

# Permitting decisions

## Variation

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We have decided to grant the variation application for Preston New Road Exploration Site operated by Cuadrilla Bowland Limited.

The variation number is EPR/AB3101MW/V003.

We have also carried out an Environment Agency initiated variation to the permit.

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

## Purpose of this document

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

- highlights key issues in the determination
- summarises the decision making process in the decision checklist to show how all relevant factors have been taken into account
- explains why we have also made an Environment Agency initiated variation
- summarises the engagement carried out because this is a site of high public interest
- shows how we have considered the consultation responses

This is a decision document, which accompanies a variation notice.

It explains how we have considered the Applicant's application, and why we have included the specific conditions in the variation notice we have issued 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.

Read the permitting decisions in conjunction with the environmental permit and the variation notice. The introductory note summarises what the variation covers.

## Key issues of the decision

### Preliminary information

The application we received contained proposals to vary the existing permit EPR/AB3101MW issued 16/01/2015:

We gave the variation the reference number EPR/AB3101MW/V003. We refer to the Application as "the Application" in this document for consistency.

The number we have given to the variation notice is EPR/AB3101MW/V003. We refer to the notice as "the Notice" in this document.

The Application was duly made on 23/06/2017.

A separate permit variation application (EPR/AB3010MW/V004) for the addition of a surface water discharge has been received and duly made on 30/12/2017. This is a separate application and will be determined on its own merits. It will also be subject to a separate consultation.

## Summary of the application

The Applicant requested the following changes as part of their application:

- Change the limits of activity for activity A1 (incineration of gas) in table S1.1 from being limited to 90 days per well (with four wells on site) to a total site limit of 360 days.
- Amend table S1.3 Pre Operational condition 5 (PO5) to correct the reference in the Waste Management Plan from 2.4.4 to 2.2.4
- Amend table S3.2 to change the maximum daily discharge of 765m<sup>3</sup> per day to be consistent with the Waste Management Plan limit of 765m<sup>3</sup> per hydraulic fracturing stage.
- Amend table S3.5 to reflect the fact that 4 groundwater monitoring boreholes have been installed instead of 3, update their location and in accordance with British Standard BS8576:2013, to remove the requirement to purge the boreholes prior to sampling.
- Change table S3.6 Process monitoring requirements for seismic monitoring from a surface buried array to the use of downhole seismic geophones.

## 1. Summary of our Decision

We have decided to grant the variation making the changes highlighted to the permit; in addition as part of our determination we have decided to vary the following conditions by way of an Environment Agency Initiated variation:

We have amended Table S1.3 PO3 to add the requirement for a Hydraulic Fracturing Plan for each individual well prior to hydraulic fracturing being carried out in that well, rather than having a requirement to submit one plan for all wells at the same time prior to hydraulic fracturing is carried out.

We have replaced table S1.3 PO9 with a requirement to provide an updated site plan showing the location and designation of the two proposed flares prior to start of the flaring activity.

We have added a new pre-operational condition PO10 to table S1.3 to require the Operator to provide, for our approval, operational and control procedures for the management of the flaring activity and obtain our approval prior to the start of the flaring activity.

We have amended table S3.1 and S3.6 to impose additional monitoring requirements and emissions limits on the flaring activity. We have also amended table S4.1 to reflect these additional monitoring requirements. As a result of these new more stringent monitoring requirements condition 3.5.8 is no longer required and has been removed.

To maintain clarity of the permit, the changes detailed above have been consolidated into a new version of the permit which replaces the original permit issued 15/01/2015.

The Notice and consolidated Permit include 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, Mining Waste Directive, Industrial Emissions Directive, Groundwater Directive, Water Framework Directive and other relevant legislation.

This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice and consolidated permit, we have considered the Application and accepted that the details are sufficient and satisfactory to make the standard conditions appropriate.

We have tried to explain our decisions as accurately, comprehensively and as plainly as possible, although given the nature of the Application it is inevitable that this document contains a significant amount of technical and specialist language.

## 2. How we took our decision

The Application was duly made on 23/06/17. This means that we considered it was in the correct form and contained sufficient information for us to begin our determination.

We carried out consultation on the Application taking into account the Environmental Permitting (England and Wales) Regulations 2016 and our statutory Public Participation Statement. We advertised the Application by a notice placed on our website, which contained all the information required by the Regulations, including telling people where and when they could see a copy of the Application.

We also contacted local MPs, local authorities and Parish Councils to notify them of the consultation. We also issued a press release to Lancashire media on 06/07/2017.

We placed a paper copy of the Application and all other documents relevant to our determination on our Public Register.

The Environment Agency, Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT

Anyone wishing to see these documents could do so and arrange for copies to be made.

We sent copies of the Application to the following bodies, including those with whom we have "Working Together Agreements":

- Local Planning Authority, Lancashire County Council
- Mineral Planning Authority, Lancashire County Council
- Health and Safety Executive
- Public Health England
- Director of Public Health

These are bodies whose expertise, democratic accountability and/or local knowledge make it appropriate for us to seek their views directly.

Although the application contained sufficient information for us to begin our determination we asked the Applicant to provide additional information.

Further details, along with a summary of consultation comments and our response to the representations we received, can be found in Annex 1 to this Decision Document. We have carefully considered all representations and have taken into account any relevant points in reaching our draft determination.

We carried out a Minded to consultation on our draft decision, taking into account the Environmental Permitting (England and Wales) Regulations 2016 and our statutory Public Participation Statement. We advertised the Application by a notice placed on our website, which contained all the information required by the Regulations, including telling people where and when they could see a copy of the Application.

No additional changes were made as a result of the Minded to consultation.

### **3. Description of the changes to the Permit**

#### **3.1 Changes requested by the Applicant**

##### **3.1.1 Change the limits of activity for activity A1 (incineration of gas) in table S1.1 from being limited to 90 days per well (with four wells on site) to a total site limit of 360 days (8,640 hours):**

The Applicant has requested this change to allow for more flexibility to test the gas flow from the wells being tested.

