Environment Agency Permitting Decisions

Bespoke permit

The Permit Number is : EPR/BB3000KC

The Applicant/Operator is : Rathlin Energy (UK) Limited

The Site is located at : Crawberry Hill Well Site,
Land South West of Crawberry Hill,
Walkington Heads,
Beverley
HU17 RU

Consultation commenced on : 12 February 2014

Consultation ended on : 12 March 2014

We have decided to grant a permit for the Crawberry Hill well site operated by Rathlin Energy (UK) Limited.

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 document 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 matters 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

We gave the Application the reference number EPR/BB3000KC/A001. We refer to the Application as "the **Application**" in this document in order to be consistent.

The number we have given to the permit is EPR/BB3000KC. We refer to the permit as "the **Permit**" in this document.

The Application was duly made on 04/02/2014.

The site for the proposed mining waste operation is located at Crawberry Hill Well Site on land south west of Crawberry Hill, Walkington Heads, Beverley, HU17 8RU.

Use of terms

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 Permit is granted, we call Rathlin Energy (UK) Limited "the **Operator**".

Conditioning spacer
Conditioning spacer is a fluid used to separate drilling fluids and cement and is used to displace drilling muds from the borehole prior to cement being applied.

Drilling muds
Drilling muds are used to lubricate the well bore while drilling.

Drill cutting
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.

Prospecting
Is defined by article 3(21) of the Mining Waste Directive as 'the search for mineral deposits of economic value, including sampling, bulk sampling, drilling and trenching, but excluding any works required for the development of such deposits, and any activities directly associated with an existing extractive operation'.

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 gas are burnt in a controlled manner. The gas flow is ignited under controlled conditions and this test allows the potential gas reservoir characteristics to be determined.

Regulated facility
This is the term used in the Environmental Permitting (England and Wales) Regulations. Those regulations provide that any regulated facility must be operated only under and in accordance with an environmental permit. The regulations define this term as to include a "mining operation". A "mining operation" is further defined so as to include the management of extractive waste whether or not it involves a waste facility. The term "regulated facility" is therefore quite different to the term "waste facility" which is defined in the Mining Waste Directive.

Reservoir
A porous and permeable rock in which oil or gas may be present.

Surface conductor
The first string of casing run to prevent surface losses and or washouts below the cellar base in addition to isolating aquifers.

Well bore
The inside of the borehole which has been drilled through different geology and characteristics of the rock.

This decision document:
- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

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

Structure of this document

Key issues
1. Summary of our proposed decision
2. How we took our decision
3. Brief outline of process
4. The legal framework
5. Description of the facility
6. General issues
7. Environmental issues: and their control
8. Other legal requirements

Annex 1 the consultation and web publicising responses

Key issues of the decision

This Application is for a permit for the management of the extractive waste resulting from prospecting for hydrocarbon resources, namely oil and gas at Crawberry Hill well site in East Riding of Yorkshire.

The Application includes the flaring of waste gas arising from such prospecting activities. As the produced water arising from the appraisal activities has the potential to contain low levels of Naturally Occurring Radioactive Material (NORM) in sufficient quantities to be classed as radioactive waste, the operator has applied for a separate Radioactive Substances Regulation (RSR) permit which will regulate the ways in which the operator manages radioactive material.

The RSR permit Application, will be considered separately from this permit and will also be regulated by the Environment Agency.

If, following this stage, the Applicant decides it wishes to proceed to either any different or additional prospecting activities and/or full scale commercial production, a variation of the permit will be required.

Any such Application would be determined on its merits and be subject to our normal consultation process. Any Application to vary will require an amended waste management plan to be submitted and considered by us.

Unless otherwise agreed in writing by the Agency, the permit requires the Operator to comply with the techniques in the waste management plan and limits the activities to those stated. We will only authorise minor amendments to the waste management plan without the need to vary the permit.

1. Summary of our decision

We have decided to grant the Permit to the Applicant. This will allow it to operate the mining waste operation, for the management of extractive waste arising from prospecting for mineral resources as set out in their waste management plan. The permit will also allow flaring of waste gas arising from prospecting activities as set out in the waste management plan and subject to any 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 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 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 the details are sufficient and satisfactory to make the standard condition appropriate.

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

2. How we took our decision

The Application was duly made on 04/02/2014. This means 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 Regulations 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 placed a paper copy of the Application and all other documents relevant to our determination on our Public Register at Lateral house, 8 City Walk, Leeds, LS11 9AT.

We also sent a copy of the Application to East Riding of Yorkshire Council Offices for its own Public Register. 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, East Riding of Yorkshire Council
- Mineral Planning Authority, East Riding of Yorkshire Council
- Health and Safety Executive
- Public Health England Director of Public Health
- Director of Public Health, East Riding of Yorkshire Council

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

Further details along with a summary of consultation comments and our response to the representations we received can be found in Annex 1. We have taken all relevant representations into consideration in reaching our determination.

3. Brief outline of process

The waste to be managed, which includes the flaring of waste gas, arise from the prospecting for mineral resources.

The formations in which prospecting will take place are the Upper Visean/Lower Namurian at a depth of approximately between 2,677 metres to 2,682 metres and the Carboniferous Sandstone and Permian Carbonate formations at depth of approximately 1,850m.

In the shale interval of upper Visean and Lower Namurian shale interval the intention is to establish whether and if so at what pressure the formation becomes permeable. This test relates to the search for gas and oil reserves of economic value.

The Lower Namurian interval is itself a carboniferous sandstone formation, within which a flow test may be performed if permeability of the interval is suitable. A flow test will be done in the Carboniferous Sandstone formation and Permian Carbonate formation. In the event the flow test produces a mineral resource of economic value it is expected to be natural gas, although it may have hydrocarbon liquids, formation water and oil associated with it.

The Crawberry Hill well site was constructed in the second quarter of 2013. The site was constructed by removing the topsoil and subsoil to create a level plateau. A containment ditch was created around the site.

A 1 mm fully welded impermeable membrane was then laid across the site and perimeter containment ditches, protected above and below by a layer of non-needle punch geotextile. The high density polyethylene membrane and geotextile was then overlaid with a geo-grid which was then covered with 300mm surface layer of MOT Type 1 stone. The impermeable membrane provides containment for any spilled liquid.

Following construction of the site, a borehole which is 2,750 metres in depth was drilled on site. The drilling was done in two separate phases. The first phase involved drilling using a conventional water well drilling rig to drill the surface conductor up to a depth of 203 metres. The second phase involved drilling with a conventional oilfield drilling rig up to 2,750 metres.

It is proposed to drill a second exploratory borehole on the same site using methods similar to those adopted in drilling the first borehole. These methods are described in the Waste Management Plan.

The prospecting activities are targeting rock formations that lie between 1,500 metres and 2,750 metres depth.

The previously drilled borehole and the proposed new borehole will be subjected to a well maintenance and drilling programme involving the following operations in chronological order:

3.1. Well maintenance

This will involve cementing operations and routine maintenance operations to ensure integrity of the borehole.

3.2. Well testing

Well testing involves various different processes, all of which are intended to obtain a greater understanding of the underground geology and ultimately determine whether the geological formations are capable of producing commercial quantities of petroleum. Well testing processes do vary, depending on the geological formation being tested as is the case here.

Geological logging is undertaken during well construction to determine whether geological formations encountered during drilling contain hydrocarbons. The borehole logs assist the operator to determine specific zones which can be targeted for subsequent testing.

An overview of the well testing processes is:

3.2.1. Mini fall-off test in the Upper Visean/Lower Namurian shale:

A mini fall-off test is a short term duration formation test designed to gather reservoir engineering data including data on characteristics and properties of the Upper Visean/Lower Namurian shale formations. The test which is performed in the geological formations at a depth of approximately between 2,677 and 2,682metres, is carried out to establish the pressure at which injectivity of fluid occurs into the geological formation.

It is also used to determine how the pressure permeates through the formation over a period of about 14 days. The test involves pumping into the rock formation between 5 cubic metres and 10 cubic metres of a solution of Potassium Chloride (KCl) and water for about 5 to 10 minutes. When pumping is complete, the residual pressure within the tubing used for pumping the water is shut in and monitored for about 14 days.

