

Permitting Decisions- Variation

Consultation on our decision document recording our decision-making process

The Permit Number is:	EPR/BB3001FT/V005
The Applicant/Operator is:	Rathlin Energy (UK) Limited
The installation is located at:	West Newton 'A' Well Site Fosham Road Marton Hull HU11 5DA
Application consultation commenced on:	25/11/2021
Application consultation ended on:	07/01/2022
Draft decision consultation commences on:	07/06/2023
Draft decision consultation ends on:	05/07/2023

What this document is about

This is a draft decision document, which accompanies a draft permit.

It explains how we have considered the Applicant's application, and why we have included the specific conditions in the draft permit we are proposing to issue to the Applicant. It is our record of our decision-making process, to show how we have taken into account all relevant factors in reaching our position. Unless the document explains otherwise, we have accepted the Applicant's proposals.

The document is in draft at this stage, because we have yet to make a final decision. Before we make this decision we want to explain our thinking to the public and other interested parties, to give them a chance to understand that thinking and, if they wish, to make relevant representations to us. We will make our final decision only after carefully taking into account any relevant matter raised in the responses we receive. Our mind remains open at this stage: although we believe we have covered all the relevant issues and reached a reasonable conclusion, our ultimate decision could yet be affected by any

information that is relevant to the issues we have to consider. However, unless we receive information that leads us to alter the conditions in the draft permit, or to reject the application altogether, we will issue the draft permit in its current form.

In this document we frequently say “we have decided”. That gives the impression that our mind is already made up; but as we have explained above, we have not yet done so. The language we use enables this document to become the final decision document in due course with no more re-drafting than is absolutely necessary.

Our proposed decision

We are minded to grant the variation for West Newton ‘A’ Well Site operated by Rathlin Energy (UK) Limited.

This variation application is to add -

- Further appraisal works and workover activities on the existing wells for the purpose of gathering additional information over the extent of the hydrocarbon reservoir;
- Drilling of a sidetrack well from each of the existing wells;
- Drilling of up to six additional wells;
- The undertaking of well treatments and well clean-up activities for each additional well to be drilled;
- Appraisal testing of each additional well, including all sidetrack wells;
- Long term production of each well including the conducting of routine maintenance, workovers and sidetracks;
- Well plugging and decommissioning following the cessation of production operations;
- Operation of up to four combustion units to burn waste natural gas and provide electricity to the site with any surplus electricity being exported either to the grid transmission or storage batteries; and
- Flaring of waste gas during well clean-up (estimated duration 30 days per well) in a shrouded flare. Flaring of waste gas in enclosed flare during extended well testing (estimated duration 30 days per well). Flaring of gas during production for emergency and maintenance purposes only, in an enclosed flare.

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:

- highlights key issues in the determination;
- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account;
- summarises the engagement carried out because this is a site of high public interest; and
- 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 and the variation notice.

Key issues of the decision

Brief outline of the process

The site is located to the north of West Newton and east of Marton. It is located within the parish of Aldbrough, in the East Riding of Yorkshire at National Grid Reference (NGR) TA 19268 39131.

The wellsite was constructed in 2013, to enable the drilling and testing of up to two exploratory boreholes referenced West Newton A-1 Borehole (WNA-1) and West Newton A-2 Borehole (WNA-2).

The application is to vary the permit to include the following:

- Further appraisal works and workover activities on the existing WNA-1 and WNA-2 wells for the purpose of gathering additional information over the extent of the hydrocarbon reservoir;
- Drilling of a sidetrack well from each of the existing wells WNA-1z and WNA-2z;

- Drilling of up to six additional wells across the lifetime of the development known as WNA-3 to WNA-8, with a further sidetrack for each well (WNA-3z – WNA-8z);
- The undertaking of well treatments and well clean-up activities for each additional well to be drilled, including all sidetrack wells, such activities include washing and lifting techniques as dictated by well conditions;
- Appraisal testing of each additional well, including all sidetrack wells;
- Long term production of each well (WNA-1 – WNA-8) including the conducting of routine maintenance, workovers and sidetracks;
- Well plugging and decommissioning following the cessation of production operations;
- Operation of four natural gas fired gas engines to burn produced natural gas and provide electricity to the site with any surplus electricity being exported either to the grid transmission or storage batteries; and
- Flaring of waste gas during well clean-up (estimated duration 30 days per well) in a shrouded flare. Flaring of waste gas in enclosed flare during extended well testing (estimated duration 30 days per well). Flaring of gas during production for emergency and maintenance purposes only, in an enclosed flare.

Risk to groundwater and surface water

Additional information requirements

A groundwater activity is defined in Schedule 22 to the 2016 Regulations as broadly meaning the discharge of a pollutant that results in the direct input of that pollutant to groundwater, or a discharge of a pollutant in circumstances that might lead to an indirect input of that pollutant to groundwater or any other discharge or activity that might lead to a direct or indirect input of a pollutant to groundwater. A groundwater activity can also occur by notice by virtue of paragraph 10 of Schedule 22. There were no groundwater activities applied for under this variation.

However, we have carried out an assessment of the proposed chemicals to be used for well appraisal, workover and drilling activities (6 wells and sidetracks) and associated well treatments and clean-up activities including acid washing.

A hydrogeological risk assessment (HRA) was submitted in support of the application, along with a chemical inventory, waste management plan, and surface water management plan (SWMP). We reviewed all these documents and issued 3 Schedule 5 Notices on 11/03/2022, 21/07/2022 and 18/11/2022 seeking additional information. These included the following key issues:

Amendments to the waste management plan, including:

- Construction schematics for all proposed wells to be drilled
- Testing procedures to ensure well integrity
- Solvent pre-flush procedures used in well maintenance
- Clarification on specific well treatments used in chemicals inventory
- Cement products and chemicals used
- Duration and timing of well testing
- CO₂ clean out process
- Updates to chemicals inventory and materials data safety sheets for assessment

Amendments to the HRA, site condition report and environmental risk assessment, including:

- Drainage strategy in line with SWMP
- Construction details for well cellars, mouse and ratholes to ensure no groundwater pathway
- Rainfall management from bunds

Amendments to the SWMP, including

- SWMP discharge screening limits and location to ensure no impacts on receiving water - Lambwath stream
- Volume of holding tank and sampling details for surface water discharges

We are satisfied that the revisions to the above documents have been completed in accordance with our web guidance [Groundwater risk assessment for your environmental permit](#) and [Onshore oil and gas sector guidance](#) and the potential risks to surface water and groundwater have been adequately identified and addressed.