The requirement to flare natural gas is based on a need to collect natural gas data. The initial flow test purpose is to enable a continual uninterrupted flow from the well head to a flare. The uninterrupted flow of natural gas is required to provide the necessary data to measure the flow rate of natural gas and the initial decline rate of flow and pressure as well as the gas composition. This allows for the forecasting of potential future production flow from the well. Interrupting the flow, or risk of interruption from utilising the natural gas on site, would impact the necessary data collection and ability to predict future decline curves of natural gas.

The proposal to move from a 90 day limit per well to a limit of a maximum aggregate of 8,640 hours (360 days x 24 hours) for all the wells at the site provides operational flexibility to enable each well to be assessed on a case by case basis. If there is uncertainty in the data being captured, the flexibility of the aggregate site limit means that a particular well can be flared for longer if required e.g. where flow is interrupted.

Alternatively, in circumstances where data is quickly validated, flaring duration can be reduced for a well and the remaining hours then used in relation to another well. The overriding objective of the initial flow test is to flare for the least time possible to reduce the amount of emissions being generated.

The flare system will be fitted with an hours run gauge enabling accurate reading of flare time.

Once the initial flow test has established data, natural gas flowing from the well during the extended well test would be sent to the gas grid rather than flaring. The extended well test is based on site specific information e.g. the gas composition and flow rates established during the initial flow test, to enable a connection into the gas grid.

#### **Flare 'commissioning' periods:**

The operator has stated in their waste management plan (S5.6, p32) that the flares will be "subject to a 7 day commissioning period per well which would not count towards the site flaring limit of a maximum aggregate of 8,640 hours for all the wells at the site."

While it is reasonable that the flares themselves could be subject to a commissioning period, it is judged that the operator's proposal as currently structured is not acceptable.

Any period set aside for 'commissioning' should be used to verify the correct installation and configuration of the item of equipment being commissioned, in this case, the two flares. However, the operator's proposal appears to be more focussed on the 'commissioning' of the well/s themselves. We consider these periods (of up to 7 days per well) a fundamental part of the permitted activity A1 (the testing of the wells by flaring the produced gas).

The operator's proposed '7 day commissioning periods' are not accepted, and the operator will have to comply with the limitations placed on their well testing activities at all times including during commissioning periods.

#### **Air quality impacts:**

The Applicant has included within their application an independent air quality assessment of the proposed flaring activity at the site. The study assessed the likely impacts of the flaring activity at a range of receptors (both human and ecological) and for a range of parameters using local air quality and meteorological data as a baseline.

The air quality assessment assumes a worst case scenario of two flares operating continuously and at full capacity for the full 360 days applied for. The assessment concludes that no exceedances for any parameter against the applicable air quality standard (AQS) are predicted.

We have carried out a further air quality screening exercise as part of our assessment of the Applicant's proposal. This exercise considered the actual range of gas disposal volumes proposed, and the predicted impact of the flaring activity on nearby receptors (5 human and 6 ecological).

This screening exercise is more conservative still in that it models impacts on a purely distance-based basis, not taking account of locally prevalent wind patterns.

This screening assessment concludes that the predicted environmental concentration of each pollutant modelled is not expected to exceed 70% of the applicable environmental quality standard (EQS), and as such, an EQS breach is considered highly unlikely in a rural area.

Furthermore, the screening assessment concludes that the process contributions at all ecological receptors are insignificant. As such, the environmental risk from the flaring activity can be considered low.

We are therefore satisfied that changing the flaring limit from 90 days per well to an overall site limit of 360 days is appropriate and will not cause harm to human health or the environment.

However, to ensure the operation conforms to the assumptions contained within these air quality assessments, the flaring activity should be controlled by both an overall limit on the quantity of gas combusted, along with compliance limits to control the quality of combustion achieved throughout and we have therefore made changes to the monitoring requirements and added a new preoperational condition (PO10) to request for approval operational and control procedure for the flares prior to that activity starting - see section 3.2. below for more details.

3.1.2 Amend table S1.3 Pre Operational condition 5 (PO5) to update the reference in the Waste Management Plan from 2.4.4 to 2.2.4:

This is an administrative change to reflect the correct reference number for the Integrity Testing section in the approved Waste Management Plan V8.0 as submitted with the Application.

3.1.3 Amend table S3.2 to change the maximum daily discharge of 765m<sup>3</sup> per day to be consistent with the Waste Management Plan limit of 765m<sup>3</sup> per hydraulic fracturing stage:

This change to reflect the wording of the approved Waste Management Plan. The Applicant has clarified that multiple stages may be carried out on a daily basis.

There is no increase in risk to groundwater associated with this change. The maximum quantity of waste flowback fluid that can be stored on site has not been changed and remains at 3,000 cubic metres.

As stated in Section 5.9 Table 5 of the approved Waste Management Plan, this waste will be regularly removed and taken to an offsite approved waste facility. In the event that the operator could not find somewhere to take their waste, the operator would have to take the necessary measures to ensure that no further waste of this type is generated until alternative treatment/disposal routes were in place.

3.1.4 Amend table S3.5 to reflect the fact that 4 groundwater monitoring have been drilled instead of 3, update their location and in accordance with British Standard BS8576:2013, to remove the requirement to purge the boreholes prior to sampling:

This change is to reflect the fact that 4 groundwater boreholes have been drilled and installed instead of the original proposed 3 and to update the permit with accurate grid references for their location. In addition, the monitoring requirements have been altered to remove the requirement to purge the borehole prior to sampling. This is in accordance with British Standard BS856:2013 and we are satisfied that this is appropriate.

3.1.5 Change table S3.6 Process monitoring requirements for seismic monitoring from a surface buried array to the use of downhole seismic geophones:

We have reviewed the Applicant's proposal to change the seismic monitoring from a surface buried array to the use of downhole seismic geophones. The Applicant has changed the sequencing of works on site from drilling a well then hydraulic fracturing the well before moving to drill and test the next well to drilling multiple wells before starting hydraulic fracturing. This means that while one well is being hydraulically fractured, and adjacent well can be used to monitor fracture growth by installing downhole microseismic geophones.

We have consulted professional colleagues within and outside the Environment Agency, including other Regulators. We are satisfied that the downhole array will be an improvement over the shallow

borehole array for microseismic event location associated with the hydraulic fracturing. Our reasoning is based on the observations that:

- The array is much closer to the event sources: seismic energy will have propagated through a more uniform and predictable seismic velocity structure, and will not have had to pass through more-attenuative surface layers.
- The downhole array is further from sources of surface noise such as traffic and industrial noise.
- Coupling of the geophones is by clamping within the second borehole of a pair where the first borehole is to be hydraulically fractured, and the integrity and orientation of the geophone array can be adequately verified by downhole shots before the system is used to record microseismic events from the hydraulic fracturing.
- The geophones are 3-component types designed for this application and are spread over a sufficient vertical and horizontal aperture. For stronger events, the possibility remains of using vibration directions, as well as moveout, to estimate arrival directions.
- The velocity model required to calculate positions of event sources is simpler and less prone to measurement error than that required for processing shallow-borehole array data.
- The geophones are less vulnerable to damage, deliberate or otherwise, that might occur by having a number of shallow borehole access points and cabling distributed across the countryside.
- The methodology is well-established and supported by a number of published case studies.
- We are aware that accurate event location is required for possible fault reactivations. We have required the Operator to take into account smaller discontinuities noted in their 3D seismic exploration data volume, as being possible faults, during the injection.

In addition the Operator has undertaken to operate the Traffic Light System from 4 weeks before to 2 weeks after injection operations.

We are satisfied that this change of monitoring method will provide more accurate data than the original proposal (using a surface buried array). No hydraulic fracturing can take place until the Environment Agency has approved the proposed Hydraulic fracturing plan as required by the pre-operational conditions in the permit.

### **3.2 Changes we have imposed**

- 3.2.1 We have amended Table S1.3 PO3 to add the requirement for a Hydraulic Fracturing Plan for each individual well prior to hydraulic fracturing being carried out in that well rather than having a requirement to submit plan for all wells at the same time prior to hydraulic fracturing being carried out:

We have made this change to the permit to allow for separate Hydraulic Fracturing Plans to be submitted for each well prior to the hydraulic fracturing taking place in that well. This will allow the Environment Agency to scrutinise and review each step of the process as operation proceed on site. It will also allow the Operator to update and refine subsequent Hydraulic Fracturing Plans based on the information gathered as part of the previous tests performed on the initial wells.

- 3.2.2 We have replaced table S1.3 PO9 with a requirement to provide an updated site plan showing the location and designation of the two proposed flares prior to start of the flaring activity:

The original pre-operational condition PO9 required the Operator to provide a method to calculate emissions from the flares. This is no longer required as the updated proposals from the Applicant to use two enclosed ground flares, which can be directly monitored, in line with the requirements of our Onshore Oil and Gas Sector Guidance (V1, 17 August 2016).

We have replaced the requirements of the original PO9 with a new requirement to provide an updated site plan showing the location of the flares prior to the start of the flaring activity as the original proposals have changed and the originally proposed location of the flares will change on site as a result of the new proposal. Their final location will only be confirmed once initial drilling operations are completed.

3.2.3 We have added a new pre-operational condition PO10 to table S1.3 to require the Operator to provide for approval operational and control procedures for the management of the flaring activity and obtain our approval prior to the start of the flaring activity:

The Operator, by way of this variation, is seeking to significantly improve their flaring proposal relative to that which was originally proposed. The precise details of the improved flaring proposal only became available after the Operator had submitted their application documents and have been made available to the public as part of the minded to consultation. As such, the application does not, as yet, include the detailed operational procedures and controls for the flaring activity that would typically be expected. The Operator will be required to provide these procedures for our approval prior to the commencement of the permitted activities on site.

This information should cover:

- Details of staff training and competence management
- Details of flare installation, commissioning and testing
- Flare start up and shut down procedures
- Routine system operation
- Flare monitoring and data recording procedures
- Non-routine operation and emergency shut down procedures
- Details of how the flares interact with, and can be affected by wider wellsite operations (for example, well events which may affect the flare/s or flare/s events which may affect well test operations).

3.2.4 We have amended table S3.1 and S3.6 to impose additional monitoring requirements and emissions limits on the flaring activity. We have also amended table S4.1 to reflect these additional monitoring requirements. As a result of these new, more stringent monitoring requirements condition 3.5.8 is no longer required and has been removed:

### **Flaring activity register**

As described in Section 3.1.1 we have accepted the Applicant's request to vary their permit to change the limits on flaring from 90 days per well to an overall site limit of 360 days.

The purpose of this change to is to allow the operator greater flexibility during their initial well testing phase, and in particular to allow more time to appraise the earlier wells tested, while not increasing the amount of testing overall.

In order to demonstrate compliance with this limit, we have added a requirement as part of Table S3.6 Process Monitoring Requirements to maintain a daily 'flaring register' for the duration of the permitted activities. The Operator is required to record each day on which flaring (of any duration) takes place, up to a maximum of 360 days.

Table S4.1 has also been amended to include the flaring register as part of the Reporting Requirements.

### **Monitoring requirements**

Relative to the operator's original permit, the specification of the flaring activity has been improved in as much as it now includes enclosed ground flares in line with Onshore Oil and Gas Technical

Guidance (V1, 17 August 2016) which provide higher environmental performance relative to other flare types.

