PSSL
Petroleum Safety Services Limited

# SCREENING REQUEST

## VIKING UK GAS LIMITED

WHENBY-B
WELLSITE,
NEAR TERRINGTON
NORTH YORKSHIRE

MAY 2013

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# 1 INTRODUCTION

## 1.1 THE APPLICANT

Viking UK Gas Limited (the "Applicant") is the operator of gas fields within the Ryedale area and, at the time of submitting this application, holds interests in a total of six (6) Petroleum Licences and one (1) Petroleum Appraisal Licence, granted by the Secretary of State at the Department of Energy and Climate Change (DECC). Under the Petroleum Licensing system this permits the licence holder to '*search, bore and get petroleum within the licence boundary'* subject to the granting of planning permission, in accordance with the Town and County Planning Act 1990.

Many of the Ryedale gas fields were originally discovered by Taylor Woodrow Exploration Limited and subsequently developed by Kelt UK Limited. Kelt sold its interest in the Ryedale Gas Fields to Tullow Oil and Edinburgh Oil and Gas. Tullow Oil went on to acquire the interest held by Edinburgh Oil and Gas. The Applicant acquired the interests of the Ryedale Gas Fields from Tullow in 2003 and has subsequently undertaken an active drilling and workover programme to enhance production of gas from the gas fields located at Kirby Misperton, Pickering, Marishes and Malton.

The Applicant also holds a number of exploration licences and has previously constructed and drilled wells at Ebberston Moor, within the North York Moors National Park.

Petroleum Safety Services Limited is an independent company providing planning services and safety supervision to the petroleum industry. Petroleum Safety Services is working on behalf of the Applicant and is responsible for planning and designing projects and obtaining the necessary permissions.

## 1.2 SCREENING REQUEST

The Applicant is requesting a screening opinion from North Yorkshire County Council (Minerals Planning Authority) under Section 5 of the Town and Country Planning (Environmental Impact Assessment) Regulation 2011.

To enable the Minerals Planning Authority (MPA) to provide a screening opinion, the Applicant has included the following in accordance with the regulations:

> *(a) A plan sufficient to identify the land;*
>
> *(b) A brief description of the nature and purpose of the development and of its possible effects on the environment; and*
>
> *(c) Such other information or representations as the person making the request may wish to provide or make.*

This document contains information for the MPA to provide a screening opinion for this proposal, in accordance with Section 5 of the Town and Country Planning (Environmental Impact Assessment) Regulation 2011.

## 1.3 THE PROPOSAL

The Applicant is proposing to construct the Whenby-B wellsite to accommodate the drilling of up to two (2) petroleum exploration and appraisal boreholes followed by testing.

The development will consist of three principal phases:

- Site Construction
- Drilling
- Well Test

Each borehole will be tested for its potential to produce commercial quantities of petroleum. If drilling is unsuccessful in proving commercial viability, then the borehole(s) will be suspended in accordance with Oil and Gas UK guidance.

Further details on the development are included in Chapter 2 of this document.

## 1.4 THE PETROLEUM LICENSING SYSTEM

Ownership of the petroleum resources of the nation is vested in the Crown and the right to explore for and produce petroleum is controlled by DECC, under a licensing system. Companies are granted a Petroleum Exploration and Development Licence (PEDL) under the Petroleum (Production) (Landward Areas) Regulations 1995. Older licences were issued depending on whether the licence was exploration, appraisal or development. These licences are gradually being replaced with the single PEDL licence when older licences are relinquished by the licence holder. This licence grants the licensee the exclusive right "*to search and bore for and get petroleum within the licence boundary*". The Applicant has acquired the right to operate under Production Licence (PL) 079.

## 1.5 THE NEED FOR PETROLEUM DEVELOPMENT

The UK is heavily reliant on obtaining energy from fossil fuels and this will continue for a number of years. Oil and gas from the UK currently supplies 60% of the UK's energy needs[1]. The North Sea oil fields are gradually depleting, having peaked in 1999. Therefore, it is imperative that this supply is maintained and additional reserves of oil and gas are found. As a result of the need for more reliable and secure sources of oil and gas, the exploration and development of onshore prospects is of ever increasing importance, to ensure the continued growth of UK energy supply and security.

In 2004 the UK became a net importer of oil and gas for the first time; this has continued with increasing demand. The UK is currently importing 8% of oil and 32% of gas. It is estimated that by 2020, import dependence will increase to 45 – 60% for oil and 70% or more for gas[2]. These significant increases in demand are also being seen in many other countries, consequently, there will be continued demand for mineral resources in the future.