Wellpad integrity

The Applicant has set out their outline design of the proposed liner construction on the extension area and quality assurance requirements in Hydrogeological Risk Assessment Technical Addendum ref: P22-096 Rathlin 2022\HRA Addendum Date 26/05/22. We are satisfied with these and included them as an operating technique in the Table S1.2 of the draft permit. As the secondary and tertiary containment plan including the construction quality assurance (CQA) plan has not been finalised for the extension area, we have required this to be submitted to us for approval prior to construction under pre-operational condition PO5 in Table S1.4B of the draft permit.

Groundwater monitoring

There are two existing shallow groundwater monitoring boreholes installed at the site. These remain unchanged.

We are satisfied that no additional groundwater monitoring is required as a result of this variation and sufficient mitigation measures and procedures are in place to prevent any potential impact on groundwater. Groundwater monitoring requirements are detailed in table S3.2 of the draft permit. Groundwater quality monitoring data is collected to support future permit surrender and demonstrate no deterioration of groundwater quality has occurred during the operational life of the permit. We have determined that there is no potential for a groundwater activity from the surface activities as the site extension area will have appropriate tertiary containment and is underlain by till (that only contains groundwater in isolated lenses).

We are also satisfied that the Glacial till is mostly comprised of clay with thin layers of sands and gravels and whilst a Secondary A aquifer, there is unlikely to be any significant amounts of groundwater within the till.

Odour management

We have reviewed the Applicant's Odour Management Plan (OMP) Ref. RE-EPRA-WNA-OMP-009 Rev 6 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 web guidance 'Control and monitor emissions for your environmental permit'.

While we consider that the Applicant's proposals represent the appropriate measures to prevent/minimise odour from the permitted activities, we also consider that it is appropriate for them to review their plan prior to moving on to the production phase based on the change in gas volumes and management and utilisation via the new engines, in order to provide additional environmental protection. We have therefore required that the Applicant review their OMP under

pre-operational condition PO6 in Table S1.4B of the draft permit prior to the production phase commencing.

The odour management plan has been incorporated into the operating techniques in Table S1.2 of the draft permit.

Noise impact assessment and management

The application contained a noise impact assessment (NIA) which identified local noise-sensitive receptors (NSR), potential sources of noise at the proposed installation and noise attenuation measures.

We identified a number of areas of the initial noise impact that required additional information to enable us to carry out a full audit. We requested a revised noise impact assessment to be submitted via a Schedule 5 Notice dated 11/03/2022. The Applicant submitted a revised noise impact assessment on 10/06/2022. We considered that the issues raised through the Schedule 5 Notice had been corrected and we based our assessment on the revised impact assessment which was in accordance with BS4142:2014.

The Applicant's assessment included assessment of a number of scenarios including:

- Appraisal testing and workover of existing wells
- Construction
- Drilling
- Well treatment and clean up
- Well testing
- Operational phase

We have focused on the longer-term phases of operation which are within our remit. Construction elements are covered by the planning regime.

The Applicant's assessment of the potential noise impact during operation of the installation was based on the modelling software package CadnaA, which is a commonly used computer model for regulatory noise modelling. The assessment considered operations during both the daytime and the night-time period.

The potential impact due to the operation of the installation has been determined in accordance with the methodology in British Standard BS4142:2014, 'Methods for rating and assessing industrial and commercial sound.' The significance of industrial/commercial sound depends on the difference between the rating level (which is the predicted sound output of the industrial/commercial premises, corrected to account for tonality, impulsivity, intermittency or other applicable sound characteristics) and the background sound level. Typically, the greater the difference, the greater the magnitude of the impact.

A difference of around +10dB or more is likely to be an indication of a significant adverse impact, while a difference of around +5dB is likely to be an indication of an adverse impact. The lower the rating is, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. If the rating level does not exceed the background sound level, this is an indication of a low impact. BS4142:2014 requires that the assessment of potential impact takes into account the 'context' in which the sound occurs. This entails having a sufficient understanding of the situation to be rated and assessed, and placing the sound being assessed in context when making conclusions.

Modelling predictions were made at 8 noise sensitive receptors (NSR). The closest existing receptors are located approximately 480m to the east, 600m to the south-west and 950m north-east and of the proposed installation.

The Applicant undertook environmental sound surveys at locations close to the NSRs between the 11th and 27th August 2021 in order to establish background sound levels. Weather conditions were monitored throughout the survey period. Periods where wind speed exceeded 5 m/s were excluded from the analysis. No significant period of rain was recorded during the survey period. In general, we considered that the data has been used in accordance with the BS4142 methodology.

The way in which the Applicant has used the noise model, the selection of input data, use of background data and the assumptions made have been reviewed by us to establish the robustness of the Applicant's noise impact assessment. Our view is that the methodology used by the Applicant is acceptable.

The predictions of the noise impact assessment indicated a minor adverse impact during the operational phase and the well testing phase (when flaring occurs) in accordance with BS4142. We agree that impacts from the operational phase and well testing phase will be below adverse.

The Applicant has proposed an enclosure around the gas generators and a silencer on the gas generator exhaust. The impacts are therefore dependent on the performance of these mitigation measures. We have ensured that the sound reduction performance of the Applicant's proposed mitigation measures is demonstrated before production phase commencement by inclusion of a pre-operational condition PO6 in Table S1.4B of the draft permit.

BAT requires prevention or, where that is not practicable, reduction in noise emissions through design, control and mitigation measures on site. The following have been proposed by the Applicant:

- Operational measures
- Preventative maintenance programme
- Low-noise equipment
- Noise Attenuation including:
 - acoustic enclosures

- acoustic lagging
- silencers
- screening

We consider that the above measures represent BAT and broadly follow the noise control hierarchy outlined in our web guidance [Noise and vibration management: environmental permits](#).

We have specified a pre-operational condition PO6 in Table S1.4B of the draft permit requiring that the Applicant confirm the final design of the proposed noise mitigation from the engines including justification of how these will ensure that noise from the installation is minimised at receptors.

