HPI Decision Document - Variation

Determination of an Application for an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2016

Consultation on our decision document recording our decision-making process

The Permit Number is:	EPR/BB3001FT/V006 (EAWML/400996)
The Applicant / Operator is:	Rathlin Energy (UK) Limited
The Installation is located at:	West Newton 'A' Well Site, Fosham Road, Marton, Hull, HU11 5DA
1st Consultation commenced on:	19 November 2024
Consultation ended on:	24 January 2025
2nd Consultation commenced on:	29 July 2025
Consultation ended on:	06 October 2025

What this document is about

This is a decision document, which accompanies a permit.

It explains how we have considered the applicant's application, and why we have included the specific conditions in the permit we are issuing 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.

This document explains our thinking to the public and other interested parties. We have made our final decision only after carefully taking into account any relevant matter raised in the responses we received. We believe we have covered all the relevant issues and reached a reasonable conclusion.

We try to explain our decision as accurately, comprehensively and plainly as possible.

Preliminary information and use of terms

We gave the variation application the reference number EPR/BB3001FT/V006. We refer to the variation application as “the application” in this document in order to be consistent.

The application was duly made on 17 September 2024.

The applicant is Rathlin Energy (UK) Limited. We refer to Rathlin Energy (UK) Limited as “the Applicant” in this document.

Where we are talking about what would happen after the variation is granted (if that is our final decision), we call Rathlin Energy (UK) Limited “the Operator”.
Rathlin Energy (UK) Limited proposed facility is located at West Newton ‘A’ Well Site, Fosham Road, Marton, Hull, HU11 5DA. We refer to this as “the Installation” in this document.

Additive	Chemical or chemicals manually added to clean water, or to flow-back fluid and clean water, to assist with the hydraulic fracturing process.
Conditioning spacer/spacer fluid	Conditioning spacer/spacer fluid is a fluid used to separate drilling muds and cement and is used to displace drilling muds from the borehole prior to cement being applied.
Conventional and unconventional oil and gas	The term ‘unconventional gas’ refers to natural gas which is tightly trapped within underground rocks, such as shale rock or coal beds and which is hard to extract. ‘Conventional’ hydrocarbon fields are usually situated in natural reservoirs caused by overlying impermeable layers containing hydrocarbons which have risen through strata below. The proposed activities at West Newton A well site are for conventional oil production and not unconventional oil production as shale formations are not targeted in the West Newton A area Conventional and unconventional fossil fuels differ in their geologic locations and accessibility; conventional fuels are often found in discrete, easily accessible reservoirs, while unconventional fuels are found throughout a wide geologic formation, requiring advanced extraction techniques.
Drilling muds	Drilling muds are fluids used to lubricate the drilling bit while drilling.
Drill cuttings	Drill cuttings are broken bits of solid material naturally occurring underground and removed from a borehole as part of the drilling process into underground formations.
Exploration	Activities carried out to provide information about geological structures and the presence or absence of hydrocarbons together with assessments to determine whether the reservoir development is economically feasible.

Extractive waste	Extractive waste is waste directly resulting from the prospecting, extraction, treatment and storage of mineral resources and the working of quarries.
Flaring	Flaring is a technique used where quantities of flammable waste gas are burnt in a controlled manner. The gas flow is ignited under controlled conditions.
Flow-back fluid	A mixture of hydraulic fracturing fluid, which may include mobilised natural gas and formation water which returns to the surface following the hydraulic fracturing process.
High volume hydraulic fracturing (aka associated hydraulic fracturing)	High volume hydraulic fracturing or “fracking” is a hydraulic fracturing technique that uses large quantities of fluid, usually water, pumped at high pressure into the rock to create narrow fractures which provide paths for the tight gas to flow into the well bore and to surface. Once the fractures have been created, small particles, usually of sand, are pumped into them; these particles keep the fractures open when the water is flowed back up the well. The water normally contains small quantities of other substances to improve the efficiency of the process, e.g. to reduce friction.
Reservoir stimulation (aka low volume hydraulic fracturing, proppant squeeze, mini-frack)	Reservoir stimulation is a hydraulic fracturing technique that involves the injection of a small amount of fracturing fluid into a target formation designed to improve the efficiency of the flow of fluids through the reservoir rock and into the well. At West Newton A the reservoir stimulation involves squeezing a small volume of oil-based fluid into the formation to bypass any reservoir damage created during drilling, or by other fluids previously used during well testing, and then using proppant to keep the pathways open to allow gas and hydrocarbon fluids to flow into the well at economic rates. The difference between high-volume hydraulic fracturing or “fracking” and reservoir stimulation is the smaller quantity of fluid used.
Hydraulic fracturing fluid	The fluid injected into the formation under pressure, and which consists predominantly of clean water, or flow-back fluid and clean water, together with a proppant and a friction reducer.
HSE	Health and Safety Executive
JAGDAG	Joint Agencies Groundwater Directive Advisory Group
NORM	An abbreviation for naturally occurring radioactive material. Due to the highly reducing conditions in hydrocarbon reservoirs and the long residence time, formation waters may contain moderate concentrations of natural radioactive elements (such as radium). Thus, formation water recovered at the surface, or scales formed on well casing or downhole equipment, may contain elevated total alpha and total beta radioactivity counts.

Regulated facility.	This is the term used in the Environmental Permitting (England and Wales) Regulations 2016. Those Regulations provide that any regulated facility must be operated only under and in accordance with an environmental permit. The term is defined in the Regulations so as to include a “mining waste operation, a “groundwater activity” and an “installation”, which in this case includes a facility for the loading, unloading, handling or storage of, or the physical, chemical or thermal treatment of crude oil or stabilised crude petroleum as an activity listed in Schedule 1 section 1.2 Part A (1) (e) to the Environmental Permitting (England and Wales) Regulations 2016). A “mining waste operation” is further defined so as to include the management of extractive waste, whether or not it involves a waste facility.
Reservoir	The rock formation in which the hydrocarbon being targeted is held. In this case this is the Kirkham Abbey Formation.
Wellbore	The engineered construction through which the hydrocarbon is to be extracted.
Proppant	Proppant is a solid particulate material, injected with a stimulant fluid, designed to hold fractures open after the active reservoir stimulation has ceased.
20/40 sand	Refers to the standard US sieve sizes through which sand grains pass; in this case the sand grain size falls between mesh sizes 20 and 40 (0.43 to 0.85 mm)

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1. Our proposed decision

We are minded to grant the permit to the applicant. This will allow it to operate the Installation, subject to the conditions in the permit.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the permit will ensure that a high level of protection is provided for the environment and human health.

The permit contains many conditions taken from our standard Environmental permit template including the relevant Annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations (EPR) and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the permit, we have considered the application and accepted that the details provided are sufficient and satisfactory to make use of the standard condition acceptable and appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our permit template provides two or more options, an explanation of the reason(s) for choosing the option that has been specified.

2. Purpose of this document

This decision document provides a record of the decision making process. It summarises the decision-making process to show how the main relevant factors have been taken into account. We have assessed the aspects that are changing as part of this variation, we have not revisited any other sections of the permit.

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
- 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.

3. Receipt of application

The application was duly made on 17/09/2024. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination: see section 4 below.

4. Requests for further information

Although we were able to consider the application duly made, we needed more information to determine it, which we received on 12/12/24, 28/02/2025 and 11/04/2025. A copy of the information was placed on our public register.

Having carefully considered the application and all other relevant information, we put our draft decision before the public and other interested parties in the form of a draft permit, together with this explanatory decision document. As a result of this stage in the process, the public has been provided with all the information that is relevant to our determination, including the original application and additional information obtained subsequently, and we have given the public two separate opportunities (including this one) to comment on the application and its determination. Once again, we will consider all relevant representations we receive in response to this final consultation and will amend this explanatory document as appropriate to explain how we have done this, when we publish our final decision.

5. Key issues of the decision

5.1 Variation overview

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.

This variation is to carry out a reservoir stimulation activity on the existing well WNA-2 drilled in 2019. The geological formation (the body of rock) in which the reservoir stimulation is proposed to take place is known as the Kirkham Abbey Formation (KAF). The reservoir stimulation will target the Permian age KAF at approximately 1.7 km below the ground surface, to re-establish permeability within the KAF, having been impeded by formation damage because of the initial drilling and completion operation.

The design of the reservoir stimulation activity will affect only the target reservoir: the Kirkham Abbey Formation. The Waste Management Plan confirms zone of

influence that the stimulation is designed to impact as a 30 m thick zone in the Kirkham Abbey Formation, penetrating up to 32.8 m diameter (16.4 m radius), lending to a mining waste facility with a total volume of 25,349 m^3. This has been further refined in the Hydrogeological Risk Assessment (HRA) to a 27 m zone (between 1715-1742 m TVD), with a slightly greater radius of 20 m – 30 m, lending to a revised mining waste facility volume of 33,929 m^3. The stimulation will take place over a one-hour period, where the proppant will be injected into the formation at a pressure of 9,000 psi. After that, some of the fluid will be brought back to the surface in a controlled way. The sand proppant is included to 'prop' open the channels that are created.

The volume of fluid used for the stimulation is small (60 m^3) and does contain hazardous properties. The surrounding lithologies exhibit very low permeability, which limits fluid movement and provides hydraulic separation from the zone of stimulation. Supporting documents demonstrate the overall percentage of hazardous substances remaining in the spatial volume of the mining waste facility will be 0.24% immediately following the reservoir stimulation activity. This will reduce during the ongoing production of hydrocarbons and/or comingling with other extractive wastes. As such, even if the well is never brought onstream, we consider that the reservoir stimulation fluid will not lead to any danger to the environment and, therefore, is not classified as a Category A Mining Waste Facility.

Reservoir stimulation is the injection of stimulation fluid into a target formation designed to improve the efficiency of the flow of fluids through the reservoir rock and into the well. The reservoir stimulation would need to be authorised as a groundwater activity under Schedule 22 of the Environmental Permitting Regulations 2016. The reservoir stimulation would leave some sand proppant and fluid in the ground, which will become extractive waste at the end of the period that the well is operating and therefore the applicant has also applied to vary the 'mining waste facility' to authorise this.

The application is not for high volume hydraulic fracturing. The Infrastructure Act 2015 defines high volume hydraulic fracturing as associated hydraulic fracturing, involving the injection of more than 1,000 m^3 of fluid in any one stage, or more than 10,000 m^3 of fluid in total. The proposal from Rathlin Energy (UK) Limited is below these thresholds. The proposed reservoir stimulation involves injection of fluid into the rock (geological formation) at a pressure above the fracture pressure of the formation. It is not associated hydraulic fracturing due to the smaller quantity of fluid involved.

In England, reservoir stimulation is allowed because it involves much lower volumes of fluid (and chemicals) compared to high volume hydraulic fracturing. This makes it easier to manage and mitigate potential risks.

The key factor here is the scale, hydraulic fracturing in shale gas reservoirs, which has generated concern regarding the potential for induced seismicity, uses 1000s of m^3, injected via multiple stages along horizontal wells. Whereas proppant squeeze operations typically use less than 200 m^3, and in the case for West Newton only 60

m^3 to 70 m^3 not exceeding 85 m^3 with a single injection stage. The 85 m^3 includes the volume used for the diagnostic fracture injection test (DFIT).

The Environmental Permitting (England and Wales) Regulations 2016 provide a framework for regulating activities that could impact the environment, including reservoir stimulation. These regulations require operators to obtain an environmental permit for activities that involve the management of extractive waste, such as the fluids and proppants used in reservoir stimulation.

Note: We do not regulate seismicity. The North Sea Transition Authority (NSTA) are the responsible authority for this and for the seismic monitoring. In addition, the Health and Safety Executive (HSE) regulate people safety as well as well integrity which is primarily regulated by the HSE which oversees the design, construction and operation of wells to manage safety risks. Environmental protection is enforced by ourselves, whilst the NSTA handles the licensing.

The current permit, most recently varied in August 2023, allows the operator to drill additional oil and gas wells and carry out commercial production.

Several activities are already permitted at this site (permit variation V005). This included the drilling of 'side-track wells' from WNA-1 and WNA-2, and drilling of up to six new additional wells. A side-track well is another path, which is drilled from the first well. This creates a new track to explore the reservoir without drilling a new well from the surface.

Well clean up (a process used to remove debris, drilling fluids, and other materials from a well after drilling) and testing activities; hydrocarbon production; use of gas for electricity generation; flaring of gas; storage of crude oil; well plugging and decommissioning (permanently sealing the well) are also regulated by this permit.

Onshore oil and gas (OOG) permits are often multi-regime permits. Onshore oil and gas exploration and production is not a permitted activity on its own right in the Environmental Permitting Regulations, but the operator may need a permit from the Environment Agency for handling of waste and naturally occurring radioactive materials (NORM), oil storage, combustion of gas and surface and groundwater discharge/abstraction activities. This is the case for West Newton A.

For clarity, the documents submitted in support of the application are 'working' documents which include all operations currently undertaken and proposed at the site. This application to vary the permit is only for the addition of the reservoir stimulation within the WNA-2 well. All other activities have already been included and assessed in previous permit variations. This includes the area of the permit, the drilling testing and production of up to 8 wells and potential sidetracks, all with the use of acid and other wellbore treatments.

The permit activities are as follows.

- An Industrial Emission activity as defined by the Industrial Emissions Directive and Schedule 1, Part 2, Section 1.2 of the Environmental Permitting (England

and Wales) Regulations 2016, relating to production of fluids extracted from the resource formation, separation and storage of products (crude oil) and waste prior to onward transport (Existing)

- Schedule 1, Part 2, Section 5.1 of the Environmental Permitting (England and Wales) Regulations 2016, relating to the flaring of waste gas, from onshore oil and gas exploration, appraisal and production activities (>10t/d) (Existing)
- Medium Combustion Plant - Schedule 25A for the use of produced gas in gas engines to produce electricity (Existing)
- A Mining Waste Operation, as defined by the Mining Waste Directive and Schedule 20 of the Environmental Permitting (England and Wales) Regulations 2016, relating to the management of extractive waste. In respect of hydraulically fractured wells, a non-hazardous Mining Waste Facility for the accumulation of injected hydraulic fracturing fluid which will remain in the underground target formation and has become waste. (Existing but being amended by this variation to include reservoir stimulation).
- A groundwater activity, as defined by the Groundwater Directive and Schedule 22 of the Environmental Permitting (England and Wales) Regulations 2016, for the discharge, injection of fracturing fluid into the target formation that might lead to an indirect input of a pollutant to groundwater. (New)

Note: The reservoir stimulation and groundwater activity is finite; this means that the process occurs for one session, any further reservoir stimulation will necessitate a new variation application.

5.2 Technical considerations

- The vertical and horizontal limit of the stimulation activity
- The use of oil based (hazardous) fluids over water-based (non-hazardous) fluids
- Clarity on the chemical inventory
- Absent Hydraulic Fracture Plan (HFP)

Technical issues focused on how well constrained the extent of the stimulation would be, both vertically and laterally and what the volume of material injected would be. The extent of the reservoir stimulation activities and therefore the location of the mining waste facility is dependent on the rock properties of the reservoir and over and underlying formations, the injection pressures and volume of stimulant. These factors have been investigated as part of the determination. For clarity, the permit allows the reservoir stimulation to occur in close proximity of the well (within 30 m) between the depth of 1715-1724 m MD KB (measured depth (MD), Kelly Bushing (KB)) and 1736-1761 m MD KB within the Kirkham Abbey Formation (KAF). The extent of the stimulation has been shown to be limited by the Fordon

Formation (a sequence of anhydrite and halite which directly overlies the Kirkham Abbey Formation). The Fordon is a sequence of anhydrite and halite (both evaporites) which directly overlies the KAF.

