

# Environment Agency permitting decisions

## Bespoke permit

The Permit Number is: EPR/DB3400TG

The Applicant / Operator is: Island Gas Limited

The Site is located at: Misson Wellsite, Springs Road, Misson, Doncaster, Nottinghamshire, DN10 6ET

Consultation commenced on: 21 January 2016

Consultation ended on: 08 March 2016

Minded to consultation commenced on: 06 May 2016

Minded to consultation ended on: 07 June 2016

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 to permit a mining waste operation for the Misson wellsite, 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.

## Preliminary information

We gave the Application the reference number EPR/DB3400TG/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/DB3400TG. We refer to the permit as "the **Permit**" in this document.

The Application was duly made on 15/01/16.

The site for the proposed mining waste operation is located at: Springs Road, Misson, Doncaster, Nottinghamshire, DN10 6ET.

## Use of terms

The Applicant is Island Gas Limited. We refer to Island Gas Limited as “the **Applicant**” in this document. Where we are talking about what would happen after the Permit is granted, we call Island Gas Limited “the **Operator**”.

### *Drilling muds*

Drilling muds are used to lubricate the wellbore while drilling.

### *Drill cuttings*

Drill cuttings are broken bits of solid material naturally occurring underground and removed from a borehole as part of the drilling process into underground formations.

### *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.

### *Cement*

Cement is pumped to seal off the formations when installing casing. During the drilling process, steel casing is installed within the wellbore in stages, then cemented in place.

### *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.

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. Brief outline of process
  2. Summary of our proposed decision
  3. How we took our decision
  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**
  - A. Advertising and Consultation on the Application
  - B. Advertising and consultation on the Draft Decision

## Key issues of the decision

### 1. Brief outline of process

The operator intends to carry out the boring 2 boreholes for the purposes of prospecting for hydrocarbon resources and monitoring. The planned operations are assessed by the operator as an appraisal borehole for mineral exploration. This application is for a vertically inclined well drilled to a depth of approximately 3500 metres, and a second well will consist of a section drilled vertically for approximately 2500 metres, then a section drilled horizontally of up to 1500 metres.

The well construction will take place in stages. The drilling method and any additives are detailed in the Waste management Plan SR-EPA-004, Rev 3.

Springs Road 01 Well:

- The first stage will involve setting the conductor and upper section, a 20" or 18<sup>5</sup>/<sub>8</sub>" conductor will be set at 60m depth and grouted to the surface, a 17<sup>1</sup>/<sub>2</sub>" open hole will then be drilled to approximately 340m depth with a 13<sup>3</sup>/<sub>8</sub>" casing set and cemented back to the surface.
- The 13<sup>3</sup>/<sub>8</sub>" casing shoe will be set 20m into the Roxby formation prior to entering the Magnesian Limestone, the casing will prevent upward migration of gas from the Magnesium Limestone and cross contamination of the Sherwood Sandstone aquifer.
- The next section is the *Intermediate Section 1*, a 12<sup>1</sup>/<sub>4</sub>" open hole will be drilled down to a depth of approximately 1500m and cased using 9<sup>5</sup>/<sub>8</sub>" casing then cemented back to the 13<sup>3</sup>/<sub>8</sub>" section. This will cover the lower Permian and Westphalian formations and includes a formation classified as a principle aquifer as such the first stage and intermediate section1 will be drilled using Water Based Drilling Muds to protect the aquifer.
- The next section is the *Intermediate Section 2*, this section will be drilled down to approximately 2500m with a 8<sup>1</sup>/<sub>2</sub>" open hole and then cased using 7" casing and cemented. This section will be drilled using Low Tox Oil Based Muds (LTOBM).
- The final section to be drilled is the *Lower Section* will be drilled to a depth of approximately 3500m, an open hole of 6" will either be cased with a 4<sup>1</sup>/<sub>2</sub>" liner and cemented or left open and isolated with plugs in accordance with Oil and Gas UK Guidelines. The lower section will be drilled using Water Based Drilling Muds.
- Wireline logs will be run through all sections of the well prior to each casing run and on completion of drilling.
- The composition of drilling muds for each section are detailed in the Waste Management Plan.

Springs Road 02 Well design will depend on the actual conditions encountered during the drilling of Springs Road 01, however, it is expected to mirror the process outlined above for the *Upper Section* and *Intermediate Section 1* of Springs Road 01. After the Intermediate Section 1 has been drilled the well will be bored horizontally using an 8½” open hole cased using 5½” casing and cemented in place. Water Based Drilling Muds will be used through out the Springs Road 02 Well apart from the 8½” section where LTOBM will be used to drill through the Millstone Grit and Bowland Shale.

Once the drilling of the well is completed well testing will commence. During the drilling and well construction phases geological logging is undertaken to determine whether formations contain petroleum. This borehole log will help identify which zones justify subsequent testing. There is a suite of tests that could be used, depending on the results of the borehole logs and geological formations being encountered.

During the drilling and well construction of both wells, steel casing will be cemented in the wellbore at the end of each hole section. The purpose of this steel casing is to stabilise the hole, manage the pressure regime, protect potable groundwater where it is present and maintain well integrity over its full lifecycle. The cement will be pumped in a slurry form down the inside of the casing and up through the annular space between the outside of the casing and the bore side wall, once the in place the cement sets hard. The cement slurry displaces the mud both from the casing and the borehole, returning the drilling muds to the surface and creates a sheath for well integrity. Returning drilling muds will either be reused or, if heavily contaminated with cement will be sent off site for disposal via a registered waste carrier to an appropriately permitted waste treatment facility.

Well integrity will be assessed after each section has been completed and the casing is set, this assessment will be reviewed by an independent well examiner and will consist of the following – Assessment of well design, assessment of the displacement volume, assessment of the cement sample taken during the operation, pressure test of the casing, cement evaluation log when required.

On completion of drilling the wells will be suspended / temporarily abandoned as per Oil and Gas UK guidelines and industry practices.

The management of all extractive waste will be confined to the area of approximately 5.33 hectares; this includes the internal access road, fencing and gates,

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 Application is only for a permit for the management of the non-hazardous and hazardous extractive waste, resulting from prospecting for oil. The Application does not propose to stimulate either well, consequently the potential to produce oil and gas from the wells is low as both wells will be suspended / temporarily abandoned. As such there is no requirement to classify the operation as a NORM Industrial Activity (NIA) and a radioactive substances permit is not required at this time.