Based on the information submitted to us we are satisfied that the appropriate measures will be in place to prevent or where that is not practicable to minimise noise and vibration and to prevent pollution from noise and vibration outside the site boundary.

Emissions to air (human health and ecological impacts)

The methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits, is set out in our web guidance [Air emissions risk assessment for your environmental permit](#) and has the following steps:

- Describe emissions and receptors.
- Calculate process contributions.
- Screen out insignificant emissions that do not warrant further investigation using the Environment Agency's screening tool.
- Decide if detailed air modelling is needed.
- Assess emissions against relevant standards.
- Summarise the effects of emissions.

The methodology uses a concept of 'process contribution' (PC), which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The methodology provides a simple method of calculating PC primarily for screening purposes and for estimating process contributions where environmental consequences are relatively low. It is based on using dispersion factors. These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the process contributions calculated are likely to be an overestimate of the actual maximum concentrations. More accurate calculation of process contributions can be achieved by mathematical dispersion models, which take into account relevant parameters of the release and surrounding conditions, including local meteorology.

Air dispersion modelling enables the PC to be predicted at any environmental receptor that might be impacted by the plant. Once short-term and long-term PCs have been calculated in this way, they are compared with Environmental Standards (ES)/Environmental Assessment Levels (EAL).

PCs are considered insignificant if:

- the long-term process contribution is less than 1% of the relevant ES; and
- the short-term process contribution is less than 10% of the relevant ES.

The long term 1% process contribution insignificance threshold is based on the judgements that:

- It is unlikely that an emission at this level will make a significant contribution to air quality; and
- the threshold provides a substantial safety margin to protect health and the environment.

The short term 10% process contribution insignificance threshold is based on the judgements that:

- spatial and temporal conditions mean that short term process contributions are transient and limited in comparison with long term process contributions; and
- the threshold provides a substantial safety margin to protect health and the environment.

Where an emission is screened out in this way, we would normally consider that the Applicant's proposals for the prevention and control of the emission to be acceptable. However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.

For those pollutants which do not screen out as insignificant, we determine whether exceedances of the relevant ES are likely. This is done through detailed audit and review of the Applicant's air dispersion modelling, taking background concentrations and modelling uncertainties into account.

Where the PC is greater than these thresholds, the assessment must continue to determine the impact by considering the predicted environmental concentration (PEC). The PEC is the combination of the PC substance to air and the background concentration of the substance which is already present in the environment.

The PECs can be considered 'not significant' if the assessment has shown that both the following apply:

- proposed emissions comply with associated emission levels (AELs) or the equivalent requirements where there is no AEL.
- the resulting PECs will not exceed 100% of the environmental standards

The Applicant's air dispersion model used the modelling software, ADMS 5.2, which is a commonly used computer model for regulatory dispersion. There are two assessments; air quality impacts on human receptors and ecological sites. The report is titled:

- *Air quality assessment of a wellsite development: West Newton A wellsite dated 28th 2021*

The air quality report includes a schedule of potential emissions from the equipment operated on site associated with a number of project phases. For the purpose of the assessment it was assumed that once commenced, the programme would run continuously with no breaks between phases or within phases which we agree is a worst-case assessment.

The Applicant concluded that the years resulting in the highest pollutant release rates and subsequent air quality impact were years 1, 4 and 5. These years were modelled to determine the worst-case air quality impact from the project. The project schedule during each of these years has been assessed over 5 meteorological years (2016 – 2020).

In addition, assessments were also made to determine the impact of cold venting as an alternative to incineration during well lifting episodes.

We have assessed the Applicant's assessments and we agree with the Applicant's conclusions that impacts will not be significant and there will be no exceedances of the relevant environmental standards. Our consideration of the Applicant's assessments is described below.

Assessment of impact on human health

The Applicant has assessed the Installation's potential emissions to air against the relevant air quality standards, and their potential impact upon local conservation and habitat sites and human health. These assessments predicted the potential effects on local air quality from emission from the site as set out in the Application.

We have checked the background pollution data used by the Applicant for those pollutants which did not screen out as insignificant. We consider the assumed background concentrations to be appropriate.

Normal operational scenarios

The Applicant's modelling predictions for the worst-case operational scenario are summarised in the table below.

Table 1 – Predicted impacts to air from the Installation at residential receptors (human health)				
Pollutant	AQS	Background	Process	Predicted environmental

			contribution (PC)		concentration (PEC)	
	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	% of ES	$\mu\text{g}/\text{m}^3$	% of ES
NO ₂	¹ 40	8.99	4.47	11.2	13	33.6
	² 200	17.98	41.29	20.6	59	29.6
PM ₁₀	¹ 40	16.1	0.23	0.6	16	40.8
	³ 50	19	0.63	1.3	20	39.3
PM _{2.5}	¹ 25	8.81	0.23	1.1	9	45.2
SO ₂	⁴ 266	3.64	2.57	1	6	2.3
	⁵ 350	2.72	2.04	0.6	5	1.4
	⁶ 125	1.6	1.21	1	3	2.2
NO	310	1.83	4.17	1.3	6	1.9
	4400	3.66	91.34	2.1	95	2.2
CO	⁷ 30,000	1470	62.95	0.6	1533	15.3
VOC	¹ 5	0.36	0.57	11.4	1	18.6
(as benzene)	⁸ 30	0.42	4.16	13.9	5	15.3
<u>Notes</u> ¹ Annual mean ² 99.79 th percentile of 1 hour means ³ 90.41 st percentile of 24 hour means ⁴ 99.9 th percentile of 15 minute means ⁵ 99.73 rd percentile of 1 hour means ⁶ 99.18 th percentile of 24 hour means ⁷ maximum daily running 8 hour mean ⁸ 24 hourly mean.						

The modelling showed that the relevant environmental standards will not be exceeded by any of the modelled emissions at the sensitive receptor locations.

From the table above, all emissions can either be screened out as insignificant in that the process contribution is <1% of the long-term ES and <10% of the short term air quality standard or if they cannot be considered insignificant, that there is adequate headroom between the PEC and the ES to indicate that an exceedance of the air quality standard is unlikely.

Cold venting

Cold venting of produced natural gas is expected to be short in duration (45 minutes or less) and an infrequent event resulting from the lifting of the well prior to the routing of gases to the flare. The Applicant has therefore considered only potential short-term impacts associated with the event. We are in agreement with this approach. The key pollutants associated with the event would be VOCs, hydrogen sulphides and methyl mercaptan.