3.2.2. Flow test within carboniferous sandstone

Pressure monitoring and flow test of gas will be performed within the Lower Namurian sandstone formation that is at a depth of 2,587 metres.

In order to establish communication between the formation and the well bore, perforating guns will be run into the well bore and fired, providing a direct connection between the formation and the well bore. A retrievable packer will then be lowered into the well bore across the formation to monitor formation pressure. In the event that hydrocarbons are encountered and permeability in the Lower Namurian sandstone formation is suitable, a flow test may be undertaken, as described in section 3.6. below. Based on the current available information, the flow test will be of natural gas, which may have hydrocarbon liquids, formation water and oil associated with it.

3.2.3. Acid wash/squeeze and flow test in the Permian carbonate formation

The acid wash and squeeze is being performed as part of the prospecting within the geological formations at a depth of 1,850 metres.

To improve the flow of gas or other hydrocarbons that may be present within a carbonate formation, and hydrochloric acid (HCl) solution at 15% concentration with water, is applied to the formation through the well bore. The operation is similar to acidisation of boreholes in the water well industry and results in high permeability channels through which material can flow.

An acid wash is applied using low pressure and will be used to clean out the natural fractures, which would have been blocked as a result of the initial drilling operation. An acid squeeze means applying the dilute hydrochloric acid solution to the formation under pressure not exceeding the fracture pressure of the formation, resulting in the acid being squeezed through the natural fractures within the geological formation and increasing the near hole permeability.

The proposed dilution of hydrochloric acid is 15%, i.e. 150 litres of HCl with 850 litres of water, which is circulated across the perforations using 1 cubic metre of HCl solution per single stage wash. The process of washing the perforations is repeated a further four times. Following the washing of the perforations, HCl solution is then selectively squeezed into the formation at 1 cubic metre of HCl solution per metre of perforation.

3.2.4. Flow test (Carboniferous sandstone and Permian carbonate) and flaring of gas

A flow test is a short to medium duration test to analyse the flow characteristics of a formation. In this case the carboniferous sandstone formation and the Permian carbonate will primarily be tested for natural gas which may have hydrocarbon liquids, formation water and oil associated with it.

In order to establish communication between the formations and the well bore, perforating guns will be run into the well bore and fired, providing a direct pathway from the formations to the well bore, through which hydrocarbons can flow. This is expected to be natural gas which may have hydrocarbon liquids, formation water and

oil associated with it. This is flowed to surface together with produced fluids through the well bore into temporary fluid separation equipment located on site.

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.

Formation water, which is considered a waste, will be transported by a licensed haulier to a permitted water treatment facility where it will be processed, treated and discharged in accordance with the permitted controls of the water treatment facility. Formation water has been classed as non-hazardous.

Gasses are separated from produced fluids, the flow rate and pressure of the gas are measured and then the gas will be diverted via temporary pipe work to an enclosed single point enclosed flare located on site for incineration. The gas will become waste after its flow rate and pressure are measured. 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.

3.4. Well abandonment

In the event that any of the wells are not successful in establishing commercially producible mineral resources, the wells will be abandoned in accordance with Oil and Gas “UK Guidelines for the suspension and abandonment of wells”, the Borehole Sites and Operations Regulations 1995, and the Offshore Installations and Wells (Design and Construction regulations)1996. The guidelines and regulations require all distinct permeable zones penetrated by the well to be isolated from each other and from surface by a minimum of one permanent barrier. If any permeable zone penetrated by the well is hydrocarbon-bearing or over-pressured and water-bearing then the requirement is for two permanent barriers from surface, the second barrier being a back-up to the first.

Once the well is abandoned, the casing strings will be mechanically cut off at 1.5 metres below the original ground level and a steel plate welded over the top. The pre-cast concrete drilling cellar would then be removed and the site restored to its former use.

4. The legal framework

The drilling and management of the extractive waste are regulated under different regimes. An Operator will need planning permission from the local Minerals Planning Authority, and a Petroleum Exploration and Development Licence (PEDL) from the Department of Energy and Climate Change (DECC).

The Permit is granted under regulation 13 of the Environmental Permitting (England and Wales) Regulations 2010, which regulates facilities whose activities involve water discharges and groundwater activities, radioactive substances, waste, mining waste or which are listed in schedule 1 to the 2010 Regulations. The Environmental Permitting regime is the regulatory framework which requires the Environment Agency to deliver the obligations required by national policy and various EC Directives.

We consider that the permit will ensure that the operation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

5. Description of the operation

The operation involves two classes of “regulated facility” as defined in the Environmental Permitting (England and Wales) Regulations 2010 (EPR), namely a mining waste operation and an installation.

As well as being a mining waste operation involving the management of extractive waste the activities also involve an installation because the proposed activities will involve the incineration of hazardous waste, namely gas.

By virtue of the 2010 regulations, an environmental permit is required for the operation of a regulated facility.

5.1. Description of the site and related issues

5.1.1. Location

The site is called Crawberry Hill Well Site and is located 1500 metres to the north east of Walkington and about 2000 metres south west of Bishop Burton. Residential receptors that are located within a 1.5 mile radius of the site are Cold Harbour Farm which is 870 metres to the north, Westfield farm which is 1070 metres to the south east and Walkington Wold Farm which is 1050 metres to the south west.

5.1.2. Site of Special Scientific Interest

There are no Sites of Special Scientific Interest that are located within 1 kilometre of the site.

5.1.3. Special Protection Areas

There are no Special Protection Areas that are located within a 10 mile radius of the site.

5.1.4. National reserve, Special Areas of Conservation and Ramsar sites

There are no national reserves, special areas of conservation or Ramsar sites located within a 10 kilometre radius of the site.

5.1.5. Local wildlife sites

Wildlife sites that are within a two mile radius of the site are Little Wood, North Newbald, Low Balk, Crawberry and Court Garth Rush.

The Applicant submitted a plan showing the extent of the site and locations to be used for monitoring air quality. We are satisfied with this plan. The plan is included in the permit

5.2. What the regulated facility does

The permit will authorise the operation of a regulated facility, namely a mining waste operation for the management of extractive waste not involving a waste facility. The permit will also authorise the incineration of hazardous waste, namely waste gas in a waste incineration plant with a capacity exceeding 10 tonnes a day.

If the project does progress to either further prospecting activities and/or full scale production and/or mineral exploitation (including any pre-production development), a variation of the permit will be required. This would take into account any changes in the nature and management of extractive wastes and also any changes in the manner and/or scale of operation. If a permit variation is applied for, this will need to be accompanied by an amended waste management plan which will be carefully reviewed. Any such application will be determined in accordance with our normal procedures, including consultation.

5.3. Waste management activities

The wastes that will or may need to be managed on site are:

- Well suspension brine (01 05 08)
- Solidified cement which is in excess of that used (17 01 01)
- Spent hydrochloric acid and calcium chloride (16 10 02)
- Formation water (16 10 02)
- Waste gas
- Nitrogen
- Waste clays and sand (01 04 09)
- Waste water based drilling muds (01 05 04 and 01 05 08)
- Drill cuttings (01 04 08 and 01 05 08)
- Any excess conditioning spacer
- Potassium chloride solution left in the Upper Visean/Lower Namurian Formation

Storage arrangements and pollution prevention measures are discussed in Sections 6.9 and 6.10.

The following text is a brief description of how the wastes arise and what will happen to them.

5.3.1. Well suspension brine

The Crawberry Hill 1 well is currently suspended using suspension brine and mechanical plugs. The brine is used to fill the well bore to prevent the ingress of natural gas to the well bore. During any well intervention work/and or flow testing the suspension brine will be circulated out of the well to an onsite storage facility via temporary surface pipe work. The suspension brine will be stored onsite for subsequent reuse as suspension brine within the well operation or at other well site operations. If it can be re-used this will minimise waste.

Once the suspension fluid has fully served its purpose at the well site or other well site operations, the suspension brine will be removed from site via a licensed haulier to a suitably permitted waste water treatment works facility where it is processed, treated and discharged in accordance with permitted controls. None of the suspension brine will remain in the formation as it is circulated out prior to well intervention and/or flow testing.