If, following this stage, the Applicant decides it wishes to proceed either to further testing using well stimulation and/or to extraction (including pre-production development), 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 used 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.

The discarded drill cuttings, spent drilling muds and cement are considered to be extractive waste and as such fall to be regulated under the Mining Waste Directive (MWD). The Applicant has considered this and provided monitoring and mitigation measures in the Waste Management Plan and Environmental Risk Assessment.

The activity of managing these extractive wastes under the permit is classified as the management of extractive waste. Mining waste operations, with or without a mining waste facility are regulated by the Environment Agency by means of a permit subject to the Environmental Permitting Regulations. The Applicant has applied for a permit involving the management of waste that does not include a waste facility. We have carefully considered the proposed activity and have concluded that there will be no waste facility as defined in the Mining Waste Directive.

## **2. Summary of our proposed 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 limited to mineral resources without well stimulation.

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 have 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.

### **3. How we took our decision**

The Application was duly made on 15/01/2016. This means we considered it was in the correct form and contained sufficient information for us to begin our determination but not that it necessarily contained all the information we would need to complete that determination.

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. The consultation period commenced on 27/01/2016 and concluded on 08/03/2016, this period was extended beyond the usual 4 weeks to allow for sufficient time for comments to be submitted, after a public drop event was held in the Misson village, to provide local residents and interested parties a forum to discuss any concerns over the Application.

We placed a paper copy of the Application and all other documents relevant to our determination on our Public Register at The Environment Agency's Trentside Office, Trentside North, West Bridgford, Nottingham, NG2 5FA. We also sent a copy to Nottinghamshire County Council 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
- Mineral Planning Authority
- Health and Safety Executive
- Public Health England
- Director of Public Health

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

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.

Although we were able to consider the Application duly made, additional information in support of the Application was also received as follows:

Following the submission of the permit application we requested further information on the documents submitted via a schedule 5 notice. Additional information was subsequently received on 07/03/16. The Waste Management Plan, Environmental Risk Assessment, Site Condition Report and Hydrogeological Risk Assessment were amended to include the information requested in the schedule 5 notice. Further drawings were also submitted detailing proposed site elevations & sections and Regional monitoring locations. Further revisions of the Waste Management Plan, Environmental Risk Assessment, Site Condition Report and Hydrogeological Risk Assessment were submitted on 15/04/16. The Waste Management Plan was amended to remove a typographical error and re-issued on 22/04/16.

We carried out a Minded to consultation on our draft decision. 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 draft decision.

The Minded to consultation ran from 06 May 2016 to 07 June 2016, a period of just over 4 weeks, to allow for an extra day for the bank holiday on 02 May 2016.

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

## 4. The legal framework

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.

The regulated facility in question is within the scope of the Mining Waste Directive, because it involves the management of extractive waste.

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

Description of the site and related issues

### 5.1 Location

The site is called the Misson Wellsite and is located to the East of Springs Road, Misson, Nottinghamshire.

The site forms part of existing commercial premises of L. Jackson & Co. Ltd (sellers of ex-army vehicles, plant and equipment) to the east and south and is mainly hardstanding with some grassed areas. The following receptors are located nearby:

- The nearest residential property is Misson Springs Cottage located within the boundary of the site, Prospect Farm located 268 metres to the West North West, Levels Farm located approximately 288 metres West North West, Range Farm located approximately 570 metres to the South South West, April Cottage and Newlands Farm approximately 555 metres and 610 metres to the North North West, Springs Farm Bungalow and Red House Farm approximately 875 metres and 890 metres to the South West, Springs Farm approximately 942 metres to the West North West and Misson Springs Farm approximately 716 metres to the North West of the wellsite.

- There are surface water drains within the site boundary and the surrounding area. The nearest main watercourse, the River Idle is located 2km South East of the site which feeds the River Trent, situated over 9.5km to the East of the site. ;
- The nearest local wildlife site Misson Carr is located 125m to the east of the site.
- The nearest local nature reserve Misson Carr Nature Reserve is located 125m to the east of the site.
- The nearest SSSI Mission Training Area located 125m to the east of the site.
- Misson Line Bank SSSI is located approximately 1.7km to the south-east of the site.
- River Idle Washlands SSSI is located approximately to the south-east of the site.
- The site is not within a Groundwater Source Protection Zone;
- Hartfield Moor SAC is approximately 6km to the north of the site.
- Thorne and Hartfield Moor SPA is approximately 6km to the north of the site.
- In addition to the Misson Carr local wildlife site there are 14 drainage ditches located within 2.5km of the site that are designated local wildlife sites.

The Applicant submitted a plan showing the extent of the site. 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 including a waste facility. With the exception of any gas that may arise, all other wastes will be non-hazardous.

## 5.3 Waste management activities

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

The proposal is to drill 2 wells on site, a vertically inclined well called 'Springs Road 01' and a second vertical then horizontally inclined well called 'Springs Road 02'. The drilling operation from start to installation of the completion is estimated to take around 12 weeks using a compact drilling unit. The drilling will utilise a closed loop drilling fluid (known as drilling "mud") system to remove drill cuttings from the well bore and maintain hydrostatic pressure and control the temperature of the drill bit. Aquifers will be drilled through in the shortest possible time with water based drilling muds. The well bore will then be cased off and cemented to prevent any further aquifer impact. During the drilling programme a number of extractive wastes are

produced, these principally include: drilling muds, drill cuttings and cement. These wastes will be temporarily stored on site in suitable containment before being transferred to an appropriately permitted waste treatment facility. We are satisfied that the operating procedures will minimise the emissions as far as practicable and that there is still a high level of protection for the environment as a whole.

On completion of the drilling phase, the drilling unit will be moved off location and (in the event that hydrocarbons are discovered) a separate well testing programme shall be conducted.