Although the AQS for methyl mercaptan was calculated using a methodology which has now been withdrawn, we consider that the assessment of potential impact on air quality from the emissions against the benzene AQS is protective and therefore we have not revisited this calculation.

Table 1 – Predicted impacts to air from the Installation at residential receptors (human health)

Pollutant	AQS	Background	Process contribution (PC)		Predicted environmental concentration (PEC)	
	µg/m ³	µg/m ³	µg/m ³	% of ES	µg/m ³	% of ES
VOC (as benzene)	130	0.42	5.2	17.3	5.62	18.73
Hydrogen sulphide ²	³ 150	-	1.9	1.2	-	-
Methyl mercaptan ²	³ 300	-	2.6	0.9	-	-
Methane	³ 2141 71	-	10711	5	-	-

Notes

¹ 24 hourly mean.

² It is assumed that the total sulphur content of the gas is present as either hydrogen sulphide or methyl mercaptan depending on the substance being assessed.

³ Hourly mean

From the table above, all emissions can either be screened out as insignificant in that the short-term process contribution is <10% of the air quality standard except for emissions of benzene. However, when taking the background into

consideration, there is adequate headroom between the PEC and the ES to indicate that an exceedance of the air quality standard is unlikely.

Assessment of impact on Habitats sites, Sites of Special Scientific Interest and non-statutory conservation sites

There are a number of protected conservation sites within the relevant screening distances from the installation. These include the following (with proximity to the installation):

- Greater Wash Special Protection Area (SPA) – 5360m
- Hornsea Mere Special Protection Area (SPA) – 7048m
- Lambwath Meadows Site of Special Scientific Interest (SSSI) – 882m
- Wycliffe, North Plantation Local Wildlife Site – 1065m
- Sallymere Plantation Local Wildlife Site – 1879m
- The Moors, Burton Constable Local Wildlife Site – 971m
- Mill Avenue, Burton Constable Local Wildlife Site – 1339m
- Burton Constable Parkland Local Wildlife Site – 1828m

The primary impacts from this installation on habitat sites will be from the combustion emissions to the SSSI, SPAs and non-statutory sites. These pollutants include NO_x and SO₂ ambient concentrations and deposition from nutrient nitrogen and acidification. We agree with the Applicant’s conclusions that there will be no exceedances of the relevant critical loads and levels at any protected conservation site.

Where the process contribution of a pollutant is considered insignificant compared to the relevant critical level or load we do not go on to consider the background levels of the pollutant.

The Applicant’s results are presented below.

Predicted impacts at Hornsea Mere SPA

Table 3 – Maximum modelled ambient concentrations of NO_x and SO₂, at Hornsea Mere SPA						
Pollutant	Critical level	Background	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
Unit	µg/m³	µg/m³	µg/m³	% of Critical	µg/m³	PEC% of Critical

				level		level
NO _x annual mean	30	11.05	0.08	0.3	-	-
NO _x 24 hour mean	75	22.1	3	4	-	-
SO ₂ annual mean	10	1.64	0.003	0.03	-	-

From the results presented above, the process contributions from NO_x and SO₂ are less than 1% (for long term impacts) and less than 10% (for short term impacts) of the relevant critical levels. The effects of these pollutants can be considered insignificant. No likely significant effect can be concluded, and no further assessment is necessary.

The Air Pollution Information System ([APIS](#)) does not specify a Critical load (CL) for nutrient nitrogen. The Applicant selected 10-20 kgN/ha/yr and used 10 kgN/ha/yr as a CL. We also compared the PC against a lower value of 5 kgN/ha/yr and this did not alter the conclusions.

Table 4 – Maximum modelled nutrient nitrogen and acid deposition at Hornsea Mere SPA					
Critical load	Baseline deposition rates	PC	PC% of Critical load	PEC	PEC% of Critical load
Nutrient nitrogen deposition (kgN/ha/yr)					
10 – 20 broadleaved deciduous woodland	39.0	0.01617	0.16	-	-
Acid deposition (keq/ha/y)					
2.614	3.00	0.00136	0.05	-	-

In the case of nutrient nitrogen deposition and acid deposition at the Hornsea Mere SPA the predicted process contributions are less than 1% of the specified

critical loads and can be considered insignificant. No likely significant effect can be concluded and no further assessment is necessary.

Predicted impacts at Greater Wash SPA

Table 5 – Maximum modelled ambient concentrations of NO_x and SO₂, at Greater Wash SPA						
Pollutant	Critical level	Background	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
Unit	µg/m³	µg/m³	µg/m³	% of Critical level	µg/m³	PEC % of Critical level
NO _x annual mean	30	-	0.20	0.7	-	-
NO _x 24 hour mean	75	-	2.5	3.4	-	-
SO ₂ annual mean	10	-	0.008	0.08	-	-

From the results presented above, the process contributions from NO_x and SO₂ are less than 1% (for long term impacts) and less than 10% (for short term impacts) of the relevant critical levels. The effects of these pollutants can be considered insignificant and therefore no further assessment is required, and no likely significant effect can be concluded.

Table 6 – Maximum modelled nutrient nitrogen and acid deposition at Greater Wash SPA					
Critical load	Baseline deposition rates	PC	PC% of Critical load	PEC	PEC% of Critical load
Nutrient nitrogen deposition (kgN/ha/yr)					
8 – 10 supra littoral	13.5	0.03997	0.50	-	-

sediment					
Acid deposition (keq/ha/y)					
0.693	1.2	0.00395	0.57	-	-

In the case of nutrient nitrogen deposition and acid deposition at the Greater Wash SPA the predicted process contributions are less than 1% of the specified critical loads and can be considered insignificant. No likely significant effect can be concluded, and no further assessment is necessary.

Predicted impacts at Lambwath Meadows SSSI

Table 7 – Maximum modelled ambient concentrations of NO_x and SO₂, at Lambwath Meadows SSSI						
Pollutant	Critical level	Background	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
Unit	µg/m³	µg/m³	µg/m³	% of Critical level	µg/m³	PEC% of Critical level
NO _x annual mean	30	11.97	2.44	8.1	14.41	48
NO _x 24 hour mean	75	23.9	27.3	36.5	51.3	68
SO ₂ annual mean	10	-	0.094	0.94	-	-

From the results presented above, the process contribution from SO₂ is less than 1% (for long term impacts). The effects of this pollutant can be considered insignificant and therefore no further assessment is required. For long term and short-term NO_x, although the process contribution cannot be considered insignificant, there is adequate headroom between the PEC and the critical level to indicate an exceedance of the critical level is unlikely.

Table 8 – Maximum modelled nutrient nitrogen and acid deposition at Lambwath Meadows SSSI					
Critical load	Baseline deposition rates	PC	PC% of Critical load	PEC	PEC% of Critical load
Nutrient nitrogen deposition (kgN/ha/yr)					
20 – 30 (neutral grassland)	24.30	0.246	1.23	24.5	123
Acid deposition (keq/ha/y)					
2.008	1.90	0.0335	1.67	1.93	96

In the case of nutrient nitrogen deposition and acid deposition at the Lambwath SSSI, both pollutants are over the 1% screening criteria and therefore cannot be considered insignificant. The existing backgrounds are already high however it is considered, based on the small margin of exceedance of the insignificance threshold, that the process contributions are unlikely to have a significant impact on the habitat.

We recognise the high background level and that the exceedance is marginal but requested the Applicant via a Schedule 5 Notice dated 18/11/2022 to provide either with more data to quantify the impacts on the SSSI or submit a revised more accurate modelling which includes actual operations compared to current worst-case calculations assuming full load, 24 hours a day operations in order to show that there is no significant impact. The ecological report submitted to us on 02/09/2022, also concludes a slight exceedance but doesn't explain further any impacts.

As a response to the Schedule 5 Notice the Applicant submitted a revised Air Quality Assessment that assessed impacts on the Lambwath Meadows SSSI based on an average loading of 70% across the year. This represents predicted actual operation. The stationary plant that is included in the assessment includes the lighting equipment, welfare unit, surface conductor rig, workover rig, camp generator, rig engines and oil heaters. The emissions have been calculated using the same emission standards as previously used.

The Applicant has assessed several years of operation. The Applicant identified that year 1 was the worst-case year for annual NO_x PCs, and therefore for nutrient deposition PCs, at Lambwath Meadows SSSI. The Applicant has reassessed the significance of nutrient nitrogen deposition PCs at Lambwath Meadows SSSI. The PC is 0.164 kgN/ha/yr equating to 0.8% of the critical load of 20 kgN/ha/yr, therefore, nutrient nitrogen deposition impacts are now considered insignificant. As a result of our checks, we agree with the Applicant's conclusions.

Predicted impacts at Local Wildlife Sites

Table 8 – Maximum modelled ambient concentrations of NO_x and SO₂ at Local Wildlife Sites						
Pollutant	Critical level	Background	Process Contribution (PC)		Predicted Environmental Concentration (PEC)	
Unit	µg/m³	µg/m³	µg/m³	% of Critical level	µg/m³	PEC% of Critical level
NO _x annual mean	30	12.34	1.43	4.8	13.77	46
NO _x 24 hour mean	75	24.7	33.1	44.1	57.8	77
SO ₂ annual mean	10	1.85	0.040	0.40	-	-

From the results presented above, the process contribution from SO₂ is less than 1% (for long term impacts). The effects of this pollutant can be considered insignificant and therefore no further assessment is required. For long term and short-term NO_x, although the process contribution cannot be considered insignificant, there is adequate headroom between the PEC and the critical level to indicate an exceedance of the critical level is unlikely.

Table 9 – Maximum modelled nutrient nitrogen and acid deposition at Local Wildlife Sites					
Critical load	Baseline deposition rates	PC	PC% of Critical load	PEC	PEC% of Critical load
Nutrient nitrogen deposition (kgN/ha/yr)					
10 – 20 (Broadleaved, mixed)	37.10	0.28892	2.89	37.4	374

and yew woodland)					
Acid deposition (keq/ha/y)					
2.674	2.93	0.02207	0.83	-	-

In the case of acid deposition at the Local Wildlife Site, the process contribution is less than the 1% screening criteria and therefore can be considered insignificant.

In the case of nutrient nitrogen deposition the pollutant is over the 1% screening criteria and therefore cannot be considered insignificant. The existing backgrounds are already high however it is considered based on the relatively small margin of exceedance of the insignificance threshold that the process contributions are unlikely to have a significant impact on the habitat.

Waste Gas Management

Selection of Waste Gas Management Techniques during the lifecycle stages

The Applicant has carried out a BAT assessment in accordance with the methodology set out in Appendix E (Cost Benefit Analysis methodology) and Appendix G (Qualitative assessment methodology) in the Waste Gas Management Report RE-EPRA-WNA-WGMP-010 Rev 7, dated 11/2022 in accordance with our web guidance [Waste gas management at onshore oil and gas sites: framework for technique selection](#).

A number of different phases were considered in relation to gas management:

Well Clean Up (WCU) Phase

The Applicant has proposed the use of a PW Well Test (PWWT) shrouded flare for the purpose of the WCU phase. The PWWT shrouded flare was selected following consideration of the operational requirements, in particular:

- The ability of a shrouded flare to operate over a wide flow range
- The ability to inject support fuel into the flare during a gas lift.

It is proposed to flare up to 2.5mmscfd (~2,800Nm³/h) during the WCU phase. This equates to >10 tonnes per day and therefore falls under the Industrial Emission Directive for Hazardous Waste Incineration for disposal.

We accept that in the WCU Phase the limited information available on gas flow rates makes correct sizing of an enclosed flare problematic and therefore the use of a shrouded flare is considered BAT.

Gas Lift

A nitrogen or carbon dioxide (inert) gas lift is being considered as one of the methods for artificially lifting the well, should the need arise. The use of flammable gas for a gas lift has been discounted due to safety concerns around transportation, storage and handling.

'Inert' gas lifts are problematic from a gas management perspective as the inert gas dilutes the natural gas that may be released during the lifting operation making the gas mix incombustible and potentially resulting in significant cold venting.

The Applicant has proposed a phased approach to limit the amount of cold venting.

To further reduce the amount of cold venting, the Applicant is proposing to stop the injection of nitrogen/carbon dioxide once sufficient gas has reached the wellbore to lift the fluid in the well. This will be determined by measuring the gas return rate and the gas gravity. The PWWT flare is fitted with a permanent pilot light which will ignite the gas stream once a combustible mix has been achieved.

