Permitting Decisions- Bespoke Permit

We have decided to grant the permit for Knostrop Sludge Treatment and Tankered Waste Facility operated by SGN Gas to Grid ProjectCo1 Limited.

The permit number is EPR/YP3627SL/A001.

The permit was granted on 04/03/2026.

The application is for SGN Gas to Grid ProjectCo1 Limited (SGN) proposes to operate a new biomethane to grid (BtG) plant within Knostrop STF, which is owned and operated by Yorkshire Water Services Limited. The STF is an existing regulated facility and the BtG plant will be a Directly Associated Activity (DAA) to the scheduled activities permitted on the WwTW under the permit number EPR/FB3809MM.

Raw biogas will be generated at the STF through anaerobic digestion of sewage sludge. The raw biogas will be transferred to the BtG plant where it will be cleaned upgraded to produce biomethane of a quality that will be suitable for injection into the local grid network.

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

Operation of biomethane flare

BAT 15 of the Waste Treatment BAT Conclusions states that:

BAT is to use flaring only for safety reasons or for non-routine operating conditions (e.g. start-ups, shutdowns) by using both of the techniques:

- *Correct plant design which includes the provision of a gas recovery system with sufficient capacity and the use of high-integrity relief valves.*
- *Plant management which includes balancing the gas system and using advanced process control.*

The applicant reports that the new biomethane flare will be a shrouded ground flare with a maximum flow capacity of 1,675 Nm^3/h. This is above the maximum biomethane production capacity of the BtG plant. The biomethane flare is designed for fully automatic, unattended operation. In-built process controls automatically initiate the operation of the biomethane flare in response to operating system triggers and then control combustion conditions for optimum performance.

The applicant states that the biomethane flare will be subject to regular performance monitoring and planned maintenance to ensure minimum emissions, maximum combustion efficiency and maximum operational availability. The biomethane flare will comply with the operating conditions of 0.3 seconds' residence time at 1,000°C as specified in Environment Agency guidance document: Guidance for Monitoring Enclosed Landfill Gas Flares (LFTGN05 v2 2010)10, will be fitted with a monitoring port, and is designed to meet the emission limits set in LFTGN05 v2 2010.

Section 2.3.5.5 of the Waste Treatment BREF describes *flaring as a high-temperature oxidation process used to burn combustible components of waste gases from industrial operations. Flares are used for safety reasons or during non-routine operating conditions (e.g. start-ups, shutdowns). Flaring is used to safely combust vented flammable gases (hydrocarbons) at a pressure drop which does not compromise plant relief systems. Because flaring is both a source of pollution and leads to the burning of a potentially valuable product, its use should be limited to non-routine, momentary stoppages or emergency releases. Uncontrolled emissions (especially VOCs) from vents and relief valves should be routed to recovery systems, with flares serving only as a backup system.*

We asked the applicant to provide further information that demonstrates appropriate use of the flare in accordance with Waste Treatment BAT Conclusions BATc 15, including the description of abnormal scenarios during site operation.

The applicant reported that the new biomethane flare will be installed to enable the safe disposal of non-compliant biomethane. The biomethane flare will operate on start-up of BtG plant or in the event of the production of non-compliant biomethane gas. The biomethane flare is not anticipated to operate for more than a 30-minute period under normal circumstances.

Start-up and Abnormal Operation

The applicant states that if there is a period where no biogas is available from YWS, the BtG plant will idle in standby mode awaiting run command from YWS. When biogas is available once more, the BtG plant will receive a signal which will automatically initiate the start-up sequence. Other than when biogas is not available, there are four main modes of atypical /abnormal operation:

- start-up of the BtG plant;
- receipt of off-specification biogas from YWS;
- production of non-compliant biomethane; and
- closure of the Remote Operated Valve (ROV).

The applicant states that the use of the biomethane flare for all modes of atypical operation will be less than 10% of the year; however, a more realistic expectation is estimated at less than 200 hours per year.

Start-up of the BtG plant

The BtG plant will be required to start up periodically, after maintenance and /or after unplanned shutdown or process upset conditions such as:

- an electricity supply failure;
- equipment failure; or
- insufficient biogas to maintain the operation of the BtG plant.

When the BtG plant first starts up, biogas will be processed at low flow conditions. The initial output gas will not be suitable for injection to the grid, as it will not meet the grid entry requirements under the Gas Safety Management Regulations (GSMR). Gas which is not compliant with GSMR poses a risk to downstream consumers i.e. gas appliances not operating correctly/malfunction and incomplete combustion which would increase risk to consumers health and safety. The initial output gas will not be suitable for injection to the grid, as it will not meet the grid entry requirements. The output gas product will therefore be directed to the biomethane flare whilst the process stabilises and the requirements for grid injection can be demonstrated as met. This includes blending of propane with the product gas flow to ensure the product biomethane meets the requirement of the UK's Gas Calculation of Thermal Energy

Regulations to achieve a target calorific value set by the receiving gas distribution network. This is done through process automation by blending approximately 4% propane by volume with the outlet product gas flow rate to achieve target calorific value and a stable gas quality that meets the requirements of the UK's GSMR. Once these requirements are met, grid injection commences, and flaring will cease. Rejection of biomethane during start- up is expected to occur for typically 20 minutes. In the event of this exceeding this limit, it will trigger an alarm for intervention by SGN engineer to investigate.