The environmental performance of these enclosed ground flares can be directly measured using well established, quality-assured monitoring techniques, as opposed to the proposal contained in the original permit application which were not able to be monitored accurately and therefore required using a calculation method to estimate emissions.

As the operator will be using a technique which can be readily and safely monitored, and could take place over a significant proportion of a calendar year (up to c.98%), we consider that the operator's current 'by calculation' monitoring conditions should be replaced by a direct measurement condition.

This requirement is more stringent than the operator's submitted proposal (as detailed in EMMP S4.1, p4), but provides a more reliable measurement of the flare's actual environmental performance, particularly when used in combination with the combustion temperature compliance limit.

Table S3.1 has been amended to add strict emission limits for oxides of nitrogen, carbon monoxide and total volatile organic compounds to be monitored on an annual basis. We have based these limits on the high standards of waste incineration we expect in other sectors we regulate. These limits will demonstrate that the operator's equipment and processes are adequate to minimise emissions to air to their lowest possible level. There are no changes to the maximum daily flow rate of 130,000 m<sup>3</sup>/day or to the minimum flare combustion temperature which remains at a minimum of 800°C.

Table S4.1 has also been amended to include the monitoring results as part of the Reporting Requirements.

## **4. General issues**

### **4.1. Administrative issues**

We are satisfied that the Applicant is the person who will have control over the operation of the regulated facility after we grant the Notice, in line with our Regulatory Guidance Note RGN 1: *Understanding the meaning of Operator (version 4.0)*; and that the Applicant will be able to operate the regulated facility in compliance with the conditions included in the consolidated permit.

### **4.2. Management**

Having considered the information submitted in the application, we are satisfied that appropriate management systems and management structures will be in place.

### **4.3. Financial competence and relevant convictions**

The variation does not include any changes that would require a change to the existing Financial Provision arrangements.

The Operator does not have any relevant convictions and it is technically competent.

### **4.4. External Emergency Plan**

The provisions relating to an external emergency plan do not apply as none of the mining waste facilities are Category A facilities,

### **4.5. Accident management**

Having considered the information submitted in the application, we are satisfied that appropriate measures will be in place to ensure that environmental accidents that may cause pollution are prevented. However, in the unlikely event that an accident should happen, we are satisfied that the consequences will be minimised. This is part of the written management system of the site, required under permit condition 1.1.1 a.



#### **4.6. Surrender of the permit**

When the Operator wants to surrender their permit, they will have to satisfy us that the necessary measures have been taken to:

- Avoid any on-going pollution risk resulting from the operation of the facility; and
- To return the site to a satisfactory state, having regard to the state of the site before the activity was put into operation.

We will not grant any application for surrender unless and until we are satisfied that these requirements have been complied with.

#### **4.7. Site security and protection**

The variation does not include any changes that would impact site security and protection.

#### **4.8. Planning Permission**

Our decision on whether to grant an Environmental Permit is separate from the planning process. An Environmental Permit allows the site to operate and to be regulated by the Environment Agency exercising its pollution control functions. The Planning Authority, in this case the Lancashire County Council, decides whether or not to grant planning permission.

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 planning authority must also consider and respond to any objections they may receive on a particular planning application.

There is no requirement for planning permission to be in force before an environmental permit is granted.

#### **4.9. Pollution prevention measures**

The variation does not include any changes to the existing pollution prevention measures.

#### **4.10. Odour management**

We carefully considered potential odour emissions from the activity during our determination.

Odour, from the activities we permit, is not considered likely to be an issue considering the site is in a rural location, which is 250 metres from the nearest sensitive receptor. In addition the regulated activities are not likely to produce any odours due to the processes and chemicals used being inherently non-odorous.

We are satisfied that the environmental risk assessments contain adequate measures to manage any potential odour and that the regulated activities will not cause pollution of the environment or harm to human health from odour.

Under Condition 3.3 of the permit, we can require the Operator to produce and implement an odour management plan in the unlikely event that activities at the site give rise to odour. Should a plan be required in the future, once we have assessed this plan as suitable, it will form part of the permit and the Operator must carry out the activity in accordance with the approved techniques.

#### **4.11. Noise management**

We carefully considered emissions from noise and vibration during our determination and concluded that noise and vibration from the regulated activities are not considered to be an issue due to the design of the flare, the rural location of the site, the distance to the nearest receptor (250 metres) and the level of background noise (the site is located close to the M55 and A583).

The risk of the flares themselves causing noise complaints is low. Based on the sound pressures presented by the Applicant, it is unlikely to cause a noise level that is greater than 10dB above background at the closest receptor (270m). As these figures assume the flares run at 100% capacity and the distances represent actual distances from the flare, we are satisfied that the environmental risk assessments contain adequate measures to manage noise and that the regulated activities will not cause pollution of the environment or harm to human health from noise.

Under Condition 3.4 of the permit, we can require the Operator to submit a specific noise and vibration management plan, should noise and vibration become a problem from activities we regulate. Should a plan be required in the future, once we have assessed this plan as suitable, it will form part of the permit and the Operator must carry out the activity in accordance with the approved techniques.

## **5. Other legal requirements**

### **5.1. Mining Waste Directive 2006/21/EC**

In this section we explain how we have addressed other relevant legal requirements under the Mining Waste Directive, to the extent that we have not addressed them elsewhere in this document and they apply to this variation.

#### **5.1.1. Article 4 – General requirements**

Article 4 sets out requirements for the protection of the environment and human health which apply to the management of extractive waste. Under the Environmental Permitting (England and Wales) Regulations 2016 an environmental permit is required for a mining waste operation, which is defined as the management of waste whether or not it involves a waste facility. It is through the permit and the conditions imposed that we are satisfied that the provisions of Article 4 will be met.

#### **5.1.2. Article 5 - Waste management plan**

This includes the requirement for the Operator to provide a waste management plan and the information required within this. The waste management plan, 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.

