1 Wardell Armstrong were commissioned to undertake an air quality assessment for the Monckton Gas Peaking facility comprising 5 gas generators of 2MW capacity each (total capacity of 10MW). The air quality assessment report considered the impacts of the emissions of Nitrogen oxides (NOx) and Carbon Monoxide (CO) associated with the proposed gas generators on the neighbouring properties and was submitted as part of the planning application in September 2016 (Planning application reference: 2016/1169).

1.1.2 Subsequent to the planning application submission, a revised scheme of reduced capacity of 7MW (maximum capacity) is now proposed on the site (Refer Drawing SP-01 Rev. C Site Layout). Further, the height of the stacks has now been increased to 10m against the 7.1m height proposed in the original scheme (See Drawing 02 Rev. A Peaking Plant Plan and Elevation). Discussions were undertaken with the Technical Officer (Pollution Control), at Barnsley Council to agree the approach for the revised scheme and it was agreed that since the revised scheme will not lead to any increase in emissions, but will only reduce the impact, there is no requirement to update the air dispersion model.

1.1.3 However, since the submission, new guidance has been issued regarding gas peaking facilities and generators. This addendum report provides an assessment of the impacts of NO_2 and CO emissions from the proposed facility in accordance with relevant new guidance as agreed with the Technical Officer (Pollution Control). This report should be read in conjunction with the Air Quality Assessment report (Ref. LE13674/002 dated September 2016).

2 GUIDANCE FOR STOR SITES

2.1 EA's Report on Diesel generator short term NO_2 impact assessment

2.1.1 The Environment Agency's Air Quality Modelling and Assessment Unit (AQMAU) were asked by the Department for Environment, Food & Rural Affairs (Defra) to investigate the potential for diesel generator arrays, for National Grid back up to cause a breach of the short-term nitrogen dioxide (NO_2) air quality Standard. Based on discussions with the Technical Officer, it is understood that this report is also considered applicable for gas generators and has therefore been considered for the proposed scheme.

2.1.2 AQMAU undertook precautionary modelling making conservative assumptions on emissions, along with more realistic assumptions for NOX to NO_2 conversion. The report recommended that a site-specific assessment should be conducted unless large multi-flue stack configurations are proposed or any of the following:

- Operational hours are restricted to 50 hours per year and there are no sensitive receptors within 150 m.
- Emissions are at the MCPD ELV and there are no sensitive receptors within 150 m.
- The total rated thermal input is less than 5 MWth and there are no sensitive receptors within 150 m.

2.1.3 A site-specific assessment for the site is already available based on a proprietary quantitative air dispersion model, AERMOD (Lakes Environmental model version 9.1), based on the Gaussian theory of plume dispersion. No further actions are therefore required and this approach has been confirmed with Barnsley Council.

2.2 IAQM's Interim Statement on STOR facilities

2.2.1 The Institute of Air Quality Management has released an interim position statement on 'Assessment of Air Quality Impacts from Short Term Operating Reserve (STOR) facilities and other limited hours of operation plant' in September 2017. The guidance states:

"The IAQM considers that assessment of the impact of emissions from STOR-type plant cannot be disregarded on the basis of limited operating hours.... The EPUK & IAQM's guidance[1] on the assessment of air quality for planning includes an approach for describing impacts. The IAQM's position is that this guidance should also be applied when assessing the impacts of combustion plant that is operated on a limited-hours basis. Therefore, predicted total concentrations that are below the objective level should not automatically lead to conclusions that impacts are 'negligible' and therefore 'not significant'. Instead, the IAQM guidance should be followed and the impact should be assigned an appropriate impact descriptor; this may then show that impacts are not 'negligible' at concentrations below the objective level."

2.2.2 The Environmental Protection UK (EPUK) and the IAQM's guidance for the assessment of the air quality impacts of proposed developments and their significance, takes into

[1] Environmental Protection UK and the Institute of Air Quality Management, Land-Use Planning and Development Control: Planning for Air Quality, May 2015

account both the long-term background concentrations, in relation to the relevant Air Quality Assessment Level (AQAL) at these receptors, and the change with the development in place. The impact descriptors for individual receptors are detailed in Table 1.