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

#### 1. Drilling muds

- Water Based Drilling Muds and waste (EWC code 01 05 04) non hazardous, estimated quantity<sup>1</sup> 3500 tonnes, and Water Based Barite-containing drilling muds and waste (EWC code 01 05 07) non hazardous, estimated quantity<sup>1</sup> 3500 Tonnes and Water Based Chloride containing drilling muds and waste (EWC code 01 05 08) non hazardous, estimated quantity<sup>1</sup> 3500 tonnes. Drilling mud waste is minimised by continually reusing the mud in a closed loop system and sustained by way of filtering out rock cuttings and finer particles of rock. Drill cuttings returned to surface will be separated from drilling muds using a 3 stage separation process: The first separation stage vibrates the returned drilling muds over a screen, which separates out the larger cuttings into a 90m<sup>3</sup> capacity metallic rectangular bin for storage. The second stage will involve the drilling mud passing through centrifuges to separate out the fine particulates; the fine materials will be stored in the large metallic bin for storage. The third stage will involve the muds passing through another shaker. Following separation, the clean drilling fluids are returned into the mud system for reuse. The collected drill cuttings will be taken off site for disposal via a registered waste contractor to a suitably permitted waste facility.
- Low Toxicity Oil Based Drilling Muds (EWC code 01 05 05\*) hazardous, no waste expected to be produced. Oil based drilling muds will be transferred off site at the end of the operation to the supplier for reuse. Any contaminated mud which the supplier cannot use will be disposed of at a suitably permitted waste treatment facility.
- Drilling muds in use on site will be temporarily stored in dedicated steel mud tanks with a total volume of 200m<sup>3</sup> there will also be an additional vertical tanks up to 12 if required with a capacity of 80m<sup>3</sup> each.

#### 2. Drill cuttings

- Waste clays and sand (EWC code 01 04 09) non hazardous, estimated quantity<sup>1</sup> 3500 tonnes. The waste will be minimised through the selection of a drill bit size that is comparable to the hole size required for each section of the well bore. The waste will be transported off site via a licensed haulier to a suitably permitted waste treatment facility.
- Water based rock cuttings (EWC code 01 04 08) non hazardous, estimated quantity<sup>1</sup> 3500 tonnes. The waste will be minimised through the selection of a drill bit size that is comparable to the hole size required for each section of the well bore. Rock cuttings and finer particles are removed from the drilling muds using the 3 stage separation process outlined in point 1 above. The waste will be transported off site via a licensed haulier to a suitably permitted waste treatment facility.

<sup>1</sup>Estimated quantity total is 3500 Tonnes from all Water Based Drilling Muds and drill cuttings derived from boring the two wells

- Water based rock cuttings containing Chloride (EWC code 01 05 08) non hazardous, estimated quantity<sup>1</sup> 3500 Tonnes. The waste will be minimised through the selection of a drill bit size that is comparable to the hole size required for each section of the well bore. Rock cuttings and finer particles are removed from the drilling muds using the 3 stage separation process outlined in section 1 above. The waste will be transported off site via a licensed haulier to a suitably permitted waste treatment facility.
- Low Toxicity Oil Based drilling cuttings (EWC code 01 05 05\*) hazardous, estimated quantity 775 Tonnes. Drilling mud waste is minimised by continually reusing the mud in a closed loop system and sustained by way of filtering out rock cuttings and finer particles of rock. Rock cuttings and finer particles are removed from the drilling muds using the 3 stage separation process outlined in point 1 above. The waste will be transported off site via a licensed haulier to a suitably permitted waste treatment facility.

### 3. Cement

- Concrete (EWC code 17 01 01) non hazardous, estimated quantity 30 Tonnes. The amount of cement required is carefully calculated to reduce the amount of potential waste. Excess returns are transferred to lined skips for removal to a suitably permitted waste treatment facility where it is recycled as building rubble for use in the building industry.

## 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 facility after we grant the permit in line with our Environmental management – guidance: *Legal operator and compliance requirements: environmental permits web guide*; 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

As the activity does not involve a waste facility, there is no requirement for an External Emergency Plan.

## 6.5 Site security

This is required as part of the written management system of the permit in condition 1.1.1 (a). and will be assessed as part of enforcement inspections.

## 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.

The Operator's Waste Management Plan contains information on the steps that they will take to remediate the site.

## 6.8 The site and its protection

### 6.8.1 Site setting, layout and history

The site is located 2.9km to the NNE of Misson village on Springs Road, Nottingham, DN10 6ET, NGR SK 70600 97800.

### 6.8.2 Planning permission

Our decision on whether to grant an environmental permit is separate from the planning application 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 Nottinghamshire County Council, decides whether or not to grant planning permission.

The planning authority determines whether the activity is an acceptable use of the land. It considers matters such as visual impact, traffic and access issues, which do not form part of our environmental permit decision making process. The planning authority must also consider and respond to any objections they may receive on a particular planning application.

The regulated facility does not involve a mining waste facility. Therefore the requirement in paragraph 13 of schedule 20 of EPR for planning permission to be in force before a permit is granted does not apply.

### 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 on 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.

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

### **Surface water management**

The construction of the wellpad is over the existing ground surface to create a sealed and impermeable site, it will consist of a sand protection layer, a geotextile membrane and low-permeability bentonite mat, before being covered with aggregate to an approximate depth of 300 mm. This impermeable membrane will provide containment for any spilled liquids (capacity 110% of the largest tank). The drilling muds and cutting skips will be located within the impermeable membrane area. Surface water will be directed via a drains system to a ground installed holding tank located within the site perimeter. The contents of the holding tank will be periodically pumped out for treatment and/or disposal at an appropriately permitted waste treatment facility.

Any precipitation onto the well site along with any potential contaminants such as fuel and oils used in operating the site preparation and drilling machinery, will be collected in a perimeter drain surrounding the wellpad which flows to a holding tank. It will then be tankered off site for disposal at an appropriately permitted waste management facility. There will be no discharge to local surface waters from the site.

### **Storage arrangements**

The temporary storage of extractive waste is limited to such storage pending collection as part of the process of transporting the waste off site for recovery or disposal. It will take place on the impermeable HDPE geomembrane layer, which will also provide secondary containment for drilling muds and drilling cuttings.

The drill cuttings will be collected in an open top tank with a capacity of 90m<sup>3</sup>;

The returning cement will be collected in a skip with a capacity of 6,000 litres.

### **Fugitive emissions**

Fugitive emissions of natural gas are to be prevented by mud control so there should be no emissions.

Fugitive emissions of methane could potentially arise from the wellbore 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.

### **Odour management**

Odour is not considered to be a particular concern for this site considering its location, which is 125 metres from the nearest sensitive receptor. The activity is expected to be of short duration. A risk assessment was submitted on DD/MM/16 that provides consideration of odour. We are satisfied that adequate measures will be in place to manage odour.

### **Noise management**

The Applicant provided a risk assessment on DD/MM/16 that provides consideration of noise. Noise management measures include acoustic shielding via site fencing and soil bunds, equipment specifically selected for low acoustic performance. Silencers will also be fitted to equipment to reduce noise. Noise analysis will also be conducted during operations to ensure that planning permission conditions are adhered to. 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 facility 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
- Water quality

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

### **7.1 Assessment of environmental impact**

We are satisfied that the Applicant has properly assessed the risk posed by the proposed activity. The risks identified are detailed in the Operator's risk assessment. This covers an assessment of the risk to surface, ground and air. We have reviewed

the Operator's assessment of the environmental risk from the operations. The Operator's risk assessment is satisfactory.