#### **5.1.3. Article 6 – Major accident prevention**

We are satisfied that the proposed activities do not involve a Mining Waste Facility which should be classified as a Category A facility.

#### **5.1.4. Article 7 – Application for a permit**

The permit covers the management of extractive waste and includes a Mining Waste Facility as defined in the MWD. The Application contained all necessary elements in Article 7(2) relevant to this site. We are satisfied that the requirements in Article 7(3) are met.

#### **5.1.5. Article 8 – Public participation**

Through our consultation procedure we are satisfied that the public have been informed as required by Article 8 and that we have made available the information set out in Article 8(2). We have provided the public with the ability to express comments and opinions to us before a decision has been taken and the results of the consultation will be taken into account in deciding whether to grant this permit.

#### **5.1.6. Article 9 – Classification system for waste facilities**

We are satisfied that there is no waste facility that should be classified as a category A facility. Although the waste facility in respect of the on-site storage of waste will contain hazardous waste during the operational phase, no waste is expected to be present at the end of the planned period of operation.

#### **5.1.7 Article 11- Construction and management of facilities**

This outlines a requirement for the facility to be suitably constructed, managed and maintained to ensure its physical stability and to prevent pollution and contamination of soil, air, surface water and groundwater. Under this article there is a requirement for suitable plans and arrangements for regular monitoring and inspection of the facility by competent persons.

We are satisfied that the operator will comply with these requirements, based on the information provided and the conditions in the permit.

#### **5.1.8. Article 13 - Prevention of water status deterioration, air and soil pollution**

We are required, as the competent authority, to be satisfied that the Operator has taken the necessary measures in order to meet environmental standards, particularly to prevent deterioration of current water status.

We are satisfied that the Operator will comply with these requirements based on the information provided and the conditions in the permit.

#### **5.1.9. Article 14 - Financial Guarantee**

Article 14 requires the provision of a financial guarantee, in respect of a waste facility, to ensure funds are available to meet the obligations of the permit and to rehabilitate the site when operations finish. We will require a financial guarantee to be provided in respect of the area designated for the accumulation or deposit of hazardous waste stored at the surface before any permit is issued to satisfy this requirement.

In respect of the waste facility relating to waste fluid left in the formation, we are satisfied that this waste is properly characterised as non hazardous waste. By virtue of paragraph 9(3) of Schedule 20 to the Environmental Permitting (England and Wales) Regulations 2016 the requirements mentioned in Article 2(3) of the MWD are waived. These waived requirements include the need for a financial guarantee for non hazardous waste, unless deposited in a Category A facility. So no financial guarantee can be required in respect of the fluid left in the target formation.

### **5.2. Further legislation**

#### **5.2.1 Industrial Emissions Directive (IED)**

We have addressed the requirements of the IED as part of the determination of the original permit. The changes made by this variation do not change that assessment.

#### **5.2.3. Directive 2003/35/EC – The Public Participation Directive**

Regulation 59 of the EPR 2010 requires the Environment Agency to prepare and publish a statement of its policies for complying with its public participation duties. We have published our public participation statement.

This Application has been consulted upon, in line with that statement, as well as with our guidance RGS6 on Sites of High Public Interest, which addresses specifically extended consultation arrangements for determinations where public interest is particularly high. This satisfies the requirements of the Public Participation Directive.

Our decision in this case has been reached following a programme of extended public consultation, both on the original application and later, separately, on this permit and a decision document. The way in which this has been done is set out in Section 2. A summary of the responses received to our consultations and our consideration of them is set out in Annex 1.

#### **5.2.4. Section 4 Environment Act 1995 (pursuit of sustainable development)**

We are required to contribute towards achieving sustainable development, as considered appropriate by Ministers and set out in guidance issued to us. The Secretary of State for Environment, Food and Rural Affairs has issued *The Environment Agency's Objectives and Contribution to Sustainable Development: Statutory Guidance (December 2002)*. That document:

*“provides guidance to the Environment Agency on such matters as the formulation of approaches that the Environment Agency should take to its work, decisions about priorities for the Environment Agency and the allocation of our resources. It is not directly applicable to individual regulatory decisions of the Environment Agency.”*

The guidance contains objectives in relation to the Environment Agency's operational functions and corporate strategy. Some of these objectives relate to the Environment Agency's wider role in waste management and strategy. In respect of the management of extractive waste, the guidance notes state that the Environment Agency should pursue the following objective:

*"to prevent or reduce as far as possible any adverse effects on the environment as well as any resultant risk to human health from the management of waste from the quarrying and mineral extraction industries."*

In respect of water quality, the Environment Agency is required to: *'protect, enhance and restore the environmental quality of inland and coastal surface water and groundwater, and in particular:*

- *To address both point source and diffuse pollution;*
- *To implement the EC Water Framework Directive; and to ensure that all relevant quality standards are met.'*

In respect of regulation of industrial pollution through the EPR, the Guidance refers in particular to the objective of setting permit conditions *"in a consistent and proportionate fashion based on Best Available Techniques and taking into account all relevant matters..."*.

The Environment Agency considers that it has pursued the objectives set out in the Government's guidance, where relevant, and that there are no additional conditions that should be included in this Permit to take account of the Section 4 duty

#### **5.2.5. Section 5 Environment Act 1995 (preventing or minimising effects of pollution to the environment)**

We are satisfied that our pollution control powers have been exercised for the purpose of preventing or minimising, or remedying or mitigating the effects of pollution of the environment in accordance with section 5 of the Environment Act 1995.

#### **5.2.5. Section 7 Environment Act 1995 (pursuit of conservation interests)**

Section 7(1)(c) of the Environment Act 1995 places a duty on us, when considering any proposal relating to our functions, to have regard amongst others to any effect which the proposals would have on the beauty and amenity of any urban or rural area.

We do not consider that any conditions additional to those in the permit are required to meet this duty. The structures that could affect visual amenity will be the drilling rig and the flares. These structures are temporary in nature and any visual impact will be limited.

