Environment and Sustainability Committee

E&S(4)-13-12 paper 4

Inquiry into energy policy and planning in Wales – Evidence from Environment Agency Wales on Unconventional Gas (including Shale Gas and Coal Bed Methane)

1.0 Summary

Unconventional Gas

1.1 UK companies are exploring the potential for extracting unconventional gas from shale rock, coal bed or coal seams. This can involve using the following processes.

- Shale gas extraction
- Coal bed methane extraction
- Underground coal gasification and extraction

1.2 "Unconventional" refers to the source for gas extraction: shale or coal bed. These have not traditionally been exploited for gas production.

Our Role

1.3 Our key role in onshore drilling is to protect the environment specifically aquifers and rivers from pollution. We make sure that any work to explore or extract gas does not pose a threat to local rivers, groundwater or public water supplies.

1.4 We are a statutory consultee in the planning process and provide advice to Local Planning Authorities on individual unconventional gas sites when they receive a planning application.

1.5 If planning permission is granted for exploration or exploitation, a company would need to discuss with us whether they need an environmental permit and apply if appropriate. This is covered in more detail later.

1.6 We believe the current regulatory framework gives us the tools we need to protect the environment. We are continuing to keep this under review.

The Role of Others

1.7 If a company wants to carry out any unconventional gas activities in England or Wales it must first obtain a Petroleum Exploration and Development Licence from Department for Energy and Climate Change (DECC). This licence gives an

operator exclusive rights to prospect for all petroleum types (conventional and unconventional oil and gas) in a licensed area.

1.8 To extract coal bed methane or undertake underground coal gasification, extraction consent is also required from the Coal Authority. The Coal Authority is part of DECC.

1.9 A company needs land use planning approval from the relevant Local Planning Authority.

1.10 The Heath and Safety Executive (HSE) regulate the safety aspects of drilling work. The HSE are responsible for ensuring the appropriate design and construction of a well casing for any unconventional gas borehole. The HSE also contribute to mitigating potential environmental risks, for example regulating fugitive methane emissions to protect human health.

2.0 Shale Gas & Coal Bed Methane

2.1 Shale gas involves the extraction of natural gas held in fractures, pore spaces and absorbed on to the organic material of shale.

2.2 Coal bed methane extraction works by releasing pressure in coal seams to allow natural gas adsorbed to the surface of the coal to be captured.

2.3 Both require the drilling of boreholes, usually to considerable depth and in some cases horizontally.

2.4 Where there is insufficient natural permeability in the rock, this can be enhanced by hydraulic fracturing or “fracking”. This is where fluid (water, sand and other substances) are pumped into the well at pressure to create and increase fractures in the rock.

2.5 Fluid that returns to the surface is captured, treated and disposed of. Gas that flows to the surface is captured and used for electricity generation or is put into the mains supply.

2.6 The first fracking activity linked to shale rock occurred in April and May 2011 at the Preese Hall site in Lancashire. This activity is currently suspended. There is currently no permission to fracture shale rock at any other site in England and Wales.

2.7 There are proposals for shale gas exploration at a number of locations in England and Wales. Exploration does not involve “fracking”. As of 16 March 2012 no environmental permits have been issued for shale gas exploration in England and Wales.

2.9 The British Geological Survey are producing new estimates of shale gas resource for DECC using more recent data.

Our Role

Planning Process

2.10 We are a statutory consultee in the planning process. We undertake a desk top appraisal and provide environmental protection advice to Local Planning Authorities on individual shale gas sites when they receive a planning application for exploration, extraction or decommissioning.

2.11 The Local Planning Authority may impose conditions to meet our advice and concerns. For example, we may advise on conditions to protect habitats, prevent pollution of the water environment or to monitor drilling fluid on site.

Environmental Permitting

2.12 If a Local Planning Authority grants planning permission, a company would need to discuss with us whether they need an environmental permit and apply if appropriate.

2.13 An environmental permit is needed if fluids containing pollutants are injected in to rock formations that contain groundwater. The operators must disclose all chemicals that will be used. We can also require the disclosure of substances even if an environmental permit is not required. This information is available to the public.

2.14 We will only issue a permit if we believe that the activity does not pose an unacceptable risk to the environment. Where a permit is granted, officers will inspect the site to check that permit conditions are being met.

Protection of Water Resources and Water Quality

2.15 We must be notified when a company wishes to sink a borehole so that we can ensure that the borehole design affords proper protection of any groundwater present.

2.16 Works at the surface may require areas to store fuel, chemicals and waste water from drilling or hydraulic fracturing. Operators must follow our pollution prevention guidelines to prevent any leaks into the environment.

Abstraction Licences

2.17 We regulate water abstraction linked to any extraction process if the operator wanted to take water directly from a river or from

groundwater. We will not licence water abstractions that are unsustainable.

Disposal Permissions

2.18 An environmental permit will be required to dispose of any fluids in to the environment, to ground or to watercourse. An environmental permit is also required to dispose of fluids that contain naturally occurring radioactive material in excess of certain limits.

3.0 Underground Coal Gasification (UCG)

3.1 UCG involves the gasification of the coal in-situ by drilling boreholes into the seam, injecting water and oxygen mixtures down one pipe, igniting and partially combusting the coal and extracting the gasification products (known as syngas) through the other pipe.

Our Role

Planning Process

3.2 We are a statutory consultee in the planning process. We undertake a desk top appraisal and provide environmental protection advice to Local Planning Authorities on individual sites when they receive a planning application for exploration, extraction or decommissioning.

3.3 The Local Planning Authority may impose conditions to meet our advice and concerns. For example, we may advise on conditions to protect habitats, prevent pollution of the water environment or to monitor drilling fluid on site.

Environmental Permitting

3.4 Coal gasification is a listed activity in under the Environmental Permitting Regulations 2010. An activity will require a permit whether it is carried out onshore, offshore, above ground or underground. The Environmental Permitting Regulations apply out as far as the seaward boundary of the territorial sea (12 miles).

3.5 If proposals include generating more than 20 megawatts of electricity on site then it will also require an EU Emissions Trading permit issued by us.

Protection of Water Resources and Water Quality

3.6 We must be notified when a company wishes to sink a borehole so that we can ensure that its design affords proper protection of any groundwater present.

3.7 The operator must produce a site condition report to demonstrate that the land and groundwater have been protected during the lifetime of the operation.

Control of Major Accident Hazards

3.8 UCG operations that store large quantities of oxygen, carbon monoxide and hydrogen will be subject to the Control of Major Accident Hazards (COMAH) regulations. We are the joint regulator with the HSE.

4.0 What we are doing

4.1 Our view at present is that we have the necessary regulatory powers to manage the potential environmental risks of unconventional gas through the Environmental Permitting Regulations 2010 and the Water Resources Act 1991. As our experience of these activities increases we will further develop our technical guidance.

4.2 We are proposing to undertake an Environmental Risk Assessment for shale gas, similar to that produced for carbon capture and storage. This will be used to produce a set of recommendations showing where improvements to shale gas processes could be implemented. This will be completed in April 2013.

4.3 We have commissioned work to look at the sources and pathways of fugitive methane emissions from unconventional gas operations, and the possibilities for monitoring and control. This will help further inform the UK's approach.

4.4 Current unconventional gas operations in the UK are being carefully monitored by us, HSE and DECC. We are also in regular contact with other regulatory bodies to exchange information and ensure effective coordination.

4.5 We are undertaking a project to better understand how the environmental impacts of shale gas production are managed in other European countries and America.

Date: 16 March 2012