[1] DECC, 2011, Oil and Gas, http://www.decc.gov.uk/en/content/cms/meeting_energy/oil_gas/oil_gas.aspx,
[2] DECC, 2010, Annual Energy Statement - DECC Departmental Memorandum, DECC, London

In 2007 the Energy White Paper was produced, which highlighted the significant demand for oil and gas and how this will meet the UK's requirements for the foreseeable future[3]. It highlights that the majority of demand for petroleum reserves is from the transport sector in the UK. In addition, it highlights that fossil fuels are to be supported by appropriate Government policies to ensure a continuous supply and to maintain competitiveness.

The UK wishes to ensure security of supply by exploring for indigenous oil and gas reserves both onshore and offshore, where they can be exploited in a safe and sensitive manner having regard to the environment. This was highlighted in the recent National Policy Statement for Energy. If the UK does not maintain security of supply it will become more susceptible to fluctuations in price and demand volatilities. Many of the countries which produce significant quantities of petroleum are politically unstable. Therefore, there is an increasing risk that geopolitical interference could impact on the UK when trying to ensure demand is met.

[3] DTI, 2007, Energy White Paper,

# 2 Site Location and Description

The proposed Whenby - B wellsite is located within open countryside in the county of North Yorkshire, in the District of Ryedale and within the Parish of Terrington. The National Grid Reference is SE 685716 (Easting 4685, Northing 4716) and the site is approximately 60m Above Ordnance Datum (AOD), the site location plan is attached at Appendix 1. The site is adjacent to the Terrington to Coneysthorpe Road and is currently in agricultural use (arable). The site boundaries are formed by established woodland to the south and north. To the east is a stretch of arable agricultural land which extends to 0.5km from the proposed wellsite bounded by established woodland on rising ground. To the west, a further area of land in arable use extending to approximately 0.5km is bounded by mature woodland. There is a break in this stretch of woodland through which glimpsed distance views of the site can be gained, however the rolling nature of the landscape is such that these views are limited. The woodland to the north of the site is situated on rising ground, providing a good level of existing natural screening for the proposed development.

The nearest residential property is Low Baxtonhowe which lies 750m (approx) to the north of the site. The village of Terrington is located approximately 1.6km to the south west of the site and the village of Ganthorpe is approximately 1.2km to the south.

Access is proposed to be from the Terrington to Coneysthorpe Road to the south of the site.

The site is within the nationally designated Howardian Hills Area of Outstanding Natural Beauty (AONB). The site benefits from a high level of existing natural screening minimising the temporary effects of the development on the landscape and environment.

The area is designated as a Nitrate Vulnerable Zone (NVZ). NVZ's were set up under European Council Directive 91/676/EEC and have been established in areas where nitrate from agricultural land is causing, or could cause, pollution of the water environment. Whilst an agricultural restriction, the Applicant is aware of the designation and any planning application submitted for the site will be accompanied by a hydrogeological risk assessment to ensure water protection issues are fully taken into account.

The proposed site has no local or national cultural heritage designations. The Castle Howard Historic Park and Garden is located approximately 1.2km to the south east of the proposed site, and there are several listed buildings within the villages of Terrington and Ganthorpe, however these are not visible from the proposed wellsite.

There are no known Archaeological remains within the proposed site boundaries, however any planning application will be accompanied by a desk based archaeological assessment.

There are no known sites of ecological importance either on, or in close proximity to the proposed site, however any planning application submitted will be accompanied by a base line ecological assessment.

No public rights of way are affected by the proposed development. A public Right of Way runs close to the northern boundary of the site, however this will be unaffected by the development.

The site is not within an identified Flood Risk Zone.

THE DEVELOPMENT
The development consists of three principal phases, they are:

1. Site Construction
2. Drilling
3. Well Test

The following chapter provides a summary of the proposed development.

## 2.1 SITE AND CELLAR CONSTRUCTION

To accommodate the drilling of the wells within the proposed Whenby wellsite, careful ground preparation and protection works must be undertaken. The site has been designed such that it minimises the area of agricultural land required, with the site area amounting to approximately 1.3 hectares. A site layout plan is included at Appendix 2.