5.3.2. Excess solidified cement

Cementing remediation work will be done as part of the well maintenance operations. Cement will also be used to completely seal the well bore annulus, and in the case of well abandonment a number of cement plugs will be set inside the borehole.

Measures will be taken to correctly assess the amount of cement that is required.

However, it will not be possible to make completely accurate predictions and there may be an amount which is in excess of that used. Measures will be taken to minimise the amount of excess material, namely calculating the quantity of cement required as accurately as possible based on the engineering characteristics of the well.

Excess cement which will be returned to the surface will be transferred to a number of open top builders' skips for subsequent removal and disposal to a suitably permitted waste facility.

5.3.3. Hydrochloric acid

Hydrochloric acid is used to wash and clean out natural fractures within carbonate formations that would have been blocked as a result of the initial drilling operations. In addition, dilute hydrochloric acid solution is squeezed into the natural fractures of the carbonate formation under pressure, increasing permeability.

The hydrochloric acid solution will be used in stages to ensure the quantity used is minimised. Hydrochloric acid reacts with calcite and dolomite to produce calcium chloride, which is non-hazardous.

The calcium chloride will be reverse circulated out of the well bore into a number of 1 cubic metre containers stored onsite for subsequent removal via a licensed haulier to a suitably permitted facility where it is processed, treated and discharged in accordance with permitted controls.

5.3.4. Produced water

During flow testing operations of the Carboniferous Sandstone and Permian Carbonate formations, there is a possibility of formation water being produced together with gas and oil. Formation water is separated from the gas or gas and oil on surface using temporary fluid separation equipment and transferred via temporary pipe work to storage tanks located onsite for off site removal.

The ability to prevent or minimise formation water is extremely limited. Options for reinjection of produced water have not been considered as the operations are exploratory at this stage and there is uncertainty as to whether produced water will arise from the permitted activities. We are satisfied that the waste, should it arise will be non-hazardous.

5.3.5. Waste gas

During flow testing operations there is a likelihood of natural gas being produced from the Carboniferous Sandstone and Permian Carbonate formations. This will be flowed to determine the characteristics of the formation, allowing the Operator to determine whether or not the reservoir is sufficient enough to produce commercial quantities of natural gas. After the gas has been tested, it will become waste unless it can be used.

There is a requirement to prevent or minimise the generation of wastes. We are satisfied that it would not be feasible to use the gas on site during this prospecting stage.

Natural gas is separated from hydrocarbon liquids, produced water and oil fluids at surface and diverted via temporary pipe work for the flow rate to be tested. It will then enter a ground flare located onsite for incineration.

The ground flare will be fitted with a pilot and an electrical ignition system. Natural gas is considered waste at the point of incineration. An air modelling and dispersion assessment has been carried out to assess the impact of incinerating gas and we are satisfied that the contribution of emissions from the proposed flaring at locations closest to the well sites is considered to be insignificant. Condition 3.1.2 of the permit imposes limits for gaseous emissions which must not be exceeded. The operator will be required to monitor the emissions to air from the incineration activity.

5.3.6. Nitrogen

Nitrogen is injected into the well to aid the initial lifting of well bore fluids, thus reducing the hydrostatic pressure and allowing natural gas to flow to the surface. The quantities of nitrogen required are small and limited to the minimum necessary. As an inert gas nitrogen that has been previously extracted from the atmosphere will be vented back into the atmosphere without the need for any treatment.

5.3.7. Waste clays, sand and conditioning spacer

The drilling of the exploratory borehole will commence with drilling and installation of a casing string known as a surface conductor. The drilling operation will be carried out using a water well drilling rig which will drill the near surface clays and sands within which the surface conductor casing will be set and cemented into position.

The clay and sand will be circulated out of the well using either an auger or water based drilling fluids and returned to the surface where it is transferred to an open square tank. The ability to prevent or minimise clay and sand arisings is limited given that the underground material within the path of the borehole needs to be removed to allow the conductor casing to be installed. The clay and sand will be transported offsite to a permitted waste facility.

5.3.8. Drilling muds and drill cuttings

An exploratory vertical borehole will be drilled through several layers of rock to a depth of approximately 3,200metres. The process of drilling the borehole will create extractive waste in the form of drill cuttings, spent drilling muds, and solidified cement.

Water based drilling mud will be used in the drilling process.

Drilling muds are used to aid in the drilling process by lubricating the drill bit, circulating to surface the rock cuttings from the drilling process and for well control by maintaining a prescribed hydrostatic pressure within the well to prevent the uncontrolled release of natural gas or formation pressure. Drilling muds are used in a closed loop system, within which the rock cuttings are circulated to surface and removed by vibrating screens (shakers). Finer particles of rock cuttings are then extracted from the drilling mud by a centrifuge and the drilling mud will be circulated back down the well.

Drilling mud waste will be minimised by continually reusing the mud, until it is spent, in a closed loop system and sustained by way of filtering out rock cuttings and finer particles of rock. The rock cuttings tank is a fluid separator tank (perforated false floor), which allows drilling muds coated to the rock cuttings to percolate down through the false floor where it is collected and pumped back into the closed loop mud system.

When the drilling mud weight exceeds the prescribed mud weight, having utilised all means to remove the finer particles, it will need to be diluted. Dilution requires the removal of a prescribed volume of active drilling mud which becomes waste spent drilling muds and diluting the remaining volume with new drilling mud.

Drilling muds are used in a closed loop system and become a waste when no longer required for use in the operation or become spent. In such an event the drilling mud will be transferred from the active mud system on the drilling rig to a vacuum tanker for removal offsite via licenced haulier to an authorised permitted facility.

Drilling muds used will be monitored to ensure that losses to the surrounding geological formation are prevented or where that is not possible minimised. If there are any variations in pressure and pump rates which may indicate fluid losses to the mud formation, water based fluid loss control agents will be used to minimise leaks. These loss control agents are added to drilling muds and they form a thin low-permeable layer that seal and plug small holes or fractures which stops fluid loss to the surrounding formation.

5.3.9 Potassium chloride solution left in the Upper Visean/Lower Namurian Shale Formation

The mini-fall off test to be carried out in the Upper Visean/Lower Namurian shale formation as part of the prospecting will involve pumping a small quantity (5-10 cubic metres) of dilute potassium chloride solution without a propant into the Shale formation at pressure below the fracturing pressure of the formation for 5-10 minutes. The well will then be shut in for 14 days while the operator monitors how the residual pressure permeates through the formation.

This dilute solution will be absorbed and remain locked within the micro pore space of the rock formation once the test is complete and can not return to the surface or migrate from the target formation due to the natural impermeable nature of the formation. Only the required quantity of fluid will be use in this process. This potassium chloride solution is non-hazardous.

6. General issues

6.1. 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 permit 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 permit.

6.2. Management

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

6.3. Financial competence and relevant convictions

We are satisfied that sufficient financial resources are available to the Operator to ensure compliance with the permit conditions.

The Operator does not have any relevant convictions.

6.4. External Emergency Plan

The provisions relating to an external emergency plan do not apply.

6.5. Site security

Having considered the information submitted in the application, we are satisfied that appropriate infrastructure and procedures will be in place to ensure that the site remains secure. This is part of the written management system of the permit, condition 1.1.1 (a).

6.6. 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 but that, if they should occur, their

consequences are minimised. This is part of the written management system of the permit, required by condition 1.1.1 (a).

6.7. Surrender of the permit

When the Operator wants to surrender their permit, they 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.

6.8. The site and its protection

6.8.1 Site setting, layout and history

The site is located on Crawberry Hill Well Site on land south west of Crawberry Hill, Walkington Heads, Beverley, HU17 8RU.

6.8.2. 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 East Riding of Yorkshire 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.

6.8.3. Site condition report

The Operator submitted a site condition report detailing the condition of the site as part of their application. We use the information in a site condition report to

establish a baseline for the condition of the site prior to the permitted activity starting. This baseline will be used as a comparison, to establish whether there has been any deterioration of the land as a result of the permitted activities, when the Operator applies to surrender their permit.