## 7.2 Nature Conservation

We have considered the location of the site, the activity taking place and the materials likely to be present within the extractive waste in order to set suitable conditions and limits in the permit.

The application site is within the relevant distance criteria of a Protected Site; Mission Training Area is located approximately 125m from the boundary edge of the well site. An Appendix 4 (CRoW) assessment was completed for the purposes of assessing impacts from the proposed activity on Sites of Special Scientific Interest (SSSIs). The assessment concluded that the proposed activity was not an operation likely to damage the SSSIs due to the standard conditions of the permit which do not allow fugitive emissions to land, air or water and this includes dust and the Operator's Waste Management Plan, which includes mitigation measures and procedures to eliminate and mitigate dust problems. Should it be necessary then we can, through enforcement measures, make the Operator amend their Waste Management Plan to include additional measures for mitigation. In an extreme case we could revoke the permit.

As stated above, we are satisfied that there will be no emissions at levels that would have a significant effect on this site. As a result of this conclusion the Appendix 4 was sent to Natural England for information only.

There are several Local Wildlife Sites (LWS) within 2.5km of the proposed well site. We are satisfied that due to the mitigating processes proposed by the applicant and the standard conditions of the permit, the operation will not have an impact on the LWS located in the area.

## 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 WMP in line with the requirements of Article 5. We have approved the plan subject to conditions in the permit. We are satisfied the permit requirements, including the WMP, will protect the environment and that Article 4 and 5 of the MWD are met.

The WMP provides that the material inputs (e.g. drilling muds) 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.

The WMP is 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 thereafter implemented. 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 two months.

#### 7.4 Setting permit conditions

We have set conditions in the Permit in accordance with our guidance 'Setting standards for environmental protection' (version 3.0), which explains how we determine the requirements that should apply to a particular activity. 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 facility. We have included our generic conditions on fugitive emissions, odour and noise/ vibration to control emissions from the facility.

#### 7.5 Protection of groundwater

In addition to information provided by the Applicant, we have carried out our own groundwater risk assessment.

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 activity which is limited to vertically inclined drilling for exploratory purposes, based on the following:

We consider that the use of the proposed drilling muds will comply with the groundwater activity exclusion under the EPR 2010 (paragraph 3.3(b) of Schedule 22) in that any discharge to groundwater that may occur would be of a quantity and concentration 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 only potential contamination source is the drilling muds. As stated above we believe this source is of a quantity and concentration so small as to obviate any present or future danger of deterioration of groundwater.

Given this, and that the Application is for a straight forward stratigraphic investigation it is considered that there need be no requirement for monitoring as a condition in the permit. It would be unreasonable to require the Operator to monitor groundwater and surface water for something they are unlikely to find.

Other considerations are:

- 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 practise 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 Environment Agency has assessed the risk of drilling a borehole at this location and we consider that the design of the proposed boreholes meets the requirement to prevent any release of liquids into the water environment. The borehole will be constructed in accordance with the agreed notification submitted under section 199 Water Resources Act 1991.

- 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. Other potential hazards from the management of the waste are failure of containment of the solids and liquids. These will be stored in suitable containers awaiting removal off site.

Should a container or tank fail, the whole site has secondary bunding which will contain any spillages. During operations, any solid spills will be collected and removed off site and liquid spills will be directed to sealed drainage for containment prior to collection.

No spilled material will be able to leave the site and there will be no pathway for these wastes to affect land or water. The site is entirely contained and provides adequate containment for the activities. There will be no discharge to surface water. Well pad construction is detailed in section 6.8.4 above. We are satisfied with these pollution prevention measures.

Well integrity is assured through compliance with the well examination regime and regulation by the Health and Safety Executive, and further through conformance conformity to Oil & Gas UK and UK Onshore Operators' Group good practice guidelines for well design and construction.

- 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.

## 7.6 Emissions to air

We carefully considered emissions to air during the determination of the application, as the site is not located in an Air Quality Management Area (AQMA) and the proposed operational activities are not expected to impact on the air quality we are satisfied that these measures to minimise the risk of fugitive emissions, together with condition 3.1 provide acceptable controls.

## 7.7. Monitoring

### Groundwater and surface water

Incorporated into the design of the wellsite is an impermeable a geotextile membrane constructed using HDPE. The membrane was laid across the entire site as a means of sealing the site and capturing any spills that may occur during the exploratory operations preventing any environmental contamination. The HDPE membrane was heat welded and tested to confirm its integrity.

The impermeable membrane prevents surface fluids penetrating the underlying subsoils. Surface water will be directed via a drains system to a ground installed holding tank located within the site perimeter. The contents of the holding tank will be periodically pumped out for treatment and/or disposal at an appropriately permitted waste treatment facility.

A daily inspection of all tanks and other waste storage containers shall be undertaken to ensure they remain fit for purpose. The inspections will aid early identification of any potential release to site from equipment that deteriorates over time.

## 7.8 Fugitive emissions

We carefully considered emissions to air during the determination of the Application. Fugitive emissions of methane could potentially arise from the wellbore and mud circulation system. The Operator has provided an environmental risk assessment and consideration in the WMP for this scenario which includes monitoring and proposes abatement measures, including mud weight and a blow-out preventer. We are satisfied that these measures to minimise the risk of fugitive emissions, together with condition 3.1 provide acceptable controls.

## 7.9 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 do not consider that the activity will give rise to significant levels of odour. However, we have included a pre operational condition in the permit. This condition requires the Operator to submit a specific odour management plan, at least 2 weeks before commencement of any drilling activities. The operator shall submit to the Environment Agency a written odour management plan for approval and the activities shall not commence until the operator has obtained the Environment Agency's written approval to it.

The odour management plan must identify potential sources of odour, potential odour release points, unit operations resulting in venting of gas to atmosphere, abnormal operations that could result in venting of gas to atmosphere, calculation of maximum quantities of gas that could be released to atmosphere from each unit operation and abnormal operation, measures for the prevention, containment and abatement of odour releases, procedures for odour monitoring, procedures for odour complaint investigation. The plan must include an assessment of releases of nitrogen gas containing organics.

The odour management plan must comply with relevant Environment Agency guidance "H4 Odour Management: How to comply with your environmental permit".