### 2.1.1 Preparation

Initial preparation of the site requires the removal of topsoil, which will be carefully rolled back and stored in a screening bund on the eastern boundary of the site. Subsoil will then be excavated to a depth required to achieve a level site, this will require a degree of cut and fill. Any excess subsoil will be stored in a screening bund on the eastern boundary of the site. The removal and storage of topsoil and subsoil will be undertaken in accordance with best practice guidance and will be minimised as far as is reasonably practicable. To undertake this work, a range of typical construction vehicles will be required including an excavator, dumper truck, grader and a compactor.

Once the site is level a perimeter drain will be excavated around the whole perimeter of the wellsite, which will form part of the wellsite's environmental risk mitigation strategy (see Section 2.1.3).

### 2.1.2 Cellar and Conductor

Within the centre of the site, two cellars will be constructed. The cellars form a containment area from which the production boreholes(s) can be drilled, whilst also housing the wellhead. The cellar is constructed from pre-cast concrete rings, approximately 2400mm nominal diameter. An impermeable membrane is incorporated into the cellar construction to maintain the integrity of the site.

Upon completion of the site construction and prior to the start of the drilling operations, a conductor casing will be set in the top section of the well bore. The top section will be drilled with a geotechnical drilling rig. This section is typically drilled with air, however, there may be a requirement for minimal water to aid the drilling.

### 2.1.3 Liner, Drainage and Working Surface

Once the site is level, the perimeter drain has been excavated and the drilling cellars constructed, an impermeable membrane will be laid across the whole wellsite, including the perimeter ditch, and heat welded to ensure integrity. The membrane is similar to the liners used for landfills and is typically made from High Density Polyethylene. It provides an

environmental barrier between site operations and the underlying subsoils. In the unlikely event of a spill, the contents of the spill percolate through the site stone onto the impermeable membrane, where it migrates outwards to the perimeter ditch for subsequent collection and disposal at a licenced waste facility.

The impermeable membrane is protected by two layers of non-woven geotextile matting, one is laid under the membrane to protect against damage from the subsoil and a second layer is laid above the membrane to protect against damage from the site surfacing.

Site surfacing is MOT Type 1 granular sub base aggregate, which is constructed to a thickness of approximately 300mm, the depth of which is very much dependent on the shear and tensile strength of the existing subsoils.

### 2.1.4 Vehicle Movements and Personnel

Site construction will be carried out over a period of approximately five (5) weeks and will require up to 10 personnel. The construction work will be carried out during the hours stated in **Table** 1.

| Day | Time |
|---|---|
| Monday to Friday | 07:00 to 18:00 |
| Saturday | 07:00 to 18:00 |
| Sunday and Bank Holidays | N/A |

**Table 1. Construction phase working hours**

## 2.2 DRILLING

### 2.2.1 Mobilisation and Demobilisation

Once the site has been constructed, the drilling rig and associated equipment will be mobilised to the wellsite and rigged up. This will be performed over a period of up to two (2) weeks and depends very much upon the drilling rig selected. Appendix 3 provides images of similar facilities. The demobilisation will be the reverse of the mobilisation, which will occur on completion of the drilling operation and will take approximately one (1) week.

### 2.2.2 Drilling Operation

The Applicant is proposing to drill up to two (2) boreholes at the Whenby-B site. Both wells will be drilled directionally to intersect primary and secondary targets. The primary targets are The Kirkham Abbey Formation carbonates, which is the main reservoir for the Ryedale Gas Fields. The secondary target is the Sherwood Sandstone. The first well will be drilled to a total depth of approximately 2,000m. The second of the two boreholes is still under review, the details of which will be included in the planning application. A full geological description of the well will be included in the planning statement accompanying the planning application. It is anticipated that the drilling operations will be completed within six (6) to eight (8) weeks

per borehole. This timeframe is dependent on a number of factors, including progress through the different strata and whether gas is identified in the primary and secondary target zone. Once drilling starts, it is necessary for it to continue 24 hours a day. The drilling rig that would perform this work will not be determined until planning permission is sought and will be largely dependent on availability. The application, however, will provide details on the largest rig likely to be required to drill the borehole. Appendix 3 provides photographs of drilling rigs to give an indication of the rig likely to be used on the Whenby-B site.

During drilling, a dense fluid known as “mud” is pumped down the inside of the drill string. The mud lubricates the drill bit and returns to surface bringing with it fragments of rock which are analysed to identify and correlate the strata through which the bit is passing. It also indicates the presence of any gas within any reservoir rocks encountered. An aspect of safety is provided by the hydrostatic weight of the column of mud providing primary pressure control, which is designed to exceed any underground pressures thereby containing them and maintaining the safety of the drilling operation. The rig is also fitted with valves known as “Blow Out Preventers” which act as secondary well control measures and can be closed immediately if an unexpected increase in pressure occurs.

