


IQE Europe performance review 2022.
Environmental Operating Permit
EPR/KP3235SS

January 24 2023

2022

Prepared on behalf of IQE Europe Ltd.


IQE Group HSE Manager.

Introduction

This report has been prepared for Natural Resources Wales “*the regulator*” in line with the requirements of IQE EU “*the operator*” environmental operating permit EPR/KP3235SS to satisfy permit condition 4.2.2.

General Information

This is the sixth report submitted by IQE since the issue of the consolidated operating permit by the regulator on 25th July 2017 and the first report after our recent rebranding which is reflected with our new logo on the front page above. It is also the first report since the business made the decision that the IQE Europe site would become an innovation centre with a strategic value for the group in technology creation, new capability development and NPI. IQE Europe still has production responsibilities for legacy work with no changes to the chemicals and substances used at the site. This transition over from the Production group to Technology group has no impact on our environmental operating permit conditions. Communication of this change was made to Lewis Evans our Natural Resource Senior Officer.

During 2022 IQE sites across South Wales have engaged with Achilles to gain accreditation to ISO 14064-1. The standard specifies principles and requirements at the organization level for the quantification and reporting of greenhouse gas (GHG) emissions and removals. It includes requirements for the design, development, management, reporting and verification of an organization's GHG inventory. In April 2022 IQE group had the GHG inventory accredited to Iso 14064-1. IQE group have also signed up to the science-based targets initiative with it announced to the markets in May 2022.

With IQE Newport’s mass-manufacturing plant operating with ten reactors significant VCSEL R&D and some legacy products remain prevalent at the IQE Europe plant, along with GaAs edge-emitter products, using arsine and will remain roughly in line with 2022 production figures. Phosphine-related production is also looking similar to 2022 levels and has been captured wholly by the IQE Europe plant. As a result, phosphine-related production will remain here for the foreseeable future. G5+ ammonia-based reactor is projected to become more productive, having been largely in R&D mode, hence ammonia-related use will also continue for the foreseeable future.

Monitoring Results (Condition 4.2.2 (a))

The table below summarises the results from the latest round of emission monitoring conducted in line with the requirements of permit condition 3.3.1 (a) and table S3.1 of KP3235SS for emission points A1 and A3.

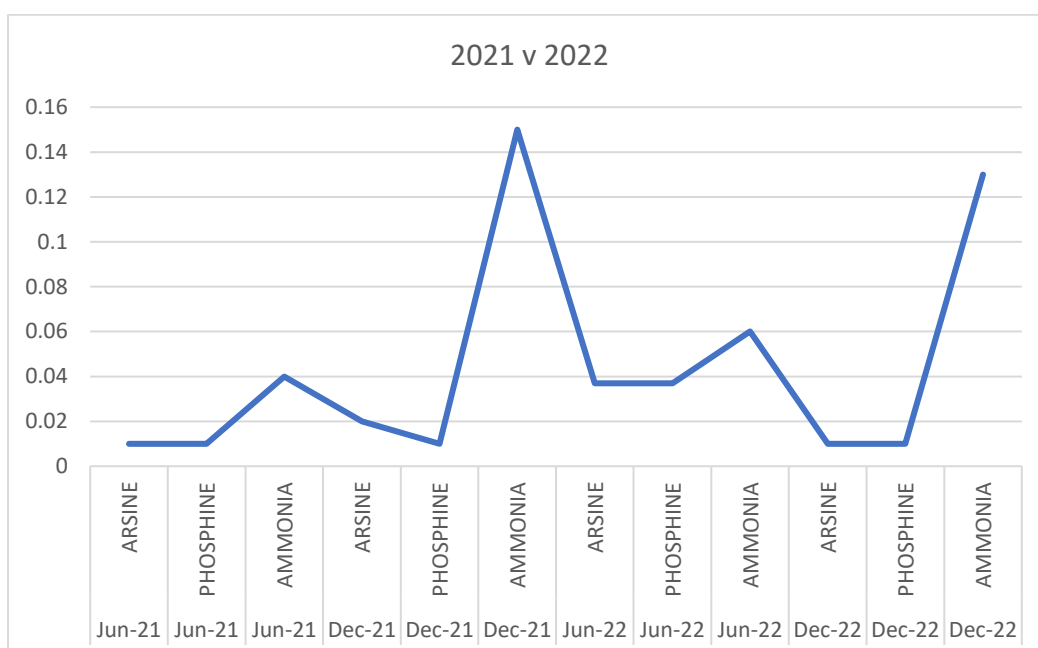
Emissions to Air			
Emission Point	Substance/Parameter	Emission Limit Value	Result ^[1]
A1	Ammonia ⁽⁷⁾	10 mg/m ³	0.031 mg/m ³
A1	Hydrogen Chloride	10 mg/m ³	0.008 mg/m ³
A3	Arsine ⁽⁶⁾	0.42 mg/m ³	0.01 mg/m ³
A3	Phosphine ⁽⁶⁾	0.42 mg/m ³	0.01 mg/m ³
A3	Ammonia ⁽⁷⁾	9 mg/m ³	0.13 mg/m ³

2021 v 2022 Comparison

Emission Point	Substance	Emission Limit Value	2021 Result	2022 Result	+ / - Balance
A1	Ammonia	10mg/m ³	0.09mg/m ³	0.03mg/m ³	-0.06mg/m ³
A1	Hydrogen Chloride	10mg/m ³	0.06mg/m ³	0.008mg/m ³	-0.05mg/m ³
A3	Arsine	0.42mg/m ³	0.02mg/m ³	0.01mg/m ³	-0.01mg/m ³
A3	Phosphine	0.42mg/m ³	0.01mg/m ³	0.01mg/m ³	0.00mg/m ³
A3	Ammonia	9mg/m ³	0.06mg/m ³	0.13mg/m ³	+0.07mg/m ³

As we can see from the data table 'Emissions to Air' IQE EU remains significantly lower than the emission limit value of 10mg/m³ for ammonia & hydrogen chloride for emissions point A1.

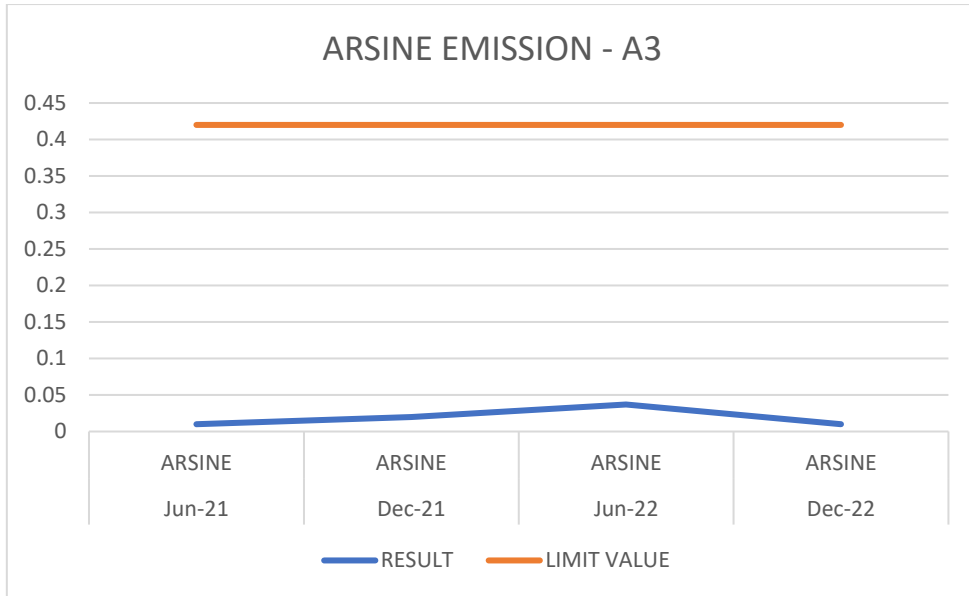
Emission point A3 for Arsine, Phosphine & Ammonia limits are also significantly lower than the ELV's.



2022 Data Review

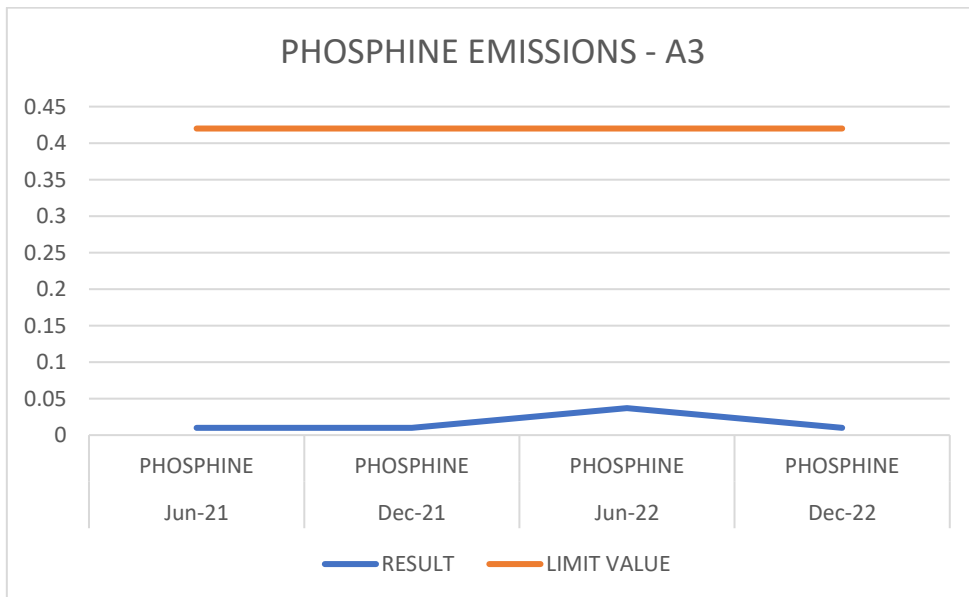
Evaluation of 2022 monitoring results for arsine emissions via point A3 against 2021 show a very slight increase in emissions in the June readings from 0.01mg/m³ to 0.04mg/m³ but have then drop back down to 0.01 mg/m³ in the results obtained on the 14th December 2022.

The emissions continue to remain significantly lower than the limit value of 0.42 mg/m³.

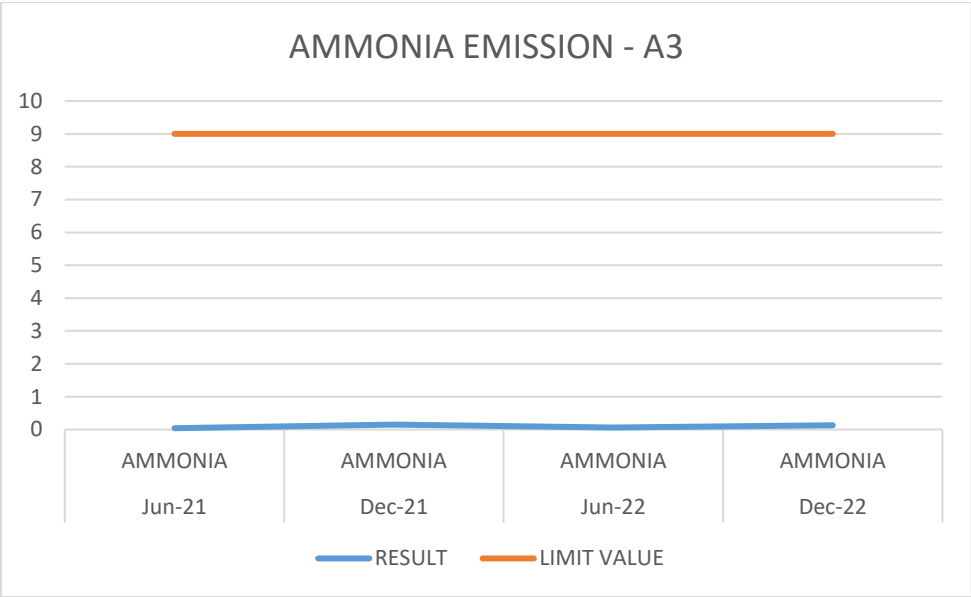


The EU facility continues to operate a minimum of three production tools where phosphine is required. The results for phosphine emissions via point A3 against 2021 show a very slight increase in emissions in the June readings from 0.01mg/m³ to 0.04mg/m³ but have then drop back down to 0.01 mg/m³ in the results obtained on the 14th December 2022.

Phosphine emissions remain well within limits set as evidenced in the chart below.



2021 to 2022 ammonia emissions remain steady. Emissions to air remain well below the prescribed limit.



As required under permit condition 4.2.2 (table S4.2) for the period 01/01/22 – 31/12/22 the annual amount of raw ammonia used was 800kg / 0.8tonnes.

All emissions to atmosphere from emission point A3 are significantly below prescribed limits and IQE EU continues to operate in compliance with the conditions laid down in EPR/KP3235SS.