Whilst we have no objection to the use of nitrogen, we did raise concerns over the use of carbon dioxide for lifting purposes as it is likely to increase the likelihood of cold venting. This is due to carbon dioxide having a higher specific heat capacity than nitrogen, making it a more powerful inerting agent, therefore, to increase the flammability of the gas it would be preferable to use nitrogen as the lifting gas.

The Applicant provided further information clarifying that the use of carbon dioxide and nitrogen have different purposes. Carbon dioxide will only be used for the cleaning out the near wellbore which may have blockages caused by debris. The Applicant considers that the properties of carbon dioxide provide for a better result in relation to the removal of near wellbore debris compared to nitrogen.

Based on this information we are satisfied with the use of carbon dioxide for the cleaning out of the near wellbore debris. The Applicant has updated their gas management plan accordingly to clarify this point.

Extended Well Test (EWT) Phase

The Applicant has proposed the use of enclosed flare units (Aereon CEB- Certified ultra-low Emissions Burner) for the purpose of the EWT. We accept that enclosed flares are BAT for EWT operations (where sufficient information on gas composition and likely flow rates should have been established following the initial flow test (WCU phase) to allow the approximate sizing of the flare). We also accept that utilisation of gas is not possible during the initial EWT phases– but it may be possible during later EWT phases. The purpose of an extended well test is to evaluate the reservoir flow characteristics and a sustainable hydrocarbon flow rate so during the initial EWT phases there will be insufficient data to allow correct sizing of gas utilisation plant. Additionally, as the commercial viability of the site

has not yet been determined, there is limited opportunity to export gas or electrical power from the site as grid connections have not yet been installed. It is also unlikely that there will be a significant on-site power demand during the initial EWT phases to make use the power that could be generated by utilising the waste gas.

Production Phase

The Applicant has proposed a gas to wire (power export) scheme during production operations. Gas to wire (GTW) was selected following consideration of the following:

- Incineration
- Power export (gas to wire)
- Gas export (gas to grid)

Under both high and low gas volume scenarios the gas to wire scheme was found to present the highest Net Present Value (NPV) of the considered options. The cost to export gas to the gas grid was found to be excessive, even under the high gas production scenario.

The gas to wire scheme will involve the use of up to four spark ignition gas engines. Example technical specifications have been provided for a Jenbacher JSM 624 (4.4MW electrical output) cogeneration unit, but it is accepted that the final engine specification and final number of engines (up to four authorised under the this draft permit) may differ. The engines are required to meet the emission limits set out in the Medium Combustion Plant Regulations.

Although the indicative site layout plan for production phase indicated that up to six engines may be utilised, the air quality impact assessment was based on four in operation and therefore the permit limits the number to four, and the aggregated capacity below 38.8MW thermal input. This is now reflected in the site plan in Schedule 7 of the draft permit.

We are satisfied that the Applicant has carried out the BAT assessment in accordance with our web guidance [Waste gas management at onshore oil and gas sites: framework for technique selection](#).

Energy efficiency

Article 14 requires an assessment of the potential for waste heat use from installations with over 20MW for certain installations that generate electricity. As the proposed engines for use on this site are spark ignition engines, they fall outside of this requirement and therefore there is no requirement for an Article 14 assessment in this instance. The Applicant is still required to ensure the site is as energy efficient as possible under permit condition 1.2.1 which implements the requirement set out in the Industrial Emissions Directive.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has been made.

The claim has been made by the manufacturers of a biodegradable drilling fluid proposed for use by the Applicant.

We have accepted the claim for confidentiality.

We have excluded details about the drilling fluid which could enable identification of its make up.

We consider that the inclusion of the relevant information on the public register would prejudice the Applicant's interests to an unreasonable degree.

The decision was taken in accordance with our web guidance on [Environmental permits privacy notice](#).

Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our web guidance [Environmental permits: when and how we consult](#).

The application was publicised on the GOV.UK website from 25/11/2022 to 07/01/2022.

We consider this application to be of high public interest (HPI) and so we extended the period of consultation with the public from four weeks to six weeks.

We consulted the following organisations:

- Local Authority – Environmental Health
- Health and Safety Executive (HSE)
- Director of Public Health
- UK Health Security Agency
- Mineral Planning Authority

The comments and our responses are summarised in the [consultation responses](#) section.

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'.

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 draft permit.

The site

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

This shows the extent of the site of the facility.

The plan is included in the draft permit.

Site condition report

The Applicant 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.

Waste management plan

The Applicant has provided a waste management plan which we consider is satisfactory. The waste management plan is a key operational document for the management of extractive wastes resulting from oil and gas exploration and production and is therefore incorporated to the operating techniques in table S1.2 of the draft permit.

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 within our screening distances for the following designation with their distance from the site listed:

- Greater Wash Special Protection Area – 5360m
- Hornsea Mere Special Protection Area – 7048m
- Lambwath Meadows Site of Special Scientific Interest – 882m
- Wycliffe, North Plantation Local Wildlife Site – 1065m
- Sallymere Plantation Local Wildlife Site – 1879m
- The Moors, Burton Constable Local Wildlife Site – 971m
- Mill Avenue, Burton Constable Local Wildlife Site – 1339m
- Burton Constable Parkland Local Wildlife Site – 1828m

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England. We have sent a Habitats Regulation Assessment Stage 1 to Natural England on 26/08/2022 for information only.

The decision was taken in accordance with our guidance.

Environmental risk

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

The Applicant's risk assessment is satisfactory.

Operating techniques

The operating techniques that the Applicant must use are specified in table S1.2 of the draft 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.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions for future development, due to insufficient detail being available during the determination of the variation application.

PO5 in Table S1.4B of the draft permit is required for the Applicant to provide additional details on the construction and containment measures proposed for the extension area, including review by a competent structural engineer to ensure the standard is in line with BAT and CIRIA 736 in order to prevent any loss of containment, or leaks to surface or groundwater.

PO6 in Table S1.4B of the draft permit is required for the Applicant to verify that the final design of gas engines and gas management does not present any increased environmental risk to air, noise or odour as previously presented or modelled within the variation application.

The previous pre-operational conditions in the permit have all been completed.