The use of oil based (hazardous) gelling fluids over water-based alternatives for use in the proppant squeeze was also a technical issue for this application. A Schedule 5 Notice to request further information, sought clarification on this and explained that using water-based fluids caused damage to the Kirkham Abbey Formation. The formation appeared to be acting like a “check valve” during the completion and testing operations, meaning that the reservoir readily accepted the input of the water-based completion fluids, including the acid stimulations, but returned those same fluids slowly, which appeared to be restricting the flow of gas from the reservoir. An independent evaluation of Kirkham Abbey core samples from WNA-2, completed Roller Oven Erosional Stability Testing samples which concluded that hydrocarbon-based fluids were favourable.

Clarity on the chemical inventory was also an issue for this application, specifically relating to the MO-IV Breaker fluid. Schedule 5 Notices responses addressed this but ultimately this product has been removed from the application.

The absence of the Hydraulic Fracture Plan (HFP) was also an issue for this application. The original application confirmed the HFP had been submitted and approved by the NSTA and we had a copy. Schedule 5 Noice requests for information, meetings with the operator and confirmation from the NSTA confirmed that the HFP would be provided post well testing. The requirement for the HFP is included in table S1.4A. Pre-Operational Measures’, pre-operational measure 5 (POM 5).

6. Decision considerations

6.1 Confidential information

The Applicant made no claim for commercial confidentiality. However, we did receive a confidentiality claim by the manufacturer for the process chemical MO-IV Breaker. MO-IV Breaker was the only additional product included as part of this variation application, as all other products have previously been approved under EPR/BB3001FT/V005.

Subsequently, the manufacturer confirmed that they would be withdrawing the product MO-IV Breaker from confidentiality consideration and the permitting process. The applicant’s response also informed us that MO-IV Breaker’s two other products: MO-85M and MO-86M have also been withdrawn from the permitting process. Date of confirmation of withdrawal was confirmed on the 14 March 2025.

We have not received any other information in relation to the application that appears to be confidential in relation to any other party.

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

6.2 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.

6.3 Consultation on the Application

We carried out consultation on the application in accordance with the Environmental Permitting Regulation (EPR), our statutory Public Participation Statement (PPS) and our own internal guidance RGN 6 for Determinations involving Sites of High Public Interest. RGN 6 was withdrawn as external guidance, but it is still relevant as Environment Agency internal guidance.

We consider that this process satisfies and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the Industrial Emissions Directive (IED), which applies to the regulated facility and the application. We have also taken into account our obligations under the Local Democracy, Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, we consider that our consultation already satisfies the requirements of the 2009 Act.

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

We consulted the following organisations:

- East Riding Council
- East Riding Environmental Health
- East Riding Planning
- UK Health and Security Agency UKHSA
- Health and Safety Executive
- Food Standards Agency

Any comments that have been received after the close of the consultation and prior to issue were taken into consideration as part of our determination process.

We can only consider comments which are relevant to changes proposed under the variation application.

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

6.4 Engagement

We made the application available online via our Citizen Space page where the public were able to provide comments. This contained all the information required by the IED, including telling people where and when they could see a copy of the application.

The application was publicised on the GOV.UK website at https://consult.environment-agency.gov.uk/psc/hu11-5da-rathlin-energy-uk-ltd/ between the 19 November 2024 and 3 January 2025 for a period of 6 weeks instead of the usual 4 weeks due to the proximity of the Christmas holidays period, however we did receive a number of requests to extend the deadline again and subsequently the consultation was extended for a further 4 weeks until the 24 January 2025. That is a total consultation period of 10 weeks, however the information has remained on our web site since the consultation closed on the 24 January 2025.

The application and all other documents relevant to our determination available to view on our Public Register. Anyone wishing to see these documents could do so and arrange for copies to be made.

We consider this application to be of high public interest and so we have carried out extra engagement, as follows:

- The application was advertised in the Hull Daily Mail on the 19 November 2024, this included telling people where and when they could see a copy of the application. The link to the consultation web page was provided.
- We wrote to the local residents (in total 332 occupiers) and other interested parties to inform them that we had received an application and inviting them to comment. The link to the consultation web page was provided in this letter.
- We held a public engagement event at Sproatley Village Hall on the 9 January 2025 (12-4pm) to discuss the permit variation from Rathlin Energy. The objective of the event was to answer questions on:
    - what the application is for
    - what the technique is
    - what we look at during our permitting process

- how we regulate the site/checks we make
- what the consultation is for
- how to participate in the consultation
- current permit held by Rathlin Energy

- We produced a flyer to help bring attention to the application consultation, to advertise the virtual engagement event, and to provide the link to the consultation page on our website inviting comments about this permit variation - in order to understand any concerns.

- We produced a web information page providing an overview of the site on our website to help explain the application and the process that we must follow regarding the determination.

- We produced the information about the changes that had been applied for in order to help people understand this technical information and participate in the consultation. We provided the link to our web site where the application proposals, including all technical information, could be found.

- We made a copy of the application and all other documents relevant to our determination available to view on our Public Register at our Area office. Anyone wishing to see these documents could do so and arrange for copies to be made.

Any comments that have been received after the close of the consultation and prior to issue were taken into consideration as part of our determination process.

We can only consider comments which are relevant to changes proposed under the variation application.

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

6.5 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 permit.

6.6 Management

The applicant is the sole Operator of the regulated facility.

We are satisfied that the applicant is the person who will have control over the operation of the regulated facility after the issuing of the variation; and that the applicant will be able to operate the Installation so as to comply with the conditions included in the permit.

6.7 Environmental management system

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

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

6.8 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 permit.

6.9 Site condition report

The permit boundary has not changed to that which has already been approved and shown in Schedule 7, figure 2 of the permit EPR/BB3001FT/V005.
It is appreciated that this was mentioned in the non-technical summary (NTS) but having checked with the applicant it is our understanding that the application was written ‘holistically’ and inclusive of all previous and future activities. Any changes to the boundary will require a future variation.

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.

6.10 Waste management plan

Article 5 of the Mining Waste Directive (Directive 2006/21/EC) focuses on waste management plans for extractive waste. It requires operators to develop plans for the prevention, minimisation, treatment, recovery, and disposal of waste, taking into account the principle of sustainable development. These plans must be approved by ourselves and reviewed every five years. The applicant has provided a waste management plan (WMP) which we consider is satisfactory. The WMP, including associated documents, has been assessed in accordance with these requirements and is approved subject to conditions. Condition 2.3.1 ensures that the operations are limited to those described in the WMP and in table S1.2. It also ensures that the

operator follows the techniques set out and that any deviation will require our written approval. Any significant changes will require a formal variation of the permit. Where a condition imposes a specific requirement that will take precedence over anything in the plan.

The WMP 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 permit.

6.11 Conservation, landscape, heritage, protected species, 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 these designations.

The Ecological Impact Assessment received in December 2021 remains valid as the extents of the operation still fits within the operation phase already assessed. The embedded mitigations have not changed as the well construction and surface water drainage will not change; the lighting assessment and air quality assessments have been conducted using the 'worst case scenario' of lighting during the drilling phase and the air quality when flaring. The reservoir stimulation will not add any additional sources or pathways which will have impacts upon the ecological receptors set out in the Ecological Impact Assessment. There are no additional air impacts that need to be reviewed beyond what has already been reviewed under variation V005 issued in August 2023. Rates are already permitted for incineration above 10t/d.

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

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

The closest designated site is Lambwath Meadows SSSI, located 882 m northeast of the Wellsite. This SSSI is supported by surface water but is located upstream of the Wellsite. Given this, and the underlying glacial till that separates the groundwater and surface water systems, Lambwath Meadows SSSI is not

hydraulically connected with the Wellsite, therefore is not at risk from surface or near-surface risks connected with the proposed development.

The habitats risk assessment matrix considered in Variation V005 issued August 2023 remains valid as regards its description of risks related to surface activities, storage of chemicals and conventional drilling / operations. The operator has conducted a detailed air quality assessment for Variation V005 which included modelling of the potential impacts on nearby sensitive receptors, of which the Lambwath Meadows SSSI is one. There are no increases in air emissions that haven't already been modelled under V005. There is no additional impact to the SPAs either which lie over 5.3 and 7 km to the east of the site.

To confirm, no additional gas shall be incinerated as a result of this operation that has not already been accounted for in the previous air impact assessments.

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 completed an Appendix 4 in respect of sites of special scientific interest, for information only. We have not consulted Natural England.

The decision was taken in accordance with our guidance.

6.12 Environmental risk

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

The operator's risk assessments are satisfactory.

6.13 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.

6.14 Odour management

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

We consider that the odour management plan entitles, Odour Management Plan RE-EPRA-WNA-OMP-009 Rev 7 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.

6.15 Noise and vibration management

We consider that the existing noise and vibration management plan remains satisfactory. Noise Impact Assessment JAT2106REPT-03-R5-Rathlin-WNA; Addendum JAT2106-REPT-04-R1 dated September 2021 and revised NIA dated 10/06/2022.

The Noise Impact Assessment (NIA) included assessment of the following.

- Appraisal testing and workover existing wells
- Construction
- Drilling
- Well Treatment and clean up
- Well testing
- Operational Phase

Temporary pumping equipment is already covered by conditions in extant planning permission for minerals development. The Noise Impact Assessment for West Newton A Exploration, Appraisal and Production Development, dated December 2021 - considers the worst-case scenario of two flares operating 24/7. Similar to the workover equipment and acid squeeze pumping equipment, the fluid pumping equipment is not considered a primary source of noise. Accounting for the reservoir stimulation pumping equipment, which has a similar noise profile to the acid squeeze pumping and gas lift equipment, the conclusion is the same as previously assessed due to the short duration (minutes) of activity at the wellsite. For clarity, this variation in activity is not proposing additional noise sources to run simultaneously alongside the already permitted pumping equipment. The pumping equipment will inject acid or fluid for the reservoir stimulation in isolation, never cumulatively. With the existing assessment accounting for pumping equipment, along with the short duration of daytime activity to be less than 1 hour

(measurement time for LAeq) and the existing minerals authority noise condition, there is no change to the assessment conclusions.

The existing noise and vibration management plan remains valid as we consider it to be appropriate measures based on information available to us. 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.

6.16 Updating permit conditions during consolidation

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit.

6.17 Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions. These conditions are set out below and referred to, where applicable, in the text of the decision document. We are using these conditions to require the operator to confirm that the details and measures proposed in the application have been adopted or implemented prior to the operation of the regulated facility.

Hydraulic Fracturing Plan

The hydraulic fracturing plan (HFP) will be submitted independently of the permit variation application. It was agreed within the pre-application advice that the HFP can be provided as part of a pre-operational condition. Rathlin references the HFP in both the non-technical summary NTS and Waste Management Plan but in each instance, it is noted that an HFP will be submitted and stated specific elements will be included in it. Within the pre-application advice, we recognised that 'not all information is available to formalise at this stage.' Finalisation of specific details of the operation have yet to be agreed and will be submitted to both the North Sea Transition Authority (NSTA) and ourselves in advance of the operation being conducted.

A pre-operational condition POM5 has been added.

> *At least 3 months prior to commencement of activities referenced AR9 in Table S1.1 the Operator shall submit to the Environment Agency for approval a*

written Hydraulic Fracturing Plan and obtain both the North Sea Transition Authority (NSTA) and the Environment Agency's written approval to it. The plan shall include:

- *a map showing faults near the well and along the well path, with a summary assessment of faulting and formation stresses in the area and the risk that the operations could reactivate existing faults;*
- *information on the historical seismicity and assessment of the risk of induced seismicity;*
- *summary of the planned operations, including stages, pumping pressures and volumes;*
- *the processes and procedures that will be put in place before or during hydraulic fracturing to identify the vertical and horizontal extents of the fractures within the target formation and ensure that they are not near the permitted boundary;*
- *in the event that the fractures extend beyond the permit boundary, the steps that would be taken to assess and if necessary, mitigate the effect and limit further propagation outside the target rocks;*
- *a comparison of proposed activity to any previous operations and relationship to historical seismicity;*
- *proposed measures to monitor local seismicity during the operations;*
- *proposed reporting during hydraulic fracturing and your proposals for post fracturing reporting of the location, orientation and extent of the induced fractures to demonstrate that the permit has been complied with.*

6.18 Improvement programme

Based on the information in the application, we consider that we need to include an improvement programme. These improvements will be required by conditions, and they are set out below, justifications for these are provided at the relevant section of the decision document. These conditions require the operator to provide us with necessary details that are to be established or confirmed proposals after the permit is issued and before operations begin.

New Improvement Condition (IC4). Containment - Liner

The operator shall submit a written 'secondary and tertiary containment plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of a review conducted, by a competent person, in accordance with the methodology detailed within CIRIA C736 (2014), of the condition and extent of secondary and tertiary containment systems where all polluting liquids and solids are being stored, treated, and/or handled. This review shall consider, but is not limited to, the storage vessels, separators, bath heaters, bunds, loading and unloading areas, transfer pipework/pumps, temporary storage areas, and liners underlying the site.

The plan shall contain dates for the implementation of individual improvement measures necessary for the secondary and tertiary containment systems to adhere to the standards detailed/referenced within CIRIA C736 (2014), or equivalent.

The plan shall be implemented in accordance with the Environment Agency's written approval prior to the start of activity AR9.

We have included an improvement programme to ensure that the liner integrity is maintained, and improvements made where necessary.

6.19 Emission limits

Emission Limits have been added for the following parameters for activity AR9 for the injection of hydraulic fracturing fluid for production of hydrocarbons to ground via Well WNA-2:

Maximum daily discharge volume.
Maximum rate of discharge.
Surface injection pressure.

6.20 Monitoring

We have decided that monitoring should be added for the following parameters, using the methods detailed and to the frequencies specified:

Maximum daily discharge volume.
Maximum rate of discharge.
Surface injection pressure.

These monitoring requirements have been included in order to ensure continued compliance with permitted emissions of pollutants.

We made these decisions in accordance with reference the relevant technical guidance.

We expect that all monitoring is carried out to recognised standard by competent personnel. 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.

6.21 Reporting

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

Total discharge volume of hydraulic fracturing fluid in Table S3.3 two weeks after completion of the hydraulic fracturing process, as detailed in Table S4.1 of the permit.

We made these decisions in accordance with reference the relevant technical guidance.

6.22 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.

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

6.23 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

6.24 Financial competence

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

6.25 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.

7. Consultation Responses

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

7.1 Responses from organisations listed in the consultation section

Response received from East Riding Yorkshire Council (15)
Summary of issue(s) raised Based on the information provided, East Riding Yorkshire Council confirmed that they had no objections to these proposals and did not wish to add further comment.
Summary of actions taken or show how this has been covered None required.

Response received from UK Health Security Agency (UKHSA)
Summary of issue(s) raised Concern that there was no air impact assessment provided with the application as the non-technical summary indicated that there would be one. The UKHSA was unable to comment on the application without this assessment.
Summary of actions taken or show how this has been covered We responded to the consultation response received from the UKHSA and acknowledged that the non-technical summary caused some confusion by the applicant leaving in the requirement for an air quality risk assessment which was carried out for the previous V005 variation. I invited the UKHSA to comment further but unfortunately, they confirmed that they are unable to do so at this current time but welcome being consulted again on the minded to decision in due course. This will be arranged. To confirm there are no new air emissions that have not already modelled under variation V005, and no significant increase of potential from dust, odours and products of combustion from the drilling and extraction of hydrocarbons and storage of extracted materials on site. These emissions of concern were all assessed for the previous variation V005 as the V005 variation involved drilling of further wells. Variation V005, which has already been consulted upon, was issued

in August 2023. The UKHSA was consulted on this application at the time and an air impact assessment was carried out. There were no objections made. There is no new air emissions assessment for this application

7.2 Representations from local MPs, councillors & parish/town councils

Response received from Cllr Mid Holderness Ward (17)
Summary of issue(s) raised Concern expressed over the length of the consultation period explaining that the extension would provide everyone with a fair opportunity to participate without the distractions of the holiday season.
Summary of actions taken or show how this has been covered The application was publicised on the GOV.UK website between the 19th of November 2025 and 3rd January 2025 for a period of 6 weeks instead of the usual 4 weeks due to Christmas Holidays, however on receiving requests to extend the deadline again we extended for a further 4 weeks until the 24th of January 2025. Total consultation period of 10 weeks, the information has remained available on our web site since that date.

