

Permitting Decisions- Bespoke Permit

We have decided to grant the permit for Hydrogen Generation System at Saint-Gobain Glass operated by Hygear B.V.

The permit number is EPR/NP3606MX/A001

The application is for a Hydrogen Generation System (HGS) located on the Saint-Gobain Glass United Kingdom Limited site near Eggborough, Goole, Yorkshire which is itself currently regulated by the Local Authority under an EPR A2 permit.

The HGS comprises three HyGen50 units to produce up to 126 Nm³/h of hydrogen by steam reformation of methane under scheduled activity S4.2A(1)(a)(i) to supply the adjoining Saint-Gobain glass production facility.

Raw material natural gas and water are purified before reaction to hydrogen and oxides of carbon. Each HyGen50 unit has an exhaust stack as well as a discharge of condensate water and demineralisation reject water to foul sewer. Up to 725kg of hydrogen can be stored on the installation. No methane raw material is stored.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision-making process. It:

- summarises the decision making process in the [decision considerations](#) section to show how the main relevant factors have been taken into account
- highlights [key issues](#) in the determination
- shows how we have considered the [consultation responses](#)

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit.

Key issues of the decision

Operator legal entity

The Application was duly made while the applicant applied for company registration in the United Kingdom. This was achieved before the permit was issued.

Hydrogen Production rate and storage capacity

The original application documents implied storage of 800kg of hydrogen product at 7 bar(g) in a single 900 litre vessel. At 7bar(g) this mass of hydrogen would occupy a very much larger volume.

In response to the request for further information the applicant clarified the production rate and storage capacity of the installation:

Each Hy.GEN unit has a capacity of 42 Nm³/h of hydrogen. The total capacity of the three Hy.GEN 50 units is therefore 3 x 42 Nm³/h = 126 Nm³/h. Inside each Hy.GEN, there is a 900 litre buffer tank that will store hydrogen at 7 bar(g), this is equal to 0.7 kg of hydrogen.

The average demand from Saint-Gobain is below this production rate, so the surplus hydrogen is compressed to 200 bar(g) and stored in six storage banks with a volume of 6.7 m³ each. In total, this equates to 725 kg of hydrogen at 200 bar(g).

Hazardous waste generation

The submitted supporting document section 4.2.5 states a total of ~213kg hazardous waste per year but section 4.2.4 states the total will be ~1050kg of desulphurisation pellets + waste compressor oil. But it also says 175kg pellets from each of three units twice per year which is 1050kg on its own. However, with the ~30kg compressor oil this would total 1080kg per year, still only ~3kg per day, which we consider acceptable as a worst case.

Emissions to air

Appendix A to Appendix E Environmental Risk Assessment to the Application Supporting Document includes an assessment of emissions to air using the Environment Agency's H1 assessment tool. This concludes the environmental impact is insignificant as for NO₂ the Long Term Process Contribution (PC) is <1% of the Environmental Assessment Level (0.876%) and the Short Term PC is <10% (2.31%) and for Carbon Monoxide the Short Term PC is <10% (0.00365%).

However, the input parameters for the assessment state an efflux velocity of 17.9m/s and a total flow of 112.349m³/hr that is not compatible with the stack diameter of 72.1mm stated elsewhere in the application. It is likely the efflux velocity is incorrect but if it is not the total flow would be 263m³/hr and the Long Term PC for NO₂ would be 2.05% and would no longer screen out at this step as insignificant.

We carried out a sensitivity check with the 263m³/hr flow and worst case 100% NO to NO₂ conversion rather than the 70% Long Term and 35% Short Term assumed by the applicant. Using a credible background of 16µg/m³ for NO₂ the Predicted Environmental Concentration for NO₂ screens out at Long Term <70% (43.2%) and Short Term <20% of headroom (18.4%) of the Environmental Assessment Level. We therefore accept the overall conclusion that there will not be an adverse impact on air quality from emissions to air from the installation.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has not been made.

The decision was taken in accordance with our guidance on confidentiality.

Identifying confidential information

We have not identified information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

Food Standards Agency
Selby District Council – Environmental Health Department
Health and Safety Executive
Director of Public Health and UK Health Security Agency

Only the UK Health Security Agency responded.
The comments and our responses are summarised in the [consultation responses](#) section.

Operator

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1'

The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

This permit applies to only the HGS Part A1 installation. The HGS is located on the Saint-Gobain Glass United Kingdom Limited site near Eggborough, Goole, Yorkshire which is itself currently regulated by the Local Authority under an EPR A2 permit.

The site

The operator has provided plans which we consider to be satisfactory. In the response to the request for information the applicant clarified that the relevant up to date plans were the 'Proposed Site Layout Plan' dated December 2021 and 'Multi-operator plan dated February 2022.

These show the extent of the site of the facility including the discharge points and the location of the installation to which this permit applies on the larger local authority regulated site.

The plans are included in the permit.