#### 7.10 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 set out in the plan.

#### 7.11 General considerations

##### **Site stability**

The management of waste is limited to waste generated from prospecting without well stimulation. Any waste stored on site will be limited to extractive waste temporarily stored in secure containment pending collection as part of the process of being transported off site. No waste facility will be created as a result of activities taking place on site.

## **8. Other legal requirements**

### **8.1 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.

#### 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 EPR 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.

#### 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 (WMP) 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. It also ensures that the Operator follows the techniques set out in the plan and that any deviation will require our written approval.

#### Article 6 – Major accident prevention and information

The permit does not authorise a waste facility, and therefore a MAPP is not required.

#### Article 7 – Application for a permit

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

#### Article 8 – Public participation

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

#### Article 9 – Classification system for waste facilities

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

#### 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 these requirements based on the information provided and the conditions in the permit.

#### Article 11 – Construction and management of facilities

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

#### 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.

#### Article 14 – Financial guarantee

There is no requirement for financial provision in a permit where the management of extractive waste does not involve a waste facility, which is the case here.

### **8.2 Further legislation**

#### 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 EU 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.

#### 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.

#### 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.

#### 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.

#### 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.

#### 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.

#### 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 RGN6 and the Environment Agency's Building Trust with Communities toolkit.

#### 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.

#### 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.

#### 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.

#### 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.

There is no SSSI which could be affected by the mining waste activity due to the distance – the site is 6.2 km distant from the nearest SSSI.

#### 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.

#### Government Planning Policy Guidance 10: Planning and waste management 1999<sup>1</sup>

Under section A28 in Appendix 1 of the Government Planning Policy Guidance 10 the Environment Agency has a duty to consult the Civil Aviation Authority for any New bespoke landfill or waste facility which is within 13km of an aerodrome. This directly relates to the number and movement of some species of birds that may be influenced by the distributions of landfill sites. We have considered the potential for activities being conducted at the site to attract birds as being insignificant, therefore consultation with the Civil Aviation Authority has not been conducted in this instance.

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<sup>1</sup> This was superseded by the national planning policy for waste in 2014, although no longer in date, we used it as a guide to whether we should consult with nearby aerodromes.

## 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.

Response received from
Public Health Nottinghamshire County Council
Brief summary of issues raised
Not aware of any issues that will impact on the local population from the emissions and discharges from the proposed process(es).
Summary of actions taken or show how this has been covered
None required.

Response received from
Health and Safety Executive (HSE)
Brief summary of issues raised
We have received the consultation documents relevant to this application and we would advise that from Well Operations we have no objections to the proposals. The well design is to be in compliance with the relevant legislation and suitable well construction (cemented casings) will protect the aquifer  The Well Operator will submit a Well Notification, with specific details of the well construction and operations to be conducted, to the Executive at a later date which will be inspected by a Specialist Well Operations Inspector.
Summary of actions taken or show how this has been covered
None required.

Response received from
Mineral Planning Authority
Brief summary of issues raised
See Nottinghamshire County Council above
Summary of actions taken or show how this has been covered

None required.

Response received from

Public Health England (PHE)

Brief summary of issues raised

The Applicant has not considered point source emissions from e.g. diesel fuelled plant on site. The Regulator should be satisfied that the applicant has fully considered the cumulative emission impact of all operations.

The Applicant has stated that groundwater baseline monitoring will be completed at the proposed site before subsequent evaluation operations begin. PHE, in its 2014 report recommended that 'baseline environmental monitoring is needed to facilitate the assessment of the impact of shale gas extraction on the environment and public health' and that 'effective environmental monitoring in the vicinity of shale gas extraction sites is needed throughout the lifetime of development, production and post-production'.

Summary of actions taken or show how this has been covered

None required

Response received from

Natural England (NE)

Brief summary of issues raised

NE requested further clarification on how water levels, water utilisation, drainage and water quality will be affected by the borehole and how any impacts will be mitigated to prevent adverse effects on the notified features of the SSSI.

Summary of actions taken or show how this has been covered

The following justification was supplied:

The site is entirely contained and provides adequate containment for the activities. There will be no discharge to surface water, as spilled material will not be able to leave the site. There will be no pathway for any wastes to affect land or water.

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 practise 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 Environment Agency has assessed the risk of drilling a borehole at this location and we consider that the design of the proposed boreholes meets the requirement to prevent any release of liquids into the water environment. The borehole will be constructed in accordance with the agreed notification submitted under section 199 Water Resources Act 1991. There is no pathway present for the drilling activities to affect the SSSI or its interest features.

## A) Consultation Responses from Members of the Public and Community Organisations

The Application was publicised on the Environment Agency website in line with; Operational Instruction 203\_08 Environmental Permitting: how we duly make and consult on applications for water discharges, groundwater activities, waste, mining waste and installations.

74 responses were received through the consultation process, the majority of the comments submitted were concerned with hydraulic fracturing.

Response received from
Public responses relating to hydraulic fracturing
Brief summary of issues raised
<ul style="list-style-type: none"><li>• Contamination of groundwater, surface water and drinking water.</li><li>• Risk of earthquakes.</li><li>• Health impacts to local residents and wildlife.</li><li>• Nature of chemicals used in frack fluid.</li><li>• Object to government's energy policy.</li><li>• Hydraulic fracturing contributes to climate change.</li></ul>
Summary of actions taken or show how this has been covered
The application is for a mining waste permit to allow the management of waste produced from the exploration of mineral resources, in this case, from the drilling of two boreholes. The applicant has not applied to hydraulically fracture and as a result a permit will not allow the operator to conduct any hydraulic fracturing activities.

