ONSHORE HYDROCARBON EXTRACTION

FREQUENTLY ASKED QUESTIONS

6th June 2017

Hydrocarbon Extraction

What are conventional and unconventional hydrocarbons?

The term 'conventional hydrocarbons' refers to oil and gas that flows through porous rocks (e.g. limestone, sandstone) into reservoirs under impermeable layers/'cap rock'. Vertical and sometimes horizontal drilling is used for extraction.

The term 'unconventional hydrocarbons' refers to oil and gas which is still trapped in impermeable rock (e.g. shale). Different technology (e.g. fracking) is required to extract the hydrocarbons from 'unconventional' source rock.

What is shale oil and gas?

Shale gas and oil is found in rocks, deep below the earth's surface, which had previously been considered too impermeable ('tight') to allow for the gas to be recovered economically.

What is the difference between exploration, appraisal and production?

There are three phases of extraction: exploration, appraisal, and production. Planning permissions are required for each stage, as well as other (non-planning) consents/permits required under other regulatory regimes.

Exploration Phase: Seismic surveys are used to understand the geological structure. Exploratory drilling (possibly including some hydraulic fracturing) is used to determine whether hydrocarbons are present. It is a short-term but intensive activity.

Testing and Appraisal Phase: This phase may involve further drilling to establish whether the deposit can be economically exploited. It is usually a short-term activity.

Production Phase: This involves the long-term production of oil or gas commercially.

Hydraulic Fracturing

What is fracking?

'Fracking' refers to 'hydraulic fracturing', a process sometimes used to break open rock after a well has been drilled for natural gas. The potential to use fracking depends upon the underlying geology and it is most often referred to in relation to shale gas reserves (i.e. gas trapped in shale rock). Frack fluid is used to open up and/or extend existing narrow fractures or to create new ones. Perforations are created in the rock by pumping the frack fluid (a mix of water, sand, and possibly chemicals) under high pressure down the borehole into the rock. Sand props open the fractures allowing gas to flow out more readily. The chemicals are used for various purposes including providing lubrication

and to kill bacteria. Fracking can be used at the exploration (i.e. seeing what's there and how much), appraisal (i.e. how easy it is to get) and production (i.e. pumping the gas out) stages.

What are the risks from 'fracking'?

Groundwater: This issue is regulated by the Environment Agency (EA) under the environmental permitting regime but must also be considered in relation to planning applications.

Shale gas deposits are located below aquifers, so if the cement casing around the wellhole is not adequate, both drilling and fracking have the potential to release emissions into groundwater.

These issues can be controlled by ensuring the casing around the wellhole is of an adequate standard; ensuring adequate distance (and, therefore, rock) between the fracking activity and the groundwater; ensuring that the chemicals used are harmless (non-hazardous, as determined by the Environment Agency), and sufficiently diluted (should they enter the water supply); and by controlling the storage and disposal of waste from the sites.

Seismic Activity: This issue is regulated by the Department for Business, Energy and Industrial Strategy (BEIS). BEIS has introduced controls for all future shale gas wells which would require the operator to:

- review details of faults in the area to confirm drilling would not take place into/close to faults.
- monitor background seismicity prior to fracking;
- minimise the amount of fluid used to only that needed to make gas flow;
- introduce a 'flow-back period' after each stage, allowing pressure to reduce;
- monitor seismic activity in 'real time' using a traffic light system, with operations ceased if seismic events of greater than ML 0.5 are detected; and
- publish seismic information on their own website, and to BEIS.

Water Quantities: This issue is regulated by the Environment Agency (EA).

The fracking process uses significant amounts of water, particularly at the production stage (rather than the initial exploration stage), even when recirculated. In Blackpool, Cuadrilla used some 8,400,000 litres of water in total for exploration – 125,000 litres per day, over 67 days. Greater quantities of water are likely to be used during the production stage.

Petroleum Exploration and Development Licences (PEDLs)

What is a Petroleum Exploration and Development Licence (PEDL)?

PEDLs offer licence holders exclusive rights within a licence area (usually 10km^2) to explore for oil or gas, including shale gas.

In order to pursue any proposal for oil and gas development within a licenced area, the licence holder will be required to follow existing planning and regulatory processes, i.e., in applying for planning permission and relevant environment permits, to gain consent drill from the Oil and Gas Authority (OGA). The licensee's proposals will also be subject to scrutiny by the Health and Safety Executive.

The Oil and Gas Authority, which is an executive agency of the Department for Business, Energy and Industrial Strategy (BEIS)[1], is responsible for issuing time-limited Petroleum Exploration and Development Licences (PEDLs). This is done from time to time in licensing rounds, with the previous round of PEDLs expiring in 2014.

Are there PEDL areas in Somerset?

There are currently eight PEDL areas in Somerset.

The legal agreements between South Western Energy Ltd and the Secretary of State for Trade and Industry, for the 14th oil and gas licensing round, were signed on 15th September 2016. South Western Energy Ltd accepted eight out of the ten licence blocks originally offered in Somerset. Of these eight, six are wholly in Somerset and two are on the Somerset/North Somerset border. The initial term of these licenses will be until 20 July 2021.