Site condition report

The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

The applicant has not chosen to provide site specific baseline data, though they have provided limited information from adjacent land which suggests the land is not contaminated. The information provided suggests the land was greenfield farmland prior to the applicant developing it, and so it is unlikely impacted by historical contamination.

The hazardous substances to be used under this permit are all gases, and so the pollution risk to soil or groundwater from these substances is low.

We therefore agree with the applicant's conclusion that pollution of land and water is unlikely.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is not within our screening distances for these designations.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator's risk assessment is satisfactory.

Climate change adaptation

A climate change adaptation risk assessment was not necessary for this application

General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

Operating techniques for emissions that screen out as insignificant

The applicants H1 assessment screened out emissions of nitrogen dioxide and carbon monoxide at the Process Contribution step as insignificant (Long Term

<1% of Environmental Assessment Level for NO₂, Short Term <10% for NO₂ and CO). The assessment included assumed conversions of NO to NO₂ of 70% Long Term and 35% Short Term reducing the modelled concentrations. However, even if 100% conversion is assumed the impacts still screen out at the process contribution step for CO and the predicted environmental concentration step with a credible 16µg/m³ background for NO₂. So we agree that the applicant's proposed techniques are Best Available Techniques (BAT) for the installation.

We consider that the emission limits included in the installation permit reflect the BAT for the sector.

National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting emission limit values in line with technical guidance we are minimising emissions to air. This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Odour management

Under normal operation the risk of an odour is very low. The HGS removes odorant from the natural gas raw material before reaction. For safety reasons, natural gas is handled within a fully contained system up to the point of use. Should leaks occur, for safety reasons, the system would be isolated, and repairs made.

No odour management plan was required.

Noise and vibration management

A noise assessment was submitted as Appendix D to the application. We have reviewed this assessment and agree with the conclusion that noise impact will be below the levels at which adverse effects are likely to occur for both day and night operation and there is therefore only a low potential for noise impacts at offsite Noise Sensitive Receptors.

No noise and vibration management plan was required.

Raw materials

The main installation raw materials are national grid natural gas (methane) and mains water with some nitrogen to mix with the hydrogen product. We have not specified limits and controls on the use of raw materials and fuels.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions:

PO1

In order to ensure that the application commitment to produce and put in place a site-specific Environmental Management System prior to commissioning is completed.

Emission Limits

We have decided that emission limits are not required in the permit.

There is an exhaust stack located on each of the three HyGEN50 units. The primary air pollutants of concern with the potential to impact on human health from the exhausts pipes are NO_x and CO. An H1 screening assessment has been carried out. This has concluded that the emissions to air from the process screen out as insignificant.

Emissions to sewer will result from the wastewater from the reverse osmosis unit which is part of the water purification process within the HyGEN50 units and reformer wastewater. Each HyGen50 produces 65 litres per hour of aqueous waste. In total this gives a combined release of 4.7 m³/day from all 3 units. This lightly contaminated stream is discharged into the Saint-Gobain drainage system and will subsequently enter into the foul sewer to Yorkshire Water as part of the Saint-Gobain site consented discharge. The discharge consent is to be updated and will include consideration of the wastewater from the installation, but we do not consider this contribution will have a significant environmental impact.

There are no process emissions to land.

Management System

The application contained a commitment to produce and put in place a site-specific Environmental Management System prior to commissioning is completed. A pre-operational condition has been included in the permit to ensure this is completed.

We are not aware of any reason to consider that the operator will not be able to have a management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

Technical Competence

The HGS will be monitored and operated remotely by the permit holder.

Staff remotely operating the plant or providing onsite maintenance will be sufficiently trained to ensure that they are technically competent to undertake their role. The Saint-Gobain staff required to interact with the HGS, specifically in an emergency situation, will also be sufficiently trained to ensure they are technically competent. HyGear technical specialists will be available at all times to advise as required.

We are satisfied that the operator is technically competent.

Previous performance

We have assessed operator competence. There is no known reason to consider the applicant will not comply with the permit conditions.

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution.

This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

Consultation Responses

The following summarises the responses to consultation with other organisations and our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section:

Response received from UK Health Security Agency 09/06/2022.

Brief summary of issues raised:

1. As limited information was made available for fire monitoring, we recommend that the regulator is satisfied that sufficient fire and explosive detection and monitoring systems are in place
2. That measures on the handling of hazardous waste are adequate so that it does not pose a pollution or incident risk

Summary of actions taken:

1. We are satisfied that the fire and explosion detection and monitoring will be included in the accident section of the Environmental Management System as described in overview in Section 3.3 of the submitted application supporting document. However, to ensure this we have added the wording 'The EMS should include, but not be limited to, a description of the fire and explosion monitoring systems in place and actions that will occur/must be taken if they are activated' to Pre-operational condition PO 1.
2. The liquid used compressor oil forms a relatively small fraction of the hazardous waste, the rest being solid desulphurisation pellets. We are satisfied that the measures for handling the hazardous waste will be adequate to prevent a significant pollution or incident risk.
No action required.