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 in Table S1.3 of the draft permit to ensure that the Applicant reviews their current environment management plans as a result of the variation, specifically:

IC1 - Their leak detection and repair plan six months following production activities commencing to ensure it addresses any changes to site infrastructure. A leak detection plan is currently in place for exploration and testing phases.

IC2 - Updates to their environment management plan to include procedures for notifying us when gas is vented in an emergency and providing emergency flare capacity if venting for over 24 hours.

IC3 - Analysing the flare feed gas for mercury. Some gas refineries processing gas from offshore reservoirs are seeing increasing mercury levels in the gas. This can lead to increased mercury emissions during refining and consumer use, plus accumulation of mercury in processing equipment and potential embrittlement of plant and pipework. This improvement requirement is to assess any impacts if mercury is found to be present.

Emission limits

Emissions limits have been added to Table S3.1 of the draft permit for the main point source emissions to air from the flares and gas engines for oxides of nitrogen, carbon monoxide, and total volatile organic carbons (VOCs).

We have included these limits based on BAT for flaring in accordance with our web guidance [Onshore oil and gas sector guidance](#) and requirements for new gas engines as specified under the Medium Combustion Plant Directive.

The surface water management plan has been reviewed by us to ensure that any off-site discharge will not lead to pollution. We have approved the Applicant's surface water management plan RE-EPRA-WNA-WMP-005 Revision 5, dated 03/2023 referenced in table S1.2 of the draft permit. The plan includes surface water monitoring requirements designed to identify any potential pollutants originating from the well pad. The surface water management plan details the monitoring requirements and sets screening limits for relevant substances to prevent pollution to controlled waters. The plan has been updated to provide quarterly monitoring of the Lambwath stream for zinc. The rationale behind this monitoring is to ensure the concentrations of zinc identified within the off-site discharge are monitored in the downstream Lambwath to verify that the off-site

downgradient concentrations of zinc are diluted and not impacting the stream as shown within the updated monitoring undertaken.

Screening limits have been provided in the surface water management plan for the discharge, the limit for zinc has been set as the maximum excluding outlier values (identified using the interquartile range method) for the discharge quality data. Zinc was at a higher level than other parameters and therefore it is also to be monitored in the receiving surface water. Surface water monitoring tables S3.3, S3.4 and S3.5 of the draft permit have been amended to reference the approved surface water management plan.

Monitoring

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

Groundwater monitoring – we have updated Table S3.2 of the draft permit with the existing groundwater monitoring requirements previously agreed under pre-operational condition PO1.

Ambient air monitoring – we have updated Table S3.6 of the draft permit with the ambient air monitoring requirements during flaring as previously agreed under pre-operational condition PO4.

Surface water monitoring – we have updated Tables S3.3, S3.4 and S3.5 of the draft permit to reflect the surface water monitoring requirements detailed in the approved Surface Water Management Plan RE-EPRA-WNA-WMP-005 Revision 5, dated 03/2023.

We have set new process monitoring requirements for flare feed gas composition (Table S3.7 of the draft permit as referenced in conditions 3.5.1 and 3.5.6) to better understand the gas composition and provide greater environmental control on any emissions to air, and odour risk. This includes for example mercury monitoring as set as a part of improvement condition IC3 in table S1.3 of the draft permit, chlorinated compounds, fluorinated compounds, hydrogen sulphide, mercaptans and carbon monoxide.

We made these decisions in accordance with the requirements of our web guidances [Onshore oil and gas sector guidance](#), [Monitoring enclosed landfill gas flares: LFTGN 05](#) and [The Groundwater \(Water Framework Directive\) \(England\) Direction 2016](#).

Reporting

We have added reporting in the permit for the following parameters:

- Emissions to air – updated

- Ambient air monitoring - carried over from previous permit
- Surface water monitoring - updated
- Process monitoring (Flare feed gas composition) - new requirement
- Annual production/treatment - new requirement
- Performance parameters – new requirement

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 our web guidance [Legal operator and competence requirements: environmental permits](#) and [Develop a management system: environmental permits](#).

We only review a summary of the management system during determination of the application. 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 assessment.

Previous performance

We have assessed operator competence. There is no known reason to consider the Applicant will not comply with the permit conditions. The decision was taken in accordance with our web guidance [Legal operator and competence requirements: environmental permits](#).

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions. The decision was taken in accordance with our web guidance [Legal operator and competence requirements: environmental permits](#).

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 variation.

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

The two responses received from the organisations listed in the consultation section were from the UK Health Security Agency (UKHSA) and the Environmental Health Department of East Riding Council.

Response received from
UK Health Security Agency
Brief summary of issues raised
Based on the information contained in the application supplied to them, UKHSA has no significant concerns regarding the risk to the health of the local population from the installation.
Summary of actions taken or show how this has been covered
None needed.
Response received from
East Riding Council
Brief summary of issues raised

The Council received three complaints about odour from nearby residents in October 2021 but this was not substantiated as an amenity issue or statutory nuisance.

No known substantiated issues and no objections.

Summary of actions taken or show how this has been covered

The Applicant has submitted an odour management plan with their application, which we have approved and included as an operating technique in Table S1.2 of the draft permit. Also, permit condition 3.3.1 requires the Applicant to ensure that emissions from the activities shall be free from odour at levels likely to cause pollution outside the site.

Representations from local MPs, assembly members, councillors and parish/town community councils

None

Representations from community groups and other organisations

Brief summary of issues raised	Summary of actions taken or show how this has been covered
Concern about lack of detail of well pad design and liner/ no site investigation works	We have accepted the outline proposals for the well pad and liner specification. We have required under pre-operational condition PO5 in Table S1.4B of the draft permit that the Applicant submit a detailed plan for Environment Agency approval prior to commencement of the extension of wellsite area.
Concerns about lack of shallow groundwater monitoring and frequency, with potential for shallow oil leaks to affect groundwater and underlying	Groundwater monitoring requirements are detailed in table S3.2 of the draft permit. There are two existing groundwater monitoring boreholes that will provide groundwater quality monitoring data to help support future permit surrender and demonstrate no deterioration of groundwater quality has occurred during the operational life of the