Brief summary of issues raised	Summary of actions taken or show how this has been covered
<p>Future plans if oil is discovered</p> <p>Concerns were raised that the company could continue straight to production if oil was discovered.</p>	<p>The Mining Waste permit application covers the exploration or construction of two wells only. If the Operator plans to develop the site further it will require a variation to its existing permit and/or additional permits from the Environment Agency, as well as planning permission from Nottinghamshire County Council. Further consultation processes are required for both applications should this eventuality arise.</p>
<p>Human health impacts</p> <p>Concerns have been raised that the proposed activities conducted at the well site will have general impacts on human health.</p>	<p>We are satisfied that the activities we are permitting will not give rise to significant pollution or harm to human health. We consulted Public Health England in relation to this application; they have raised no concerns regarding health impacts resulting from the proposed operations.</p>
<p>Light pollution</p> <p>Concerns have been raised that the operations on site will create light pollution which may impact on both local residents and wildlife.</p>	<p>The use of artificial lights on site is controlled by the planning permission and falls outside of the remit of this permit. However, the applicant has submitted a technical assessment of the lighting on site. We have reviewed the assessment and we are satisfied that it covers all appropriate risks and that measures are in place to address them.</p>
<p>Lack of Risk Assessment</p> <p>Concerns were raised that a risk assessment had not been submitted as part of the permit application</p>	<p>The applicant submitted a risk assessment in line with the requirements of applying for a permit under the Environmental Permitting Regulations 2010, the risk assessment was made available to read through the public register and the GOV.UK</p>

	<p>website during the consultation phase of the permit determination.</p>
<p>Suitability of the Risk Assessment</p> <p>Concerns have been raised about the adequacy of the Applicant's Risk Assessment and whether it identified all the risks and categorised them correctly.</p>	<p>We have reviewed the assessment, and we are satisfied that it complies with our relevant guidance and that it identifies and covers all appropriate risks and that measures are in place to address them.</p>
<p>Impact of property value</p> <p>A large number of comments have been made that the proposed activities will have a negative impact on property values in the local area. Concerns were raised that no consideration had been made of residences that were in close proximity to the site.</p>	<p>Any negative impact of property values in the local area is not relevant to the determination of environmental permit applications.</p>
<p>Pollution of surface water and drinking water</p> <p>A number of comments have raised concerns that the activities will cause contamination or pollution of surface water and drinking water.</p>	<p>The site will be lined with an impermeable membrane to protect the underlying soils and groundwater; this will ensure that any water will be contained on the well pad and collected in collection tanks for removal from site by tankers. The Environment Agency is satisfied that all appropriate measures will be in place to acceptably reduce any risk of contamination.</p>
<p>Pollution of Groundwater</p> <p>A number of comments have raised concerns that the activities will cause contamination or pollution of Groundwater.</p>	<p>The site will be lined with an impermeable membrane to protect the underlying soils and groundwater. The risk assessment includes details of how spillages will be reduced or avoided and 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 to surface water will be prevented by the site drainage arrangements. Spillages during transport outside the permitted</p>

	<p>site boundary are outside the scope of the permit, but are, for waste, subject to other regulatory controls (Duty of Care). The Environment Agency has fully assessed the risks associated with pollution occurring from activities on the site and is satisfied that the risk of any significant pollution is minimal.</p> <p>See section 7.5 of this document for our consideration of groundwater protection, including well integrity.</p> <p>HSE regulates wellbore completion in accordance with Design and Construction Regulations 1995 and the Borehole Site Operations Regulations 1996. We have a Memorandum of Understanding and work collaboratively with HSE to ensure that standards of construction also meet the needs of environmental regulations. We consider that the well was constructed in accordance with the requirements and offers a high protection against well failure and are therefore satisfied with the measures proposed by the operator.</p>
<p>Risk associated with well failure and well integrity</p> <p>Concerns were raised that there was no certainty that the exploratory boreholes to be drilled were safe and structurally adequate to prevent leakages that could cause pollution.</p>	<p>Well integrity is assured through compliance with the well examination regime and regulation by the Health and Safety Executive (HSE), and further through conformance conformity to Oil &amp; Gas UK and UK Onshore Operators' Group good practice guidelines for well design and construction. The well will be designed and constructed such that well integrity is appropriate to ensure that the environment is protected from fluid or gas releases, through both our requirements and those of the HSE. These standards of construction are</p>

	<p>detailed in section 3.3.2 of the approved Waste Management Plan.</p> <p>All boreholes (whether offshore or onshore) used for hydrocarbon extraction are subject to The Offshore Installations and Wells (Design and Construction) Regulations 1996 (DCR). These regulations, enforced by HSE, are primarily concerned with well integrity and require the Operator to carry out regular monitoring and reporting of the well integrity. This is usually done by monitoring well casing pressure, which would indicate possible failures of casings. The Environment Agency and HSE will work together to carry out inspections and assess well integrity during the lifetime of the well.</p>
<p>Location of the site and industrialisation of the countryside</p> <p>Concerns were raised that the site location and proposed activities were not appropriate for the Misson area.</p>	<p>Decisions over land use are matters for the planning system. Nottinghamshire County Council is responsible for determining whether or not the proposed development is appropriate in this location, having regard to relevant policies within the adopted local plan and the National Planning Policy Framework. The location of the site is a relevant consideration for Environmental Permitting, but only in so far as affects the potential for the site 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 Section 7 of the decision document above.</p>
<p>Climate change policy</p> <p>Concerns were raised regarding the impact on the climate from the</p>	<p>Policy is made by the Government and the policy on exploitation of oil is no different to that of any other fossil fuel. The policy states “We aim to maximise</p>

<p>proposed activities.</p>	<p>the economic recovery of oil and gas from the UK's oil and gas reserves, taking full account of environmental, social and economic objectives".</p>
<p>Vehicle access to the site and traffic movements</p> <p>Concerns were raised regarding the increase of traffic movements and HGVs accessing the site via Springs Road.</p>	<p>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 of pollutants 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.</p>
<p>Noise from drilling activities</p> <p>Concerns have been raised that the activities will cause noise pollution.</p>	<p>We are satisfied that the activities, if carried out in accordance with the Permit, will not cause noise pollution.</p> <p>The Operator submitted a Noise Assessment as part of the Risk Assessment, this details measures to be implemented on site to mitigate noise from permitted activities. Condition 3.4 of the Permit controls Noise and Vibration and requires that such emissions are minimised and, in the unlikely event that the activities give rise to pollution due to noise or vibration outside the site, a noise and vibration management plan can be requested and will have to be submitted to the Environment Agency for approval prior to being implemented.</p> <p>Planning permission if granted will stipulate specific noise limits that should not be exceeded at the site.</p>
<p>Odour pollution / Air Quality</p> <p>Concerns have been raised that the activities will cause odour pollution and</p>	<p>We have carefully considered all the permitted activities and there are no point sources of pollutants, from the permitted activities. We are satisfied</p>