Receipt of off-specification biogas

The applicants state that they shall install monitors to measure the flow rate and the component gases within the raw biogas supplied by YWS to ensure that it is within the agreed volume and quality specifications. If biogas production were to exceed the capacity of the BtG plant, for example during planned BtG plant maintenance, excess biogas would be directed to the YWS biogas using assets (the YWS boilers and CHP). If the capacity of all these assets were exceeded, the YWS waste gas burner would be utilised. The BtG plant will be capable of operating at approximately 25% of maximum flow. When the biogas supply is less than the minimum flow, the BtG plant will shut down until a sufficient flow rate can be resumed. During that period, biogas would be directed to the YWS boilers and CHP.

The biogas specification contains quality parameters for methane, nitrogen, oxygen, hydrogen sulphide and siloxanes. Biogas that is outside of the specification will not be accepted by SGN on the basis it cannot be processed by the BtG and /or it poses an unacceptable health and safety risk. The specification for biogas supply is based on YWS historical biogas data and the ability of the BtG assets to safely process biogas. Of particular concern for asset health and availability are hydrogen sulphide and siloxanes due to their respective corrosive and abrasive nature. Upper limits for both substances have been set at a level much higher than has been recorded on site. YWS estimates that production of off-specification biogas would occur less than once per year. If the quality of the raw biogas is out of specification, the biogas inlet valve to the BtG plant would be closed automatically and the BtG plant will start to shut down. Where technically possible and safe to do so, off-specification biogas shall be used by the YWS boilers until the composition of the biogas returns to being compliant with the specification. Only if the YWS boilers are incapable of processing the biogas during this period would the YWS waste gas burner be used.

Production of non-compliant biomethane /closure of ROV

If the grid entry requirements for biomethane cease to be met at any point during grid injection, the non-compliant biomethane will be routed to the biomethane flare. This means that the product biomethane no longer meets GSMR specification and is not fit for use by downstream consumers and presents risks to life and their health and safety. The BtG plant control and monitoring systems

will automatically attempt to correct the deviation(s) in biomethane quality. If biomethane is ‘rejected’ for prolonged periods (approximately 20-25 mins), the BtG plant will take action and shut itself down in a safe and controlled manner until the issue can be resolved. In the event of this time period expiring, it will trigger an alarm for intervention by SGN engineer to investigate further.

On exceeding of the parameters mentioned earlier, the biomethane product will be deemed not fit for use by downstream consumers and will be routed to the biomethane flare. YWS will then be responsible for the use /fate of the raw biogas. In the first instance the preferred option would be to use the biogas as a fuel. Only biogas that cannot be used as a fuel would be routed to YWS waste gas burner.

We are satisfied that the proposed use of the biomethane flare complies with the Waste Treatment BAT.

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:

- Local Authority – Environmental Protection Department
- Director of PH/UKHSA
- Health and Safety Executive
- Food Standards Agency

- Woodland Trust – covering the Halton Moor Local Nature Reserve
- West Yorkshire Ecology Service – covering Local Wildlife Sites – Leventhorpe and Kelton Lakes with Colton Beck, Rothwell Country Park and Temple Newsam Estate Wood.

The comments and our responses are summarised in the consultation responses section.

The application was publicised on the GOV.UK website.

Operator

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of part 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 one part of the installation, the biomethane to grid (BtG) plant. The names and permit numbers of the operators of other parts of the installation are detailed in the permit's introductory note.

The site

The operator has provided a plan which we consider to be satisfactory.

The plans show the location of the part of the installation to which this permit applies on that site.

The plan is 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.

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.

Operating techniques

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

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

Emissions of H_2S, Benzene, Toulene, Xylene, Ammonia, NO_2, CO and SO_2 have been screened out as insignificant, and 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

We have reviewed the odour management plan in accordance with our guidance on odour management.

We consider that the odour management plan is satisfactory and we approve this plan.

We have approved the odour management plan as we consider it to be appropriate measures based on information available to us at the current time. The applicant should not take our approval of this plan to mean that the measures in the plan are considered to cover every circumstance throughout the life of the permit.

The applicant should keep the plans under constant review and revise them annually or if necessary sooner if there have been complaints arising from operations on site or if circumstances change. This is in accordance with our guidance 'Control and monitor emissions for your environmental permit'.

The plan has been incorporated into the operating techniques S1.2.

Raw materials

We have specified limits and controls on the use of raw materials and fuels.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate; and
- the environmental risk assessment is acceptable.

We made these decisions with respect to waste types in accordance with

Pre-operational conditions

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

Pre-operational condition 1 – final site Environmental Management System EMS)

The operator provided a summary of the site's EMS as part of the application. We have therefore only reviewed the summary points. A full review of the management system will be undertaken during compliance. Pre-operational condition 2 is included requiring the operator to provide the final site EMS prior to the commissioning of the biogas upgrading plant and to make available for inspection all EMS documentation.

