SOUTH HOOK
LNG TERMINAL COMPANY LTD

Mrs Karen Dunn
Senior Officer - Industry & Waste Regulation
South West Wales Industry Regulation Team

Natural Resources Wales (NRW)
Maes Newydd,
Llandarcy,
Neath Port Talbot
SA10 6JQ

Our Ref: SHLNG-TS-ENV-C-580

Your Ref: EPR/XP3538LD

Date: 28 January 2020

Dear Mrs Dunn,

Operator: South Hook LNG Terminal Company LTD.
IED Environmental Permit Number EPR/ XP3538LD
Condition 4.2.2(a) – Report on Review and Assessment of the Permit Monitoring Results - 2019

Please find enclosed a report on the review and assessment of the permit monitoring results for the South Hook LNG Terminal permitted installation over the previous year 2019, as required by the above permit.

Please do not hesitate to contact me should you have any queries, or I can be of further assistance.

Yours sincerely

Dr Shane Evans
Senior Environmental Engineer.

Attachments:

- Report on the review and assessment of the permit monitoring results over the year 2019.

cc. Mr Zoltan Hazos, Technical Services Manager.

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EM 28/01/20

Operator: South Hook LNG Terminal Company LTD.

Permit Number: EPR/XP3538LD

Installation: South Hook LNG Terminal

Condition 4.2.2(a) – Report on Review and Assessment of the Permit Monitoring Results 2019

Signed.....S Evans..... *Date*.....27/1/2020.....
Dr Shane Evans, Senior Environmental Engineer.

(Authorised to sign as representative of Operator).

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1.0 INTRODUCTION

South Hook LNG Terminal Company LTD operates in accordance with an EPR environmental permit, (Permit Number EPR/XP3538LD), under The Environmental Permitting (England & Wales) Regulations 2016, as amended.

Condition 4.2.2(a) of the EPR Permit requires the operator annually, to provide 'a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data'.

This report presents the review of the results of the permit monitoring and assessments carried out in 2019, in compliance with the above permit condition.

2.0 INTERPRETATIVE REVIEW OF THE RESULTS FOR 2019

A review is presented below of the permit monitoring and assessment for releases to air and water in 2019, as permitted in Schedule 3 of the South Hook LNG Terminal Company LTD. EPR environmental permit to operate, Permit Number EPR/XP3538LD. Interpretation of the results was carried out in accordance with the relevant permit conditions, including the emission limit values (ELVs).

2.1 W1 Site drainage (Surface and Groundwater)

The emissions performance of the permitted site drainage discharge (emissions point reference W1) for 2019 is presented below:

2.1.1 pH

pH was monitored daily throughout 2019, in compliance with the permit. The pH data throughout 2019 were within the permitted ELVs, i.e. all results were found to be >6 and <9 pH units. The daily minimum and maximum pH recorded in 2019 were 7.1 and 8.4 pH units respectively. The main contributor to the site drainage (surface and groundwater) flow is rainfall related, so pH levels are not related to the permitted process.

2.1.2 Turbidity

No ELVs are specified for turbidity, in the EPR environmental permit. The average turbidity for 2019 was 2.7 nephelometric turbidity units (NTUs), whilst the maximum was 31 NTUs. Elevated turbidity is often associated with high rainfall (run-off) events, as expected.

2.1.3 Oil and Grease

A non-numeric condition (of no visible oil & grease) is specified in the EPR environmental permit (Number XP3538LD) issued on 14 October 2015. All visual assessments recorded "none visible" in 2019, in compliance with the permit.

2.1.4 Total Organic Carbon (TOC)

No ELVs are specified for TOC, in the EPR environmental permit. The maximum TOC result measured during 2019 was 3.7 mg/l; with an annual average of 2.0 mg/l. Review of the data indicated compliance with the permit.

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2.1.5 List 2 metals (copper, zinc, and iron only)

No ELVs are specified for List 2 metals (copper, zinc, and iron only), in the EPR environmental permit. List 2 metals were monitored monthly throughout 2019 and reported in compliance with the permit.

2.2 W2 (Process effluents)

The emissions performance of the permitted process effluents discharge (emissions point reference W2) for 2019 is presented below:

2.2.1 Flow Rate

Flow of the process effluents discharge (W2) was monitored continuously throughout 2019, in compliance with the permit. The ELVs for effluent flow volume and rate are <3500m3/day and <164m3/hour respectively. The maximum daily volume discharged and flow rate during 2019 were 1192 m3/day and 106 m3/hour respectively. Review of the data indicated compliance with the permit. The effluent flow volume and rate were positively and directly correlated to production (of natural gas send out), as expected.

2.2.2 pH

pH of the process effluents discharge (W2) was monitored continuously throughout 2019, in compliance with the permit. The pH data throughout 2019 were within the permitted ELVs, i.e. all results were found to be >6 and <9 pH units. The daily minimum and maximum pH recorded in 2019 were 6.2 and 8.3 pH units respectively, with an annual daily average of 7.2 pH units. Review of the data indicated compliance with the permit.