We have also specified a pre-operational condition 2.4.1 which compels the operator to provide the Environment Agency with a report that describes baseline groundwater quality information for the site. The report must be provided at least two weeks prior to commencement of the permitted activities.

The Operator must keep accurate records throughout the lifetime of their permit to clearly demonstrate that their activity has not adversely affected the site. This record will be used, in conjunction with the baseline data described above, to support any surrender application.

6.8.4. Pollution prevention measures

We have considered the location of the site, actual and potential emissions, the sensitivity of receptors and the nature of the activity to decide what appropriate pollution prevention measures need to be in place.

As part of our assessment of the application we have carefully considered the risk assessment and all associated documents provided by the Applicant. We consider that these cover all the potential risks and sets out appropriate measures by way of mitigation.

6.9. Soil and Surface water management

The site was constructed by removing the topsoil and storing it on the eastern and southern boundary of the site. The subsoil was then cut to create a level plateau. The site was constructed as a sealed site, with a perimeter ditch to provide containment of any surface water or spillages that may accidentally flow from the site.

A 1 mm fully welded impermeable membrane was then laid across the site and perimeter containment ditches, protected above and below by a layer of non-needle punch geotextile. The high density polyethylene membrane and geotextile was then overlaid with a geo-grid which was then covered with 300mm surface layer of MOT Type 1 stone. The impermeable membrane provides containment for any spilled liquid.

An integral part of the well design is the well cellar. A 2.75 metre deep drilling cellar was constructed using pre-cast concrete rings, with each ring being individually sealed and cemented to ensure integrity. The cellar comprises a reinforced concrete chamber sunk and cemented into the ground with the top surface, level with the main site platform. This provides containment for any overspill of returned fluids, cement and surface water run-off from the well pad area. A similar approach will be adopted in drilling the second exploratory borehole.

6.10. Storage arrangements

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 membrane is self-sealing if punctured, with high climatic and chemical resistance. The geotextile membranes are then covered with a layer of compacted stone material.

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 eleven 1 cubic metres bunded Intermediate Bulk Containers.

Formation water, which is non-hazardous waste, will be stored in four 60 cubic metres horizontal cylindrical closed tanks. This will be stored for up to three months in order to allow for radionuclide analysis.

There will be no storage for waste gas as it will be incinerated as it is produced.

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.

6.11. Air quality management

During flow testing operations, there is a likelihood of natural gas being produced from the Carboniferous Sandstone and Permian Carbonate formation and flowed at different rates to determine the characteristics of the formation. These flow tests allow the Operator to determine whether or not this reservoir is capable of producing commercial quantities of natural gas.

The ability to prevent or minimise the production of natural gas is extremely limited during this operation as it is necessary to allow the operator to determine the condition or state of the reservoir. Given that the operation is exploratory, and the infrastructure required and the temporary nature of the operations, it is not practicable to capture the gas for sale and transportation for reuse as a fuel or other means of generating energy.

Natural gas is separated from produced fluids at surface and diverted via temporary pipe work for the flow rate to be tested. It will then enter a ground flare located onsite for incineration.

When in operation, the flare will be supervised 24 hours a day to ensure its effectiveness to incinerate the natural gas. In addition air emissions from the flare will be monitored.

The operator has provided an air and dispersion modelling report that assesses the likely impact of flaring. The expected composition of any natural gas that may arise from the activities is approximately 90% methane with the remainder a mixture of ethane, propane and butane. We are satisfied that the combustion of this natural gas will not result in pollution or harm to human health and that it is not necessary to set emission limits as the operating controls will ensure effective combustion.

We have reviewed the information submitted and we are satisfied that the design of the flare is appropriate. We are also satisfied that suitable measures are in place should the conversion standards not be achieved.

We have included monitoring conditions in the permit requiring the Operator to monitor for temperature, volume of gas going into the flare, oxides of nitrogen, oxides of sulphur, carbon monoxide, methane, and total non-methane volatile organic compounds and to provide monthly reports of the monitoring results. These cover the most significant emissions that are expected to occur and will also demonstrate whether the flare is operating effectively.

During drilling of the second exploratory borehole, fugitive emissions of natural gas are to be prevented by increasing the hydrostatic pressure of fluids so as to prevent gas release. The well will also be equipped with physical control equipment which enables the well bore to be shut at the surface to prevent escape of gas emissions. Gas monitoring equipment will be in constant use. The permit does not allow the venting of natural gas.

Fugitive emissions of methane could potentially arise from the well bore and mud circulation system. The Operator has provided a specific risk assessment for this scenario which includes monitoring and proposes abatement and emergency control measures. We are satisfied that these measures to minimise the risk of fugitive emissions, together with condition 3.1 provide acceptable controls.

6.12 Odour management

Odour is not considered to be an issue considering the site is in a rural location, which is 600 metres from the nearest sensitive receptor. The activities are expected to be of short duration. We are satisfied that the environmental risk assessments contain adequate measures to manage odour. Under Condition 3.2 of the permit, the regulator 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.

6.13 Noise management

The Operator will undertake noise monitoring and implement a noise management plan, in line with their planning permission.

Under Condition 3.3 of the permit, the regulator can require the operator to produce and implement a noise management plan in the unlikely event that activities at the site give rise to noise. We are satisfied that adequate measures will be in place to manage noise.

7. Environmental Issues and their control

This section of the document explains how we have approached the critical issue of assessing the likely impact of the permitted activities on human health and the environment. It also details the measures we require to ensure a high level of protection. The principal potential emissions are those to air, water and land.

The key issues arising in relation to human health and the environment during this determination were protection of groundwater; emissions to air; odour; noise; contamination of land; and water quality.

The detail in the section below relates to how we determined these issues.

7.1. Assessment of environmental impacts

We are satisfied that the Applicant has properly assessed the risks posed by the proposed activities. The risks identified are detailed in the Applicant's risk assessment. This covers assessments of risks to surface, ground and air. We have reviewed the Applicant's assessments of the environmental risk from the operations. The Applicant's risk assessments are satisfactory.

7.2. Biodiversity, Heritage, Landscape and Nature Conservation

There are no sites of special scientific interest or designated European sites that are nearby and which can be affected by the proposed activities.

7.3. Waste Management Plan

Under the Mining Waste Directive (Article 5) an Operator of a mining waste operation must draw up a waste management plan (WMP) for the minimisation, treatment, recovery and disposal of extractive waste. We have assessed the Applicant's waste management plan. The waste management plan references other documents which together fulfil the requirements of Article 5 of the MWD and ensure that the requirements in Article 4 of the MWD are also met.

We have approved the plan as a whole, subject to conditions in the permit. We are satisfied the permit requirements including the WMP will protect the environment and that Articles 4 and 5 of the MWD are met.

The WMP provides that the material inputs (e.g. drilling muds and dilute hydrochloric acid) have been selected to minimise risk and will be restricted to the minimum amount necessary, thereby minimising the amount of waste generated. It provides an estimate of the amount of each waste that will be managed. Wastes arising from the activities will be recovered where possible. It also characterises each waste type. We are satisfied that waste is correctly characterised taking into account the definition in Article 3 of the Waste Framework Directive.

The WMP including any associated documents are incorporated into the permit by means of condition 2.3.1 and table S1.2. The WMP needs to be reviewed every 5 years but in the unlikely event that the activities give rise to pollution, condition 2.3.1 enables us to require a revision of the plan to be submitted to us for approval and implemented thereafter. Condition 2.3.2 is a standard condition and refers to an extended time period. Although the condition is used in the permit, we do not expect the mining waste operation to extend beyond a year.

7.4. Setting permit conditions

We have set conditions in the permit in accordance with our Regulatory Guidance Series, No RGN 4 – *Setting standards for environmental protection (version 3.0).* This guidance note explains how we determine the requirements that should apply to a particular activity. Permit conditions specify certain key measures for that type of activity to protect the environment. Other measures may be required through outcome-based conditions. Outcome based conditions specify what we want the Operator to achieve, but do not tell them how to achieve it.