<p>fugitive methane emissions.</p>	<p>that they are unlikely to give rise to any significant odour or impact on air quality.</p> <p>Condition 3.3 of the permit controls Odour and requires that emissions are minimised and, in the unlikely event the activities give rise to pollution due to odour outside the site, an odour management plan can be requested and will have to be submitted to the Environment Agency for approval and, once approved, be implemented.</p> <p>The largest source of emissions will be from vehicles, generators etc, which are not covered by the permit.</p>
<p>Potential impact of activity on surface water and groundwater</p> <p>Concerns were raised that surface water and groundwater may be contaminated by the proposed drilling activities.</p> <p>Concerns that the impermeable membrane cannot be guaranteed to not to leak</p>	<p>We have reviewed the Environmental Risk Assessment provided by the applicant against our information and conceptual understanding of the location. We are satisfied that the method of well construction, including drilling additives and testing activities, which are controlled by this permit, will not pose a risk to groundwater or surface water given the mitigation measures required. Drinking water supplies are not at risk.</p> <p>The Waste Management Plan (WMP) and the Environmental Risk Assessment specify the pollution prevention measures that will ensure that surface water and groundwater will be protected. The Waste Management Plan 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 measures are required through conditions in the permit.</p>

	<p>Site construction is detailed in section 6.8.4 of the approved Waste Management Plan. We are satisfied that the design of the site containment is appropriate. As part of the site construction, the impermeable membrane will be tested for integrity. During operations, the membrane will be protected via the aggregate work surface and will be visually inspected. Any spillage will be identified and remediated.</p>
<p>Operator competence and lack of trust in the Operator</p> <p>A number of concerns have been raised about the Operator and their competence to run the operations on site.</p> <p>Concerns relating to the financial viability of the company applying for the Environmental Permit.</p>	<p>The permit conditions require the Operator to have an appropriate management system in place that includes details of staff capability, roles and responsibilities, experience and training records to demonstrate technical competence. We will assess the Operator's activities and we will be checking they comply with the permit conditions as part of our compliance work.</p> <p>We have carefully considered Operator competence and we have no reason to think that they would not comply with the permit requirements and conditions.</p> <p>We have considered all relevant factors and have determined that there is no reason to consider that the Operator will not operate in accordance with the permit.</p> <p>We checked the Companies House Register where all companies operating in the UK have been registered, from conducting this check we are satisfied that the company applying for the environmental permit is a legal company.</p>
<p>Nature of chemicals used</p>	<p>The Applicant has provided a full list of</p>

<p>Concerns were raised that the proposals mention the use of chemicals within the drilling muds but no details of these chemicals have been provided.</p>	<p>all the additives and fluids that will be used for drilling, we contacted the drilling mud suppliers to discuss the different constituents used in the drilling muds to ensure that we have identified all of the ingredients present. We have assessed the additives to be used and we are satisfied that they will not cause environmental harm at the rates and levels of use proposed. The permit will limit the composition of the fluids to those disclosed in the Waste Management Plan and approved by the Environment Agency.</p>
<p>Precautionary Principle</p> <p>Concerns were raised that the Environment Agency has failed to adopt a precautionary approach in relation to the proposal to issue permits in this case.</p>	<p>The United Kingdom Interdepartmental Liaison Group on Risk Assessment (UK-ILGRA) state in their paper “The Precautionary Principle: Policy and Application” that the precautionary principle should be invoked when there is good reason to believe that harmful effects may occur and that the level of scientific uncertainty about the consequences or likelihood of the risk is such that the best available scientific advice cannot assess the risk with sufficient confidence to inform decision making.</p> <p>The Environment Agency considers it has followed all relevant EU and UK legislation regarding the protective measures to be implemented when granting permits. In setting permit conditions for the Misson site we have had proper regard to the potential impact the proposed activities will have on the hydrogeological conditions of the area concerned. We are satisfied we have sufficient information to make an informed decision.</p>
<p>Earth tremors/Seismic activity</p>	<p>We have considered the risk of</p>

<p>Concerns were raised that the drilling activity could cause earthquakes. Some of the respondents pointed to previous coal mines being at risk of collapse from the drilling activities.</p>	<p>seismicity in relation to the potential impact on the permitted activities, including the integrity of the wells, and we are satisfied that appropriate measures will be in place to ensure that seismicity will not result in pollution or harm to human health from the permitted activities.</p> <p>There are no recorded incidents of seismic activity associated with the type of exploration such as that proposed at the Misson wellsite.</p>
<p>Radioactive waste</p> <p>Several comments raised concerns that radioactive substances will be generated from the drilling activity.</p>	<p>The proposed activities are for the drilling of two wells only. A radioactive substances activity permit is not required for the drilling of wells. Should the Applicant progress to well testing and /or the production of oil and gas, a radioactive substances activity permit would then be required to address the management of naturally occurring radioactive materials (NORM) as radioactive waste arising from the activities.</p>
<p>Well abandonment and site restoration</p> <p>Concerns were raised that the well site will be left in state of disrepair.</p>	<p>We have considered the risk of the company leaving the well site in a state of disrepair and we are satisfied that appropriate measures will be in place as detailed in the section 6.7 above.</p> <p>At the point when the Operator wishes to decommission the well they will have to carry out any necessary works to make the well safe and prevent any leakage that could cause environmental damage. The Health and Safety Executive have detailed legal requirements relating to this stage of the well life, which the Operator will have to comply with. The Environment Agency will be involved in this process to ensure that any groundwater is</p>

	<p>protected during the abandonment process and for the future. The Operator will have to provide sufficient evidence to satisfy the Environment Agency that the decommissioned well will not cause any on-going or future impact on the environment before surrender of the permit would be accepted.</p> <p>Monitoring at the site will continue into the post decommissioning period and will have to demonstrate that no impact has occurred and that there are no on-going environmental issues.</p> <p>Well site restoration will be the subject of a separate waste management plan submitted by the Operator as part of any permit application to surrender the Mining Waste permit.</p>
<p>Health and Safety Executive not involved in process.</p> <p>Concerns were raised that the Health and Safety Executive had not been consulted on the permit application</p>	<p>The Health and Safety Executive (HSE) are a statutory consultee for all mining waste permit applications submitted to the Environment Agency. See statutory consultees section above for further details.</p>
<p>Proximity to local conservation area and threat to wildlife</p> <p>Concerns were raised that no assessment of the operations impact on a conservation area and local wildlife. It was stated that protected species such as owls, birds and bats are found locally in the site area.</p>	<p>As detailed in section 7.2 above the potential for the proposed activities to impact on any designated sites is not significant. The nearest designated Local Wildlife Site is Misson Carr, no direct pathway is present from the well site to the designated LWS. There are no records of protected bat, owl or bird population in the area. We are satisfied that there will be no emissions at levels that would have a significant effect on the LWS. The standard conditions of the permit do not allow fugitive emissions to land, air or water and this includes dust.</p>