At pre-determined stages in the drilling of a well, the walls of the borehole are supported by steel casing, which is cemented into place. This provides further safety measures by preventing the collapse of the borehole and the ingress of groundwater under pressure. It is essential that drilling continues throughout the day and night to sustain good hole condition and maintain control of the borehole for both safety and operational reasons.

### 2.2.3 Drill Stem Testing

A Drill Stem Test (DST) is likely to be carried out with the drilling rig on site. A DST has the objective of confirming the existence of gas whilst also establishing flow characteristics from the reservoir. The DST will attempt to flow gas to surface, prior to setting a final string of casing. A drill stem test will be of short duration, typically up to a maximum of 12 hours of flow. Any gas produced during the DST will be burned off through a flare. In the event that gas is required to be vented then this will be kept to an absolute minimum and shall only be vented through a suitable scrubbing system to remove any odours associated with the gas.

### 2.2.4 Vehicle Movements and Personnel

Once the drilling equipment has been mobilised to site there will be limited HGV movements during the operations. Additional light vehicle movements will be required for staff and rig crew changes, plus support service personnel. During the drilling operations, there may be up to 20 personnel on site.

Due to the nature of the drilling operations it is necessary to continue 24 hours a day, 7 days a week, to maintain well bore stability and permit safe operations.

## 2.3 WELL TEST

If the drilling and preliminary testing provides positive results, the Applicant may wish to test the well in order to gain a greater understanding of the reservoir.

### 2.3.1 Well Test

A well test may take place immediately after completing drilling operations, following removal of the drilling rig and associated equipment. The well test takes place after casing has been set across the productive reservoir, completion equipment installed in the well bore and the casing perforated across the reservoir to allow gas to flow. The completion equipment is connected to a string of production tubing, through which gas and fluids may flow to surface.

This phase of the operations will require well test equipment to be brought onsite and operated for up to twenty one (21) days. The objective is to provide additional data on the extent and quality of the reservoir, as well as providing samples of the produced fluid for detailed analysis. The well test will be performed 24 hours a day. Minimal equipment is required during a well test, principally separator tanks, pipe work and venting equipment. In addition, there will be some basic monitoring and control systems in place to allow the Applicant to monitor the operations and gather data.

Gas and fluids produced during the well test will, in the instance of oil, be pumped to a storage container on site, or gas, will be burned using a flare. In the event that gas is required to be vented then this will be kept to an absolute minimum and shall only be vented through a suitable scrubbing system to remove any odours associated with the gas.

# 3 ENVIRONMENTAL IMPACT ASSESSMENT

Under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (EIA Regulations), it is necessary for all developments to be screened. The Applicant is submitting a screening request for a proposed planning application under Section 5 of the above regulations.

The Applicant has considered the proposed development in relation to the regulations. The development does not fall under Schedule 1 of the EIA Regulations. The development may be considered under Schedule 2 of the EIA Regulations under Section 2 (d) and (e), which state:

| | |
|---|---|
| *(d) Deep drillings, in particular—*<br><br>*(i) geothermal drilling;*<br><br>*(ii) drilling for the storage of nuclear waste material;*<br><br>*(iii) drilling for water supplies;*<br><br>*with the exception of drillings for investigating the stability of the soil.* | *(i)In relation to any type of drilling, the area of the works exceeds 1 hectare; or*<br><br>*(ii)In relation to geothermal drilling and drilling for the storage of nuclear waste material, the drilling is within 100 metres of any controlled waters.* |
| *(e) Surface industrial installations for the extraction of coal, petroleum, natural gas and ores, as well as bituminous shale.* | *The area of the development exceeds 0.5 hectare.* |

Having considered the proposed development in the context of the guidance that it falls to be considered under Schedule 2.

The site is located within the Howardian Hills Area of Outstanding Natural Beauty which is recognised as an environmentally sensitive area as detailed in regulation 2(1) of the 2011 regulations. The proposal is for a temporary use and the topography and natural vegetation of the site minimises the temporary impact on the AONB. The site has been chosen following extensive seismic surveys of the area, which indicate the potential for petroleum. The UK Government supports the exploration of indigenous oil and gas reserves as it allows the country to maintain security of supply.