Table 1: Impact Descriptors for Individual Receptors				
Long term average concentration at receptor in assessment year*	**Percentage change in concentration relative to Air Quality Assessment Level (AQAL)***			
	1%	**2-5%**	**6-10%**	**>10**
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
**Percentage pollutant concentrations have been rounded to whole numbers, to make it easier to assess the impact. Changes of 0% (i.e. less than 0.5%) should be described as negligible*				

Determining the Significance of Effects

2.2.3 Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as either 'significant' or 'not significant'. The modelled concentrations at each of the receptor locations provided in the Air Quality Assessment Report (September 2016) have been used to assess the significance of the impacts in accordance with the EPUK and the IAQM guidance. (Refer to Table 4 and Appendix A of the Air quality assessment report (September 2016) for additional details). The significance of impacts is provided in Table 2:

Table 2: Significance of Air Quality Impacts (NO_2)						
Receptor ID	**Grid Reference**		**Receptor Address**	**Long term average conc.**	**Change in conc. relative to AQAL**	**Significance of Impact**
	X	**Y**		**(% of AQAL)**	**%**	
ESR 1	437525	412457	Lund Hill Ln, Royston	37	2.04 ()	Slight
ESR 2	437313	411715	Midland Rd, Royston	42	14.07	Moderate
ESR 3	437092	411715	Midland Rd, Royston	42	8.7	Moderate

ESR 4	437315	411628	Station Terrace, Royston	42	9.41	Moderate
ESR 5	437303	411451	End Cres, Royston	42	4.22	Slight
ESR 6	437174	411559	Caldervale, Royston	42	5.22	Moderate
ESR 7	436646	412423	Common Ln, Royston	37	1.91	Slight
ESR 8	437421	413189	Gable Cottage, Wakefield	37	0.90	Negligible
ESR 9	438530	412372	Slack Ln, South Hindley	38	1.37	Slight
ESR 10	438711	411298	Queens Dr, Shafton	39	1.42	Slight
ESR 11	438834	411544	Greenside Estate, Shafton	39	1.48	Slight

2.2.4 The impacts of the proposed gas generators have been assessed to be negligible -slight at seven receptors and moderate at four receptors. This is shown considering 5 gas generators (Total capacity of 10MW) with a stack height of 7.1m. With the proposed changes in the plant configuration with a reduced generation capacity and higher stack height, the impacts are expected to be lower. Also, the model considers a worst-case approach with 24 hours of operation throughout the year (8760hrs), whereas the actual operation of the gas generators is anticipated to be only 800 hours in a year (less than 10% of the time considered for purposes of modelling).

2.2.5 Further, the gas generators will have emission limit values in conformance of the limits specified in the forthcoming Medium Combustion Plant Directive (proposed limit of 190[2]mg/Nm^3 instead of 500mg/Nm^3 considered for the air dispersion modelling) (see Section 2.3 for further details). The air quality impacts from the proposed gas peaking facility are therefore expected to be minor.

2.3 Medium Combustion Plant Directive

2.3.1 The Department for Environment, Food and Rural Affairs released a consultation document on reducing emissions from Medium Combustion Plants and Generators to improve air quality in November 2016. The key requirements of the permit, relevant to the proposed gas peaking facility, are as follows :

[2] As recommended in the 'Consultation on reducing emissions from Medium Combustion Plants and Generators to improve air quality'. The facility will select generators that comply with the relevant emission limit values at the time of installation or any forthcoming legislations.

- All generators with a rated thermal input of 1-50MWhr to obtain a 'Permit to operate' from Environment Agency;
- Generators to comply with an Emission Limit Value of 190 mg/Nm3 for NOx.

2.3.2 The final configuration of the gas generators for the project will be selected based on the requirements of the Medium Combustion Plant Directive. The decision on spark ignition or gas compressed generators will also be made during the final selection. The Developer will also obtain a Permit to Operate for the proposed facility within the timeframe stipulated by the final legislation on generators issued by the government.