Response received from Cllr Bridlington South Ward (40 to 44)
Summary of issue(s) raised • Liner Not Fit for Purpose Liner has been exposed to the elements for over 13 years, leading to degradation and ineffectiveness. Referenced in the 2021 JBA report. Strong objection to any permit variation without full liner replacement.
Summary of actions taken or show how this has been covered These comments are noted. To avoid repeated responses on similar matters, see the response box 9 below under the Public Consultation Response Section.
Summary of issue(s) raised • Unknown Chemical Risks No data provided on Halliburton MO-IV Breaker.

Environmental and health risks from unknown chemicals.
EA deadline for chemical disclosure (10 Jan 2025) missed.
Strong objection to the use of uncertified chemicals.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response box 3 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Seismic Activity Risks

  Risk assessments based on models; hidden faults not ruled out.
  Reference to Newdigate earthquake study linking oil extraction to seismicity.
  Faults exist across East Yorkshire.
  No seismic monitoring proposed - unlike similar sites.
  Strong objection to hydraulic fracturing, oil extraction, and proppant squeeze.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response boxes 4, 5 and 7 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Underground Waste Facility

  Plan to leave 50–70% of proppant chemicals underground.
  Risk of contamination to aquifers serving East and North Yorkshire.
  Strong objection to creating an underground waste facility.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response boxes 1, 7 and 10 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Missing Hydraulic Fracturing Plan (HFP)

  No HFP provided; risks cannot be fully assessed.
  Objection to hydraulic fracturing without a plan.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response box 5 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Onsite Chemical Storage and Mixing

  Risks to air, surface water, and human health.

Objection to onsite chemical handling.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response boxes 2, 9, 11 and 16 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Missing Information

  Lack of essential data prevents informed public opinion.
  Objection based on insufficient risk information.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see response box 21 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Misleading Information regarding boundary changes

  Discrepancies in site expansion details.
  No risk assessments for expanded area.
  Objection to unclear expansion intentions.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see response box 15 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Poor Accessibility of Information

  Application is difficult for laypeople to interpret.
  Objection to lack of clear and concise documentation.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response boxes 19 to 22 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Additional Concerns

  Required chemical certifications not submitted by deadline.
  Waste from the experiment will be poorly stored.
  Up to 70% of chemicals left underground.
  No seismic monitoring or risk recognition for high-pressure injection.
  Objection to poor planning and lack of transparency.

Summary of actions taken or show how this has been covered
These comments are noted. To avoid repeated responses on similar matters, see the response boxes 1, 3, 4, 5, 7, 19 and 20 below under the Public Consultation Response Section.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section. Wider issues of government policy are outside of the remit of this determination.

7.3 Representations from community and other organisations

Response received from: Weald Action Group (135)
Summary of issue(s) raised • Lack of Acid Stimulation Plan No detailed plan provided for acid stimulation. Missing data on acid volumes per foot, total used, types and concentrations of acids, fluid volumes, and operating pressures. No information on atmospheric emissions. CO_2 emissions. Insufficient details on operation frequency and disposal of spent products.
Summary of actions taken or show how this has been covered No acid stimulation plan is required for this application. This is because the applicant is not applying for the acid wash and squeeze through this application. The applicant is applying for well stimulation which is a process that does not involve the use of acid, instead the process uses hydrocarbon-based products for the stimulation process. The operation has the following characteristics • Single stage. • Stimulation fluid – gelled hydrocarbon – 60m^3 to 70m^3, but not more than 85m^3. 85m^3 is to include the volume used for the Diagnostic Fracture Injectivity Test (DFIT). This is currently unknown, so maximum volume has been specified to allow for assessment of worst case scenario. • Proppant – 12.5 tonnes of 20/40 sand (or other grade / size, as informed by DFIT). • Fluid introduced at low flow rate and a surface pressure of up to 9000 psi for less than 1 hour • Height of stimulated fractures – 30m.

- Half-length of stimulated fractures – 16.4m

The stimulation fluid, strength, quantities, depth of injection and pressure injection are set out in 'Waste Management Plan RE-EPRA-WNA-WMP-005 Revision 10 dated July 2024 (section 6.8) and Technical Addendum: West Newton A wellsite. WNA-2 reservoir stimulation HRA' (Hydrogeological Risk Assessment) figure 3.

Section 7 of the Waste Management Plan covers management of extractive and non-extractive wastes. All wastes are removed from site by licensed waste carriers to a licensed waste facility. Waste removed from site will be taken to a permitted treatment facility and is subject to waste duty of care requirements.

It is uncertain as to what part of the process the concern over CO_2 emissions is directed. An air impact assessment was carried out for the previous variation that covered air quality emissions from the equipment operated on site - associated with a number of the project phases. The addition of the single phase well stimulation of the WNA-2 well is not significant in terms of additional CO_2 contributions from the operation.

The main sources of pollutant releases during site operations are from the use of diesel fuel in on-site stationary engines and construction and transport vehicles and from the combustion of produced natural gas by incineration and in gas engines for electricity generation. Releases of nitrogen oxides, carbon monoxide, volatile organic compounds, sulphur dioxide and particulate matter have already been considered. The previous assessment made under variation application V005 was undertaken using the UK ADMS 5.2 modelling system with operating scenarios considered to provide worst case conditions for pollutant releases and air quality impact. This operating schedule also assumes that electricity produced on site would, where possible, be used to power stationary engines and displace the use of diesel fuel. Any surplus electricity would be exported.

Summary of issue(s) raised

- Chemical Transparency and Risk

  Lack of disclosure on chemicals like MO-IV BREAKER.
  Public health risk due to undisclosed chemical compositions.

Without full chemical transparency, proper risk assessments are impossible.

Summary of actions taken or show how this has been covered

MO-IV BREAKER has been withdrawn from use by the manufacturer. No additional chemicals were proposed as a result of this chemical being withdrawn.

The chemical inventory has been submitted with the application, reference Chemical Inventory Revision 5B RE-EPRA-WNA-CI-008 dated May 2025, which provides full chemical transparency. There are no undisclosed chemical compositions.
Summary of issue(s) raised. • Acidisation vs. Hydraulic Fracturing UK law redefined fracking by fluid volume, not pressure. Acidising uses higher chemical concentrations (up to 17–18%) vs. fracking (0.5%). Risks include water usage, air pollution, flares, toxic waste, community stress, and traffic. Acidisation often misrepresented as benign “acid wash.”
Summary of actions taken or show how this has been covered These comments are noted but these are general comments not specific to this variation application. Risks from permitted activities to the natural environment including water quality and human health were considered during determination of the existing permit. Additional risks introduced by the proposed changes in this application have been reviewed as part of this determination. We have reviewed the hydrogeological risk assessment submitted as part of the permit variation application and concluded the proposed activities do not present a significant risk to groundwater. It is clear what the difference is between acid wash and well stimulation, the acid wash is proposed to be applied to the formation under pressure not exceeding the fracture pressure of the formation whilst the reservoir stimulation is proposed to be carried out at a pressure above the fracture pressure of the formation using a hydrocarbon based fluid plus proppant. The proposed activities are at the lowest end of the pressure spectrum associated with conventional hydraulic fracturing with small injection volumes proposed. Stimulation fluid – gelled hydrocarbon – 60m3 to 70m3, but not more than 85m3. 85m3 is to include the volume used for the DFIT. This is currently unknown, so maximum volume has been specified to allow for assessment of worst case scenario.
Summary of issue(s) raised • Misleading Information Lack of transparency on chemicals used and waste generated. Risk of hazardous waste with increased truck traffic. HDPE liners’ resistance to strong acids not confirmed.

Planning Process flawed

Summary of actions taken or show how this has been covered

The chemical inventory has been provided, reference Chemical Inventory Revision 5B RE-EPRA-WNA-CI-008 dated May 2025.

Wastes generated are detailed in section 7.3 of the Waste Management Plan. RE-EPRA-WNA-WMP-005 dated Rev 10 dated July 2024.

We consider these documents to be acceptable and transparent.

Comments relating to the planning process including increased traffic movements is not a consideration for determination of the permit variation application.

We note issues relating to potential deterioration of site liner and this is addressed by improvement condition IC4, section 6.18 of this decision document.

The liner meets BS EN 13493: Characteristics required for use in the construction of solid waste storage and disposal sites. This standard specifies the required characteristics of geosynthetic barriers used in the construction of solid waste storage and disposal sites focusing on their ability to resist acids and other fluids. These barriers act as fluid barriers and separation layers, controlling fluid leakage. It also addresses the factory production control and assessment of the barriers' performance. The liner is also subject to improvement condition reference IC4.

NORM waste is transported via a licensed haulier to either an Agency permitted wastewater treatment facility where it will be processed, treated and discharged in accordance with the permitted controls, or to a bespoke RSR (radioactive substances regulation) permitted waste treatment facility for treatment and disposal.

See section 7 of the Waste Management Plan Rev.10 dated July 2024 which covers management of extractive and non-extractive wastes states that waste removed from site will be taken to a permitted waste treatment facility for that type of waste. All waste is subject to duty of care requirements.

Summary of issue(s) raised

- Hydrogeological Risk Assessment Issues

  Past failures by Envireau Water in assessments (e.g., Markwells Wood).
  Criticised by independent hydrogeologist for factual errors.
  Environment Agency urged to apply precautionary principle and scrutinise assessments.

Summary of actions taken or show how this has been covered

The comments are an opinion on previous work carried out by the applicant's hydrogeological consultant at other sites. The comments are not specific to the West Newton A permit variation application being determined. Therefore, these comments have not been considered further.

Summary of issue(s) raised

- Seismic Activity and Reinjection Wells

  Reinjection linked to increased seismic activity (e.g., Oklahoma case studies).
  No updated GeoHazards Assessment provided.
  Risks to well integrity and groundwater contamination.
  Need for detailed seismic data.

Summary of actions taken or show how this has been covered

There are no re-injection wells. The application does not propose the reinjection of wastewater or produced water for disposal.

Seismicity and the requirement for seismic monitoring are assessed and regulated by the North Sea Transition Authority.

Central Regional Geo-Seismic Cross-Section has been provided. Since the initial mapping of the area in 2008 additional proprietary seismic maps, both 2D and 3D, have been provided. Updated mapping, particularly around the West Newton wells where a three dimensional three component (3D3C) survey was acquired by the applicant, show no evidence for faulting in the immediate area that would extend either into the deeper Carboniferous or overlying Sherwood Sandstone sections from the Kirkham Abbey. Additional detail in this regard is provided in the Seismic Hazard Assessment by Outer Limits Geophysical.

We have reviewed the hydrogeological risk assessment submitted as part of the permit variation application and considered the use and retention of fluid within the ground and the possible creation of pathways caused by seismicity. We have concluded that the proposed activities do not present a significant risk to groundwater quality.

We do not regulate seismicity. The North Sea Transition Authority (NSTA) are the responsible authority for this and for the seismic monitoring. In addition, the Health and Safety Executive (HSE) regulate people safety and well integrity is primarily regulated by the HSE which oversees the design, construction and operation of wells to manage safety risks. Environmental protection is enforced by the ourselves, whilst the NSTA handles the licensing.

Summary of issue(s) raised

- Radioactive Waste Concerns

  Radium-226 and radon pose long-term environmental and health risks.
  Radioactive materials can contaminate water and air.

Summary of actions taken or show how this has been covered

Management of naturally occurring radioactive material (NORM) waste produced on site (such as radon) is regulated under separate radioactive substance regulation (RSR) permit ref EPR/PB3030DJ. NORM is not being considered as part of this permit variation application and is also not subject to any amendments by this variation.

Flowback fluid following the stimulation has the potential to contain low levels of NORM. Samples of the flowback fluid will be sent to a laboratory holding the appropriate accreditations for radionuclide analysis by gamma spectrum. Depending on the outcome of radionuclides analysis, the flowback fluid will be transported via a licenced haulier to either an appropriately permitted wastewater treatment facility or to a bespoke radioactive substances regulation (RSR) permitted waste treatment facility for treatment and disposal.

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section.

Response received from: CPRE North and East Yorkshire (CPRENEY) 'The Countryside Charity' (221)

Summary of issue(s) raised

- Technical Concerns

  Proposed stimulation involves injecting 60–70m³ of oil-based fluid with 12.5 tonnes of sand at 9,000 psi.
  CPRENEY argues this qualifies as low-volume hydraulic fracturing, which still poses significant environmental risks.
  Planning Practice Guidance for Minerals (PPGM) does not distinguish between high- and low-volume fracturing.

Summary of actions taken or show how this has been covered

Low level hydraulic well stimulation can generate micro seismicity, however the proposed activities pose a very low risk with respect to seismic risk. Low level reservoir stimulation has no past record of causing seismicity which has only

been associated with large scale, high volume hydraulic fracturing of shale gas formations, which uses far higher injection volumes compared to those being considered in this application.

The North Sea Transition Authority (NSTA) are the regulator responsible for induced seismicity and have an interest in any proposals that include a deliberate intention to fracture (break) the rock formation.

We are satisfied that the changes in this variation do not increase the potential for tremors. Any changes to the fracturing process would form part of the approval of the relevant Hydraulic Fracturing Plan, which is a separate process to this variation and is completed in association with the NSTA, the Health and Safety Executive and the Environment Agency. Whilst the NSTA gives final agreement on the HFP, it is part of a multi-agency process.

Comments relating to the planning process are not a consideration for determination of the permit variation application.

Summary of issue(s) raised

- Climate and Policy Conflicts

  Contradicts UK's net-zero by 2050 target.
  Conflicts with the Paris Agreement and Glasgow Climate Pact.
  Inconsistent with the Sixth and upcoming Seventh Carbon Budgets.
  Opposes East Riding of Yorkshire Council's Climate Emergency declaration and local climate strategy.

Summary of actions taken or show how this has been covered

We cannot consider energy policy when determining a permit variation application. This is because energy policy is set by the government, and our role is to assess applications against environmental legislation, ensuring protection of the environment and human health. We are legally obliged to issue a permit if the application meets all requirements under relevant environmental legislation.

Energy policy and environmental permitting are distinct areas of governance. Energy policy, which covers the broader strategy for energy production and consumption, falls under the purview of the government (e.g., the Department for Energy Security and Net Zero). The Environment Agency's role is focused on environmental protection and regulation.

While we consider public feedback on local environmental factors during the consultation phase of a permit application, this feedback must align with the legal requirements of the Environmental Permit Applications (EPR).

Comments relating to the planning process are not a consideration for determination of the permit variation application.

Summary of issue(s) raised.

- Environmental and Health Risks

  Concerns about chemical use (e.g. Halliburton MO-IV Breaker) with unknown ecotoxicity.
  Risks of seismic activity and groundwater contamination from proppant left underground.
  Inadequate site liner design.
  Residual risk assessments are flawed or underestimated.

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response boxes 3, 4, 7 and 9 below under the Public Consultation Response Section.

Summary of issue(s) raised

- Procedural and Legal Issues

  CPRENEY claims the Environment Agency's interpretation of hydraulic fracturing in the 'Overview' document on the web page - is flawed and misleading.
  Application lacks sufficient technical detail and updated risk assessments.
  JBA Consulting report highlighted deficiencies in hydrological and flood risk assessments.
  CPRENEY strongly objects to the permit variation due to:
  Environmental and climate risks.
  Policy contradictions.
  Inadequate and flawed technical documentation.
  Potential long-term oil production and plastic manufacturing use.

Summary of actions taken or show how this has been covered

The text referred to on the Environment Agency 'overview' page is part of a signpost to the permit application documents. The text does not form part of the permit variation application or the determination. The text was created in response to a request for a simplified summary of the application. The message the text sets out to communicate is that the proposed well stimulation is not 'high volume hydraulic fracturing' as defined by the Infrastructure Act 2015. The text succeeds in this objective. We do not consider the text to be blatantly flawed and misleading.

The Infrastructure Act 2015 defines hydraulic fracturing as involving the injection of more than 1,000 cubic metres of fluid in any one stage, or more than 10,000 cubic metres of fluid in total.

Reservoir stimulation, or proppant squeeze, is similar to hydraulic fracturing in that it involves injection of fluid into rock (geological formation) at a pressure above the fracture pressure of the formation.

However, it is not regarded as hydraulic fracturing due to the smaller quantity of fluid involved.

The type of reservoir stimulation proposed at WNA-2 well is proppant squeeze, this works in a similar way to hydraulic fracturing but uses significantly smaller quantities of fluid and as such does not meet the accepted definition of hydraulic fracturing.

We have reviewed the hydrogeological risk assessment submitted as part of the permit variation and considered the use and retention of fluid within the ground and the possible creation of pathways caused by seismicity. In conclusion, we consider that the proposed activities do not present a significant risk to groundwater quality.

The design of the reservoir stimulation activity will affect only the target reservoir: the Kirkham Abbey Formation (KAF) and therefore there is separation of KAF from aquifer used for water abstraction.

Seismicity and the requirement for seismic monitoring are assessed and regulated by the North Sea Transition Authority.

The types of products which may be manufactured from extracted oil is not a factor the Environment Agency can consider in determination of the permit variation application. The Environment Agency's role is to assess applications against environmental legislation, ensuring protection of the environment and human health. We are legally obliged to issue a permit if the application meets all requirements under relevant environmental legislation.

We have reviewed the technical information and associated risk assessments to ensure that the regulated facility does not cause significant pollution or harm to human health. We are satisfied that this facility will not cause significant pollution or harm and that it will provide a high level of protection for the environment as a whole.

The JBA report has been assessed. We have included an improvement programme to ensure that the liner integrity is maintained, and improvements made where necessary.

See improvement condition reference IC4 is detailed above in the improvement condition section 6.18.

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section.

Response received from: West Newton Said No (12 & 45)
Summary of issue(s) raised • Consultation Extension Request Request to extend consultation to end of January 2025 due to: - Complex technical content, even in the non-technical summary. - Consultation overlaps with the Christmas holiday period. - Request for face-to-face public information events and online Q&A sessions. - Many local residents are not online and cannot access documents.
Summary of actions taken or show how this has been covered The application was publicised on the GOV.UK website between the 19th of November 2025 and 3rd January 2025 for a period of 6 weeks instead of the usual 4 weeks due to Christmas Holidays. However, we did receive a number of requests to extend the deadline again and subsequently the consultation was extended for a further 4 weeks until the 24th of January 2025. This is a total consultation period of 10 weeks, though the information has remained available on our web site since then. Extra engagement was carried out to give the public opportunities to ask questions. It is acknowledged that this application is a complex application. The public events were run in order that questions about the proposed activities could be asked and the proposals explained. See more detailed response below under public consultation response boxes 19, 20 and 22.
Summary of issue(s) raised • Reference to Government Consultation Principles (2018) Part C: Ensure consultees understand issues. Part E: Avoid rushed consultations.

Part F: Tailor to needs of specific groups (e.g., elderly, disabled).
Part G: Account for holiday periods and allow more time.

Summary of actions taken or show how this has been covered

We agree these principles give clear guidance to government departments on conducting consultations. The Government Consultation Principles A to K (2018) have been followed, hence why we held additional engagement, provided additional information, and extended the consultation period.
See more detailed response below under public consultation boxes 19, 20 and 22.

Summary of issue(s) raised.

Key Objections
Liner Not Fit for Purpose: Exposed for over 13 years; degraded (9)
Unknown Chemical Risks: No data on MO-IV Breaker; missed Environment Agency deadline (3).
Seismic Activity Risks: Based on models; hidden faults not ruled out; no seismic monitoring proposed (4).
Underground Waste Facility: Plan to leave 50–70% of proppant chemicals underground; risk to aquifers (1), (7) and (10).
No Hydraulic Fracturing Plan (HFP): Risks cannot be assessed without it (5).
Onsite Chemical Storage and Mixing: Risks to environment and health (11), (16).
Missing Information: Lack of essential data for public understanding (19) and 21).
Inaccurate and Misleading Information: Discrepancies in site expansion (15).
Difficult to Interpret: Application is not accessible to laypeople (19 and 22).

Summary of actions taken or show how this has been covered

These comments are noted. To avoid repeated responses on similar matters, see the response boxes 1, 3, 4, 5, 7, 9,10,11, 15, 16,19, 21 and 22 below under the Public Consultation Response Section (and as indicated in brackets after the summarised issues).

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the Public Consultation Section.

Response received from: Friends of the Earth – York Local Area Group (70)
Summary of issue(s) raised • Seismic Activity Risk (4): Risk assessments are based solely on modelling. Hidden faults cannot be ruled out. Reference to the Newdigate earthquake swarm study linking oil extraction and fracking to induced seismicity. Faults exist throughout East Yorkshire, including near West Newton and surrounding areas. Seismic activity is especially concerning due to proximity to groundwater. Strong objection to hydraulic fracturing (5), oil extraction, and proppant squeeze (7).
• Underground Waste Facility (1, 7 and 10): Plan to leave 50–70% of proppant chemicals underground in the Kirkham Abbey formation. Risk of chemical leaching and contamination of aquifers supplying drinking water to East and North Yorkshire. Precautionary principles should apply—no underground storage unless proven safe. Objection to the area becoming an underground waste facility.
• Lack of Hydraulic Fracturing Plan (HFP) (5 and 12): No HFP submitted with the application. Risks cannot be properly assessed without it. High volume hydraulic fracturing has previously been banned due to safety concerns.
• Missing Information (21): Significant data gaps prevent the public from making informed decisions. Objection based on lack of essential environmental and health risk information.
Summary of actions taken or show how this has been covered These comments are noted. To avoid repeated responses on similar matters, see the response boxes 1, 4, 5, 7,10 and 21 below under the Public Consultation Response Section (and as indicated in brackets after the summarised issues).

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section.

Response received from: York Green Party (120 to 124)
Summary of issue(s) raised • Chemical Safety and Unknown Risks (3) Concerns about the unknown risk of Halliburton MO-IV Breaker and its ecotoxicity. Emphasis on the precautionary principle: all chemicals and their combinations must be proven safe before use. Rathlin has not provided sufficient information on the chemicals; in the absence of proof of safety, they should be assumed harmful and prohibited.
• Seismic Activity (1, 4 and 7) Strong objection to hydraulic fracturing, oil extraction, and proppant squeeze. Risk assessments are based solely on models; hidden faults cannot be ruled out. Reference to a Geological Magazine paper on the Newdigate earthquake swarm, suggesting oil extraction and fracking can trigger seismic events even tens of kilometers away. East Yorkshire has known faults, increasing the risk of induced seismicity. Seismic activity could create pathways for chemical migration, especially concerning due to plans to retain 50–70% of proppant fluid underground.
• Underground Waste Facility (7 and 10) Objection to the area becoming an underground waste storage site. Potential contamination of aquifers supplying drinking water to East and North Yorkshire. Storage should not be allowed unless it can be guaranteed to be safe.
• Lack of Hydraulic Fracturing Plan (HFP) (5) No HFP provided, making risk assessment impossible. Renaming the process does not change its nature or associated risks. Fracking has previously caused significant issues, leading to a government ban.
Summary of actions taken or show how this has been covered These comments are noted. To avoid repeated responses on similar matters, see section 6.11 and the response boxes 1, 3, 4, 5, 7 and 10 below under the Public

Consultation Response Section (and as indicated in brackets after the summarised issues).

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section.

Response received from: Frack Free Selby (130 to 133)
Summary of issue(s) raised • Timing of Consultation (20): Scheduled during a busy holiday period, limiting public and organizational participation. Perceived as a deliberate attempt to reduce responses.
• Lack of Chemical Information (3): Required chemical details not provided by the Environment Agency's January 10th deadline. Lack knowledge of chemical composition and associated risks.
• Seismic and Groundwater Risks (1, 4 and 5): Injection of chemicals, sand, and water under pressure may damage underground rock formations. Known faults in East Riding increase seismic risk. Proximity to underground water raises contamination concerns.
• Underground Waste Concerns (1, 4, 7,10 and 16): Large percentage of proppant to be left underground. Potential long-term impact on groundwater and seismic stability. Raises question of whether the site should be classified as a waste facility. Lack of clarity on monitoring and mitigation.
• Monitoring Requirements (4): Strong call for 24/7 micro seismic monitoring with backup systems to ensure no data loss.
• Onsite Chemical Handling: Objection to storage and mixing of (some unknown) chemicals on site. Risks to local community, agriculture, wildlife, air and water quality, and site (1, 2 and 16) workers.

• Transparency and Trust (20, 21 and 22): Noted shortage of information. Concerns about lack of openness and accountability.
• Site Expansion (15): EA unclear about potential site expansion. No visible risk or impact assessments for expansion. Concern that changes may be approved without proper scrutiny.
Summary of actions taken or show how this has been covered These comments are noted. To avoid repeated responses on similar matters, see the response boxes 1, 2, 3, 4, 5, 7, 10, 15, 16 and 20, 21, 22 below under the Public Consultation Response Section (and as indicated in brackets after the summarised issues).

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section.

Response received from: Frack Free Ryedale (142)
Summary of issue(s) raised • Difficult to Interpret (19): Application is not accessible to laypeople. Lack of clear and concise information (21). • Inaccurate and Misleading Information: Discrepancies regarding the size of the well pad (21). No figures or assessments provided for potential site expansion (15). • Missing Information: Essential data on environmental and health risks is absent (16). Public cannot make informed decisions (19, 20, 21 and 22).
• Onsite Chemical Storage and Mixing (11): Significant hazards to air, surface water, and health. Objection to handling of chemicals on site.
• No Hydraulic Fracturing Plan (HFP) (5): No HFP submitted. Risks cannot be fully assessed without it.
• Underground Waste Facility (1, 7 and 10): Plan to leave 50–70% of proppant chemicals underground in the Kirkham Abbey formation.

Risk of contamination to aquifers serving East and North Yorkshire. Strong objection to the area becoming a waste facility.
• Seismic Activity Risk (4): Risk assessment based solely on models; hidden faults not ruled out. Reference to Newdigate earthquake study linking oil extraction to seismicity. Faults exist throughout East Yorkshire. No seismic monitoring proposed for West Newton, unlike similar sites.
• Unknown Chemical Risk (3,16): No data on Halliburton MO-IV Breaker. Environmental and health risks unassessed. EA deadline for disclosure missed.
• Liner Not Fit for Purpose (2, 9): Liner exposed for over 13 years and degraded. Referenced in 2021 JBA Report. Strong objection to permit variation without liner replacement.
Summary of actions taken or show how this has been covered These comments are noted. To avoid repeated responses on similar matters, see the response boxes 1, 2, 3, 4, 5, 7, 9, 10, 16, 19, 20, 21 and 22 below under the Public Consultation Response Section (and as indicated in brackets after the summarised issues).

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section.

7.4 Representations from individual members of the public

The consultation responses received from individual members of the public were wide ranging and a number of the issues raised were outside the Environment Agency's remit in reaching its permitting decisions. Specifically, questions were raised which fall within the jurisdiction of the planning system. Guidance on the interaction between planning and pollution control is given in the National Planning Policy Framework. It says that the planning and pollution control systems are separate but complementary. We are only able to take into account those issues which fall within the scope of our regulatory powers.

Of the 227 public responses received, 70% of these expressed concern over the following four areas.

- Water pollution
- Seismic activity

- Chemicals used in stimulation
- Liner

The responses raised many of the same issues. All concerns raised are addressed below.

Box	
1	Groundwater / Surface Water / Drinking Water / Aquifer
2	Surface Water
3	Chemicals / MO-IV Breaker
4	Seismic Risk / Earthquakes / Fault Lines / Explosions / UCL Article / Newdigate
5	Hydraulic Fracturing Plan (HFP)
6	Acid Stimulation Plan
7	Proppant Squeeze Retained in Target Formation
8	Wash and Squeeze
9	Liner / Well Pad
10	Waste Facility Objection
11	Storage and mixing of chemicals on site.
12	Banned Activity in the UK
13	Noise
14	Traffic
15	Boundary Changes
16	Harm To Human Health
17	Climate Change / Fossil Fuels / Finch Case (June 2024)
18	Boland Shale Reservoir
19	Public Information Events / Accessibility
20	Extend Consultation
21	Lack of Information / Detail / Missing Information
22	Too Technical
23	Site Regulation

1. Groundwater / Surface Water / Drinking Water / Aquifer
Summary of issue(s) raised There were several concerns that surface water and groundwater may be contaminated by the proposed hydraulic fracturing activities.
Summary of actions taken or show how this has been covered 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. The hydrogeological risk assessment has evaluated any risks to groundwater, and associated receptors, from substances used or released from the activities that take place at the surface, or from drilling the well and any subsequent well stimulation.

We have reviewed the Environmental Risk Assessment and the Hydrogeological Risk Assessment provided by the applicant against our information and conceptual understanding of the location. We are satisfied that the well stimulation activities, which are controlled by this permit, will not pose a risk to groundwater or surface water given the mitigation measures required. We are satisfied that drinking water supplies are not at risk.

It is unlikely that the fracturing fluids, which remain in the ground after the operations are complete, could migrate any significant distance from the fractures created by the hydraulic fracturing process within the target formation. In order for fluids to move in the rock a driving head would be required to produce a gradient to cause fluid movement. Once the hydraulic fracturing stage is complete the pressure is released to allow the fluid and gas to return to the extraction well and the pressure gradient will be from the rock towards the well.

This permit variation does not allow reinjection of water at the site. All produced and flow back water will be transported off site to an appropriately permitted disposal facility.

The fluid used for hydraulic fracturing will contain only additives that have been assessed by the Environment Agency, this limitation applies at all times and is enforced through a condition in the permit. The proposed fracturing will be a one-off activity.

We are satisfied that measures can be taken to ensure that the fracturing fluids do not migrate from the target formation. We have included a pre-operational condition which requires that hydraulic fracturing shall not commence until we have approved, in writing, the hydraulic fracturing plan. A stepped approach will allow the geo-mechanical properties of the reservoir to be understood and the hydraulic fracturing programme to be tailored accordingly.

The operations will be continually monitored, reviewed and modified to ensure that the programme is carried out in the safest and most effective way.

It is expected that up to 50% of the injected fracturing fluid will return to the surface as part of the flow back fluid. Fracturing fluid left behind will have nothing to ‘push’ it further into the formation. Therefore, this would limit the potential for fluids to migrate further into the rocks.

When the wells come to the end of their useful life they will be either suspended or plugged and decommissioned; this process ensures that there is no pressure gradient remaining that could continue to push fluid away from the well locations.

The operator is required to carry out groundwater monitoring and periodic monitoring of soil and groundwater as specified in the permit and report

monitoring results to the Environment Agency which forms a part of ongoing compliance assessment.

In the Key Issues section we have explained how we have assessed the risks to groundwater and surface water. We are satisfied that we have fully assessed the risk and that there will be no unacceptable impact or risk of pollution.

We are confident that the risks can be controlled by good operational practice, reinforced through effective, robust regulation. We are committed to ensuring that people and the environment are protected.

2. Surface Water

No change is being sought to the Surface Water Management Plan (SWMP) techniques to those already approved. The applicant has provided a SWMP management and a monitoring plan and in order to demonstrate that the activities are not causing pollution, we have included this monitoring in the permit.

The only surface water discharge is rainfall dependent surface water runoff. The surface water management system manages surface water runoff from rainfall which will gather in the perimeter ditches. An existing oil separator which currently services the exploration wellsite prior to the discharge point, will be replaced with a similar but larger separator. Both the drilling area and the production area shall have valves to close off each system independently prior to the separator. Another valve shall be installed downstream of the separator at the discharge point. The surface water management system will prevent uncontrolled release of contaminated water and will be managed in compliance with the environmental permit conditions and arrangements.

The purpose of the surface water monitoring is to ensure that any surface water discharged from the site is clean. For clarity, water discharges will only take place when the site is either inactive or in a period of production. No discharges shall take place during either drilling, testing or similar operations unless the water has been transferred to an isolated storage tank and analysed prior to discharge.

Incorporated into the design of the wellsite is an impermeable membrane liner constructed using fully welded HDPE, protected above and below with non-needle punch geotextile. The impermeable membrane prevents surface fluids (mainly rainwater) penetrating the underlying subsoils. Surface fluids will migrate along the surface of the impermeable membrane to a perimeter ditch, where it will be contained. An improvement condition ref. IC4, has also been included in the variation notice to require a written secondary and tertiary

containment plan which will include a review of the integrity of the existing containment systems including the liner – see box 9.

During periods of activity within the active area of the wellsite, all water contained within the perimeter containment ditches is contained and tested prior to discharge if proven to be uncontaminated, or it will be removed via road tanker and disposed of at an appropriately permitted facility.

During periods of inactivity within the active area of the wellsite, water contained within the perimeter containment ditch will be tested to confirm it is suitable for discharge via the Class 1 SPEL oil-water separator to an adjacent land drain, in accordance with the SWMP.

If the results of the test identify that the surface run-off water is not suitable for discharge, the water will be removed via road tanker and disposed of at an appropriately permitted facility. In the Key Issues Section we have explained how we have assessed the risks to groundwater and surface water. We are satisfied that we have fully assessed the risk and that there will be no unacceptable impact or risk of pollution.

3. Chemicals / MO-IV Breaker
Summary of issue(s) raised Concerns were raised that the applicant had not declared fully the nature of some chemicals proposed for use and that we have not fully assessed the proposed chemicals. Particular concern was expressed over the content of the MO-IV Breaker chemical, a new chemical introduced as part of this variation. Strong objection to the use of uncertified chemicals.
Summary of actions taken or show how this has been covered The applicant made no claim for commercial confidentiality. However, we did receive a confidentiality claim by the manufacturer for the process chemical MO-IV Breaker. MO-IV Breaker is the only additional product as all other products have previously been approved under EPR/BB3001FT/V005. Whilst the deadline for chemical disclosure (10 Jan 2025) for provision of data was missed we were in communication with the manufacturer at that time and were aware of the manufacturer's intentions to withdraw. Subsequently, this was confirmed by the manufacturer that they would be withdrawing the product MO-IV from confidentiality consideration and the permitting process for this application. Their response also informed us that MO-IV Breaker plus two other products MO-85M and MO-86M have also been withdrawn from the permitting process. We have assessed all the chemicals to be used using the determination under new Groundwater Directive 2006/118/E which is followed by JAGDAG (Joint Agencies Groundwater Directive Advisory Group). The permit will limit the composition of the fluids to those disclosed in the Waste Management Plan and approved by the Environment Agency. We do not consider that the approved chemicals will cause any environmental harm at the rates and levels of use proposed. The approved chemicals are disclosed in the approved Waste Management Plan which contains safety data sheets of proppant carrier fluid. The approved Waste Management Plan is available on our public register. We requested that the applicant provide information on the degradation, bioaccumulation and toxicity to aquatic life and human health for all chemicals proposed for use. We assessed all the information provided and we have approved their use. We are satisfied that the potential risks to groundwater have been adequately identified and addressed through mitigation measures and monitoring conditions specified in the permit.

4. Seismic risk / Earthquakes / Fault lines / Explosions /UCL article/ Newdigate

Summary of issue(s) raised

A number of concerns were raised - about the tremors and earthquakes associated with similar activities and the potential for the new activities to induce tremors. Some of the respondents pointed to previous earth tremors and aftershocks that were experienced in the Newdigate area as a result of hydraulic fracturing. Concerns were also raised that the operator was planning to drill straight through a fault and hydraulically fracture close to it.

Concern over the study carried out by UCL (University College London) and published in Phys.Org on 9th January 2025 which indicates that not only can seismic activity be triggered by low levels of hydraulic fracturing but that proppants can diffuse much further through the strata and faults than previous experience suggests.

Summary of actions taken or show how this has been covered

Low level hydraulic well stimulation can generate micro seismicity, however the proposed activities pose a very low risk with respect to seismic risk. Low level reservoir stimulation has no past record of causing seismicity which has only been associated with large scale, high volume hydraulic fracturing of shale gas formations, which uses far higher injection volumes compared to those being considered in this application.

The North Sea Transition Authority (NSTA) are the regulator responsible for induced seismicity and have an interest in any proposals that include a deliberate intention to fracture (break) the rock formation. The NSTA requires seismic monitoring to be included in any Hydraulic Fracture Plan.

We are satisfied that the changes in this variation do not increase the potential for tremors. Any changes to the fracturing process would form part of the approval of the relevant Hydraulic Fracturing Plan, which is a separate process to this variation and is completed in association with the NSTA, the Health and Safety Executive and the Environment Agency. Whilst the NSTA gives final agreement on the HFP, it is part of a multi-agency process.

Precautions against seismic activity are addressed by conditions on permissions for hydraulic fracturing that are granted by the NSTA. NSTA oversee the implementation of precautions to prevent the occurrence of earth tremors, as a result of hydraulic fracturing. The proposed mitigation measures will be built into the hydraulic fracturing plan which the Operator is required to provide for approval to the Environment Agency prior to undertaking any well stimulation.

A seismic risk assessment was provided to specifically evaluate seismic hazard resulting from the proposed reservoir stimulation activities (Outer

Limits, 2024). The report concludes that the proposed activities pose a very low risk with respect to induced seismicity.

The operator has mapped faults in the Kirkham Abbey Formation using 3D reflection seismic surveys. The nearest mapped fault is approximately 1 km from the well. This is much further than the maximum possible perturbation is expected to reach (the expected fracture length is less than 30m).

Faulting is therefore not expected to provide a likely pathway at stratigraphic levels higher than the Permian strata for the migration of fluids and gases between the hydrocarbon bearing formations and the overlying strata containing useful groundwater.

The nearest mapped fault is approximately 1km from the WNA-2 well. Given the distances to any mapped faults and the small injection volumes proposed (~60m3), any perturbations are unlikely to extend any significant distance beyond the planned stimulation distance (<20m – 30m).

The pressures stated (9000psi) are surface pressures rather than sub-surface fracture pressures. The surface pressure required to achieve a certain sub-surface pressure will depend upon a number of factors, including fluid rheology, depth at which fluid is being pumped to, size of tubing being flowed through and the flow rates. The final pressures and models have not yet been completed and may depend upon information gained through a Diagnostic Fracture Injectivity Test (DFIT). DFIT is a pre-injection pressure transient test carried out in the target formation to obtain reservoir characteristics and inform treatment parameters).

With regards to pressure and the likelihood of fault re-activation, The Seismic Hazard Assessment undertakes a geo-mechanical evaluation of the *in situ* stress conditions and the orientation of mapped faults, in order to assess whether the planned stimulation activities are likely to intersect critically stressed faults. The Seismic Hazard Assessment concludes that there are no identified critically-stressed faults within a distance of the WNA-2 well that could be influenced by fluid injection of the scale and volume under consideration in this case.

A central regional geo-seismic cross-section has been provided. Since the initial mapping of the area in 2008 additional proprietary seismic mapping, both 2D and 3D, have been acquired. Updated mapping, particularly around the West Newton wells, where a three dimensional three-component (3D3C) survey was acquired by the operator, - show no evidence for faulting in the immediate area that would extend either into the deeper Carboniferous or overlying Sherwood Sandstone sections from the Kirkham Abbey. Additional detail in this regard is provided in the Seismic Hazard Assessment by Outer Limits.

The Applicant will be required to submit a Hydraulic Fracturing Plan which will need to be approved by the North Sea Transition Authority and the Environment Agency prior to any operations taking place. (See pre-operational condition POM5) The Hydraulic Fracturing Plan will include but is not limited to a map showing faults near the well and along the well path, with a summary assessment of faulting and formation stresses in the area, and the risk that the operations could reactivate existing faults.

Seismicity and the requirement for seismic monitoring are assessed and regulated by the North Sea Transition Authority.

Our view is that there is no risk of explosion from this activity.

See Hydraulic Fracturing Plan (HFP) comments below in box 5.

5. Hydraulic Fracturing Plan (HFP)

Summary of issue(s) raised

Concern that a HFP has not yet been submitted

Summary of actions taken or show how this has been covered

Summary of actions taken or show how this has been covered

The Infrastructure Act 2015 defines hydraulic fracturing as involving the injection of more than 1,000 cubic metres of fluid in any one stage, or more than 10,000 cubic metres of fluid in total.

Reservoir stimulation, or proppant squeeze, is similar to hydraulic fracturing in that it involves injection of fluid into rock (geological formation) at a pressure above the fracture pressure of the formation.

However, it is not regarded as hydraulic fracturing due to the smaller quantity of fluid involved.

The type of reservoir stimulation proposed at WNA-2 well is proppant squeeze, this works in a similar way to hydraulic fracturing but uses significantly smaller quantities of fluid and as such does not meet the accepted definition of hydraulic fracturing.

The operator must submit a HFP to the North Sea Transition Authority (NSTA) for written approval.

The NSTA will requires seismic monitoring and data submission. While the Environment Agency focuses on environmental protection, it is the NSTA that

sets the requirements for managing induced seismicity and reporting data, in co-ordination with other agencies.

We have considered the risk from seismicity though the North Sea Transition Authority (NSTA) who is responsible for seismicity. The proposed activities are at the lowest end of the pressure spectrum associated with conventional hydraulic fracturing and are therefore unlikely to induce any seismic movements in the area.

The North Sea Transition Authority (NSTA) is responsible for ensuring that operators put in place measures to control the level of induced seismicity from hydraulic fracturing. Operators must carry out prior geological analysis to identify natural faulting, background monitoring of seismicity before operations start and on-going monitoring during operations. For high volume hydraulic fracking Operators must use the ‘traffic-light system’ to ensure that operations can be stopped quickly and reviewed if seismic activity is detected. If the magnitude increases the operation may need to be reconsidered or stopped altogether (see box 12). However, NSTA’s guidance states that less information may be required for a small volume hydraulic stimulation of a conventional target.

Low volume and high volume hydraulic fracturing are two separate activities.

The Environment Agency is responsible for regulating environmental impacts and Operators must satisfy the Environment Agency that they have appropriate safeguards in place to avoid impacts on geological structure and infrastructure where this could put the environment at risk.

The hydraulic fracturing plan is submitted independently from the permit variation application. It was agreed within the pre-application advice that the HFP can be provided as part of a pre-operational condition. The operator references the HFP in both the Non-Technical Summary (NTS) and the Waste Management Plan (WMP), but in each instance it is noted that an HFP will be submitted and stated specific elements will be included in it. Within the pre-application advice, the EA recognised that 'not all information is available to formalise at this stage.' Finalisation of specific details of the operation have yet to be agreed and will be submitted to both the NSTA and the EA in advance of the operation being conducted, this is standard practice for oil and gas applications.

The hydraulic fracturing plan will contain information on:

- the historical seismicity and assessment of the risk of induced seismicity;
- summary of the planned operations, including stages, pumping pressures and volumes;
- an assessment of the anticipated extent of fracturing resulting from

injection and proposed method for confirming the validity of the model;
- a comparison of proposed activity to any previous operations and relationship to historical seismicity;
- proposed measures to monitor local seismicity during the operations; and
- proposed methods for limiting fracture height.

It is a pre-operational condition which means that the activity cannot commence until they have agreement from both the NSTA and the EA.

See pre-operational condition POM5 above in the pre-operational condition section.

At least 3 months prior to commencement of activities referenced AR9 in Table S1.1 the Operator shall submit to the Environment Agency for approval a written Hydraulic Fracturing Plan and obtain both the North Sea Transition Authority (NSTA) and the Environment Agency's written approval to it. The plan shall include:

- *a map showing faults near the well and along the well path, with a summary assessment of faulting and formation stresses in the area and the risk that the operations could reactivate existing faults;*
- *information on the historical seismicity and assessment of the risk of induced seismicity;*
- *summary of the planned operations, including stages, pumping pressures and volumes;*
- *the processes and procedures that will be put in place before or during hydraulic fracturing to identify the vertical and horizontal extents of the fractures within the target formation and ensure that they are not near the permitted boundary;*
- *in the event that the fractures extend beyond the permit boundary, the steps that would be taken to assess and if necessary mitigate the effect and limit further propagation outside the target rocks;*
- *a comparison of proposed activity to any previous operations and relationship to historical seismicity;*
- *proposed measures to monitor local seismicity during the operations;*
- *proposed reporting during hydraulic fracturing and your proposals for post fracturing reporting of the location, orientation and extent of the induced fractures to demonstrate that the permit has been complied with.*

6. Acid Stimulation Plan
Summary of issue(s) raised No acid stimulation plan provided with application
Summary of actions taken or show how this has been covered That is correct, however, as detailed above, a hydraulic fracturing plan is required and the HFP must be agreed with the NSTA and the Environment Agency prior to commencement of operations. The applicant is not applying for acid wash and squeeze through this variation application; it was covered in the Non-Technical Summary (NTS) for completeness because the operator has already carried this activity out. The process does not use acid during this stimulation process, the operator proposes using hydrocarbon-based products for the stimulation process. Therefore, an Acid Stimulation Plan is not required.

7. Proppant Squeeze Retained in Target Formation
Summary of issue(s) raised Concerns raised regarding the remaining 50% to 70% of Proppant Carrier Fluid that will be retained in the target formation. As such the target formation will be classified as a waste facility under Schedule 20 (2)(1) of EPR2016. Objections raised that the site is being turned into a waste facility / underground waste storage.
Summary of actions taken or show how this has been covered The proposed proppant squeeze well stimulation is a small scale hydraulic fracturing at the lowest range of the fracturing spectrum that will be done only once to enhance the productivity of the conventional oil well drilled at this site. Low volume hydraulic fracture well stimulation is also referred to as a proppant squeeze. The application included supporting documents which consider the environmental impacts to the formation and surrounding areas. The Environment Agency considers that the risk to any receptor beyond the formation is not significant, and that this risk is limited because of the depth of target formation and its hydraulic isolation. The formation is bound vertically in both directions by adjacent lithologies: the Fordon Evaporite and Hayton Anhydrite Formations (see table below); and laterally by wider stratigraphic

structures lending to distal depositional environments decreasing permeability to the east and a lagoonal setting owning laterally impermeability to the west.

The design of the reservoir stimulation activity will affect only the target reservoir: the Kirkham Abbey Formation. The Waste Management Plan (WMP) confirms the zone of influence that the stimulation is designed to impact - is a 30m thick zone in the Kirkham Abbey Formation, penetrating up to 32.8m diameter (16.4m radius), lending to a mining waste facility with a volume of 25,349m^3 total volume. This has been further refined in the Hydrogeological Risk Assessment (HRA) to a 27m zone (between 1715-1742m True Vertical Depth) (TVD), with a slightly greater radius of 20m – 30m, leading to a revised mining waste facility volume of 33,929m^3. The stimulation will take place over a one-hour period, where the proppant will be injected into the formation at a pressure of 9,000psi.