We have used the relevant generic conditions from our bespoke permit template along with other, activity-specific conditions to ensure that the permit provides the appropriate standards of environmental protection.

Our generic conditions allow us to deal with common regulatory issues in a consistent way and help us to be consistent across the different types of regulated facilities. We have included our generic conditions on fugitive emissions, odour and noise/ vibration to control emissions from the facility.

7.5 Protection of groundwater

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 potential risks to groundwater have been adequately identified and addressed through mitigation measures.

We have evaluated whether a Groundwater Activity Permit is required. Based on the information presented, we have determined that a Groundwater Activity Permit is not required for the proposed activities of drilling for exploratory purposes and the limited well testing, based on the following:

We consider that the use of proposed drilling muds and well testing activities will comply with the groundwater activity exclusion under the Environmental Permitting (England and Wales) Regulations 2010, paragraph 3.3(b) of Schedule 22 in that any discharge to groundwater that may occur would be of a quantity so small as to obviate any present or future danger of deterioration in the quality of any receiving groundwater and that a permit will not be required.

The geological formations into which the tests will be carried out are isolated from near surface aquifers and groundwater formations by about 1,600 metres of overlying rock formations.

The acid wash and squeeze is being performed within at a depth of 1,850 metres. It is anticipated that between 6 cubic metres to 11 cubic metres of diluted hydrochloric acid solution will be pumped into the geological formation during the acid operation, with all spent acid being recovered to surface. The diluted hydrochloric acid solution reacts with calcite or dolomite through a dissolution process to produce carbon dioxide, water and chloride ions. The chloride ions exist in the water and pair to form calcium chloride. Calcium chloride is not a hazardous substance and can therefore be considered as a non-hazardous pollutant. All of the spent hydrochloric acid and calcium chloride solution will return to the surface.

As a precautionary approach, we have imposed a pre-operational condition 2.4.1. that requires the operator to establish baseline groundwater quality data. We have imposed condition 3.5.1 (b) that requires the Operator to monitor groundwater.

Other considerations are:

7.5.1. That the well bore is to be constructed in accordance with the requirements of the HSE and the Petroleum and Development Licence. It is also designed in accordance with industry best practice and in compliance with the Installation and Wells (Design and Construction) Regulations 1996 (DCR). DCR requires the design of the well to be such that no unplanned escape of fluids can occur. The Agency has assessed the risk of drilling a borehole through the Cretaceous Chalk aquifer and we consider that the design of the proposed well bore meets the requirement to prevent any release of liquids in to the water environment.

7.5.2. We have assessed the method of construction of the borehole and the proposed drilling additives and we are satisfied that the methods used are appropriate and will ensure that the groundwater is protected. The Operator can only use additives that have been assessed and approved by the Environment Agency or equivalent alternatives subsequently approved. Assessment and approval is also required prior to the use of any other additive during the activities if the Operator needs to use different additives for operational reasons.

7.5.3. We have carefully considered the risk assessment provided by the Applicant and consider that it covers all the potential risks and sets out appropriate measures by way of mitigation.

7.5.4. The Operator's own monitoring will include the monitoring of any loss or gain of fluids within the mud system throughout drilling and appropriate actions to be taken.

7.5.5. As previously stated, only water based drilling muds will be used due to the nature of the formations being drilled.

7.6. Emissions to air

During the determination of this application, we carefully considered emissions to air that will arise from the flow testing operations. During these operations, there is a likelihood of natural gas being produced from the formation and flowed at different rates to determine the characteristics of the formation.

The Operator has provided environmental risk assessments and consideration in the WMP and associated documents for this scenario which includes monitoring. Natural gas is separated from produced fluids at surface and diverted via temporary pipe work to an enclosed ground flare located onsite for incineration.

Due to the absence of infrastructure that would be necessary to allow for the storage or utilisation of the gas and considering the temporary nature of the activities under this prospecting phase, it is necessary for the gas to be flared.

The ability to prevent or minimise the production of natural gas is extremely limited during this operation as the Operator will need to determine the condition and state of the reservoir and make a determination of whether or not the reservoir is viable for commercial production.

Natural gas is considered waste once it has served its useful purpose, namely having been tested. It will therefore be a waste at the point of incineration. An air modelling and dispersion assessment has been carried out to assess the impact of incinerating gas. The expected composition of any natural gas that may arise from the activities is approximately 90% methane with the remainder a mixture of ethane, propane and butane. We are satisfied that the combustion of this natural gas will not result in pollution or harm to human health and that it is not necessary to set emission limits as the operating controls will ensure effective combustion.

We have reviewed the information submitted and we are satisfied that the design of the flare is appropriate. We are also satisfied that suitable measures are in place should the conversion standards not be achieved.

The operator will be required to monitor emissions from incineration activities which will be released into the air. We are satisfied that these measures to minimise the risk of fugitive emissions, together with condition 3.1 provide acceptable controls.

7.7. Odour

We carefully considered potential odour emissions from the activity during our determination. Condition 3.2.1 in the permit requires that emissions from the activities shall be free from odour at levels likely to cause pollution outside the site.

We are satisfied that adequate measures will be in place to manage odour.

We do not consider that the activity will give rise to significant levels of odour. However, we have included condition 3.2.2 in the permit. This condition enables us to require the Operator to submit a specific odour management plan, should odour become a problem. 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.

7.8. Noise and vibration

We carefully considered emissions from noise and vibration during our determination. Condition 3.3 in the permit requires that emissions from the activities shall be free of noise and vibration at levels likely to cause pollution outside the site.

We have included condition 3.3.2 in the permit. This condition enables us to require the Operator to submit a specific noise and vibration management plan, should noise and vibration become a problem. 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.

There are also planning conditions in place relating to the level of noise emitted from the site during the drilling phase.

7.9. Monitoring

Condition 3.5 of the permit will require the operator to monitor emissions into air and groundwater.

The Applicant has provided a site management and monitoring plan and in order to demonstrate that the activities are not causing pollution, we have included this monitoring in the permit. The operator will be required to monitor emissions which will be released into the air from incineration of gas. We are satisfied that these measures to minimise the risk of fugitive emissions, together with condition 3.1

provide acceptable controls.

7.10. Site stability

The management of waste is limited to waste generated from prospecting. The well testing activities will involve pumping of low volumes of liquid, of less than 10 cubic metres into formations at depths of more than 1,600 metres for duration of 5 to 10 minutes at a time and flow test from the Carboniferous Sandstone and Permian Carbonate formations. Given the low volumes of fluid involved, the limited duration of injecting the fluids and flow testing, it is unlikely that these well testing activities will affect the stability of the site.

7.11. Other legal requirements

7.11.1. Mining Waste Directive 2006/21/EC

In this section we explain how we have addressed other relevant legal requirements, to the extent that we have not addressed them elsewhere in this document.

7.11.2. 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 Regulations (England and Wales) 2010 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.

7.11.3. Article 5 - Waste management plan

This outlines 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 satisfactory. 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.

7.11.4. Article 6 – Major accident prevention

The permit does not authorise a waste facility and therefore there is no a Category A waste facility

7.11.5. Article 7 – Application for a permit

The permit covers the management of extractive waste that does not involve regulation as a waste facility. We are satisfied that there is no area designated for the accumulation or deposit of extractive waste beyond the time periods specified.

7.11.6. Article 8 – Public participation

The permit covers the management of extractive waste that does not involve regulation as a waste facility. However, we have provided the public with the ability to express comments and opinions to us before a decision has been taken and we have taken the results of consultation into account in making the decision to grant this permit.

7.11.7. Article 9 – Classification system for waste facilities

The permit covers the management of extractive waste that does not involve regulation of a waste facility.

7.11.8. Article 10 - Excavation voids

There is a requirement under this article of the Mining Waste Directive for the Operator to take appropriate measures in order to secure the stability of the extractive waste, prevent the pollution of soil, surface water and groundwater and ensure the monitoring of the extractive waste and the excavation void when placing extractive waste into excavation voids.

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

7.11.9. Article 11- Construction and management of facilities

The permit covers the management of extractive waste that does not involve regulation of a waste facility.