We are satisfied that appropriate management systems and management structures will be in place for this facility, and that sufficient resources are available to the operator to ensure compliance with all permit conditions.

Pre-operational condition 2

– Commissioning plan

The biogas upgrading plant will undergo a period of commissioning before becoming fully operational. The conditions set out in the permit cover the activities once operational – accepting raw biogas for treatment. At the commissioning stage, operators are required to demonstrate that the plant is working effectively and that appropriate measures are in place to protect the environment and human health during this period (prior to the commencement of operations). As the biogas upgrading plant is yet to receive waste, we have included pre-operational condition 3 (PO3) in the permit which requires the operator to submit a commissioning plan to the Environment Agency for approval. As the use of the biomethane flare was the main concern during the determination, we expect the operator to pay particular attention to this issue in the commissioning plan.

Pre-operational condition 3

Final site drainage plan

The operator provided details of drainage systems and an indicative drainage plan within the application. However, there is reference to the final plans being confirmed during "detailed drainage design". Therefore, we have asked the operator to provide this to the Environment Agency for approval prior to commencement of operations.

Commented [A1]: New section for final review by Sarah

Improvement programme

Based on the information on the application, we consider that we need to include an improvement programme.

We have included an improvement programme to ensure that effectiveness of abatement plant to determine whether the measures have been effective in prevent/minimise emissions.

Improvement condition 1 – review of odour management measures

The Waste Treatment BREF outlines techniques for minimising the impact from odour pollution from operations which are likely to cause odour. Treatment and handling of raw biogas can be highly odorous. The Waste Treatment BREF includes general BAT conclusions which operators must implement where odour nuisance at sensitive receptors is expected and/or has been substantiated (BATc 10 and 12).

We have reviewed the applicant's odour management plan and we are satisfied that it meets the requirements of Waste Treatment BAT conclusion 10 and 12.

As part of the Environment Agency approach to reduce emissions in the biowaste treatment sector, we have set an improvement condition (IC1). The improvement condition requires the operator to demonstrate that the odour management measures are effective in dealing with odour emissions generated on site. Where further improvements are identified, the operator is required to implement these measures. It should be noted that a review of the existing system could determine that they are not suitable. Where further improvements are identified, the operator is required to implement these measures.

Improvement condition 2 and 3 – biogas upgrading plant

The applicant submitted an assessment to consider the impact of air emissions from the biogas upgrading plant. The emissions data from the biogas upgrading plant were obtained from the manufacturer and not based on real-time operational monitoring data. We have included improvement condition 2 (IC2) which requires the operator to undertake a monitoring survey following the commissioning and commencement of operations at the biogas upgrading plant to obtain actual (real-time) operational monitoring data.

Following completion of IC2, the Improvement Condition 3 (IC3) requires the operator to undertake an air emissions impact assessment (H1 software tool) using the results of the monitoring survey and compare the long- and short-term impacts of pollutants in accordance with the Environment Agency Guidance – *Air emissions risk assessment for your environmental permit*. Following the review of results from the monitoring survey and impact assessment, the Environment Agency shall consider whether or not emission limits are appropriate at emission point A1. We have used this approach for biowaste treatment facilities with associated biogas upgrading plants across England.

Emission Limits

Emission Limit Values (ELVs) and equivalent parameters or technical measures based on Best Available Techniques (BAT) have been added for the following substances:

Ammonia 20 mg/m^3

Odour concentration 1,000 ou_E/m^3

Oxides of Nitrogen 150 mg/m^3

Carbon monoxide 50 mg/m^3

Total VOCs 10 mg/m^3

Emission limit values are derived from:

- Waste Treatment BREF for BAT associated emission limits.
- Schedule 25A of the Environmental Permitting (England and Wales) (Amendment) Regulations 2018.

Monitoring

We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.

We made these decisions in accordance with Waste Treatment Best Available Techniques BAT conclusions.

Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.

Reporting

We have specified reporting in the permit.

We made these decisions in accordance with Waste Treatment BAT conclusions.

Management System

We are not aware of any reason to consider that the operator will not have the 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.

We only review a summary of the management system during determination. The applicant submitted their full management system. We have therefore only reviewed the summary points.

A full review of the management system is undertaken during compliance checks.

Technical Competence

Technical competence is required for activities permitted.

The operator is a member of the CIWM/WAMITAB scheme

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.

We have checked our systems to ensure that all relevant convictions have been declared.

No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.

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, 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 UKHSA

Brief summary of issues raised:

The main emissions of potential concern are biogas, biomethane, propane, hydrogen sulphide and volatile organic compounds from the plant equipment and pipework. The UKHSA is satisfied that the control measures proposed by the applicant should be sufficient to ensure that there are no significant impacts on public health given the site's distance to nearest residential receptors located 900m to the south. This consultation response is based on the assumption that the permit holder shall take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance and industry best practice

Summary of actions taken:

The installation will be operated in accordance with BAT to prevent or control pollution as specified in the Waste Treatment BREF /BAT Conclusions 2018 and our technical guidance notes: Biological waste treatment: appropriate measures for permitted facilities and H4 – Odour Management. We are satisfied that the measures proposed by the operator are in accordance with BAT.