<p>Misson Carr SSSI and Protected birds bats and owls</p> <p>Concerns were raised that the groundwater level in the SSSI would be adversely affected from the well site</p> <p>Concerns were raised that no assessment of the operations impact on a conservation area and local wildlife. It was stated that protected species such as owls, birds and bats are found locally in the site area.</p>	<p>As detailed in section 7.2 above the potential for the proposed activities to impact on the designated site is not significant. The nearest designated Site of Special Scientific Interest is Mission Training Area, an Appendix 4 (CRoW) assessment was completed for the purposes of assessing impacts from the proposed activity on Misson Training Area SSSI. The assessment concluded that the proposed activity was not an operation likely to damage SSSIs. Standard conditions of the permit do not allow fugitive emissions to land, air or water and this includes dust.</p> <p>There are no records of protected bat, owl or bird populations in the area.</p>
<p>Energy policy</p> <p>Several comments raised concerns with the proposed activities not being in line with the current Energy Policy.</p>	<p>Energy policy is made by the Government and the policy on exploitation of oil is no different to that of any other fossil fuel. One of the policy's main goals is to maximise the economic recovery of oil and gas from the UK's oil and gas reserves, whilst taking full account of environmental, social and economic objectives.</p>
<p>Dust / exhaust from plant</p> <p>Concerns were raised that the site will cause pollution in the form of dust and exhaust fumes from the plant and vehicles movement.</p>	<p>The Operator has submitted a Dust Management Plan as part of the Risk Assessment, it has measures in place to monitor and clean up dust emitted from the site. The operator will carry out visual assessments of dust impacts from the permitted activities, and take remedial action as necessary.</p> <p>We have carefully considered all the permitted activities and there are no point sources of pollutants, from the permitted activities. We are satisfied that they are unlikely to give rise to any</p>

	<p>significant dust or impact on air quality.</p> <p>The largest source of emissions will be from vehicles, generators etc, which are not covered by the permit.</p>
<p>Railway crossing</p> <p>Concerns were raised regarding the safety of the Beech Hill Railway crossing in relation to increased vehicle movements.</p>	<p>Decisions over land use are matters for the planning system. Nottinghamshire County Council is responsible for determining whether or not the proposed development is appropriate in this location, having regard to relevant policies within the adopted local plan and the National Planning Policy Framework. The location of the site is a relevant consideration for Environmental Permitting, but only in so far as affects the potential for the site 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 Section 7 of the decision document above.</p>
<p>Hydrogeological report not adequate</p> <p>Concerns were raised that geological fault lines had not been mapped correctly</p>	<p>We have reviewed the Hydrogeological Risk Assessment (HRA) provided by the applicant against our information and conceptual understanding of the location. We are satisfied that the HRA has accurately documented the risks posed from the drilling of the two wells in relation to mapped fault lines throughout the targeted drilling zone.</p>
<p>Venting / methane release</p> <p>Several comments were submitted raising concerns that methane will be vented as a result of the permitted activities.</p>	<p>There are no plans by the Operator to vent methane as a result of the proposed activities. The conditions of the Mining Waste Permit do not authorise any point source emissions from the site.</p> <p>If the Operator plans to develop the site further it will require additional permits</p>

	<p>from the Environment Agency, as well as planning permission from Nottinghamshire County Council. Further consultation processes are required for both applications should this eventuality arise.</p>
<p><b>Wellsite and risk of flooding</b></p> <p>Concerns were raised that the site could be flooded in periods of high precipitation.</p>	<p>The site has been assessed for flood risk and the site is located in a flood risk zone 3.</p> <p>The operator has included a detailed section in the revised Environmental Risk Assessment (ERA) addressing the flood risks, including how the site benefits from flood defences of the River Idle. It also includes mitigation measures to protect the well site in periods of high precipitation. We have reviewed the ERA and are satisfied that sufficient measures are in place to protect the well site.</p>

## B) Advertising and Consultation on the Draft Decision

This section reports on consultation on our draft decision carried out between 06 May 2016 and 07 June 2016. A total of 11 responses were received.

In some cases the issues raised in the consultation were the same as those raised previously and already reported in section A of this Annex. Where this is the case, the Environment Agency response provided in section A of this Annex has not necessarily been repeated and reference should therefore be made to section A in addition to any response below.

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

Brief summary of issues raised:	Summary of action taken / how this has been covered
Unexploded ordnance - there is a potential risk resulting from vibration during drilling activities.	<p>The Environmental Permit does not authorise the drilling per se, it regulates the mining waste produced and that the additives in the drilling muds do not cause pollution.</p> <p>Decisions over land use are matters for the planning system. Nottinghamshire County Council is responsible for determining whether or not the proposed development is appropriate in this location, having regard to relevant policies within the adopted local plan and the National Planning Policy Framework. The location of the site is a relevant consideration for Environmental Permitting, but only in so far as affects the potential for the site 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 Section 7 of the decision document above.</p>
Nottinghamshire Fire and Rescue has not been consulted as specified	Our guidance on the Environmental Risk Assessment doesn't require the consultation

<p>in the Environmental Risk Assessment.</p>	<p>with the local Fire and Rescue department, as a result we did not consider it necessary to consult with Nottinghamshire Fire and Rescue on this application.</p>
<p>Location of site is unacceptably close to Public Right of Ways</p>	<p>Decisions over land use are matters for the planning system. Nottinghamshire County Council is responsible for determining whether or not the proposed development is appropriate in this location, having regard to relevant policies within the adopted local plan and the National Planning Policy Framework. The location of the site is a relevant consideration for Environmental Permitting, but only in so far as affects the potential for the site 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 Section 7 of the decision document above.</p> <p>We do not consider any emissions from the permitted activities will impact on any Public Rights of Way, fugitive emissions have been discussed in section 6.8.4 Pollution prevention measures above.</p>
<p>Further comments were received which have been submitted during the first round of public consultation, these comments related to:</p> <ul style="list-style-type: none"> <li>• Flood risk</li> <li>• Air quality</li> <li>• HGV movements</li> <li>• Contamination of groundwater</li> </ul>	<p>See above for the relevant point in section A for full details on how these issues have already been covered.</p>

<ul style="list-style-type: none"><li>• Noise</li><li>• Hydraulic fracturing</li><li>• Global warming</li><li>• Radioactive waste</li><li>• Well integrity</li><li>• Environmental Risk Assessment</li></ul>	
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