7.11.10. 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.

7.11.11. Article 14 - Financial guarantee

The permit covers the management of extractive waste that does not involve regulation of a waste facility and therefore there is no requirement for financial provision.

7.11.12. Further legislation

7.11.12.a) Section 4 Environment Act 1995 (pursuit of sustainable development)

Consideration has been given as to whether the granting of an environmental permit meets our principal aim of contributing to attaining the objective of sustainable development under section 4 of the Environment Act 1995. It is felt that the proposed conditions are appropriate in providing effective protection of the environment and in turn sustainable development, in accordance with Section 4 of the Environment Act 1995 and the Department of Environment, Food and Rural Affairs statutory guidance.

That guidance is '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.'*

The Environment Agency has had regard to these objectives. We are satisfied that the imposition of conditions on the permit will mean it is operated in a way which protects the environment and human health.

7.11.12.b) 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.

7.11.12.c) Section 6 Environment Act 1995 (conservation duties with regard to water)

Consideration has been given to our duty to promote the conservation and enhancement of the natural beauty and amenity of inland waters and the land associated with such waters, and the conservation of flora and fauna which are dependent on an aquatic environment.

We do not feel that any additional conditions are required.

7.11.12.d) 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 feel that any additional conditions are required.

7.11.12.e) 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 permit.

7.11.12.f) 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 its 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 additional or different conditions are required.

7.11.12.g) 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 the Environmental Permitting (England and Wales) Regulations 2010, 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.

7.11.12.h) Water Environment (Water Framework Directive) (England and Wales) Regulations 2003

Consideration has been given to whether any additional requirements should be imposed in terms of the Environment Agency's duty under regulation 3 to secure compliance with the requirements of the Water Framework Directive through (inter alia) environmental permits, but it is felt that existing conditions are sufficient in this regard and no other appropriate requirements have been identified.

7.11.12.i) Human Rights Act 1998

We have considered potential interference with rights addressed by 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.

7.11.12.j) 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 mining waste activity or gas incineration activity.

7.11.12.k) 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.

The application is not within the relevant distance criteria for a Site of Special Scientific Interest, local nature reserves, local wildlife sites, and ancient woodland.
It is not considered that there proposed activities will have an impact on any Site of Special Scientific Interest.

7.11.12.l) 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.

There are no Special Conservation Areas (SCAs), or RAMSAR sites within a 10 kilometre radius of the site.

The proposed activities are not likely to have any significant effect on the interest features of the SPA.

Annex 1: Consultation and web publicising

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 and Local Authority public registers.

The Application was advertised on the Environment Agency website from 05/02/2014 to 04/03/2014. Copies of the Application were placed in the Environment Agency Public Register at Lateral House, 8 City Walk, Leeds, LS11 9AT.

The following statutory and non-statutory bodies were consulted:

- Local Planning Authority – East Riding of Yorkshire Council
- Public Health England
- Director of Public Health – East Riding of Yorkshire Council
- Health and Safety Executive

No objections or concerns were received from East Riding of Yorkshire Council Director of Public Health and the Health and Safety Executive.

1) Consultation Responses from Statutory and Non-Statutory Bodies

Response Received from Public Health England, 20/02/14	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
Public Health England had no significant concerns regarding the risk to the health of the local population from the proposed activities. However they noted that their response was based on the assumption that the Operator shall take all appropriate measures to prevent or control pollution, in accordance with the relevant sector guidance.	Condition 2.3 of the permit specifies operating techniques that will be adopted to ensure the appropriate measures are taken to prevent pollution. The specified operating techniques include the Waste Management Plan, the Environmental Risk Assessments, Groundwater management plan for exploratory operations and the Operator's Environmental Management System Policy Manual. Conditions 3.2, 3.3 and 3.4 controls pollution caused by emissions, odour and noise and vibration respectively. The flare has been designed and will be operated in line with best available techniques. We are satisfied that all appropriate measures will be taken.

Response Received from Local Planning Authority – East Riding of Yorkshire Council 12/03/2014	
Brief summary of issues raised:	**Summary of action taken / how this has been covered**
East Riding of Yorkshire Council did not object to the permit application, as long as there was no conflict in permitted activities allowed under this permit with those approved by the planning permission for the site issued to the Operator.	There is no longer a requirement that planning permission is in place before a permit can be issued for a mining waste operation. In any event regulation of the planning regime is for the Local Planning Authority council and any permit would not affect the need to also comply with any planning restrictions.

2) Consultation Responses from Members of the Public and Community Organisations

A total of 105 responses were received. The respondents included:
- Friends of the Earth
- Greenpeace
- Ward Councilor for mid-Holderness
- Withernwick Parish Council
- Ellerby Parish Council
- Member of Parliament for Hull North

Although the consultation ended on 12 March 2014, all comments that were received after the close of the consultation and prior to the issue of the permit were taken into consideration as part of our determination process.

We can only consider comments which pertain to the management of the extractive waste arising from the exploration for oil and gas and well testing, including flaring of gas regulated under the Industrial Emission Directive which is what the Application relates to. For consultation comments that relate to matters beyond our regulatory control see section 3 below.

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

i) Lack of clarity over operations

A large number of comments raised concerns on lack of clarity on the proposed activities.

In section 3 of Key Issues above, we have comprehensively described the activities proposed by the operator. It is only wastes that arise from these sources that can be managed.

Neither “fracking”, “hydraulic fracking” or “hydraulic fracturing” are terms that are legally defined in the legislation for which we are the Competent Authority. The Environmental Permitting (England and Wales) Regulations 2010, the legislation under which this permit is issued, makes no distinction based on this term. We do not directly regulate the mining activity we regulate the waste that is generated from mining. The permit is for the management of extractive waste from prospecting for mineral resources, including the flaring of gas. In determining the permit we need to be satisfied that the waste is managed in accordance with the regulations.

However the operator is limited to managing waste, including by flaring gas, from the specified activities set out in the permit and waste management plan. In other words, they can not go beyond the activities that we have described in section 3 above and in particular in this context cannot go beyond the mini fall off test described in section 3.3. Should the operator wish to proceed to using further prospecting and/or extraction techniques, they will need to apply for a variation of the permit which will be considered in the usual way.

ii) Planning discrepancy

Concerns have been raised that the proposed activities differ from the activities authorised by the planning permission.

It is not a requirement for planning permission to be in place before an environmental permit is issued.

It is the Operator's responsibility to resolve any discrepancy between the permitted activities and the planning permission as it is their responsibility to comply with all relevant regulatory regimes

iii) Potential impact of activity on surface water

Concerns were raised that the proximity of the site to unnamed field drains could result in surface water pollution. Heavy rainfall and inadequate storage capacity could result in an overflow of the stored fluids.

There will be no discharges of liquid waste to surface water or groundwater as the liquid waste will be taken off site for treatment by a suitably permitted facility. Storage arrangements and the associated risks and mitigation measures are addressed in section 6.10 above and we are satisfied they are adequate. Therefore there will be no pathway between the outputs of the proposed activity and local surface water or groundwater, and no potential for environmental harm.

There will be no discharge to surface waters.

We recognise that the integrity of the well is critical to ensuring that there is no indirect discharge to surface water. This is addressed in the key issues section above.

We are satisfied we have fully assessed the risk to surface water and that there will be no unacceptable risk of pollution.

iv) Potential for polluting water supply

Concerns were raised during consultation, that public water supplies and groundwater may be contaminated.

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 method of well construction, operations and drilling additive used, will not pose a risk to groundwater or surface water and therefore drinking water supplies are not at risk.

The Waste Management Plan, the Environmental Risk Assessment and the Groundwater Management Plan specify the mitigation measures that will ensure surface water and groundwater will be protected. The Waste Management Plan (WMP) sets out the nature of the fluids to be used in each process of the proposal,

their expected volumes and their treatment or disposal, where applicable. These quantities are outlined in section 3 above. Relatively small volumes of fluids will be returned to surface for subsequent treatment or disposal as a result of the proposed drilling and well testing set out in the application documents.