The volume of fluid used for the stimulation is small (60m^3) and contains hazardous properties. The surrounding lithological properties are low permeability and as such hydraulically isolate the zone of stimulation. Supporting documents demonstrate the overall percentage of hazardous substances remaining in the spatial volume of mining waste facility will be 0.24% immediately following the reservoir stimulation activity. This will reduce during the ongoing production of hydrocarbons and/or comingling with other extractive wastes. As such, even if the well is never brought onstream, the Agency agrees that the reservoir stimulation fluid will not lead to a significant risk to the environment.

8.Wash and Squeeze

Summary of issue(s) raised

Concern generally over any wash and squeeze activity

Summary of actions taken or show how this has been covered

Acid wash and squeeze is not part of this application. This activity is de minimis and has already been permitted in a previous variation.

To improve the flow of petroleum an acid or alkali may be applied to the formation through the borehole. The wash is designed to remove scale or similar deposits from perforations and well-completion components. The wash can be used to repair formation blinding and help restore the natural porosity of the formation and is applied to the formation under pressure not exceeding the fracture pressure of the formation.

A dilute acid / alkali solution is used and is circulated across the formation perforations, the process of washing the perforations is repeated until there is

adequate clean-up of the immediate area (face of the formation). The acid or alkali is then squeezed into the near formation again to clean out the near borehole perforation channels.

Whilst the injection of acid or alkali within deep saline water bearing formations is a 'groundwater activity', the activity is considered *de minimis* and can be excluded under Schedule 22 3 (3) of EPR2016. The wash/squeeze does not, therefore, require a groundwater permit.

For clarity, the acid and wash squeeze is not part of this application and has already been permitted in a previous variation and has been completed. This variation does not change this activity. The activity remains the same, the quantities and frequencies and receiving formations have not altered from the previously permitted *de` minimis* activity.

9. Liner / Well Pad

Summary of issue(s) raised

Concern over the condition of the site surface liner. Liner not fit for purpose. (JBA 2021 report)

Summary of actions taken or show how this has been covered

The HDPE impermeable membrane liner has been in place for 13 years and in the areas adjacent to the drainage ditches, has been exposed to the elements and sunlight for the whole of this period.

We have included an improvement programme to ensure that the liner integrity is maintained, and improvements made where necessary.

See improvement condition reference IC4 is detailed above in the improvement condition section 6.18.

> *The operator shall submit a written 'secondary and tertiary containment plan' and shall obtain the Environment Agency's written approval to it. The plan shall contain the results of a review conducted, by a competent person, in accordance with the methodology detailed within CIRIA C736 (2014), of the condition and extent of secondary and tertiary containment systems where all polluting liquids and solids are being stored, treated, and/or handled. This review should consider, but is not limited to, the storage vessels, separators, bath heaters, bunds, loading and unloading areas, transfer pipework/pumps, temporary storage areas, and liners underlying the site.*
>
> *The plan shall contain dates for the implementation of individual improvement measures necessary for the secondary and tertiary*

containment systems to adhere to the standards detailed/referenced within CIRIA C736 (2014), or equivalent.

The plan shall be implemented in accordance with the Environment Agency's written approval.

10. Waste Facility Objection
Summary of issue(s) raised Concerns over this activity on site.
Summary of actions taken or show how this has been covered The mining waste activity is already permitted. This variation is to amend this activity to include well stimulation to include the target formation within the AR8 activity. 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 permit. The waste management plan is discussed in the Key Issues section and section 6.10. The well stimulation process will by default require a mining waste activity to be included under existing activity AR8 because whilst proppant carrier fluid will be returned to surface via the well clean-up equipment, some of the proppant carrier fluid will be retained in the target formation. As such, the target formation will be classified as a waste facility under Schedule 20 (2)(1) of EPR2016 which defines a mining waste operation as being the management of extractive waste, whether or not it involves a waste facility. A conventional, purpose-built mining waste facility is not required at West Newton. The quantity of each waste will be recorded as it is removed from site. All records of waste movements (extractive and non-extractive wastes) will be retained by the operator and made available for inspection by the Environment Agency on request. It is estimated that approximately 30% to 50% of the gelled hydrocarbon stimulation fluid will be recovered to surface via the well clean-up equipment and stored on site for subsequent offsite transfer to an Environment Agency permitted waste treatment facility for disposal in accordance with the receiving waste treatment facility's environmental permits.

Flowback fluid following the stimulation has the potential to contain low levels of NORM. Samples of the flowback fluid will be sent to a laboratory holding the appropriate accreditations for radionuclide analysis by gamma spectrum. Depending on the outcome of radionuclides analysis, the flowback fluid will be transported via a licensed haulier to either an Environment Agency permitted wastewater treatment works facility where it will be processed, treated and discharged in accordance with the permitted controls of the water treatment facility, or to a bespoke RSR (radioactive substances regulation) permitted waste treatment facility for treatment and disposal in accordance with the best available technology.

Once at surface, fluids will be diverted by temporary pipework to a three phase separator, which will separate out oil, gas and produced fluids. Oil and produced fluids will be diverted via temporary pipework to dedicated storage tanks onsite for subsequent offsite removal for sale and disposal respectively. Oil, that is not considered a waste, will be transported by a licenced haulier to a permitted refinery for sale.

Water produced during hydrocarbon production has the potential to contain low levels of Naturally Occurring Radioactive Material (NORM). A competent Radiation Protection Supervisor (RPS) and/or Radioactive Waste Advisor (RWA) shall be appointed to ensure that NORM is managed correctly. Formation water cannot be reused onsite due to unknown components within the formation water and its high salinity. Formation water will be tested at a laboratory and its components determined and will be transported by a licensed haulier to an Environment Agency permitted water treatment facility where it is processed, treated and discharged in accordance with the permitted controls of the water treatment facility.

11. Storage and mixing of chemicals on site

Summary of issue(s) raised

Concerns over this activity on site.

Summary of actions taken or show how this has been covered

Incorporated into the design of the well site is a HDPE impermeable membrane liner. The impermeable membrane prevents surface fluids (mainly rainwater) from penetrating the underlying subsoils. Surface fluids migrate along the surface of the impermeable membrane to a perimeter ditch, where it is contained. The membrane liner is subject to improvement condition reference IC4. See box 9.

The wellsite has been designed to ensure complete containment of any spillages in the unlikely event they occur onsite. All mixing of chemicals takes place within the bunded areas.

In addition to general spill containment and clean up equipment provided on site; an environmental incident response trailer is provided. The trailer contains equipment necessary to minimise and if possible, contain an environmental incident in the unlikely event that the impermeable membrane or containment ditch is compromised. The equipment provides for damming of any nearby water course and subsequent clean up, including temporary bunding of spent clean-up equipment.

Concrete bunds and pads are designed to hold the more permanent production equipment. Secondary containment bunds and tanks are designed in accordance with Ciria C736 guidance and the Oil Storage Regulations 2001.

The site is due to be extended to facilitate the production facility and therefore the permitted activity will need to be updated to include the revised site layout and the surface water management process during production operations and during periods of increased activity i.e. drilling and testing. As the secondary and tertiary containment plan including the construction quality assurance (CQA) plan has not been finalised for the production area, we have required this to be submitted to us for approval prior to commencement of activity AR9 under pre-operational condition reference POM5 in Table S1.4B of the permit. This extension and pre-operational condition were previously agreed under variation V005.

The Environment Agency and Construction Industry Research and Information Association (CIRIA) provide guidance on the design and construction of bunds for tanks containing liquids, particularly those that could harm the environment if spilled. CIRIA guidance, such as C736, offers detailed recommendations for secondary containment systems, including bund design, construction, and maintenance. The Environment Agency also emphasizes the need for appropriate measures to prevent pollution from storage tanks and bunds.

All chemicals are known and have been assessed, see box 3 above.

12. Banned Activity in the UK
Summary of issue(s) raised Statements made that this activity is banned by the UK government
Summary of actions taken or show how this has been covered

In the UK, there remains a moratorium on high volume hydraulic fracturing.

This application is not for high volume hydraulic fracturing. The Infrastructure Act 2015 defines associated hydraulic fracturing as involving the injection of more than 1,000 cubic metres of fluid in any one stage, or more than 10,000 cubic metres of fluid in total. The proposal in this application is below these thresholds. The proposed reservoir stimulation is similar to associated hydraulic fracturing in that it involves injection of fluid into the rock (geological formation) at a pressure above the fracture pressure of the formation. However, it is not regarded as associated hydraulic fracturing due to the smaller quantity of fluid involved.

In England, reservoir stimulation is allowed because it involves much lower volumes of fluid (and chemicals) compared to high volume hydraulic fracturing. This makes it easier to manage and mitigate potential risks.

Wider issues of government policy are outside of the remit of this determination.

13. Noise
Summary of issue(s) raised Concern over noise increase at the site
Summary of actions taken or show how this has been covered We are satisfied that there will no additional or significant impact from noise due to measures that will be used. Noise is considered in more detail in the section on Noise and Vibration Management in section 6.15 of this decision document. The noise from this activity comes solely from the equipment and processes located on the surface. There are no 'explosions' associated with this activity.

14. Traffic
Summary of issue(s) raised Concern over traffic increase at the site
Summary of actions taken or show how this has been covered The local planning authority is responsible for determining land use through the planning application process, this includes transport. Consideration of

increased traffic movements beyond the Installation boundary is outside the scope of our determination of this permit variation application.

On-site noise is relevant to our determination and has been considered.

An environmental permit and planning permission are two separate permissions and determined by different authorities.

The planning authority determines whether the activity is an acceptable use of the land. It considers matters such as visual impact, traffic and access issues, which do not form part of our environmental permit decision making process. 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.

These concerns are relevant considerations for the grant of a planning permission, but do not form part of our permit variation decision making process, except where there are established high background concentrations of pollutants contributing to poor air quality and the increased level of traffic might be significant in these circumstances. This is not the case at this location.

Section 3.4 of the permit controls noise and vibration and requires that such emissions are minimised and, in the unlikely event that the activities give rise to pollution due to noise or vibration outside the site, a noise and vibration management plan can be requested and will have to be submitted to the Environment Agency for approval prior to being implemented.

The reduction in property values is outside of the remit of the Environment Agency.

15. Boundary Changes

Summary of issue(s) raised

Questions raised as to whether there were any boundary changes as a result of this variation.

Summary of actions taken or show how this has been covered

We can confirm that the permit boundary has not changed to that which has already been approved and as detailed in Schedule 7, figure 2 of the Permit EPR/BB3001FT/V005.

It is appreciated that an extension to the boundary is detailed in the non-technical summary (NTS), however, the applicant has clarified that the application was written 'holistically' and inclusive of all previous and future activities. Any further changes to the boundary other than those agreed in variation V005, will require a future variation.

16. Harm to Human Health
Summary of issue(s) raised A number of comments have raised concerns that the activities will cause harm to health and stress to the local community.
Summary of actions taken or show how this has been covered We are satisfied that the appropriate controls are in place and that activities will be properly regulated and not cause pollution or harm to human health. In the permit, we have imposed condition 3.5 which require the operator to monitor and submit monitoring reports on groundwater quality, surface water quality, point source emissions and process emissions. The permit conditions allow us to take regulatory action if we note that the activities are causing environmental pollution. We requested that the applicant provide information on the degradation, bioaccumulation and toxicity to aquatic life and human health for all chemicals proposed for use. We assessed all the information provided and we have approved their use. We are satisfied that the potential risks to groundwater have been adequately identified and addressed through mitigation measures and monitoring conditions specified in the permit.

17. Climate Change / Fossil fuels / Finch Case (June 2024)
Brief summary of issue(s) raised Concerns were raised about the impacts of the activities on climate change.
Summary of actions taken or show how this has been covered Wider issues of government policy are outside of the remit of this determination however, Government policy on onshore oil and gas focuses on balancing resource development with environmental protection and climate goals.

The "Finch v Surrey County Council" case involved a challenge to a planning permission for oil production at a site in Surrey, arguing that the environmental impact assessment (EIA) failed to adequately consider the "downstream" greenhouse gas (GHG) emissions resulting from burning the extracted oil. The Supreme Court ruled in favour of Sarah Finch, deciding that these downstream emissions must be included in the EIA.

This study is not relevant to this application as it is relating to the burning of gas and not to the low volume well stimulation which is the subject of this variation.

We have assessed the environmental impacts of the proposed activities falling under the Environmental Permitting Regulations, 2016 SI 1154 (EPR) within this variation application.

Our role in EPR permitting is to ensure that any regulated facility does not cause significant pollution or harm to human health. We are satisfied that this facility will not cause significant pollution or harm and that it will provide a high level of protection for the environment as a whole, as such it fits with these aims.

18. Bowland Shale Reservoir
Summary of issue(s) raised Concern that the proposed activities at West Newton A would pollute the Bowland Shale Reservoir.
Summary of actions taken or show how this has been covered The permitted site is not within the Bowland Shale Reservoir. We have defined the permitted site where the proposed activities will take place in section 2.2 of the permit. We have also imposed condition 3.1 and 3.2 that prohibits the operator from emitting substances that cause pollution. The permit empowers the Environment Agency to take regulatory action where pollution incidents arise.

19. Public Information Events / Accessibility
Summary of issue(s) raised Information events open to the public requested. Greater accessibility.
Summary of actions taken or show how this has been covered

We consider this application to be of high public interest and so we carried out additional engagement with the public and interested parties.

- The application was advertised in Hull Daily Mail on the 19th of November 2024, this advert included information telling people where and when they could see a copy of the application. A link to the consultation web page was also provided.
- We wrote to 332 residents and other interested parties to inform them that we had received an application and inviting them to comment. The link to the consultation web page was provided in this letter.
- We held a public engagement event at Sproatley Village Hall on the 9th of January 2025 (12-4pm) to discuss the permit variation application.

  The objective of the event was to answer questions on:
  - what the application is for
  - what the technique is
  - what we (EA) look at during our permitting process
  - how we regulate the site/checks we make
  - what the consultation is for
  - how to participate in the consultation
  - current permit held by Rathlin Energy

- We produced a flyer to help bring attention to the application consultation, to advertise the virtual engagement event and to provide the link to the consultation page on our website inviting comments about this permit variation application in order to understand any concerns.

- We produced an Overview site information page on our website to help explain the application and the process we have to follow regarding the determination.

- We produced information about the changes that the applicant had applied for, in order to help people understand the technical information and participate in the consultation. We provided the link to our web site where the application proposals, including all technical information, could be found.
- We made a copy of the application and all other documents relevant to our determination available to view on our Public Register. Anyone wishing to see these documents could do so and arrange for copies to be made.
- We produced a frequently asked question sheet for use at all the public events

We are satisfied that we took appropriate steps to inform people about the application and how they could comment on it.

20. Extend Consultation
Summary of issue(s) raised Requests made to extend the consultation period
Summary of actions taken or show how this has been covered We advertised the application by a notice placed on our website, including telling people where and when they could see a copy of the application. The application was initially publicised on the GOV.UK website at https://consult.environment-agency.gov.uk/psc/hu11-5da-rathlin-energy-uk-ltd/ between the 19th November 2025 and 3rd January 2025 for a period of 6 weeks instead of the usual 4 weeks due to Christmas Holidays, however we did receive a number of requests to extend the deadline again and subsequently the consultation was extended for a further 4 weeks until the 24th January 2025. This is a total consultation period of 10 weeks, though the information has remained available on our web site since then. Any comments that have been received after the close of the consultation and prior to issue were taken into consideration as part of our determination process.