#### **5.2.6. Section 81 Environment Act 1995**

The site is not within a designated Air Quality Management Area.

We consider that we have taken our decision in compliance with the National Air Quality Strategy and that there are no additional or different conditions that should be included in this variation.

#### **5.2.7. Section 40 Natural Environment and Rural Communities Act 2006**

Section 40 places a duty on us to have regard, so far as it is consistent with the proper exercise of our functions, to conserving biodiversity. 'Conserving biodiversity' includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat. We have done so and consider that no conditions additional or different to those in the permit are required.

#### **5.2.8. Section 23 of the Local Democracy, Economic Development and Construction Act 2009**

Section 23 requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of interested persons in the exercise of our functions by providing them with information, consulting them or involving them in any other way. Section 24 requires us to have regard to any Secretary of State guidance as to how we should do that.

The way in which the Environment Agency has consulted with the public and other interested parties is set out in this document. The way in which we have taken account of the representations we have

received is set out in annex 1. Our public consultation duties are also set out in the Environmental Permitting (England and Wales) Regulations 2016, and our statutory Public Participation Statement, which implement the requirements of the Public Participation Directive. In addition to meeting our consultation responsibilities, we have also taken account of our guidance in Environment Agency Guidance Note RGS6 and the Environment Agency's Building Trust with Communities toolkit.

#### **5.2.10. Human Rights Act 1998**

We have considered any potential interference with rights under the European Convention on Human Rights in reaching our decision and consider that our decision is compatible with our duties under the Human Rights Act 1998. In particular, we have considered the right to life (Article 2), the right to a fair trial (Article 6), the right to respect for private and family life (Article 8) and the right to protection of property (Article 1, First Protocol). We do not believe that Convention rights are engaged in relation to this determination and to the extent that they may be, any interference with those rights is justified.

#### **5.2.11. Countryside and Rights of Way Act 2000 (CROW 2000)**

Section 85 of this Act imposes a duty on Environment Agency to have regard to the purpose of conserving and enhancing the natural beauty of the area of outstanding natural beauty (AONB). There is no AONB which could be affected by the variation of the permit.

#### **5.2.12. Wildlife and Countryside Act 1981**

Under section 28G of the Wildlife and Countryside Act 1981 the Environment Agency has a duty to take reasonable steps to further the conservation and enhancement of the flora, fauna or geological or physiographical features by reason of which a site is of special scientific interest. Under section 28I the Environment Agency has a duty to consult Natural England in relation to any permit that is likely to damage SSSIs.

We have assessed the application and concluded that there will be no likely damage to any SSSIs as there is no change to the overall impact of the activities - see section 7.2 and 7.6 of our original Decision Document.

#### **5.2.13. The Conservation of Habitats and Species Regulations 2010**

We have assessed the Application in accordance with guidance agreed jointly with Natural England and concluded that there will be no likely significant effect on any European Site.

The assessment we carried out as part of the determination of the original permit took into account the potential impacts from the continuous incineration of gas for 365 days and this impact was been fully assessed and is detailed in section 7.6 of the original Decision Document. Following our assessment we were satisfied that there would be no likely significant effect on the statutory conservation sites (SPA/Ramsars/SSSI) from air emissions and that assessment remains valid. We presented our assessment and conclusion to Natural England on an Appendix 11 form (Habitats Directive: Form for recording likely significant effect) for information as part of the determination of the original application. Natural England responded, agreeing with our conclusions.

#### **5.2.14. Section 108 Deregulation Act 2015 – Growth duty**

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

Paragraph 1.3 of the guidance says:

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

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that

the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

## Summary of responses to consultation and web publication and the way in which we have taken these into account in the determination process.

### A) Advertising and Consultation on the Application

The Application has been advertised and consulted upon in accordance with the Environment Agency's Public Participation Statement. The way in which this has been carried out, along with the results of our consultation and how we have taken consultation responses into account in reaching our decision, is summarised in this Annex. Copies of all consultation responses have been placed on the Environment Agency public registers.

The Application was advertised on the Environment Agency's Citizen Space website from 6<sup>th</sup> July 2017 to 3<sup>rd</sup> August 2017. Copies of the Application were placed in the Environment Agency Public Register at Richard Fairclough House, Knutsford House, Latchford, Warrington WA4 1HT.

The following statutory and non-statutory bodies were consulted:

- Local Planning Authority – Lancashire County Council
- Public Health England
- Director of Public Health – Lancashire County Council
- Health and Safety Executive
- Mineral Planning Authority – Lancashire County Council

### 1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Local Planning Authority - Lancashire County Council	
Brief summary of issues raised:	Summary of action taken / how this has been covered
<p><b>Seismic Monitoring</b></p> <p>The issue of induced seismicity has been a key concern for the County Council, particularly in light of the seismic events at Preece Hall in 2011.</p> <p>In determining the applications in 2015, the County Council was advised by specialists in the field of induced seismology. Following the public inquiry for the site in 2016, the Planning Inspector concluded that, based on the information submitted and the assessments made "the risk of induced seismicity has been reduced to a minimum and an acceptable level". There has then been a high level of scrutiny given to the issue of induced seismicity. The Agency will need to provide a similar level of assessment in order to satisfy itself that the proposed variation is acceptable.</p> <p>It appears the 8 surface monitors will remain in place to monitor compliance with the Traffic Light System for induced seismicity,</p>	<p>We are satisfied that the use of downhole geophones in offset wells will provide more accurate data on the extent of the fractures within the formation and will reduce even further the risk of induced seismicity occurring on site. See section 3.1.5. above for more details</p>