The operator will be carrying out groundwater monitoring to ensure that there is no pollution of groundwater. We are satisfied that both the Waste Management Plan and Environmental Risk Assessment submitted for this application adequately define the risks to groundwater in this location from both the drilling and testing and that the appropriate mitigation measures to protect the groundwater have been imposed through the permit and the incorporated Application documents.

v) Potential for polluting groundwater and breach of Groundwater Directive

Concerns were raised that there is a real risk of a breach in the Groundwater Directive (2006/118) as the Environment Agency seems to have decided that the Applicant is not required to apply for a groundwater permit under schedule 22 to the Environmental Permitting Regulations (England and Wales) 2010.

There will be no discharges of returned waters to surface water or groundwater as the liquid waste will be taken off site for treatment by a suitably permitted facility. Storage arrangements and the associated risks and mitigation measures are addressed in section 6.10. Therefore there will be no pathway between the outputs of the proposed activity and local surface water or groundwater, and no potential for environmental harm.

We have assessed the proposed well testing activities and we have concluded that the Applicant does not require a Groundwater Activity permit. The proposed testing complies with the “de minimis” groundwater activity exclusion as stated in paragraph 3.3(b) of Schedule 22 of the Environmental Permitting Regulations (England and Wales) 2010. In assessing the impact of the activities, we are satisfied that they will remain in or within the immediate vicinity of the wellbores. We recognise that the integrity of the well is critical to ensuring that this is the case and this is addressed in the key issues sections 3, 5 and 7.5 above.

vi) Lack of consideration of the precautionary principle

Some comments also raised the concern that the precautionary principle has not been effectively applied as the risk assessments provided had failed to identify and demonstrate mitigation of potential risks to groundwater.

We are satisfied that both the Waste Management Plan (WMP) and Environmental Risk Assessment (ERA) submitted adequately define the risks to groundwater and that they set out the appropriate mitigation to protect controlled waters.

vii) Overuse of groundwater

Concerns have been raised that the permitted activity will use large quantities of local groundwater and that is not a sustainable approach.

The operator is limited to managing waste, including by flaring gas, from these specified activities. Should the operator wish to proceed to further prospecting and/or extraction techniques, they will need to apply for a variation of the permit which will be considered in the usual way. None of the extractive waste management activities regulated by this proposed permit will require the use of local groundwater. Fresh water that will be imported to the site, stored and used in the process will be kept to a minimum to minimise the amount of waste generated. Section 3 above gives an indication of the volumes of water that will be used for the well testing processes and these quantities of water will be low.

viii) Breach of the Environmental Protection Act

A comment was made which raised the concern that the Environment Agency will be breaching section 78A(2) of the Environmental Protection Act 1990 if they granted a permit for the proposed activities, as they will be causing a risk of land contamination. The Act makes it an offence for anyone to risk causing land to become contaminated.

ix) Monitoring (surface water/groundwater/air)

A number of comments raised concerns on how the activities will be monitored and if baseline monitoring will be carried out.

The Waste Management Plan details the monitoring that the Operator will be carrying out before, during and after the permitted activities are taking place.

Analysis of the samples taken during this monitoring will be carried out by a UKAS accredited laboratory and the results will be made available on the Agency's public register.

We have also specified monitoring requirements in the permit. This is discussed in more details in section 7.5 on monitoring.

The Environment Agency may carry out monitoring of the activities before, during and after the permitted activities have commenced to verify the Operator's monitoring. The results of this monitoring will be made available on our public register.

As stated previously the borehole is being drilled in accordance with industry best practice and in compliance with the Installation and Wells (Design and Construction) Regulations 1996 (DCR). DCR requires the design of the well to be such that no unplanned escape of fluids is allowed. The HSE evaluate the well design and test the well integrity and would consider the risk posed by gases in their assessment.

x) Human health impacts, including stress

See above in relation to Health Protection Agency comments. The Health Protection Agency have raised no objection and we are satisfied that the activities we are permitting will not give rise to significant pollution or any emissions that will cause harm to human health, and as such there is no objective reason for anyone to be stressed.

xi) Adequacy of the Waste Management Plan and management of spent drilling muds

Concerns have been raised that the options outlined in Waste Management Plan for the disposal of spent drilling muds and radioactive waste through a composting facility could result in contamination of land beyond the permitted site.

Exploratory drilling activities are not a NORM industrial activity. Only the activities relating to well testing would fall under NORM industrial activity. Naturally occurring radioactive substances will be managed in accordance with conditions of the Radioactive Substances Regulation permit which is separate to this permit.

We have assessed the Waste Management Plan and we are satisfied that options for disposing of waste outlined in the plan are adequate. The “Best Available Technique Statement relating to the Disposal of Waste from Crawberry Hill well sites” which was provided by the Operator as part of the waste management plan identified the Best Available technique (BAT) as being the off-site transfer of waste to a suitable waste treatment facility. The permit is limited to the management of waste on this site.

The operator is limited to managing waste, including by flaring gas, from these specified activities. Should the operator wish to proceed to further prospecting and/or extraction techniques, he will need to apply for a variation of the permit which will be considered in the usual way.

xii) Cumulative impact from repetitive well tests

Some of the comments raised concerns on the lack of clarity on the number of tests that were to be carried out, as it was likely that these tests will have a cumulative effect on the environment.

The purpose of the exploratory operations is to gain an understanding of the formations encountered during the initial drilling operations. Information obtained from one test may negate the testing of another. Similarly, information obtained may provide sufficient confidence to test another part of the same formation. Given that the proposed activities are exploratory in nature, it is difficult to ascertain an accurate number of tests required from the outset.

We have carefully considered the environmental risk in respect to the proposed well testing operations, and we do not consider that there will be an environmental impact

that makes it necessary for us to impose a limit to the number of tests to be carried out.

The operator is limited to managing waste, including by flaring gas, from these specified activities. Should the operator wish to proceed to further prospecting and/or extraction techniques, he will need to apply for a variation of the permit which will be considered in the usual way.

xiii) Impact on wildlife

Concerns were raised that the proposed activities did not give any consideration to wildlife.

We have assessed the risk from the proposed activities as part of our determination and we are satisfied that the activities will not pose a risk to local wildlife populations or to any local wildlife sites or nationally or internationally designated wildlife sites.

We assessed the potential likelihood of the proposed activities to impact on designated nature conservation sites, protected wildlife and habitats and we have outlined our conclusions of these assessments in sections 7.11.11.k and 7.11.11.l.

xiv) Spillages

Concerns were raised that the risk from potential spillages had not been adequately addressed by the Applicant in their risk assessment. Concerns were also raised about potential spillages off-site during transport of the waste waters.

The risk assessment includes details of how the risks from potential spillages are going to be minimised. The extractive waste transfer and storage activities will take place on an impermeable surface with sealed drainage and containment.

Spillages during transport outside the permitted site boundary are outside the scope of the permit, but are subject to other regulatory controls (Duty of Care).

xv) Emergency planning

A number of comments were made regarding the lack of emergency planning in case of a severe accident on site or health impacts on the local community.

Public Health England and the Health and Safety Executive have been consulted and have not raised any concerns relating to emergency planning. The requirement for an emergency plan under the MWD does not apply to the permitted activities. The operator is limited to managing waste, including by flaring gas, from these specified activities. Should the operator wish to proceed to further prospecting and/or extraction techniques, he will need to apply for a variation of the permit which will be considered in the usual way.

The permit requires the Operator to have an appropriate management system, and we will be ensuring they comply with their permit conditions as part of our compliance work. This management plan will include avoidance of accidents, the

management of potential accidents and the minimisation of their consequences.

xvi) Suitability of the Risk Assessment

Concerns have been raised about the adequacy of the Applicant's Risk Assessment, whether it identified all the risks and categorised them correctly.

We have reviewed the assessment, and we are satisfied it complies with our relevant guidance and that it identifies and covers all appropriate risks and that measures are in place to address them.

xvii) Environmental Impact Assessment

A number of comments have asked why an Environmental Impact Assessment (EIA) has not been carried out to support the permit application.