There are no residential properties within 750m of the site, The nearest residential property is Low Baxton Howe, located 750m north of the site. Given the topography of the local landscape there are no views of the proposed site from this location or from the nearby villages of Terrington and Ganthorpe.

There are no unusually complex or hazardous environmental effects associated with the site.

In accordance with Schedule 3 of the regulations, the following must be considered:

- *Characteristics of development – taking into account aspects such as size, raw material usage, emissions and risk of accidents.*
- *Location of development – the environmental sensitivity of the areas likely to be affected including existing land uses and the capacity of the existing environment to 'absorb' the new development.*
- *Characteristics of the potential impact – in particular with regard to its extent, complexity, probability, duration and frequency, in relation to the characteristics and location of the development.*

The material characteristics of this development are such that the Whenby-B wellsite requires minimal land take and the drilling of borehole(s) is of short duration. The development will be carefully constructed to minimise visual impact with the use of topography and screen bunds. In accordance with industry best practice and legislation, waste will be managed in accordance with the "Waste Hierarchy". This will ensure the careful management and control of resources as well as the safe disposal of waste by licensed waste carriers and disposal sites. Drilling of petroleum wells is a very carefully managed process. Prior to drilling the well, a great deal of time is spent planning the operations to minimise the risk of any incidents and to ensure there are contingencies in place, therefore any impact is considered negligible.

The proposed Whenby-B wellsite is located within an agricultural field, which is currently in arable use.

The site is within the Howardian Hills Area of Outstanding Natural Beauty (AONB), however the impact is moderated by the temporary nature of the development and by the existing topography and vegetation of the site.

Initial survey work indicates that there is unlikely to be any adverse impact on heritage assets around the site as a result of the proposed development. There are no known archaeological remains on or in the immediate vicinity of the site. There are listed buildings within the village of Terrington 1.6km to the south west, and Ganthorpe, 1.2km to the south, and the Castle Howard Historic Park and Garden lies 1km approx. to the south east. The existing woodland and topography surrounding the site screens any views of the site from these heritage assets.No public rights of way are affected by the proposal.

The site is not within an identified Flood Risk Zone.

Petroleum exploration and production has been carried out in the UK for many years, including within Ryedale District. Practices and standards have been developed to minimise any impacts associated with the operations and to ensure safe standards, in accordance with industry best practice. As detailed within this screening request, the Applicant will ensure the appropriate mitigation of any significant impacts. The position of boreholes is carefully designed to ensure efficient use of space, to reduce land take and minimise, as far as possible, the environmental impact of the proposed development. Upon cessation of operations, the Whenby-B site will be subject to a scheme of restoration and aftercare. It can therefore be assumed that with regard to the proposal there is a high degree of reversibility.

# 4 CONCLUSION

This screening request has been submitted under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 to allow North Yorkshire County Council to provide a screening opinion.

Viking UK Gas Limited is proposing to construct a new wellsite, including the construction of two drilling cellars, They intend to directionally drill the boreholes, the first of which will be drilled to a total depth of approximately 2000m and to take between six (6) and eight (8) weeks to complete, dependant on the results of any findings and progress through the different strata. If there are positive results during the drilling then the Applicant will undertake a well test, during which they will flow gas to surface for a period of up to twenty one (21) days. This will allow the Applicant to gain a further understanding on the characteristics of the reservoir and evaluate its potential as a commercial prospect.

If at any stage the Applicant decides the prospect is not commercial, then a decision will be made to suspend or abandon the well(s) in accordance with industry best practice.

Minerals exploration and exploitation is limited by where it occurs and the extent of the prospect, but it must also take into consideration any environmental effects and locate the site within the least environmentally sensitive part. The UK Government supports the exploration of indigenous oil and gas reserves as it allows the country to maintain security of supply.

Having considered the proposals against the requirements and guidance contained in the Town and Country Planning (Environmental Impact Assessment) Regulations 2011, the Applicant does not believe this proposal requires an EIA. However, it is recognised that any planning application would need to be supported by independent technical reports. The Applicant does not consider that the proposed Whenby-B wellsite constitutes a significant environmental impact requiring an accompanying Environmental Statement. The short temporary duration drilling operation provides for an overall short duration project and following cessation of operations the Whenby-B site will be subject to a scheme of restoration and aftercare.

# APPENDIX 1 – SITE LOCATION

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# APPENDIX 2 – SITE LAYOUTS

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# APPENDIX 3 – PROVISIONAL DRILLING RIG

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**EDECO Rig 40**