<p>although this is not abundantly clear. However, it is proposed to replace the array of 80 buried seismic monitoring stations with a single monitor in an offset well. The purpose of the array is to monitor the extent and orientation of fractures to ensure groundwater is protected and within the permitted boundary.</p> <p>In light of the fact that the array of 80 monitors is being replaced by a single monitor, and in light of the fact that the single monitor will not be as close to the fractures as many of the buried array monitors (and therefore potential not as sensitive) the Agency will need to satisfy itself that the single monitor can be as effective, if not more effective, than the array of 80 monitors.</p>	
<p><b>Hydraulic Fracturing</b></p> <p>The proposal to vary the maximum daily discharge from 765m<sup>3</sup>/day to 765m<sup>3</sup> per hydraulic fracture stage can have a number of impacts that remain uncertain.</p> <p>This is because the amount of flowback fluid that is reused, and the amount that stays in the target formation (which in turn depends on the permeability of the geology) is not known.</p> <p>Clearly if, for example, five fractures are carried out in one day, then the amount of flowback allowed would be 3,825 m<sup>3</sup> (rather than the current limit of 765m<sup>3</sup>).</p> <p>In turn, such intensification could have implications for the amount of on-site storage, and the amount of HGV movements used for off-site disposal. The permit limits the amount of storage that can take place on site. There are also measures that provide for emergency storage in the event of a spill (eg, voids in the stone on the pad and drainage ditches at the site perimeter).</p> <p>The County Council is concerned that such storage limits and emergency storage facilities remain adequate in the event that the amount of flowback fluid increases; and that any increase in flowback fluid does not result in a significant increase in HGV movements for off-site disposal. The issue of HGV movements, particularly in light of the frequent disruption to the A583 and protestor</p>	<p>There is no increase in risk to groundwater associated with this change. The maximum quantity of waste flowback fluid that can be stored on site has not been changed and remains at 3,000 cubic metres.</p> <p>As stated in Section 5.9 Table 5 of the approved Waste Management Plan, this waste will be regularly removed and taken to an offsite approved waste facility. In the event that the operator could not find somewhere to take their waste, the operator would have to take the necessary measures to ensure that no further waste of this type is generated until alternative treatment/disposal routes were in place.</p>



<p>activity, is a sensitive issue that will need careful management.</p> <p>The County Council notes the flowback fluid is classified as non-hazardous under the European List of Wastes (the European List of Waste (Commission Decision 2000/532/EC) and Annex III to Directive 2008/98/EC). Nevertheless, the County Council, in its role as hazardous substances authority will need to satisfy itself (via Schedule 1 to the Planning (Hazardous Substances) Regulations 2015) whether the need for a hazardous substance consent is triggered by the amount and type of waste fluid generated. Early assessment indicates that consent is not needed.</p>	<p>No action required.</p>
<p><b>Flare and Capacity</b></p> <p>The County Council notes the proposal to amend table S.1 to state a 360 day flaring limit for the site. The County Council also notes the accompanying air quality assessment from by RSK Environment Limited which concludes the air quality impacts are not significant.</p> <p>Whilst the overall site limit is not increased, there will be potential for some wells to flare for longer periods, while others flare for shorter periods. The Agency will need to satisfy itself that any additional impacts are acceptable.</p>	<p>We are satisfied that changing the flaring limit from 90 days per well to an overall site limit of 360 days is appropriate and will not cause harm to human health or the environment.</p> <p>To ensure the operation conforms to the assumptions contained within the air quality assessments provided in the application, the flaring activity should be controlled by both an overall limit on the quantity of gas combusted, along with compliance limits to control the quality of combustion achieved throughout. We have therefore made changes to the monitoring requirements and added a new preoperational condition (PO10) to request for approval operational and control procedure for the flares prior to that activity starting - see section 3.2 for more details.</p>

<p>Response Received from Public Health England</p>	
<p><b>Brief summary of issues raised:</b></p>	<p><b>Summary of action taken / how this has been covered</b></p>
<p>We recommend that any Environmental Permit issued for this site should contain conditions to ensure that the following potential emissions do not impact upon public health: point source and fugitive emissions to air, land and water.</p> <p>Based solely on the information contained in the application provided, PHE has no significant concerns regarding risk to health of the local population from this proposed variation to the existing permit, providing that the applicant takes all appropriate measures</p>	<p>We are satisfied that the changes proposed under this variation will not have an impact on the environment or human health.</p> <p>The Operator has proposed the use of flares that conform to the requirements contained within our Onshore Oil and Gas Sector Guidance (V1, August 2016) and has provided air quality assessments demonstrating that the impacts from the proposed changes will be negligible.</p>

<p>to prevent or control pollution, in accordance with the relevant sector technical guidance or industry best practice.</p> <p>Any additional information obtained by the Environment Agency in relation to these comments should be sent to PHE for consideration. Such information could affect the comments made in this response.</p>	<p>To ensure the operation conforms to the assumptions contained within the air quality assessments provided in the application, the flaring activity should be controlled by both an overall limit on the quantity of gas combusted, along with compliance limits to control the quality of combustion achieved throughout. We have therefore made changes to the monitoring requirements and added a new preoperational condition (PO10) to request for approval operational and control procedure for the flares prior to that activity starting - see section 3.2. for more details.</p>
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## **2) Consultation Responses from Members of the Public and Community Organisations**

A total of 189 responses were received.

Although the consultation ended on 03/08/2017, any comments that have been received after the close of the consultation and prior to issue of our minded to position 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.

Summaries of the consultation responses and how we have addressed them are as follows:

### **Operator competence and lack of trust in the Operator**

A number of concerns have been raised about the Operator and their competence to run the operations on site. Concerns were also raised that the operator was not transparent in their dealings with the public.

The permit conditions require the Operator to have an appropriate management system in place that includes details of staff capability, roles and responsibilities, experience and training records to demonstrate technical competence. We will assess the operator's activities and we will be checking they comply with their permit conditions as part of our compliance work.

We have carefully considered operator competence and we have no reason to think that they would not comply with permit requirements and conditions.