<p>Glacial Till</p>	<p>permit. We have determined that there is no potential for a groundwater activity from the surface activities as the site extension area will have appropriate tertiary containment and is underlain by Glacial till (that only contains groundwater in isolated lenses).</p> <p>We are also satisfied that the Glacial till is mostly comprised of clay with thin layers of sands and gravels and whilst a Secondary A aquifer, there is unlikely to be any significant amounts of groundwater within the till.</p> <p>We have approved the Applicant's surface water management plan which includes surface water monitoring requirements designed to identify any potential pollutants originating from the well pad. The surface water management plan details the monitoring requirements and sets screening limits for relevant substances to prevent pollution to controlled waters.</p>
<p>Risk of flooding impacts as a result of bund design. Current bund would deflect flood waters but no evidence that it is designed for this purpose and able to cope. Potential risk of localised flood event overwhelming local drain.</p>	<p>Location is determined to be in flood zone 1. Therefore, the Environment Agency would not be commenting on any planning application, and it would also fall outside of our permitting remit unless there was a main river or specific flood defences. Lead Local Flood Authorities (LLFA) have the remit for surface water flooding, or the Internal Drainage Board (IDB) if it affects watercourses they operate and maintain. However, we can confirm that as the bund is limited and therefore unlikely to hinder conveyance of surface water from the site we don't have any significant concerns.</p>

Representations from individual members of the public

A total of 25 responses were received from members of the public. The representations are summarised with our response below.

Brief summary of issues raised	Summary of actions taken or show how this has been covered
Support to the proposal	
<p>Fuel security needed. Home produced energy needed. Proposals seem wholly satisfactory and in accordance with current industry best practice. Company takes into account environmental issues and adheres to the legislation.</p>	<p>No action required.</p>
Environmental impact	
<p>Concern that emissions to air of pollutants from the regulated facility will impact human health.</p>	<p>We are satisfied that the relevant air quality standards for pollutants emitted from the facility will not be exceeded. See key issues section for further information.</p>
<p>Concerns that gas released from the site will impact on human health</p>	<p>We are satisfied with the Applicant's approved Gas Management Plan and agree that appropriate measures and procedures are in place to ensure that gas is managed appropriately. We have included the approved Gas Management Plan in the operating techniques in Table S1.2 of the draft permit. We are also satisfied that the relevant air quality standards for pollutants emitted from the facility will not be exceeded. See key issues section for further information. UKHSA have been consulted on the application</p>

	from a public health perspective and have no significant concerns regarding the risk to the health of the local population from the proposal.
Concern about drilling muds and lateral well extents	We are satisfied that potential risks to groundwater of all process chemicals including those used in the drilling muds have been adequately assessed in the Applicant's hydrogeological risk assessment (HRA) along with a chemical inventory. We have not permitted any discharges of hazardous substances to groundwater.
Regulation and compliance	
Comment that existing permit conditions are sometimes breached.	Condition 4.3.1 of the draft permit requires the Environment Agency to be notified of any breaches of permit conditions. In the instance of a breach the operator would be required to take action needed to rectify the breach, minimise the recurrence of a future breach and inform the Environment Agency of the actions they have taken to support this. The Environment Agency will carry out inspections of the site and audits against the conditions set out in the permit.
Concern about whether the Applicant has sufficient experience.	We have assessed the operator competence in accordance with our web guidance Legal operator and competence requirements: environmental permits and there is no known reason to consider the Applicant will not comply with the permit conditions. In addition, Condition 1.1.1 of the draft permit requires the operator to manage and operate the activities in accordance with a written management system and using sufficient competent persons and resources.
Concern that planning permission has previously been rejected for the proposal	An environmental permit and planning permission are two separate permissions and determined by different authorities. The Environment Agency is a statutory consultee on the planning application. The Applicant will require both permissions to operate and would need to comply with any conditions set out in each.
Amenity	
Concern about road traffic and accidents	The planning authority determines whether the activity is an acceptable use of the

on nearby road.	land. It considers matters such as visual impact, traffic and access issues, which do not form part of our environmental permit decision making process. Increased traffic is outside of the remit of the Environment Agency.
Concern about increased noise pollution.	The application contained a noise impact assessment (NIA) which identified local noise-sensitive receptors (NSR), potential sources of noise at the proposed installation and noise attenuation measures. Our assessment of the potential noise impact is covered in our key issues section above. We agree with the Applicant's assessment that there is not a significant adverse impact from noise during the well appraisal and testing phases. As the gas engines final design as part of the production phase has not been finalised, we have required the operator to demonstrate that these engines will not increase the noise impact currently modelled in the application under pre-operational condition PO6 in Table S1.4B of the draft permit prior to commenced of the production phase.
Concern about light pollution	Pollution from light is primarily a concern for considering visual impacts and as such covered by the planning process and outside of the remit of the Environment Agency.
Concern about environmental impact from site development and construction works	The Applicant has assessed the air quality impacts during the construction phase, but overall environmental impact from the site development and construction is principally a planning matter and outside of the remit of the Environment Agency.
Concern about odour when previously operating	The Applicant has provided a revised odour management plan with their application. This includes how they respond to any public complaints and measures and monitoring they carry out to identify potential odour emissions. The permit also includes condition 3.3.1 which requires the operator to ensure that the activities shall be free from odour at levels likely to cause pollution beyond the site boundary. In addition, we have included pre-operational condition PO6 in Table S1.4B of the draft permit that requires the operator review the Odour Management Plan prior to the

	commencement of the production phase and to analyse the flare feed gas for odorous compounds to better understand and manage odour at the site in future.
Other issues	
Statement that the application was not advertised widely enough.	This permit variation application has been advertised and consulted on in accordance with our web guidance Environmental permits: when and how we consult . In addition, as this is a site of high public interest (HPI) we have carried out enhanced engagement, including production of a public video to explain the main application proposals and our regulatory approach. We are also now consulting on our proposed decision.
Concern that the proposal does not align with government commitment to achieving 'net zero' greenhouse gas emissions by 2050.	We have assessed the environmental impacts of the proposed activities falling under the Environmental Permitting Regulations, 2016 SI 1154 (EPR) within this variation application. Wider issues of government policy are outside of the remit of this determination.
Concern about impacts on climate change.	We have assessed the environmental impacts of the proposed activities falling under the Environmental Permitting Regulations, 2016 SI 1154 (EPR) within this variation application. Wider issues such as climate change are outside of the remit of this determination.