21. Lack of Information / Detail
Summary of issue(s) raised Lack of detail in the application / Missing Information
Summary of actions taken or show how this has been covered There were some comments on lack of detail in the application, however, responses provided no specifics on what was missing other the Hydraulic Fracturing Plan which is detailed earlier. See box 5. Where we needed more detail upon which to make our decision, we have requested further information from the applicant by way of a Schedule 5 notice and follow up questions. We are satisfied that we have sufficient relevant information upon which to make our decision.

22. Too Technical
Summary of issue(s) raised Application too difficult and complex
Summary of actions taken or show how this has been covered See public information events detailed above – box 19. To summarise we carried out consultation of the application and additional engagement to give the public and interested parties opportunities to attend and ask questions and make the application accessible. • The application was advertised in Hull Daily Mail • We wrote to local residents • We held a public engagement event at Sproatley Village Hall • We produced a flyer • We produced an 'Overview', site information page on our website • We made a copy of the application and all other documents available to view on our Public Register • We produced information about the changes the applicant had applied for • We produced a frequently asked question sheet. It is acknowledged that this application is a complex application. The non-technical summary explains the variation applied for and the activities on site. The public event was carried out so that questions about the proposed activities could be asked and the proposals explained.
Summary of actions taken or show how this has been covered See public information events detailed above. To summarise we carried out extra engagement to give the public opportunities to attend and ask questions. • The application was advertised in Hull Daily Mail • We wrote to local residents • We held a public engagement event at Sproatley Village Hall • We produced a flyer • We produced an Overview site information page on our website

- We made a copy of the application and all other documents available to view on our Public Register
- We produced a frequently asked question sheet.

It is acknowledged that this application is a complex application. The non-technical summary explains the variation applied for and the activities on site.

The public event was run in order that questions about the proposed activities could be asked and the proposals explained.

23. Site Regulation
Summary of issue(s) raised Concern over how the Environment Agency will regulate the site
Summary of actions taken or show how this has been covered We are independent from those we regulate and will regulate the site in an appropriate manner in accordance with our legal duties and our Enforcement and Sanctions policy. We will be as robust as the situation requires. We will regulate the site carrying out a continual assessment of plant operations and its environmental performance. This will include: • The operator must monitor emissions and report the results to us. • We will regularly inspect the regulated facility reviewing techniques and assessing monitoring results to measure the performance of the plant. We will review operating techniques and management systems and plans. • We will carry out on-site audits of operator monitoring • The operator must inform us within 24 hours of any breach of the emissions limits, followed by a detailed report of the size of the release, its impact and how they propose to avoid this happening in the future. • The operator's monitoring results will be placed on the public registers. If there is a breach, then we will take appropriate enforcement action. • If we receive any complaint, we will assess the complaint and investigate it as appropriate.

Extent of local opposition

It is acknowledged that there is a high level of local opposition, and this should be taken into account in the determination of the application. We have to make our decision based on the environmental and health impacts of any proposal. We carefully considered all representations made on this basis. We can only refuse the application if we consider the environmental impacts are unacceptable which for this application we do not.

8. Advertising and Consultation on the Decision

This section reports on the outcome of the public consultation on our decision carried out between 29th July to 6th October 2025.

https://consult.environment-agency.gov.uk/psc/hu11-5da-rathlin-energy-uk-limited2/

In some cases, the issues raised in the consultation were the same as those raised previously and already discussed in the key issues section of this decision document and reported in section 7, these have not been repeated in this section. All additional concerns raised are addressed below.

Wider issues of government policy are outside of the remit of this determination.

Some of the consultation responses received were on matters which are outside the scope of the Environment Agency's powers under the Environmental Permitting Regulations 2016 (EPR). Our position on these matters is as described previously.

8.1 Consultation Responses from Statutory and Non-Statutory Bodies

Further representations were received from the following organisations;

- East Riding of Yorkshire Council
- UKHSA

who raised the following issues:

Response received from East Riding Yorkshire Council (8.1.1)
Summary of issue(s) raised East Riding Yorkshire Council confirmed that they did not wish to add further comment.

Summary of actions taken or show how this has been covered
None required.

Response received from UK Health Security Agency (UKHSA) (8.1.2)
Summary of issue(s) raised Initially UKHSA understood that an Air Quality Impact Assessment would be submitted as part of this variation. It is now known that this is not necessary as there will not be any additional emissions to air as a result of this variation, when compared with the previous environmental permit variation (V005). Therefore, their previous comments from the 3 January 2015 have been addressed, and they have no further recommendations or concerns.
Summary of actions taken or show how this has been covered None required.

8.2 Representations from local MPs, councillors & parish/town councils

Further representations were received from the following organisations.

- Cllr Mid Holderness Ward
- Cllr Bridlington South Ward
- Withernwick Parish Council

Response received from Cllr Mid Holderness Ward (8.2.1)		
Ref.	**Summary of issue(s) raised**	**Summary of actions taken or show how this has been covered**
a)	**Length of Consultation.** Concern expressed over the length of the consultation period explaining that the extension would provide everyone with	Extended until 6th October

Response received from Cllr Mid Holderness Ward (8.2.1)		
	a fair opportunity to participate without the distractions of the holiday season.	
b)	**Extension of Operations**	To confirm, the permit boundary has not changed from that which has already been approved as shown in Schedule 7, figure 2 of the existing permit EPR/BB3001FT/V005. Any changes to the boundary will require a future variation.
c)	**Secondary fracture zone within Kirkham Abbey Formation (KAF)**	The second stimulation zone was highlighted in a Schedule 5 Notice and then discussed in full. Having just the one unit for stimulation was more operationally complex than doing the two units within the KAF (where the permeabilities were favourable in these two sections). The two zones were needed to ensure the KAF reached its full potential and to appraise the asset in a holistic way as opposed to compartmentalising the resource. The introduction of this secondary zone for stimulation requires no additional assessment, just an understanding of why it was not originally included in the application. The applicant explained that it wasn't included originally because of unfamiliarity around operational complexities in isolating the one zone and upon additional technical review they decided it was logical to include both at once. Having two zones does not increase the risk to the environment.
d)	**Extent of the red circle.** On the consultation maps, the red circle showing the "Mining Waste Facility" appears to extend beyond the permitted site boundary (green line). Could you confirm whether this	The proposed mining waste facility is deep underground. It is the area where fluid would be retained within the ground as a result of the well stimulation. The fluid would remain within the ground as it is not possible to recover to surface all fluid used in a well stimulation. The extent of the mining waste facility is the area calculated to be subject to the well stimulation. As part of our regulation, we shall check that the type and quantity of fluid used and the depth at which it is

Response received from Cllr Mid Holderness Ward (8.2.1)		
	is the case, and how it should be understood in regulatory terms?	injected match the information used in the well stimulation calculation.
e)	**Responsibility beyond the site boundary** If the red circle does extend beyond the permitted boundary, is the whole underground zone still regulated under the permit, or would any element fall under East Riding of Yorkshire Council's planning remit?	The mining waste facility red circle extends beyond the surface well site boundary. The operations are regulated by the Environment Agency. See box 23 above that covers site regulation.
f)	**Increase in mining waste volume** The variation shows an increase in the Mining Waste Facility from 25,349m³ to 33,929m³. Could you explain the reason for this increase and whether it reflects any change in risk?	The estimated volume of the Mining Waste Facility (MWF) reflects the volume of the formation (target zone) that is intended to be stimulated by the proppant squeeze; this zone is cylindrical in form. The operator has revised the target zone, which is now at a reduced height (down to 27m) but with a correspondingly bigger radius. The quantity of injected fluid remains unaltered, and the stimulation is still limited to the Kirkham Abbey Formation, so the risk is unaltered.
g)	**Well casing integrity** Concerns have been raised about the integrity of the WNA2	Drilling and completion of the WNA2 well was audited for compliance with the measures proposed to protect water resources as detailed in the wellbore construction programme document 'West Newton A-2 Well WR11 application supporting statement REV: 2' provided in support

Response received from Cllr Mid Holderness Ward (8.2.1)		
	well casing, particularly in light of previous issues at WNA1. What assessment has been made of casing integrity, and what safeguards are in place to protect the aquifer from contamination?	of Rathlin Energy's WR11 notice to the Environment Agency [Water Resources Act 1991 Section 199 (1) & (2) as amended]. The casing was subject to pressure testing to verify integrity. Details are provided on compliance assessment report forms: PP3833VA/0332764r2 dated 13/05/2019, PP3833VA/0335353 dated 06/06/2019, and PP3833VA/0335980 dated 20/06/2019
h)	**Surface risk** Can you confirm whether there is any realistic possibility of the proppant squeeze at WNA2 resulting in fluid, fractures, or pressure effects breaching the surface outside the permitted site boundary?	The depth of the proposed reservoir stimulation is over 1700m (5,600 feet) below ground level and the rock strata above the target formation (Kirkham Abbey Formation) includes the Fordon Evaporite is 51 m thick (above the KAF) and the Hayton Anhydrite is 163 m thick (below the KAF) of impermeable evaporites. This means that for all practical purposes, the volume of fluid used in the stimulation is insufficient for it to leave the Kirkham Abbey Formation, and it would be physically impossible for those fluids to reach the surface or contaminate potable aquifer.
i)	**Financial responsibility** In the event that Rathlin Energy were unable to complete decommissioning and restoration, what financial provisions are in place to ensure that taxpayers do not end up bearing the cost?	See box 8.3.1d below. In the event of the operator becoming insolvent there are no financial provisions in place to cover the cost of well decommissioning or site restoration. We cannot require financial provision for these activities.

Response received from Cllr Bridlington South Ward (8.2.2)	
Summary of issue(s) raised	**Summary of actions taken or show how this has been covered**
Extension request	Extended until 6th October

Response received from Withernwick Parish Council (8.2.3)	
Summary of issue(s) raised	**Summary of actions taken or show how this has been covered**
Proximity to Lamwath Drain, Geological and principal nature area (SSSI) protected.	See section 6.11 of this decision document. The closest designated site is Lambwath Meadows SSSI, located 882 m northeast of the Wellsite. This SSSI is supported by surface water but is located upstream of the Wellsite. Given this, and the underlying glacial till that separates the groundwater and surface water systems, Lambwath Meadows SSSI is not hydraulically connected with the Wellsite, therefore is not at risk from surface or near-surface risks connected with the proposed development.
Concerns from locals that this is fracking and effects on area	The Infrastructure Act 2015 defines associated hydraulic fracturing as involving the injection of more than 1,000 cubic metres of fluid in any one stage, or more than 10,000 cubic metres of fluid in total. Reservoir stimulation, or proppant squeeze, is similar to hydraulic fracturing in that it involves injection of fluid into rock (geological formation) at a pressure above the fracture pressure of the formation. However, it is not regarded as associated hydraulic fracturing due to the much smaller quantity of fluid involved. We have taken into consideration potential environmental and health risks this activity poses in permitting this site and the variation to the permit made by this application and we are satisfied that the operating techniques required by the permit will minimise the risk to the environment and to human health.

8.3 Representations from Community and Other Organisations

Further representations were received from the following organisations;

- West Newton Said No!
- Frack Free Misson
- Drill or Drop

Wider issues of government policy are outside of the remit of this determination.

The responses raised many of the same issues. All concerns raised are addressed below under the public consultation section. Where the issue has been duplicated, reference is given to the relevant section or comment box where the appropriate response is located.

Response received from: West Newton Said No (8.3.1)		
Ref.	**Summary of issue(s) raised**	**Summary of actions taken or show how this has been covered**
a)	**Extension request**	Public consultation period extended until 6th October 2025
b)	**Missing Chemical Data** Defoam Plus NS lacks CAS number.	There is no single CAS number for "chemical foam plus ns" because it is not a specific chemical, but rather a product name that refers to a mixture with different components. A Safety Data Sheet (SDS) for "FOAM PLUS" products may contain CAS numbers for its specific ingredients, such as sodium hydroxide (\(1310-73-2\)) and sodium hypochlorite (\(7681-52-9\)), while other formulations might use different ingredients. Product name: "Chemical foam plus ns" indicates a specific branded product. Manufacturer-specific: The "NS" is likely a manufacturer designation, such as in the case of ANTIFOAM-NS, a product from an unspecified supplier. Mixture: Chemical products are often mixtures of different substances.

Response received from: West Newton Said No (8.3.1)		
		To find the exact CAS numbers for the ingredients, you must refer to the specific product's Safety Data Sheet (SDS).
c)	**Liner Integrity** Liner exposed for 13+ years is degraded; Environment Agency mitigation inadequate. Refer to JBA hydrogeological report (2021). Full liner replacement required before approval.	Also see section 7 and box 9 above. The well pads have been lined with an impermeable barrier. Chemicals and waste waters must be stored in sealed containers within impermeable, walled areas in case of any spillages. Operators have accident management plans setting out how any spillages will be cleaned up. The whole site surface is underlain by a HDPE liner and surrounded by a sealed perimeter containment ditch in line with Environment Agency (EA) guidance and Best Available Techniques (BAT). We had already noted that the integrity had been potentially compromised by degradation, and the operator is required to reassess and renew if necessary. No operations can take place without this being agreed with the EA. As previously detailed the site liner is subject to improvement condition 4 and completion is required prior to operations commencing on site.
d)	**Financial Competence** Operator's £2.5M debt raises insolvency risk, threatening clean-up and aftercare funding. The Environment Agency should revoke the permit.	In the event of the operator becoming insolvent there are no financial provisions in place to cover the cost of well decommissioning or site restoration. We cannot require financial provision for these activities. Only Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste are required to make financial provision. The applicant is required to tell us in the application, if any of its personnel, defined as 'relevant persons' or the company itself, have been convicted of a relevant offence. If any relevant persons in the application have been convicted of an offence the applicant must provide details of the offence. A relevant offence is one relating to the environment or environmental regulation. The applicant also needs to provide details of any current insolvency or bankruptcy proceedings against the applicant or any relevant person. The applicant must have an effective, written management system in place that identifies and

Response received from: West Newton Said No (8.3.1)		
		reduces the risk of pollution and they must show this by using a certified scheme or their own system. The North Sea Transition Authority (NSTA) examines the operator's competency, their financial viability and financial capacity by means of a licensing system. Licensees must meet certain financial criteria to demonstrate that they have the financial capacity to exploit the exclusive rights granted by the Licence. Financial Viability refers to a company's ability to remain solvent while Financial Capacity refers to a company's ability to meet known and specific costs. The measures described in the NSTA financial guidance are solely for the purpose of establishing whether Licensees have the viability and capacity to undertake the obligations of their Licence. The requirement in the Mining Waste Directive for financial provision does not apply, Articles 14(1) to (3) of the Mining Waste Directive (Directive 2006/21/EC) require operators to provide a financial guarantee to cover all obligations arising from their permit, including the closure and rehabilitation of the waste facility. However, this site is not a Category A facility and therefore these requirements do not apply. The NSTA award the production licenses and in order to do so the applicant must demonstrate the appropriate technical and financial capacity. Technical Capability - All licensees must demonstrate their ability to meet the requirements for operations within the framework of the licence. This includes having the suitable technical and managerial ability in terms of experience and staff numbers including ensuring any operator appointed is capable of satisfactorily carrying out the functions and discharging the duties under relevant statutory provisions. The NSTA consider the fitness of a licensee and/or persons controlling a licensee whenever an application for a licence is made, or where a licensee intends to take on or extend a commitment or obligation, for example on an assignment or change in

Response received from: West Newton Said No (8.3.1)		
		control. The NSTA may also decide to investigate the issue on its own initiative, for example, following a review of corporate governance). Financial Viability and financial capacity - Licensees must meet certain financial criteria to demonstrate that they have the financial capability to exploit the exclusive rights granted by the licence. In this respect the operator was requested to explain why the auditors resigned and given the company's credit rating and what funding the company has in place to ensure they will be able to comply with the permit. By way of response, the operator has confirmed the following, *that BDO LLP resigned as auditors on 20th November 2025, due to Rathlin Energy (UK) Limited appointing an auditor commensurate with its size and strategic goals. Prior to BDO's resignation, Rathlin informed BDO that they would be transitioning to a new audit firm, CBIZ CPA P.C, to align the audit process with its broader strategy of enhancing financial flexibility as it evaluates opportunities across global capital markets. As such, BDO were required to resign as auditors. As you may be aware, Section 519(1) of the Companies Act 2006 requires an auditor of a public interest company who is ceasing to hold office to send to the company a statement of the reasons for doing so. A copy of the statement by BDO LLP has been filed with Companies House and is publicly available. You may also be aware that Section 519(3A) places a duty on BDO LLP to include within its statement matters connected with it ceasing to hold office that it considers needing to be brought to the attention of members or creditors of Rathlin Energy (UK) Limited. As you will see from BDO LLP's statement, there are none.* *The changing of auditors is common practice and there are legitimate reasons why companies do so. Business growth and fresh perspectives are just two examples. The Environment Agency should take comfort in the knowledge that legislation exists to protect members or creditors of companies with respect to any financial concerns the auditor ceasing to hold office may have. In the case of Rathlin Energy (UK) Limited, BDO LLP confirmed that there were no matters connected to it ceasing to hold office*

Response received from: West Newton Said No (8.3.1)		
		needing to be brought to the attention of members or creditors of the company. *Regarding funding, in 2024 Rathlin Energy (UK) Limited's majority shareholder, Reabold Resources PLC, acquired an additional 20.35% ownership of Rathlin Energy (UK) Limited, held by Connaught Oil and Gas Ltd, resulting in the ownership of Rathlin Energy (UK) Limited largely concentrated in a publicly listed entity with better access to capital markets. The working capital was to be funded by Reabold Resources PLC via a debt facility, whilst a longer-term financing solution is secured to fund Rathlin Energy (UK) Limited's share of NSTA licence commitments. As with a change of auditor, the raising of funding to undertake well operations, including any associated regulatory obligation, is not uncommon and the 2024 audited accounts indicated that the increased ownership of Rathlin Energy (UK) Limited by Reabold Resources PLC was a vote of confidence in Rathlin Energy (UK) Limited's ability to access additional longer term capital and advance its efforts to develop PEDL 183.* *It should be noted that Rathlin Energy (UK) Limited has no financial convictions and there is no evidence to support Rathlin Energy (UK) Limited having not met any of its financial obligations.* *Furthermore, the petroleum licencing regime, regulated by the North Sea Transition Authority, provides for financial viability and financial capacity checks at various stages throughout the licence, including licence award, licence assignments, when consenting the drilling of an exploration or appraisal well and when consenting the drilling of a development well. In the context of financial viability, the NSTA must be confident that that each group of companies on the licence are able to continue in sound financial health for the foreseeable future. In the context of financial capacity, the NSTA requires each company within the licence to demonstrate adequate financial capacity to cover its share of known costs, as well as all its existing commitments.* The operator of any regulated facility should be financially capable of complying with the environmental permit. As you are aware the Environment Agency is required to undertake financial competence checks. We can only issue a permit if we believe the operator will be capable of

Response received from: West Newton Said No (8.3.1)		
		meeting the financial obligations of the permit. Financial competence is considered throughout the life of the permit. We do not see any reason why the operator would not have the finances in place to carry out operations and meet their permit obligations.
e)	**New study (Wijanarko et al., 2025) shows Kirkham Abbey Formation's (KAF) fractured nature and unpredictable fluid migration**.	The study provides background information on the area, but there's nothing of relevance that has any bearing on the proposed operations by the applicant as suggested by consultee concerns. As explained previously, the fact is that the stimulation in the KAF is at c.1700mbgl and any secondary fractures that *might* be created in the relatively brittle, siliciclastic units of the KAF would be small and are not likely to penetrate the more ductile evaporites above and below. So, any unexpected fluid behaviour would be isolated to the KAF. This has been well described in the supporting documents and Schedule 5 notice responses. The pressures proposed to be used will not create fractures that would extend any significant distance. The structural properties of the KAF have also been reviewed in the supporting documents and shown to be at the closest point c. 1km from the well. We do not know where the claim of a fault at 500 m proximity is sourced from. The NSTA are responsible for the reviewing the seismic modelling completed, however the failure envelopes for the faulting were reviewed by the Environment Agency, and the stimulation exercise concludes that there is unlikely to be an impact to faults at 500m or 1000m. In closing, it should be stressed that the separation (vertical distance) between the zone of reservoir stimulation and the aquifer of concern, as well as the very small amount of injected fluid being deployed means that any impact is unlikely and not significant.
f)	**Waste Facility Expansion -** Volume increased by 8,580 m³ (now 33,929 m³).	See box 8.2.1f above.
g)	Retention of 50–70% proppant fluid risks aquifer contamination and earthquakes. Nearest fault is 500m away; hydraulic fracturing and	See section 7.4 box 1, 7 and 10 The stimulation in the KAF is at c.1700mbgl and any secondary fractures that *might* be created in the relatively brittle, siliciclastic units of the KAF would be small and are not likely to penetrate the more ductile evaporites above and below. So, any unexpected fluid behaviour would be

Response received from: West Newton Said No (8.3.1)		
	proppant squeeze unsafe.	isolated to the KAF. This has been well described in the supporting documents and Schedule 5 Notice responses we have received. The pressures proposed to be used are not enough to create fractures that will extend any significant distance. The structural properties of the KAF have also been reviewed in the supporting documents and shown to be at the closest point c. 1km from the well.
h)	**Secondary fracture zone within KAF**	See 8.2.1c above
i)	**Chemical Storage and Mixing**	See section 7.4 box 11 above An assessment of the potential extractive waste arising from the proposed exploratory operations has been undertaken. The potential waste, together with its classification, anticipated quantities, prevention, minimisation, storage, treatment and disposal was provided with the initial application alongside a Best Available Techniques (BAT) assessment. Storage arrangements are detailed in the Waste Management Plan referenced RE-EPRA-WNA-WMP-005 Rev 10 dated July 2024. All operations are subject to BAT and CIRIA C736. Some activities which require storage are only required during the production phase. As the site is currently in the exploration phase, not all containment is required at this time. Waste well suspension brine, which is non-hazardous waste, will be kept in a 60 cubic metres horizontal cylindrical closed tank. Excess solidified cement, which is non-hazardous waste, will be stored in five 6 cubic metres plastic lined open top builders' skips. Spent hydrochloric acid, which is non-hazardous waste, will be stored in 11 1 cubic metres bunded Intermediate Bulk Containers. Formation water, which is non-hazardous waste, will be stored in four 60 cubic metres horizontal cylindrical

Response received from: West Newton Said No (8.3.1)		
		closed tanks. This will be stored for up to three months in order to allow for radionuclide analysis. Produced fluids are separated from the oil and gas by the separator then transported via temporary pipe work to cylindrical storage tanks located on site where they are held for subsequent offsite disposal. If in sufficient quantity the oil and condensate will be transported by a licensed haulier to a permitted refinery for sale. There will be no storage for waste gas as it will be incinerated as it is produced. At this stage, it is not practical to use the gas as the activities are for an exploratory activity where no provision has been made for planned storage or use of the gas The drill cuttings will be collected in an open top skip with a capacity of 31 cubic metres. The storage of waste on site will be for a maximum of seven days. At the end of this period, or when the skips are full, whichever event comes earlier, the waste is transferred to a licensed waste treatment facility. All storage of waste will take place on impermeable membrane. This consists of a high density polyethylene membrane placed between two geotextile layers to protect it. The geotextile membranes are then covered with a layer of compacted stone material. (Containment is also subject to an improvement condition ref: IC4). In addition to general spill containment and clean up equipment provided on site; an environmental incident response trailer is provided. The trailer contains equipment necessary to minimise and if possible, contain an environmental incident in the unlikely event that the impermeable membrane or containment ditch is compromised. The equipment provides for clean up, including temporary bunding of spent clean-up equipment.

Response received from: West Newton Said No (8.3.1)		
		Concrete bunds and pads are designed to hold the more permanent production equipment. Secondary containment bunds and tanks are designed in accordance with Ciria C736 (Construction Industry Research and Information Association) guidance and the Oil Storage Regulations 2001. The site is due to be extended to facilitate the production facility and therefore the permitted activity will need to be updated to include the revised site layout and the surface water management process during production operations and during periods of increased activity i.e. drilling and testing. As the secondary and tertiary containment plan including the construction quality assurance (CQA) plan has not been finalised for the production area, we have required this to be submitted to us for approval prior to construction under pre-operational condition POM5 in Table S1.4B of the permit. This was previously agreed under variation V005. The Environment Agency and CIRIA provide guidance on the design and construction of bunds for tanks containing liquids, particularly those that could harm the environment if spilled. CIRIA guidance, such as C736, offers detailed recommendations for secondary containment systems, including bund design, construction, and maintenance. The Environment Agency also emphasises the need for appropriate measures to prevent pollution from storage tanks and bunds.
j)	**Zone Increase** Zone expanded from 16.4m to 20–30m, implying more fracks and chemicals.	See box 8.2.1f, 8.2.1e above, section 7.4 and box 7

Response received from: West Newton Said No (8.3.1)		
k)	**Human Health Risks** Studies link oil/gas wells to rare leukaemia, stillbirths, breast cancer, and respiratory disease.	We are satisfied that the appropriate controls are in place and that activities will be properly regulated and not cause pollution or harm to human health. The permit conditions allow us to take regulatory action if we note that the activities are causing environmental pollution. We consulted the UK Health Security Agency) UKHSA) on this application and no concerns were raised other than Air Emissions. We explained that for this variation there will not be any additional emissions to air and this was accepted by the UK Health Security Agency.
l)	**Boundary Issue** Waste facility boundary exceeds permitted site limits; requires council review.	See box 8.2.1b, 8.2.1d and 8.2.1e above. The permit boundary has not changed to that which has already been approved and is shown in Schedule 7, figure 2 of the existing Permit EPR/BB3001FT/V005. Any changes to the boundary will require a future variation.
m)	**Precautionary Principle**	Some comments also raised the concern of the precautionary principle has not been effectively applied. We are satisfied we have fully assessed the risk to the environment and that there will be no unacceptable impact or risk of pollution. The precautionary principle is not therefore applicable. The precautionary principle should be invoked when there is good reason to believe that harmful effects may occur and the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision making. The Environment Agency considers it has followed all relevant UK legislation regarding the protective measures to be implemented when deciding to grant this permit. In setting permit conditions, we have proper regard to the potential impact of the proposed activities. We are satisfied we have sufficient information to make an informed decision.

Response received from: Frack Free Misson (8.3.2)	
Summary of issue(s) raised	**Summary of actions taken or show how this has been covered**
Financial viability and thereby competence of this operator	See box 8.3.1d above

Response received from: Drill and Drop (8.3.3)	
Summary of issue(s) raised	**Summary of actions taken or show how this has been covered**
Extension request	Public consultation extended until 6th October 2025

8.4 Representations from Individual Members of the Public

A total of 71 responses were received from individual members of the public. Many of the issues raised were the same as those considered above. Only issues additional to those already considered are listed below. Where the issue has been duplicated, reference is given to the relevant section or comment box where the appropriate response is located.

The consultation responses received from individual members of the public were wide ranging and a number of the issues raised were outside the Environment Agency's remit in reaching its permitting decisions. Specifically, questions were raised which fall within the jurisdiction of the planning system. Guidance on the interaction between planning and pollution control is given in the National Planning Policy Framework. It says that the planning and pollution control systems are separate but complementary. We are only able to take into account those issues which fall within the scope of our regulatory powers.

Summary of Issue(s) Raised	Summary of actions taken or show how this has been covered (8.4.1)
Request to extend consultation period	Extended until 6th October 2025
No Hydraulic Fracturing Plan	Discussed in the first consultation, see box 5 above.

Summary of Issue(s) Raised	Summary of actions taken or show how this has been covered (8.4.1)
(HFP). Opportunity for public to comment on HFP.	A pre-operational condition POM5 has been added. The absence of a HFP at this stage has been explained as normal process for this sort of activity. It is also something that the North Sea Transition Authority (NSTA) approve, not the Environment Agency, though the Environment Agency will be consulted along with other agencies such as HSE. The operator has explained within the application and the Schedule 5 Notice responses, that stimulation processes pose negligible risk to the environment. Essentially the rheology's of adjacent strata will not permit any stimulation fluid entering and in the extremely unlikely event that fractures extend to these units, the ductile nature of the units is not favourable in allowing brittle features to develop (so the fluid, will not enter the adjacent bedrock). The volumes and pressures the stimulation is completed within, are unlikely to produce fractures which extend the entirety of the Kirkham Abbey Formation (KAF), or into units beyond it. In the UK, the public cannot directly comment on a NSTA HFP because the NSTA does not have a formal public consultation process for specific operational plans. The HFP is an internal regulatory document agreed upon by the NSTA in consultation with the Environment Agency (EA), with the Health and Safety Executive (HSE) also having an opportunity to comment.
Financial competence.	See box 8.3.1d above.
Liner integrity. Liner should cover whole site.	Also see section 7.4, box 9 above. The well pads have been lined with an impermeable barrier. Chemicals and waste waters must be stored in sealed containers within impermeable, walled areas in case of any spillages. Operators have accident management plans setting out how any spillages will be cleaned up. The whole site surface is underlain by a High Density Polyethylene (HDPE) liner and surrounded by a sealed perimeter containment ditch in line with the Environment Agency (EA) guidance and Best Available Techniques

Summary of Issue(s) Raised	Summary of actions taken or show how this has been covered (8.4.1)
	(BAT). We had already noted that the integrity had been compromised, and the operator is required to reassess and renew if necessary. No operations can take place without this being agreed with the EA. As previously detailed the site liner is subject to improvement condition reference IC4.
Chemicals, data gaps, CAS No.	See box 8.3.1b above and section 7.4 and box 3
Health impacts	Also see section 7.4 and box 16 above. We have taken into consideration potential environmental and health risks this activity poses in permitting this site and the variation to the permit made by this application. Permissions are granted based on guidance issued by the Environment Agency and bodies such as the UK Health Security Agency (UKHSA) and we are satisfied that the operating techniques required by the permit will minimise the risk to the environment and to human health.
Boundary issue	See section 7.4, box 15 above. We confirm that the permit boundary has not changed to that which has already been approved and shown in Schedule 7, figure 2 of the permit EPR/BB3001FT/V005. Any changes to the boundary would require a variation. This variation does not include boundary changes.
Precautionary Principle	See box 8.3.1m above
Secondary fracture zone within Kirkham Abbey Formation (KAF)	See box 8.2.1c above
Net Zero	We are only able to take into account of those issues which fall within the scope of our regulatory powers. Energy policy in the UK is the responsibility of the government, specifically the Department for Energy Security and Net Zero (DESNZ). The Environment Agency (EA) is an executive non-departmental public body that implements

Summary of Issue(s) Raised	Summary of actions taken or show how this has been covered (8.4.1)
	environmental and energy efficiency policies set by the government.
Paper (study) **Unsafe geology**	See box 8.3.1e above
Who is the responsible regulator for the waste facility?	The Environment Agency is responsible for the regulation of the permit which includes the waste facility, the North Sea Transition Authority (NSTA) are responsible for seismicity and regulation the Hydraulic Fracturing Plan (HFP).
What chemicals are used in this process.	Chemical data sheets and inventory logs have been provided and were part of the application documents. A chemical inventory has been provided Report RE-EPRA-WNA-CI-008 Revision 5B May 2025.
Storage, mixing of hazardous chemicals, CIRIA, BAT	See section 7.4, boxes 9 and 11 and 8.3.1i above.

End of Document