We have considered all relevant factors and have determined that there is no reason to consider that the applicant will not operate in accordance with the permit.

It is quite common for Operators to conduct their own outreach programmes. Although we offer guidance to Operators, we are not involved in directing how the Operators conduct their public relations exercises. However, we have noted that the Operator published on their website detailed meeting notes produced from each of the community liaison meetings that they held with the local community.

### **Noise pollution**

Concerns have been raised that the activities will cause noise pollution.

We are satisfied that the activities, if carried out in accordance with the permit, will not cause noise pollution.

Condition 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.

### **Scope of the variation**

Concerns have been raised that the Application did not sufficiently explain the scope of the changes the applicant requested.

We are satisfied that the Application contained sufficient details of their proposed changes to determine the application.

Details of the changes requested by the Applicant and how we have assessed them are detailed in section 3 above.

### **Intensification of activity and change in sequencing in relation to Hydraulic Fracturing**

Concerns have been raised that the changing the discharge limit from 765m<sup>3</sup> per day to 765m<sup>3</sup> per stage is a marked increase in the intensity of the permitted activity and the impact of that change on the storage and disposal of the return flowback fluid resulting from the hydraulic fracturing.

This change is to reflect the wording of the approved Waste Management Plan. The Applicant has clarified that multiple stages may be carried out on a daily basis.

There is no increase in risk to groundwater associated with this change. The maximum quantity of waste flowback fluid that can be stored on site has not been changed and remains at 3,000 cubic metres.

As stated in Section 5.9 Table 5 of the approved Waste Management Plan, this waste will be regularly removed and taken to an offsite approved waste facility. In the event that the operator could not find somewhere to take their waste, the operator would have to take the necessary measures to ensure that no further waste of this type is generated until alternative treatment/disposal routes were in place.

Any increase in vehicle movements that may result from this change would be managed by the Operator in accordance with their Planning Permission and would be regulated by the Local Authority.

#### **Changes to the flare limits and impacts on air quality.**

Concerns have been raised that the proposed changes to the flaring limit of 90 day/well to 360 days for the whole site will have an impact on air quality.

We have reviewed the Applicant's proposal and supporting information and we are satisfied that impact of the change from 90 day/well to 360 day for the whole site will be insignificant in terms of air quality.

However, following submission by the Applicant of improved revised flare specification proposals which comply with the requirements of our Onshore Oil and Gas Sector Guidance (v1, August 2016), we have made changes to the monitoring requirements for air emissions as well as impose strict limits on the emissions from the flares.

For more information see section 3. above.

#### **Use of hydrochloric/hydrofluoric acid**

Concerns have been raised about the use of hydrochloric acid and hydrofluoric acid to clean up the well prior to the hydraulic fracturing taking place.

The Operator has not proposed to use hydrofluoric acid as part of their activity.

The use of hydrochloric acid to clean the well prior to hydraulic fracturing has been assessed as part of the original permit application and does not form part of this variation.

#### **Changes to the seismic monitoring and adequacy of the proposed monitoring**

Concerns have been raised that the change in the seismic monitoring will result in less accurate data being collected.

We are satisfied the new proposal will provide better information on microseismic events, in terms of sensitivity and accuracy.

We have consulted professional colleagues within and outside the Environment Agency, including other Regulators. We are satisfied that the downhole array will be an improvement over the shallow borehole array for microseismic event location associated with the hydraulic fracturing. Our reasoning is based on the observations that:

- The array is much closer to the event sources: seismic energy will have propagated through a more uniform and predictable seismic velocity structure, and will not have had to pass through more-attenuative surface layers.
- The downhole array is further from sources of surface noise such as traffic and industrial noise.
- Coupling of the geophones is by clamping within the second borehole of a pair where the first borehole is to be hydraulically fractured, and the integrity and orientation of the geophone array can be adequately verified by downhole shots before the system is used to record microseismic events from the hydraulic fracturing.
- The geophones are 3-component types designed for this application and are spread over a sufficient vertical and horizontal aperture. For stronger events, the possibility remains of using vibration directions, as well as moveout, to estimate arrival directions.
- The velocity model required to calculate positions of event sources is simpler and less prone to measurement error than that required for processing shallow-borehole array data.

- The geophones are less vulnerable to damage, deliberate or otherwise, that might occur by having a number of shallow borehole access points and cabling distributed across the countryside.
- The methodology is well-established and supported by a number of published case studies.

We are aware that accurate event location is required for possible fault reactivations. We have therefore required the Operator to take into account smaller discontinuities noted in their 3D seismic exploration data volume, as being possible faults, during the injection.

**Change are different than what was part of planning application/Environmental Statement**

Concerns have been raised that the proposals in the variation differ from the details provided as part of the Planning Permission and more specifically within the Environmental Statement.

The variation application contained the necessary information for the Environment Agency to determine the application.

Our decision on whether to grant the variation to a permit is separate from the planning process. An Environmental Permit allows the site to operate and to be regulated by the Environment Agency exercising its pollution control functions. The Planning Authority, in this case the Lancashire County Council, decides whether or not to grant planning permission or if a change to a granted permission requires changing.

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 planning authority must also consider and respond to any objections they may receive on a particular planning application.

**B) Advertising and consultation on the Draft Decision**

This section reports on consultation on our draft decision carried out between 06/11/2017 and 04/12/2017

A total of 33 responses were received from individual members of the public as well as Friends of the Earth, Sefton Green Party.

The issues raised in the consultation were the same as those raised previously and already reported in section A of this Annex and the Environment Agency response provided in section A of this Annex has not been repeated and reference should therefore be made to section A.

Also, 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. Our position on these matters is as described previously.

Response Received from Public Health England	
<b>Brief summary of issues raised:</b>	<b>Summary of action taken / how this has been covered</b>
Thank you for sending the draft variation for the above application. Further to our consultation response dated 09 August, we have no further comments.	None required.