2.2.3 Nitrates

Nitrates in the process effluents discharge (W2) was monitored throughout 2019, in compliance with the permit. The annual daily maximum nitrates concentrations and loads recorded during 2019 were 15.0 mgN/l and 14.36 kgN/day, whilst the annual daily mean nitrates concentrations and loads were 8.3 mgN/l and 4.17 kgN/day respectively. Therefore, the emissions of nitrates from the installation during 2019 were compliant with the permitted ELVs, i.e. <50 mgN/l, and <100 kgN/day and <50 kgN/day annual mean. The emissions of nitrates load from the installation were positively and directly correlated to production (of natural gas send out), as expected. Review of the data indicated compliance with the permit.

2.2.4 Oil and Grease

The results were as for W1, see section 2.1.3 above. All visual assessments in 2019 were "none visible" for oil and grease, in compliance with the permit.

2.2.5 Temperature

Temperature of the process effluents discharge (W2) was monitored continuously throughout 2019, in compliance with the permit. The maximum temperature recorded in 2019 was 20.33 C° on 26 July 2019. A minor seasonality was evident in the data, with slightly warmer temperatures during the warmer summer months. Review of the data indicated compliance with the permit.

2.2.6 BOD

No ELVs are specified for BOD, in the EPR environmental permit. BOD was monitored monthly throughout 2019, in compliance with the permit. During the period, the Terminal operated for extended periods at variable and sometimes low/ minimum send out, which were associated with variable and in some cases elevated BOD emissions in the SCV

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produced waters. However, in accordance with maintaining safe, reliable (compliant) operations, the mass flows were also reduced, with no significant adverse effect on the environment. The maximum BOD recorded in 2019 was 52 mg/l, with an annual mean of 19.5 mg/l. Review of the data indicated compliance with the permit.

2.1.7 Total Residual Oxidant (as total free Chlorine)

Total Residual Oxidant (as total free chlorine) was monitored monthly throughout 2019, in compliance with the permit. The ELV for total residual oxidant is <0.1mg/l. All results for 2019 were measured at <0.02mg/l (Limit of Detection), in compliance with the permit.

2.3 Emissions to air

2.3.1 Continuous Emission Monitoring (CEMS) NOx Emissions - SCVs A8 & A11

NOx emissions from SCVs A8 (1H) & A11 (2A) were required to be monitored continuously whilst the SCVs were online throughout 2019, in compliance with the permit.

To support safe operations at variable and low/ minimum send out rates, the SCVs fitted with continuous emission monitoring systems (CEMS) for NOx have been unavailable, as follows:

- Minimum Send Out and to allow internal inspections and essential maintenance: from 1 January 2019 to on or about 6 September 2019 for SCV 1H.
- Low/ Minimum Send Out: Intermittent operation from 9 June 2019 to 2 September 2019 for SCV 2A.
- To allow internal inspections and essential maintenance: from 30 October 2019 to year-end 2019 for SCV 2A.

The annual daily mean NOx concentration for 2019 was 56.45 mg/Nm^3 for SCV 8A and 53.72 mg/Nm^3 SCV A11. The emissions of NOx were not strongly correlated to production (of natural gas send out), as expected. Review of the data indicated compliance with the permit.

2.3.2 Discontinuous (quarterly) NOx and CO Emissions - SCVs A1-A8 and A11-A17

During 2019, the National Physical Laboratory (NPL) carried out quarterly discontinuous stack monitoring on behalf of the Company, in compliance with the permit. Results of the discontinuous stack monitoring 2019 were reported in compliance with the permit. The monitoring programmes that were implemented in 2019 are presented in Table 1 below:

Monitoring Period	Number of SCV's monitored
1st Quarter 25th – 28th February 2019	11 SCV's monitored
2nd Quarter 8th April & 10th – 12th June 2019	4 SCV's monitored
3rd Quarter 15th – 18th July 2019	7 SCV's monitored
4th Quarter 18th – 22nd November 2019	3 SCV's monitored

Table 1 – Programmes of quarterly discontinuous stack monitoring undertaken by NPL during 2019

Assessment of the results of the discontinuous monitoring campaigns that were undertaken during 2019 indicated compliance with the permit.

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3.0 CONCLUSION

This report presents of the results of the permit monitoring and assessments carried out in 2019, in compliance with Condition 4.2.2(a) of the EPR environmental permit (Permit Number EPR/XP3538LD). Interpretation of the results was carried out in accordance with the relevant permit conditions, including the emission limit values (ELVs).

The emissions performance of the site drainage discharge (emissions point reference W1) for 2019 is presented in section 2.1, whilst the emissions performance of the process effluents discharge (emissions point reference W2) for 2019 is presented in section 2.2. The emissions performance of the emissions to air is presented in section 2.3.

The assessment indicated that during 2019 the Company monitored in compliance with the permit. In addition, review of the emissions data indicated compliance with the permit. The data supports the good environmental performance of the Company in 2019.

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