An EIA for the proposed activities is not obligatory. An EIA is only required where the planning authority decide the development is likely to have significant effects on the environment which they have not in this case. In any event, we are satisfied that we have sufficient information to determine the application.

xviii) Flaring of 5 million standard cubic feet of gas per day

Concerns have been raised on how fugitive methane emissions and point source emissions from the flare would be controlled. There were also concerns raised on the effect of the emissions on human health.

The Application provides for the flaring of up to 5 million standard cubic feet of natural gas per day for up to 14 days per test. The purpose of the flare is to incinerate natural gas which, if encountered during the well testing phase, is flowed to surface at controlled rates. As the natural gas flows to surface, the Operator will monitor and record flow rate and pressure, giving them a greater understanding of the likely volume of natural gas in place within the formation.

The key to a well test is not only the formation pressure and flow rate per day but the total volume of natural gas produced during the test. A flow rate of 5 million cubic feet of natural gas per day has been proposed, based upon minimizing the environmental impact.

Conditions 3.1 and 3.2. of the permit applies controls on fugitive emissions. We recognize that flaring of gas needs to be controlled. We have included condition 3.5.1. that will require the Operator to monitor the flare temperature and concentration of emitted compounds;-oxides of nitrogen and total volatile organic compounds released into the air.

In support of the permit applications, air dispersion and modeling assessments were carried out and these assessed the maximum concentrations of pollutants generated for nitrogen dioxide and carbon monoxide. The predicted concentrations were compacted against relevant air quality standards and their contribution to the ambient concentrations at locations of human habitation closest to the well site.

Modeling of emissions from the proposed ground flare achieved emission levels that were well within applicable air quality standards. We are satisfied that the contribution of emissions from the proposed flaring operation at locations of human habitation closest to the well site is considered to be insignificant.

xix) Air emissions of gas/fugitive emissions

Concerns have been raised on how fugitive methane emissions and point source emissions from a potential flare would be controlled.

On the subject of flaring, we recognise that the flaring of gas needs to be controlled and we have included monitoring conditions in the permit requiring the Operator to monitor temperature, volume of gas going into the flare, oxides of nitrogen, oxides of sulphur, carbon monoxide, methane, and total non-methane volatile organic compounds and to provide monthly reports of the monitoring results.

xx) Particulate emissions

Concerns have been raised over the potential for particulate emissions from the activities on site.

None of the mining waste management activities, including flaring regulated by this proposed permit, i.e. the management of the salty water from the spent hydrochloric acid, excess cement, drill cuttings, drilling muds and gas, are likely to emit any particulates.

However, the permit includes a condition to ensure that any particulate emissions that do arise are adequately controlled (condition 3.2).

xxi) Light pollution

Concerns have been raised that the flare will create light pollution which may impact both local residents and wildlife.

The flare is specified as an enclosed flare. This design type minimises light emissions and we are satisfied that the use of the flare will not result in light pollution.

The use of artificial lights on site is controlled by the planning permission.

xxii) Inadequate consultation

A number of comments have raised concerns that the consultation has been inadequate due to lack of public awareness and that we should have consulted on our draft decision. A few comments also raised concerns on the premature end to the consultation process.

We carried out consultation on the Application taking into account the Environmental

Permitting Regulations and our statutory Public Participation Statement and the requirements of Article 8 of the Mining Waste Directive (MWD).

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 placed a paper copy of the Application and all other documents relevant to our determination on our Public Register and also sent a copy to East Riding of Yorkshire Council. Anyone wishing to see these documents could do so and arrange for copies to be made.

Due to a technical problem the page with the advert on our website went down for a few hours on the last day of the consultation period. However, in the interest of fairness we considered and took into account all comments that we received on this application, even those received well after the end of the public consultation period.

We have discretion as to whether to carry out "minded to" consultation on draft permits for sites. We normally do so for sites of High Public Interest. The decision to do so is not solely based on the number of responses we receive as part of our standard 4 weeks consultation. It is also based on complexity of activity and the overall environmental risk associated with the application. This site is not classified as high public interest and we have decided that a "minded to" consultation is not warranted as the site is not a site of high Public Interest issues.

xxiii) Violation of Human Rights Convention

A number of comments have been made that the proposed activities are a violation to the European Convention on Human Rights.

We have considered potential interference with rights addressed by 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.

xxiv) Impact of property value

A number of comments have been made that the proposed activities will have a negative impact on the quality of life in the area which will result in the lowering of property values in the local area.

Whilst property prices are not directly relevant to determining a permit application, based on the impacts from the permitted activities authorised by the permit there is no reason why property prices should be affected.

xxv) 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. As part of assessing the operator's compliance with these conditions we will assess the operator's activities and ensure that they comply with their permit conditions.

We have to assess the application made to us and we have 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. 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.

xxvi) Pollution incident plan

Concerns have been raised that the pollution incident plan has not been made available for the public to comment on.

We have assessed the pollution mitigation measures in the Waste Management Plan and Risk Assessment and we are satisfied that they are appropriate.

However the applicant recognises the need to have internal procedures in place in case of pollution and these will form part of the management system required under condition 1.1.1 of the permit. We check the adequacy of these as part of our compliance work.

We are satisfied we have sufficient information to determine the application.

xxvii) Noise pollution

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

We are satisfied that the conditions of the permit adequately control the risk of pollution from noise.

The operator submitted a noise management plan outline measures that they will undertake to manage noise from the site. We are satisfied with this noise management plan. Condition 3.4 of the permit controls noise and vibration and requires that emissions are minimised and, if the activities give rise to pollution due to noise or vibration outside the site, a noise and vibration management plan is submitted to the Agency for approval and implemented.

xxviii) Nature of chemicals used

A comment made was that due to commercial sensitivity, the Applicant may not declare the nature of chemicals that will be added to the drilling muds and/or used in the well testing process.

The Applicant has not made any claims of confidentiality and has provided a full list of all the additives and fluids that will be used for drilling and well testing. In section 3 above we have described how these additives will be used. We have assessed the additives to be used and we do not consider that they will cause any environmental harm at the rates and levels of use proposed.

xxix) Radioactive waste

Several comments raised concerns on how the radioactive substances generated from the activity will be managed.

For clarity, section 3 has described the well tests that the operator proposes. The first test, the mini fall-off test in the Upper Visean/Lower Namurian shale geological formation, will not recover any substances from the formation.

The flow tests in the carboniferous sandstone and the Permian carbonate formations will produce natural gas, which may have hydrocarbon liquids, formation water and oil associated with it. There is a potential for recovering trace amounts of NORM from these formations, although this cannot be ascertained until well testing gets underway.

To plan for such potential, the Applicant has applied for a Radioactive Substances Regulation permit that will deal with the management of naturally occurring radioactive materials arising from the proposed activities. Issues relating to the management of radioactive materials will be considered under RSR permit.

xxx) Lack of financial provision

Comments were made which raised concerns on the absence of monetary provision that could be set aside and which could be used for any remedial work required in the event of a pollution incident. The requirement in the MWD for financial provision does not apply, see section 7.11.4.

3) Other matters outside the scope of this permit Application that the public have commented on which may be more relevant to Applications for other permissions.

a) Location of the site:

Concerns were raised on the effects that the proposed activities will have on the countryside and local populations in around living in and around the villages of Withernwick, Burton Constable and Beverley.

Decisions over land use are matters for the planning system. The location of the site is a relevant consideration for Environmental Permitting, but only in so far as its potential to have an adverse environmental impact on communities or sensitive environmental receptors. The environmental impact is assessed as part of the determination process and has been reported upon in Annex 1.

b) Vehicle access to the site and traffic movements:

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

c) Climate change and energy policy

Policy is made by the Government and the policy on exploitation of Shale Gas is no different to that of any other fossil fuel. The policy states "We aim to maximise the economic recovery of oil and gas from the UK's oil and gas reserves, taking full account of environmental, social and economic objectives".

d) Industry Self Regulation

Conventional gas and oil drilling has been regulated for a long time and there is a lot of established knowledge on those activities. Additionally the Regulations are enforced by the Environment Agency, the Health and Safety Executive and DECC.

The waste management activities proposed for this site are well established and the risk management measures in place are commonly used across a variety of industries.