3 CONCLUSIONS

3.1.1 The results of the assessment indicate that, for the receptor locations assessed, the short and long term predicted concentrations for NO_2 and CO lie within the respective air quality objectives. This is shown considering 5 gas generators (total 10MW capacity) with a stack height of 7.1m. With the proposed changes in the plant configuration with a reduced generation capacity to 7.5MW and 10m stack height, the impacts are expected to be lower. Also, the model considers a worst-case approach with 24 hours of operation throughout the year (8760hrs), whereas the actual operation of the gas generators is anticipated to be only 800 hours in a year (less than 10% of the time considered for purposes of modelling).

3.1.2 Further, the gas generators will have emission limit values in conformance of the limits specified in the forthcoming Medium Combustion Plant Directive (proposed limit of 190[3]mg/Nm^3 instead of 500mg/Nm^3 considered for the air dispersion modelling) (see Section 2.3 for further details). The air quality impacts from the proposed gas peaking facility are therefore expected to be acceptable.

[3] As recommended in the 'Consultation on reducing emissions from Medium Combustion Plants and Generators to improve air quality'. The facility will select generators that comply with the relevant emission limit values at the time of installation or any forthcoming legislations.

Post

Post

Post

68.0

64.0

66.0

North

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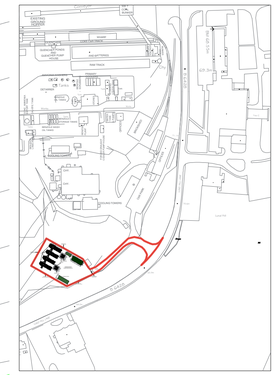
KEY

- Application Site
- LV Low Voltage
- HV High Voltage
- 12 Length in metres
- Existing Contours (Metres AOD)

SITE LOCATION



PROPOSED 2.4M
PALISADE FENCING

3200

11736

13067

PROPOSED 2.4M
PALISADE FENCING

2440

LV ROOM

6060

NEW ENGINES

4880

HV ROOM

12190

PROPOSED 2.4M
PALISADE FENCING

TRANSFORMER

PROPOSED PEAKING PLANT
COMPOUND AT 62M AOD
INCLUDING FINISHED LEVEL OF
CONCRETE PADS FOR APPARATUS

6

EXISTING
ACCESS ROAD

PROPOSED 2.4M
PALISADE FENCING

PROPOSED 2.4M
HIGH ACOUSTIC FENCING

4000

PORTABLE OFFICE

12000

EXISTING
PALISADE ACCESS
GATES RETAINED

62.0

PROPOSED 2.4M
HIGH ACOUSTIC FENCING

62.0

Monckton Power Limited

Monckton Gas Peaking Scheme

Site Layout

DATE: 29.09.2017 SCALE: 1: 100 @ A1

DRAWN BY / REVIEWED BY: VMc / JD

PROJECT NO:	DRAWING NO:	REVISION:
HG3317	SP-01	C

WYG
Rowe House, 10 East Parade, Harrogate, HG1 5LT
Tel: +44 (0)1423 857 510
Email: info@wyg.com www.**wyg**.com

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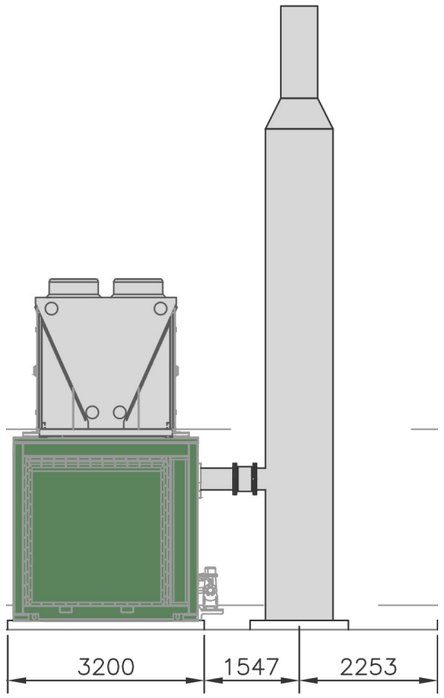

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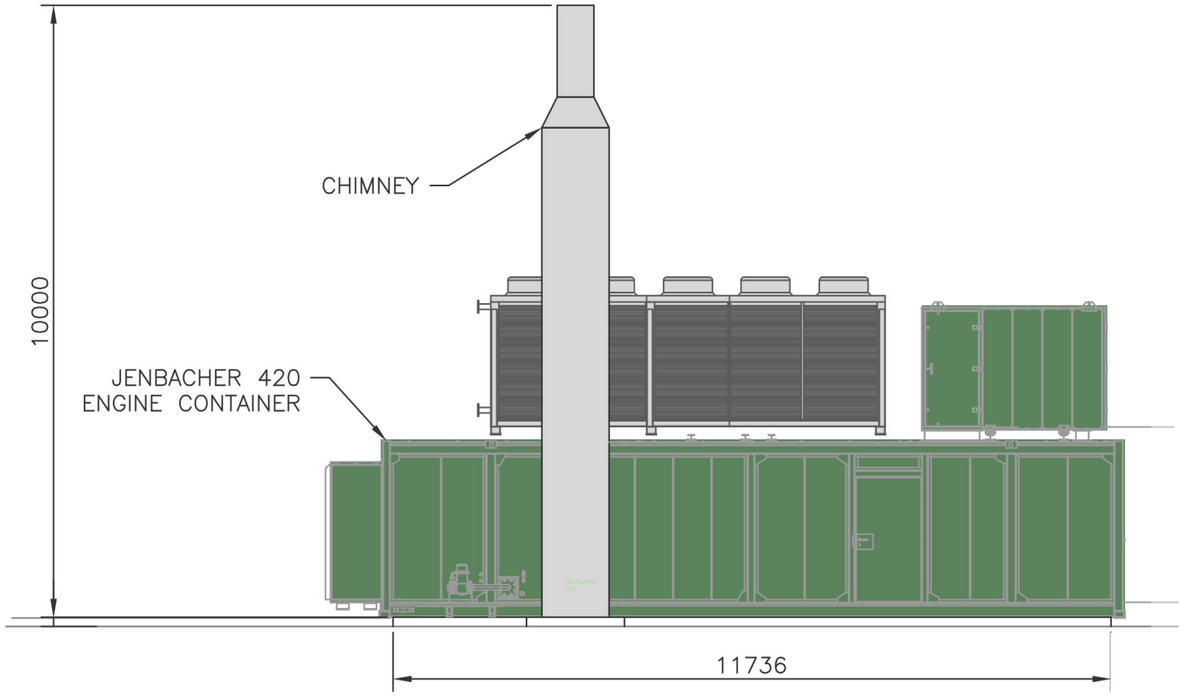

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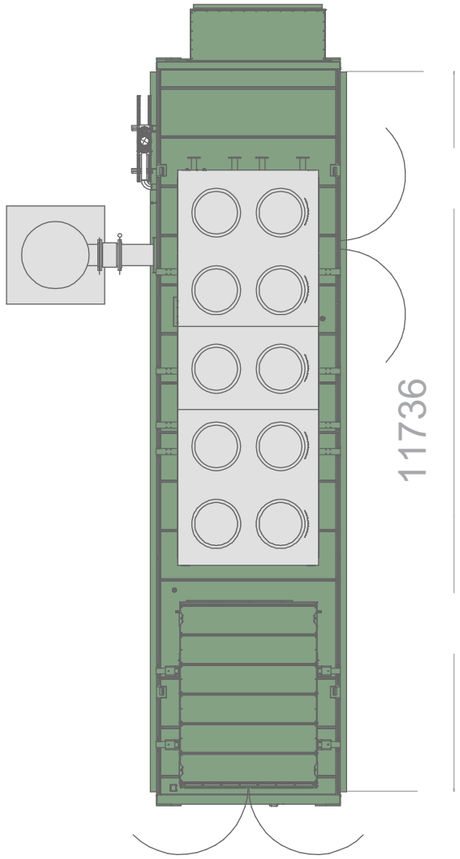

PLAN

REVISIONS

REV	AMENDMENTS	BY	DATE

Monckton Energy Limited

Monckton Works

Peaking Plant Plan and Elevation Detail

DATE: 29.09.2017 SCALE: 1: 100 @ A3

DRAWN BY / REVIEWED BY: VMc / JD

PROJECT NO:	DRAWING NO:	REVISION:
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WYG
Rowe House, 10 East Parade, Harrogate, HG1 5LT
Tel: +44 (0)1423 857 510
Email: info@wyg.com www.**wyg**.com

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