An interactive map of the PEDL areas can be found by clicking here.

Further information on the PEDL agreements in Somerset (PEDL320; PEDL321 and PEDL344) can be found on the Oil and Gas Authority website.

Are any areas protected from fracking, within a PEDL area?

The Onshore Hydraulic Fracturing (Protected Areas) Regulations 2016 sets out to protect groundwater source areas, National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage Sites. The legislation includes reference to relevant surface area, as well as depth restrictions extending beyond the 1000m specified as a minimum for hydraulic fracturing in the Infrastructure Act 2015. Furthermore, conditions attached to each PEDL state certain requirements associated with each PEDL area.

Roles and responsibilities

Who determines planning applications for oil and gas (fracking) development?

The County Council is the mineral planning authority (MPA) for Somerset - other than for the area of the Exmoor National Park - and is responsible for mineral planning policy for onshore hydrocarbon extraction; and for determining planning applications for the location of any wells and wellpads, imposing conditions to ensure that the impact on the use of the land is acceptable.

What is the County Council's role?

In determining the planning application, the County Council has to work within the planning system which governs the development and use of land in the public interest. It may not address any emissions, control processes, or health and safety issues that are matters to be addressed under other regulatory regimes.

[1] The Oil and Gas Authority (OGA) is an executive agency of the Department for Business, Energy and Industrial Strategy (BEIS), responsible for regulating offshore and onshore oil and gas operations in the UK, including: licensing; exploration and production; and infrastructure.

How is oil and gas development regulated?

Before a company can explore (to see whether oil/gas reserves are available) they must obtain a Petroleum Exploration and Development Licence (PEDL) from the Department for Business, Energy and Industrial Strategy (BEIS). PEDLs offer licence holders exclusive rights within a licence area (usually 10km^2) to explore for oil or gas, including shale gas.

In order to pursue any proposal for oil and gas development within a licenced area, the licence holder will be required to follow existing planning and regulatory processes, i.e., in applying for planning permission and relevant environment permits, to gain consent drill from the Oil and Gas Authority (OGA). The licensee's proposals will also be subject to scrutiny by the Health and Safety Executive.

As well as gaining planning permission, the operator must also gain a 'well consent' for exploration from BEIS before commencing works. BEIS also consults with the Environment Agency (EA) and the Health and Safety Executive (HSE) at this stage. The EA may also require environmental permits for mining waste activities, and radioactive substance activities (i.e. management of naturally occurring radioactive material (NORM)). If the company then wish to go into production (i.e. actually extracting oil/gas) they must gain a new planning permission from the MPA, a Field Development Consent from BEIS, and an environmental permit(s) from the EA, with processes similar to those above.

Oil and gas development exists within a complex regulatory regime. The roles of the key regulators are explained below. Further information can be found on BEIS's Regulatory Roadmap, accessed via the following link: https://www.gov.uk/government/publications/regulatory-roadmap-onshore-oil-and-gas-exploration-in-the-uk-regulation-and-best-practice

What is the role of the Department for Business, Energy and Industrial Strategy (BEIS)?

BEIS issues Petroleum Licences, gives consent to drill under the Licence once other permissions and approvals are in place, and has responsibility for assessing risk of and monitoring seismic activity, as well as granting consent to flaring or venting.

What is the role of the Environment Agency (EA)

The EA, through the environmental permitting regime, protects water resources (including groundwater aquifers), ensures appropriate treatment and disposal of mining waste, emissions to air, and suitable treatment and management of any naturally occurring radioactive materials.

What is the role of the Health and Safety Executive (HSE)

The HSE regulates the safety aspects of all phases of extraction, in particular responsibility for ensuring the appropriate design and construction of a well casing for any borehole.

Planning application process

The Somerset Minerals Plan (adopted February 2015) provides the framework within which a planning application should be made. This document can be accessed via the following link: www.somerset.gov.uk/mineralsplan.

Has Somerset County Council received any planning applications for oil and gas development?

No.

What consultation will take place on any planning application?

Every planning application is subject to public consultation, with further details in SCC's Statement of Community Involvement (SCI). A revised SCI on Planning Issues has recently been published for consultation – refer to www.somerset.gov.uk/mineralsandwaste for the latest information. Depending upon the type of application this will involve a combination of site notices, neighbour notification, and an advertisement in a local newspaper. Consultation also takes place with statutory consultees including the District Council, the Parish Council and other bodies such as the Environment Agency.

Where can I view a planning application?

Planning applications that will be determined by the County Council can be viewed online (www.somerset.gov.uk/planningcomments), at County Hall in Taunton, and at the relevant district or borough council's offices. You will need to make an appointment if you want to view an application at County Hall in Taunton.

How can I comment on a planning application?

Comments can be made on a valid live application online via the website (www.somerset.gov.uk/planningcomments), by post (Planning Control Team, Somerset County Council, County Hall, Taunton, TA1 4DY), or by email (planning@somerset.gov.uk). All comments will be available for public viewing on the website and at County Hall.

Where can I find further information on fracking and shale gas?

https://www.gov.uk/government/organisations/oil-and-gas-authority

https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy