

Briefing

Number of Briefing:	4
Title of Briefing:	Hydrocarbons in Cumbria
Date:	29 June 2018
Author:	Rachel Whaley, Minerals & Waste Planning Policy
Unit/Directorate:	Environment
Audience:	All

1.0 PURPOSE OF BRIEFING

- 1.1 Cumbria County Council officers and Members have been approached in recent years by the public, the press and other local authorities, for information on the council's position regarding fracking (hydraulic fracturing of shale rock, in order to extract shale oil or gas). Questions have also been asked on whether there are any existing licences for fracking in Cumbria and whether the county council has any briefing material on the subject.
- 1.2 This 4th update to the briefing note (originally produced in August 2013 and subsequently updated) reflects changes since 2014, including adoption of the Cumbria Minerals and Waste Local Plan in September 2017; updates to national policy and guidance (including the Written Ministerial Statement on Energy Policy made in May 2018) and any updates to the current situation regarding hydrocarbon licences in Cumbria.
- 1.3 This briefing pulls together factual data on the range of unconventional hydrocarbons, of which shale gas is one, and explains the permissioning process for hydrocarbon licences. It also sets out the current situation regarding licences in Cumbria, national policy on hydrocarbons and discusses the approach taken to hydrocarbons in the adopted Cumbria Minerals & Waste Local Plan.
- 1.4 This briefing can be used as a baseline to aid responses to questions on fracking and other unconventional hydrocarbons, or can be adapted by the county council and other local authorities in Cumbria, for presentations. This briefing will be updated further when new information is received or if the situation in Cumbria changes.

2.0 BACKGROUND

Conventional and unconventional hydrocarbons

- 2.1 Oil and gas are hydrocarbons. These can be categorised as conventional – oil and gas that are found in a reservoir of sandstone or limestone – or unconventional – shale gas, shale oil and coal bed methane that are found in a reservoir of shale rock or coal seams.

Shale gas

- 2.2 Shale gas is methane found in rocks below the earth's surface which had previously been considered too impermeable (i.e. any fissures in the rock were too small) to allow economically viable recovery. Hydraulic fracturing – often termed fracking - is the process of opening and/or extending existing narrow fractures or creating new ones (fractures are typically hairline in width) in gas or oil-bearing rock, which allows gas or oil to flow into well-bores to be captured.
- 2.3 During fracking, a mixture of water, sand and chemical additives is pumped under pressure down a borehole into the target rock unit. The grains of sand prop the fractures open to allow gas extraction. The borehole is lined with a steel casing cemented into place, which is only perforated where it crosses the target rocks, to allow the hydraulic fracturing fluid to be injected into the rock and methane to be extracted. It is often necessary to carry out several phases of fracking over the life of a production well.
- 2.4 Plugs may be used to divide the well into smaller sections (termed stages). Stages are fractured sequentially, beginning with the stage furthest away from the surface. After the fracking is complete, such plugs can be drilled through and the well depressurised.
- 2.5 The process is designed to be a closed loop, so that when the high pressure is removed, the fracking fluid returns to the surface for treatment and storage. The flowback water may also contain salts and other dissolved minerals from the shale rock formation, including naturally occurring radioactive materials (NORMs). Estimates vary on what percentage of this fluid returns to the surface: from 25% to 75%. This wide range is explained by differences in the properties of the shale and its response to the fracking.
- 2.6 The results of a study on the Bowland-Hodder shales was published in June 2013¹ by the British Geological Survey (BGS) and the Department of Energy and Climate Change (DECC). The study states that the assessment of shale gas resources in the UK is in its infancy but the work carried out on these shales -

¹ Andrews, I.J. 2013, 'The Carboniferous Bowland Shale Gas Study: geology and resource estimation', British Geological Survey for Department of Energy and Climate Change, London
<https://www.gov.uk/government/publications/bowland-shale-gas-study>

across 11 Local Authority areas - show that they have the potential to form a shale gas resource similar to the shale gas produced in North America. Other areas in the UK have shale gas and shale oil potential, and have been the subject of further BGS/DECC studies - the Weald Basin of southern England² and the Midland Valley of Scotland³.

- 2.7 Annex A shows a UK map of shale deposits. The Bowland-Hodder shales across central England and up into North Yorkshire can be clearly seen on this map, as can the relatively sparse distribution of shales across the north of Cumbria. It is known that there are black shale deposits at some of the existing, limestone quarries in the very south of the county, and it is likely that these lie at the very top of the Bowland-Hodder shale formation. These Cumbrian deposits have been detailed, but not mapped out at depth, by the BGS memoirs and maps that cover the area; however, due to a lack of exploration data, it is not presently possible to map the shale rock deposits at depth in detail. A map showing the Bowland-Hodder shales in relation to the Cumbria County Council boundary is also included in Annex A.

Coal bed methane

- 2.8 This is methane that is extracted from unworked coal seams. Further information on the location of coalfields in England may be found at <https://www.gov.uk/guidance/using-coal-mining-information#coal-authority-interactive-map-viewer>

- 2.9 Extraction of coalbed methane is usually from one of two sources:

- drilling vertically into a coal seam (making use of pre-existing fracture patterns); or more likely
- directional drilling along a coal seam

In both cases, the coal seams may be hydraulically fractured to improve flow rates; the well is then pumped to remove water and lower the pressure within the seam to allow release of methane.

- 2.10 Extracting coal bed methane does not detrimentally affect the physical properties of coal, or prevent it from being worked at a later date, unlike Underground Coal Gasification (discussed below). There are two main factors to consider:

- unlike underground coal mining, extraction of coal bed methane does not cause subsidence of the land surface;

² Andrews, I.J. 2014, 'The Jurassic Shales of the Weald Basin: geology and shale oil and shale gas estimation', British Geological Survey for Department of Energy and Climate Change, London <https://www.gov.uk/government/publications/bgs-weald-basin-jurassic-shale-reports>

³ Monaghan, A.A. 2014, 'The Carboniferous Shales of the Midland Valley of Scotland: geology and resource estimation', British Geological Survey for Department of Energy and Climate Change, London <https://www.gov.uk/government/publications/bgs-midland-valley-of-scotland-shale-reports>

- removing the water is commonly required to initiate gas production - such de-watering can take an extended period of time.
- 2.11 Due to the large reserves of coal under Cumbria, it is more likely that there will be exploitation of coal bed methane in the county, rather than shale gas or oil.

Permission process for shale gas and coal bed methane

See Annex B for diagram of permissioning process.

- 2.12 The first step that an operator must take in order to extract hydrocarbons onshore, is to obtain a Petroleum Exploration and Development Licence (PEDL) from the Oil and Gas Authority (OGA). The DECC has now been replaced by the Department for Business, Energy and Industrial Strategy (BEIS) who oversee policy and legislation. The OGA was established in 2015 to oversee exploration and production and was granted new powers as a government company in October 2016.
- 2.13 A PEDL gives the operator exclusive rights to search for oil and gas (including coal bed methane, shale gas or shale oil, conventional gas and oil and even for pumping out methane from abandoned coal mines) within the licensed area. A PEDL does not allow underground coal gasification; that process falls under a different regime.
- 2.14 Once a company is awarded a licence and wishes to drill, they must negotiate access with a landowner(s) who is willing to allow them to drill on or under their land. The operator then must seek planning permission from the county council as it is the minerals planning authority for exploratory and production drilling - the Environment Agency is always consulted on such planning applications. If planning permission is granted, the company must then obtain Environment Agency permits for Mines Waste Disposal, Radioactive Substances (if it is likely that any Naturally Occurring Radioactive Material is present in the rock) and Abstraction (in the case of de-watering for coal bed methane extraction).
- 2.15 If an operator does not drill within five years of the licence start date then they must relinquish their licence at the end of the first five years.
- 2.16 The well design must be scrutinised by the Health & Safety Executive, who can require changes if they are not satisfied. If drilling is likely to penetrate coal, the operator will need a Coal Authority Access agreement. Finally, a consent from OGA is required.
- 2.17 If the operator proposes to carry out hydraulic fracturing, they must also provide the OGA with a Hydraulic Fracturing Programme, and a detailed Environmental Risk Assessment (ERA) of seismic risks - in such cases, OGA will also require submission of a fracking plan, showing how seismic risks will be mitigated. If a test flow over 96 hours is necessary, they can apply for an Extended Well Test along with the initial drilling consent.

- 2.18 If the well finds hydrocarbons, and the company wishes to go into commercial production to extract gas or oil, they must then obtain a new planning permission for production from the minerals planning authority, secure environmental permits from the Environment Agency, have their plans scrutinised by the Health and Safety Executive and obtain a Field Development Consent from the OGA.
- 2.19 If production of shale gas or coal bed methane goes ahead, the life of a development is usually around 20 to 25 years. When production ceases, the facilities should be dismantled and the site restored to its former use, or some other beneficial use, that was agreed in the restoration scheme required by the planning permission.
- 2.20 On 17 December 2015, OGA announced that licences for a total of 159 blocks were formally offered to successful applicants under the 14th Onshore Oil and Gas Licensing Round. The 14th Round material (including an interactive map)can be viewed on the Oil and Gas Authority website :
<https://www.ogauthority.co.uk>
- 2.21 One of these 14th Round licences is located in south-west Cumbria around Barrow in Furness extending across the water to Millom. The licence is issued to Reach Coal Seam Gas Ltd and runs until the end of July 2046.
- 2.22 Further information on oil and gas on-shore exploration and production can also be found on the OGA website.
- 2.23 Alternatively, for information on wells, seismicity and historic licences on an interactive map, see the UK Onshore Geophysical Library website: www.ukogil.org.uk. The Library does not provide any assessment of these records, it merely shows the locations of where the data gathering took place.

Underground coal gasification (UCG)

- 2.24 UCG is the conversion of coal with controlled combustion(in situ underground) into a synthetic gas that is then extracted and processed to provide fuel for power generation or fuel oils.
- 2.25 The UK has large reserves of indigenous coal, both onshore and offshore. The Coal Authority has responsibility for virtually all of the unworked coal in Britain. The largest areas are in Yorkshire, Lincolnshire, the Dee estuary and Warwickshire, with smaller deposits in central Scotland and south Wales. Cumbria has a long history of coal working, but it is unknown if there are sufficient unworked seams, at a suitable depth, for a viable project.
- 2.26 UCG was first developed in the former Soviet Union in the 1930s; there is at least one commercial-scale scheme operating in Uzbekistan today. A trial was carried out in Derbyshire in the 1950s, but was abandoned at that time for economic reasons. A European trial of UCG in deep coal seams was carried out in Spain in the 1990's, involving the UK's Department of Trade and Industry (DTI). The

encouraging results of this trial led the DTI to re-evaluate UCG as a longer term option for clean coal exploitation in the UK.

- 2.27 UCG is an in situ method of converting any unworked coal, deep underground, into a combustible gas. This is achieved by drilling two boreholes into the coal seam, one to inject water/air or water/oxygen mixtures, and the other to bring the gas that comes off the gasified coal, to the surface. It is both an extraction process (like coal mining) and a conversion process (gasification) in one step. Coal has considerable variation in its resistance to flow, depending on its age, composition and geological history, so relying on the natural fissures in the coal to transport the gas is generally not satisfactory. High pressure break-up of the coal with water (hydraulic fracturing), electric-linkage and reverse combustion have all been used with success in both pilot and commercial scale operations. The technique is best suited to deep coal seams, 500 metres plus, and can be undertaken both on and off shore.
- 2.28 The gas can be used for industrial heating, power generation or the manufacture of fuels, fertilisers, hydrogen, synthetic natural gas or other chemicals. It can also be processed to remove its CO₂ content before it is passed to end users, thereby providing a source of clean energy, with minimal greenhouse gas emissions.
- 2.29 There is a need for environmental impact assessment and risk analysis, and the following may be required: protection of aquifers; protection from subsidence; and adequate depth of operation to avoid surface disruption. Although the concept is simple, there are problems with putting it into practice. The main problems are: drilling the boreholes; controlling the reaction within the seam; and producing a gas of a consistent and high quality.
- 2.30 The gasification stage will require the installation of storage facilities for nitrogen, oxygen and water, together with generating and monitoring equipment. The primary environmental considerations at this stage will be visual intrusion, noise, site traffic, water disposal, control of spillage, emissions to air and subsidence. On cessation of operations, all boreholes will need to be sealed and the surface land restored.
- 2.31 The overall impact is less than that associated with traditional coal mining activities, as no coal is brought to the surface, and the risk of subsidence is reduced by the presence of solids produced during the gasification process, which remain in the void, and by unworked coal left between gasified panels.
- 2.32 In December 2016 BEIS published a report which looked at the evidence of potential for global warming compared to traditional coal mining. This report examines the scientific evidence on underground coal gasification to inform government policy about underground coal gasification development in the UK. To date there have been no significant policy announcements from BEIS in relation to this issue. The evidence report can be found on the government website at <https://www.gov.uk/government/publications/underground-coal-gasification-evidence-statement-of-global-warming-potential>.

Underground coal gasification (UCG) licences

- 2.33 The permission process for these is entirely different to PEDLs – they are conditional licences that are granted by the Coal Authority. The technical and economic viability of UCG has not to date been demonstrated in UK conditions. BEIS is monitoring progress and continues to work with other parties (including the Coal Authority and the Environment Agency) to help ensure clarity around the regulatory aspects of the process.
- 2.34 It should be noted that all the current UCG licences are conditional. As such, no operations can take place until the licensee has satisfied the pre-conditions set out in the licence, which include the acquisition of all the other necessary rights and permissions to carry out the operations. These include consent from the minerals planning authority for any onshore installations and the equivalent consent for offshore; environmental permissions from the Environment Agency pertaining to the Water Resources Act, Environmental Permitting Regulations, the EU Emissions Trading System and the Control of Major Accident Hazards Regulations; and the consent of the Health & Safety Executive. The licensee will also have to secure the consent of a landowner(s) for any surface installation (or the equivalent for sea bed installations) and satisfy the Coal Authority that the finance is in place to carry out the operations.
- 2.35 Exploration is permitted under the consent granted by the Coal Authority, but once again this is dependent on other rights being in place. Note that the licences are only for coal gasification and do not permit shale gas or coal bed methane exploitation. The UCG licences are also separate to those granted by the Coal Authority for deep coal extraction.
- 2.36 The conditional UCG licences are granted for an initial period of 3-5 years so that the projects can be developed. This period can only be extended if the licence holder can demonstrate substantive progress and a properly funded plan to drive the project forward.
- 2.37 The Coal Authority will normally only consider UCG conditional licence applications for:-
- offshore areas, although this can include an onshore access strip to facilitate the sinking of exploration boreholes during the conditional licence phase and for sinking directional access boreholes into the offshore UCG area during the operational phase;
 - onshore areas⁴, but only where it can be demonstrated that the surface is suitable for piloting this technology;
 - areas where there are:-
 - no other Coal Authority Mining Licences & Agreements;

⁴ Onshore applications will only be accepted where the Coal Authority considers that the applicant has a reasonable chance of bringing the project to fruition. For example, an application for onshore UCG by, or with the agreement of, a surface landowner with ownership of all the surface land likely to be affected by the proposed UCG operation could be said to stand a reasonable chance of getting planning consent, etc.

- no existing Petroleum Exploration and Development Licences;
- no identifiable defence installations (MOD); and
- no existing or proposed wind farm sites or other major structures on the seabed;
- a maximum initial application area of 10,000 hectares;
- areas where the Department of Energy & Climate Change, the Crown Estate, the Ministry of Defence or other relevant bodies do not raise objections. Consultation will be undertaken by the Coal Authority with these relevant bodies on receipt of a conditional licence application.

2.38 Policy statement and guidance on underground coal and gas licensing issued by the Coal Authority can now be found on the government website at <https://www.gov.uk/government/publications/underground-coal-gasification-licences>

3.0 GOVERNMENT POLICY AND GUIDANCE

National Planning Policy Framework

3.1 Paragraphs 142 to 149 of the National Planning Policy Framework (NPPF) set out minerals planning policy. It makes clear that minerals planning authorities should identify and include policies for extraction of mineral resource of local and national importance in their area - this includes both conventional and unconventional hydrocarbons. It also expects minerals planning authorities to ensure that mineral extraction does not have an unacceptable adverse impact on the natural or historic environment or human health.

3.2 Proposed revisions to the NPPF put out for consultation in May 2018 includes additional text on on-shore oil and gas development stating minerals planning authorities should, *“recognize the benefits of on-shore oil and gas development, including unconventional hydrocarbons, for the security of energy supplies and supporting the transition to a low-carbon economy; and put in place policies to facilitate their exploration and extraction.”*

National Planning Practice Guidance

3.3 Planning Practice Guidance was published to complement the NPPF and is regularly updated as an on-line resource. Amongst the issues covered is ‘planning for hydrocarbon extraction’, for onshore oil and gas. This guidance provides advice on the planning issues associated with the three phases of extraction of hydrocarbons – exploration, testing and production. It also contains ‘model’ planning conditions, on which minerals planning authorities can base their own conditions if granting planning permission for onshore oil and gas exploration, testing or production.

3.4 Para.91 states that *“As an emerging form of energy supply, there is a pressing need to establish – through exploratory drilling – whether or not there are sufficient recoverable quantities of unconventional hydrocarbons such as shale*

gas and coalbed methane present to facilitate economically viable full scale production.”

- 3.5 Paragraph 223 refers to National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage Sites. It says that great weight should be given to conserving landscape and scenic beauty in these areas (including adjacent areas if they affect the setting) and that planning permission should be refused for major development except in exceptional circumstances, and where it can be demonstrated that it is in the public interest. Where a proposed development for unconventional hydrocarbons would lead to substantial harm to or loss of a World Heritage Site, mineral planning authorities should refuse consent unless wholly exceptional circumstances apply.
- 3.6 The planning practice guidance does not cover underground coal gasification, but the Coal Authority do provide guidance for applicants and also set out their policy towards UCG, now available on the government website at <https://www.gov.uk/government/publications/underground-coal-gasification-licences>.

Written Ministerial Statement – May 2018

- 3.7 On 17 May 2018 the Housing and Energy Secretaries issued a joint Written Ministerial Statement on Energy Policy, declaring that the development of shale gas is of national importance and that mineral plans should not place restrictions on its extraction. The Written Statement is a material consideration in plan-making and decision-taking, alongside relevant policies in the current NPPF (2012), in particular those on mineral planning (including conventional and unconventional hydrocarbons). The full statement can be found on the UK Parliament website at <https://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Commons/2018-05-17/HCWS690>
- 3.8 The statement reads – *“Shale gas development is of national importance. The Government expects Mineral Planning Authorities to give great weight to the benefits of mineral extraction, including to the economy. This includes shale gas exploration and extraction. Mineral plans should reflect that minerals resources can only be worked where they are found, and applications must be assessed on a site by site basis and having regard to their context. Plans should not set restrictions or thresholds across their plan area that limit shale development without proper justification. We expect Mineral Planning Authorities to recognize that government has set in statute the relevant definitions of hydrocarbon, natural gas and associated hydraulic fracturing. In addition these matters are described in Planning Practice Guidance, which Plans must have due regard to. Consistent with this Planning Practice Guidance, policies should avoid undue sterilization or mineral resources (including shale gas).”*
- 3.9 Once the revised NPPF is published this will sit alongside the Written Ministerial Statement. The government then intends to publish revised planning practice guidance on shale development to ensure clarity on issues such as cumulative

impact, local plan making and confirmation that planners can rely on the advice of regulatory experts.

- 3.10 Other measures referred to in the statement include setting up a new single Shale Environmental Regulator (currently three regulators are involved – the Environment Agency, the HSE and the OGA) and a commitment to improve the community benefits payments available to communities hosting shale gas developments (currently worth up to £10 million for a typical site).

4.0 THE CURRENT SITUATION IN CUMBRIA

Petroleum Exploration and Development Licences (PEDL)

- 4.1 There is currently one extant PEDL in Cumbria - PEDL No.260 located in south-west Cumbria around Barrow in Furness extending across the water to Millom (see Annex C and Annex D). The licenced areas - SD16;17; 26a and 26b - were secured by Reach CSG in December 2015. They also hold an adjacent off-shore licence (P2250). The PEDL has a start date of 21 July 2016 and runs until the end of July 2046. They will need to drill a well within five years of the start date (ie by July 2021) or else relinquish the licence. To date no planning applications or pre-application enquiries have been submitted to the county council in connection with this licence.
- 4.2 Previous PEDLs have existed in the county- one at St Bees (013) and one in north Allerdale (064). The following planning permissions were granted within these areas to Greenpark Energy Ltd and Octagon (CMB) Ltd:
- 2/09/9018 coal bed methane extraction; Fisher Gill Farm, Wigton
 - 4/01/9021 coal bed methane drilling, testing and extraction; St.Bees Road
 - 4/01/9023 coal bed methane drilling, testing and extraction; Byerstead Road
- 4.3 The planning permissions gained by Octagon (CBM) were not implemented and no drilling occurred. The Greenpark Energy site at Fisher Gill Farm was drilled and the well abandoned and sealed in accordance with the EA, HSE and DECC requirements. The site has been restored in accordance with the planning permission requirements. These licences were relinquished by the operators in March 2009 and September 2011 respectively.
- 4.4 PEDL (159) was granted in October 2004 for an area around Carlisle, with an anticipated end date of 1 October 2035. The following planning permissions have been granted by the county council within this licence area.
- 1/07/9028 coal bed methane exploration, appraisal, operation; Englishtown
 - 1/07/9029 coal bed methane exploration, appraisal and operation; Carwinley
 - 1/10/9009 coal bed methane production; Becklees Farm, Longtown

- 1/02/9018 coal bed methane drilling, testing and extraction; Moat, Longtown
- 4.5 Site visits in September 2013, showed that the site at Moat was not drilled; the site at Carwinley was fully restored and was back in agricultural use; the sites at Englishtown Farm and Becklees Farm were unrestored. Although the owners reported encouraging results from these latter two wells, in relation to gas content and seam thickness, the depth of the seams is likely to hamper commercial production. In February 2014, the county council granted planning permission for activities necessary for the abandonment process and for surface restoration back to agricultural use. These sites have now been restored.
- 4.6 The owners of this area lgas (formerly Dart Energy and Greenpark Energy) have have now relinquished the licence.

Underground Coal Gasification (UCG) Licences

- 4.7 Three UCG conditional licences have been issued by the Coal Authority, off the coast of Cumbria (see Annex E). One is an off-shore area (UCG/0021N – West Cumbria Offshore) issued to West Cumbria Mining in conjunction with their licences for exploration for coal extraction. Two licences for exploration without prior coal extraction were issued to Cluff Natural Resources Ltd in 2014 on areas shown as off-shore from Workington and Maryport (UCG/0037N Maryport and UCG/0033N Northern Cumbria Offshore).
- 4.8 Cluff Natural Resources Ltd were reported as saying that initial exploration suggests there is potential. However, further drilling and surveys would be required before mineral resource can be confirmed.
- 4.9 A conditional licence was also issued in the Solway Firth (UCG/0008/N), adjacent to an underground mining licence area, issued to Five Quarter Energy. This is recorded as being at Canonbie, so it is unclear whether land access/installations would be required in Cumbria or not. In March 2016 the company ceased trading.
- 4.10 Details of the licences granted by the Coal Authority, including for UCG, are shown in Annex E. To date (June 2018), there have been no planning applications or enquiries submitted to Cumbria County Council relating to drilling operations or infrastructure associated with UCG. The Coal Authority has also confirmed (June 2018) that any conditional licences previously granted have now either expired or have been withdrawn at the request of the licensee, and there are no current licences in place for UCG anywhere in the UK.

5.0 CUMBRIA MINERALS & WASTE LOCAL PLAN

- 5.1 As the upper tier authority in Cumbria, the county council is statutorily required to prepare a Minerals & Waste Local Plan.
- 5.2 The Cumbria Minerals and Waste Local Plan (CMWLP) was adopted on 17 September 2017. It comprises three main sections - Part 1 Strategic Policies; Part 2 Development Control Policies; Part 3 Site Allocations Policies - plus the Policies Map.
- 5.3 Policy DC13 Criteria for Energy Minerals sets out the policy approach on exploration, appraisal and commercial exploitation of hydrocarbons, including underground coal gasification (see Annex F). Any development would also have to comply with all the other relevant policies such as those for traffic, environmental impact, biodiversity and geodiversity, landscape, restoration, etc.
- 5.4 Government requires that local plan policy distinguishes between the different phases of oil and gas developments; thus Policy DC13 provides separate criteria for the exploration and appraisal phases, compared to the exploitation phase. In particular it is considered that the pressing need for full and timely restoration of exploratory or appraisal wells - in cases where they are not progressed to production - requires a specific policy in addition to Policies SP16 and DC22 which already deal with the restoration and aftercare of sites.
- 5.5 In addition, policy DC13 requires that planning applications for exploitation should be fully informed by a completed appraisal for the oil and gas field; that cumulative impacts of the development have been considered; and that significant adverse impacts are adequately mitigated or compensated for. This may be by mitigation proposed with the submission or, where appropriate, by conditions attached to the planning consent. Where the adverse impacts or harms are outside the application site, mitigation or compensation may be provided through planning obligations.

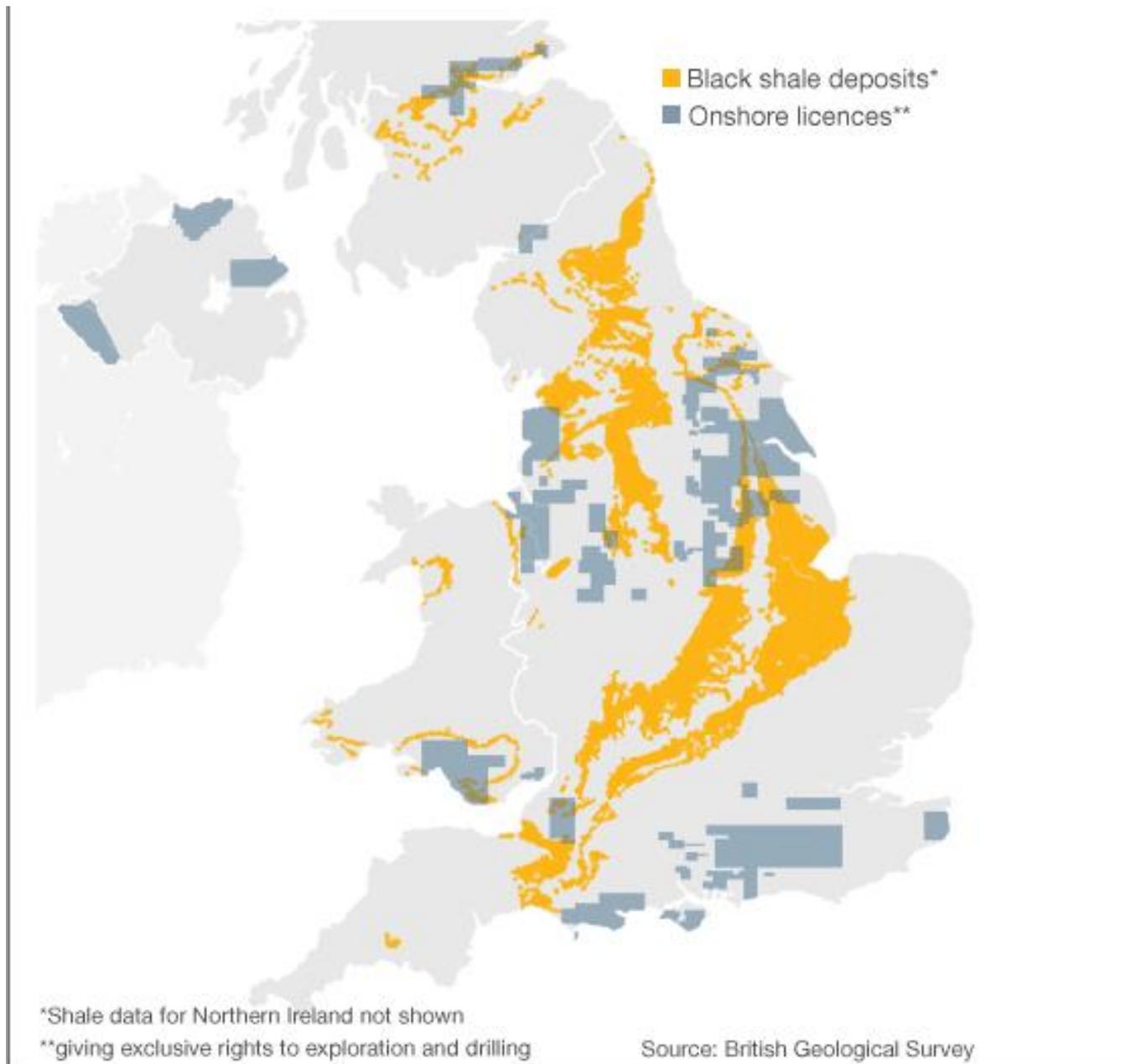
6.0 SUMMARY

- 6.1 There is a narrow band of shale rock across Allerdale and Carlisle districts, skirting the top of the Lake District National Park (see Annex A). It is also known that there are black shale deposits at some of the existing limestone quarries in the very south of the county and it is likely that these lie at the very top of the Bowland-Hodder shale formation. The Bowland Shale Study indicates very limited extension of that hydrocarbon basin into Cumbria and current maps of likely shale resources do not show further resources in the county.
- 6.2 To date no enquiries on appraising these shale resources have been received by the county council and it would be reasonable to expect that the development of shale gas would progress first in areas that are already being investigated. It is therefore considered that any significant developments relating to shale gas are more likely to come forward towards the end of the current Plan period (2015 – 2030).
- 6.3 There is a much larger resource of coal under Cumbria, both deep and shallow, which runs across the northern half of the county and into Scotland and over to the Pennines. Therefore it is more likely that proposals for coal bed methane extraction, rather than shale/gas extraction, will come forward within the Plan period. Furthermore, because of the coal, it is likely that underground coal gasification could occur offshore once the technology is mature.
- 6.4 Cumbria contains, in whole or in part, two National Parks (Lake District; Yorkshire Dales) and three Areas of Outstanding Natural Beauty (Solway Firth; Arnside and Silverdale; North Pennines) ; in total, these designations cover 49% of the county. The Lake District National Park is also designated as a UNESCO World Heritage Site and there is another World Heritage Site – Frontiers of the Roman Empire: Hadrian's Wall – to the north of the county. The Government has confirmed that applications for unconventional hydrocarbon development in these areas will only be allowed in exceptional circumstances. The planning practice guidance, referred to above, reiterates policy contained in the National Planning Policy Framework (NPPF) in regard to major development in National Parks and AONB: i.e. that great weight should be given to conserving landscape and scenic beauty in these areas (including adjacent areas if they affect the setting) and that planning permission should be refused for major development except in exceptional circumstances, and where it can be demonstrated that it is in the public interest.
- 6.5 There is currently one extant PEDL in Cumbria - PEDL No.260 located in south-west Cumbria around Barrow in Furness. This was issued to Reach CSG with a start date of July 2016 running until the end of July 2046. They will need to drill within five years of the start date (i.e. by July 2021) or else relinquish the licence.

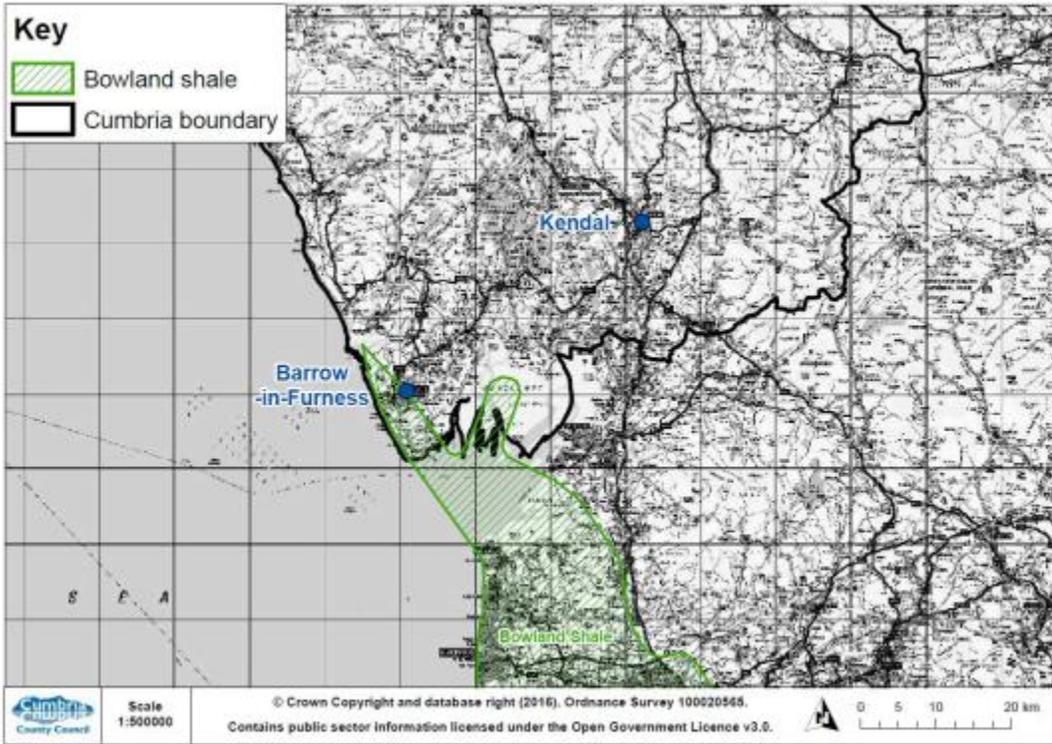
To date no planning applications or pre-application enquiries have been submitted to the county council in connection with this licence. Previous PEDLs in the county have now been relinquished.

- 6.6 Three conditional licenses for UCG have previously been issued by the Coal Authority along the west Cumbria coast as well as one in the Solway Firth. No planning applications or enquires have been received by the council in connection with these licenses. The Coal Authority has confirmed these licences are now either expired or relinquished and there are currently no conditional UCG licences in place anywhere across the UK.
 - 6.7 Policy DC13 (Criteria for Energy Minerals) in the adopted Cumbria Minerals and Waste Local Plan sets out the policy approach on exploration, appraisal and commercial exploitation of hydrocarbons, including underground coal gasification. Any development would also have to comply with all the other relevant policies such as those for traffic, environmental impact, biodiversity and geodiversity, landscape, restoration, etc.
 - 6.8 Officers will continue to monitor the situation regarding hydrocarbons in the county and this briefing will be updated to reflect any future changes to planning policy or licensing activity.
-

Annex A: Map of shale formations across the UK



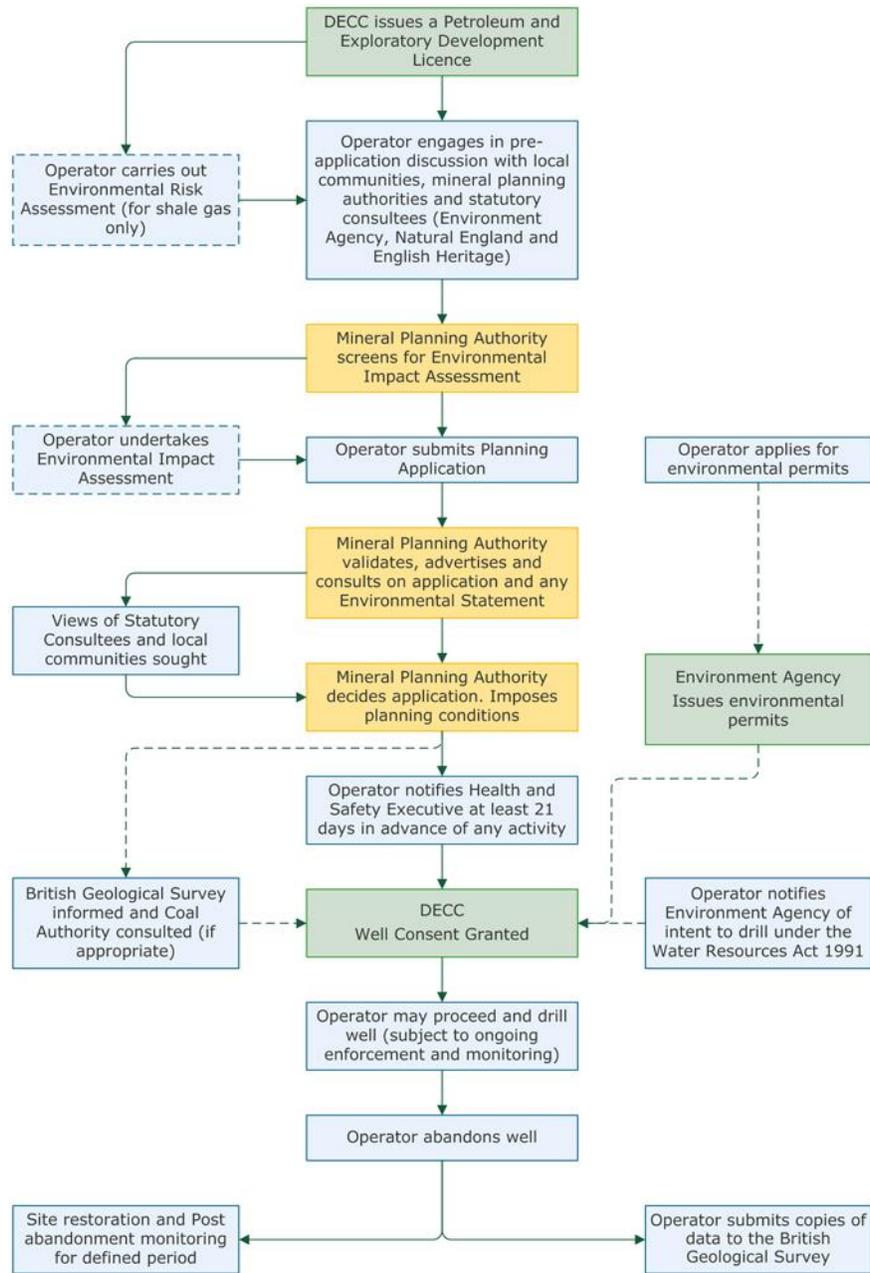
source: BBC news website, 12 August 2013



Bowland Shale in relation to Cumbria County Council

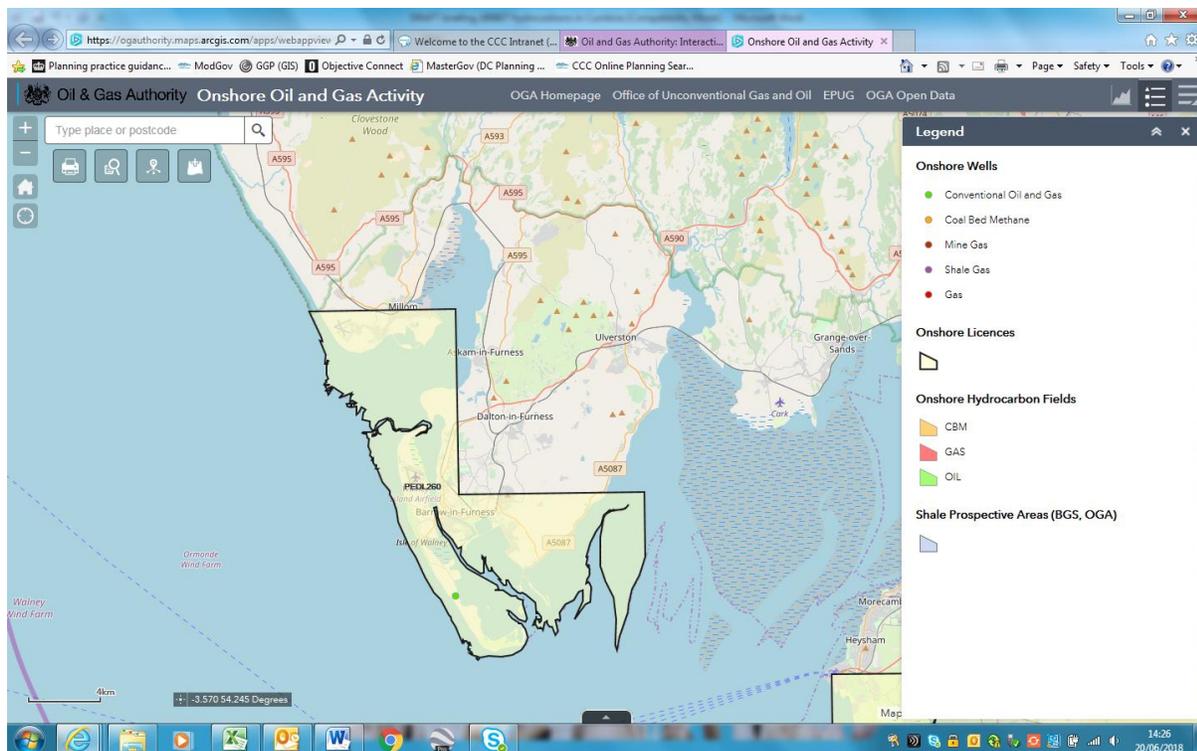
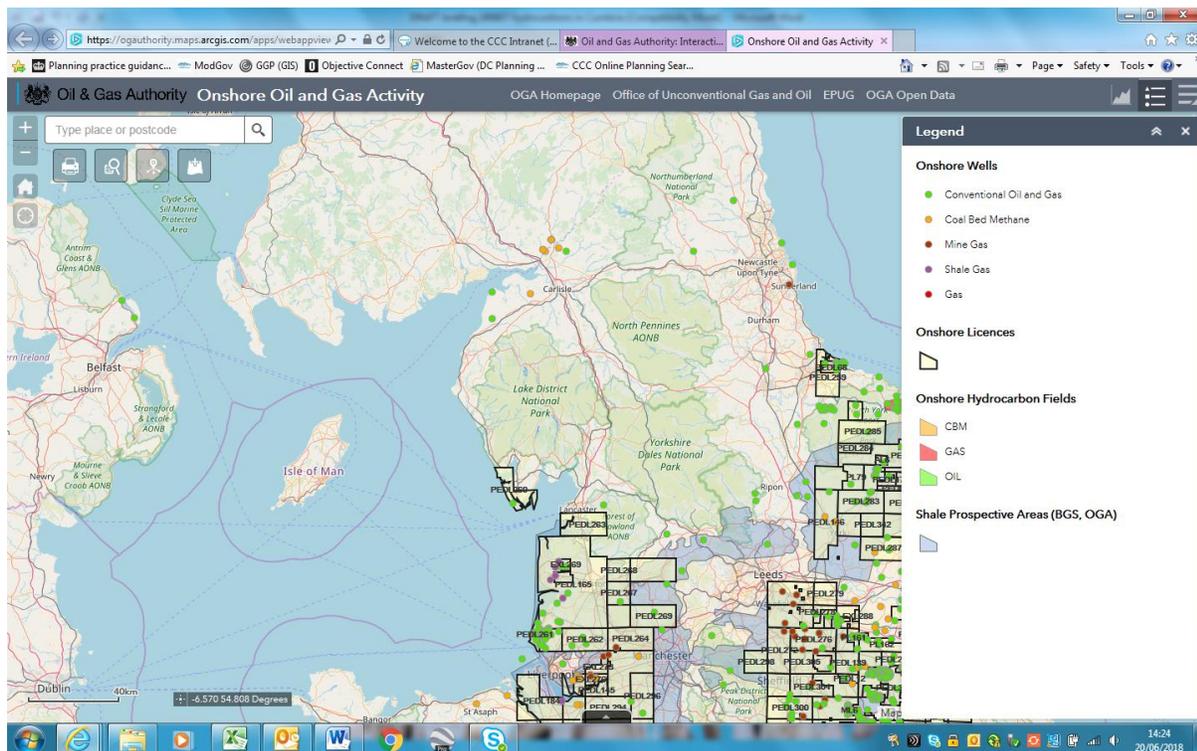
Source: The Hydrocarbon Prospectivity of Britain's Onshore Basin, DECC 2011

Annex B: Outline of process for drilling an exploratory well



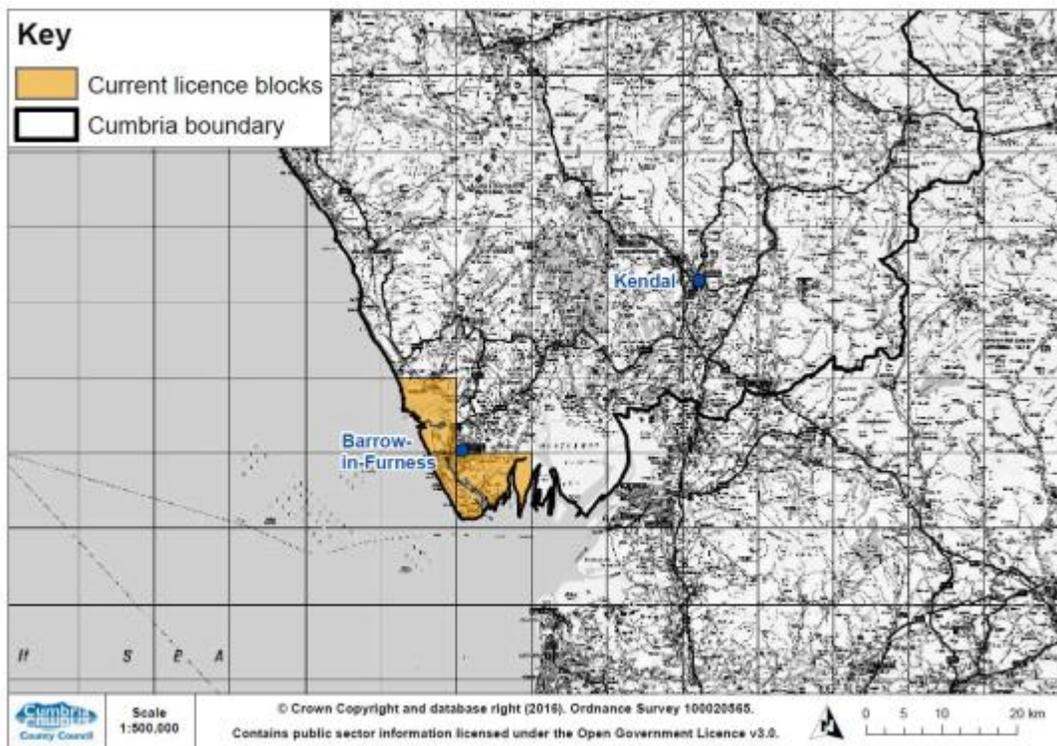
source: Planning Practice Guidance, DCLG March 2014

Annex C: Map of PEDL areas in and around Cumbria



Source: Oil and Gas Authority, 2018

Annex D: PEDL Blocks in Cumbria



Current onshore licence blocks in Cumbria (PEDL 260- shale gas - extant)
source: DECC,2016

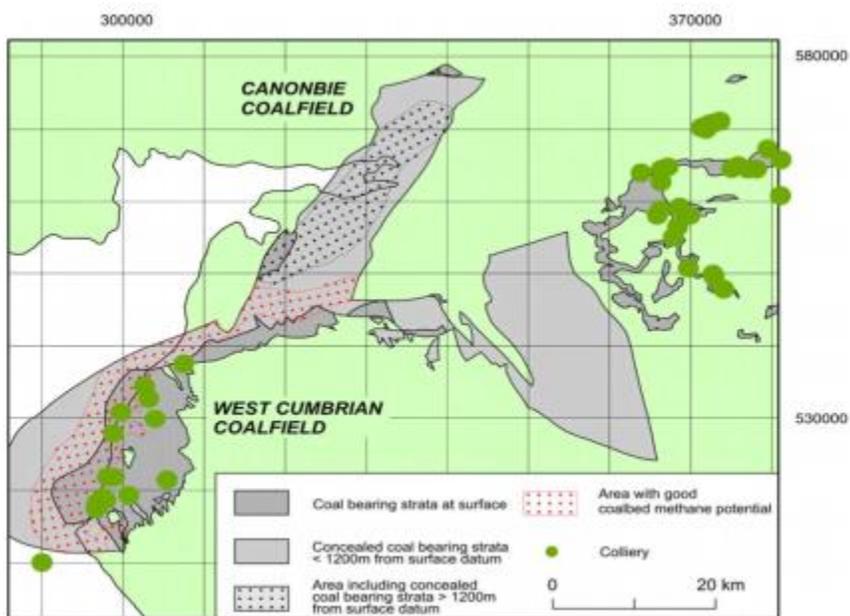


Fig. 32 Cumbria-Canonbie – summary map of unconventional hydrocarbon potential

The Cumbria – Canonbie Coalfield area (PEDL 159 – coal bed methane – relinquished)
source: DECC,2013

Annex E: Underground coal gasification licences in Cumbria



	Underground Coal Gasification (UCG)		Underground coal extraction plus UCG		Surface and/or underground coal extraction
--	-------------------------------------	--	--------------------------------------	--	--

Licences granted by the Coal Authority (at 7.4.2016)

Status	Reference	Name	Type	Company
Future	OPC/0431/N	Canonbie Prospect	Surface also permits shallow coal mining	Kier Mining and Buccleuch Estates
Future	UND/0176/N	Lochinvar Project	Underground	New Age Exploration Ltd
Future	UND/0182/N	Lochinvar Project - Southern Area	Underground	
Future	UCG/0008/N	Solway Firth	UCG	Five Quarter Energy
Future	UCG/0037/N	Maryport	UCG only	Cluff Natural Resources Ltd
Future	UCG/0033/N	Northern Cumbria Offshore	UCG only	
Future	UCG/0012/N	West Cumbria Offshore	Underground offshore	West Cumbria Mining
Future	UCG/0021/N	Whitehaven Offshore No 2	UCG only	
Future	UND/0177/N	Whitehaven South Prospect	Underground onshore	

Licence applications at April 2016

Source: Coal Authority

Annex F: Adopted Cumbria planning policies re hydrocarbons

POLICY DC13 Criteria for energy minerals

Proposals for energy minerals developments that conform to the Strategic and other Policies of this Local Plan will be supported subject to the following criteria:

Exploration and appraisal of hydrocarbons

Planning permission will be granted for proposals for exploration and appraisal of oil and gas resources provided that:

- a. the site and equipment is sited at a location where it can be demonstrated that it will not have any unacceptable social and environmental impacts; and
- b. the proposal provides for appropriate baseline monitoring prior to commencement of development; and
- c. the impacts of the development have been considered in relation to impact on climate change; and
- d. the timely restoration and subsequent aftercare of the site, whether or not oil or gas is found.

Commercial exploitation of hydrocarbons

Planning permission will be granted for proposals for commercial exploitation of oil and gas, provided that:

- a. a full appraisal programme for the oil or gas field has been completed;
- b. the proposed location is the most suitable, taking into account social, environmental, geological and technical factors;
- c. the cumulative impacts of the development of the gas field and essential associated infrastructure have been assessed;
- d. appropriate provision is made for mitigation or compensation for significantly adverse environmental and social impacts; and
- e. the impact of the development has been considered in terms of contributing to the mitigation of climate change.

Combined planning applications for more than one phase will only be considered if all relevant information, including environmental information, to support the full extent of the application is provided.

Underground Coal Gasification

The criteria set out above in this policy, for exploration and appraisal and commercial exploitation, will also apply to proposals for onshore surface works or ancillary development to support offshore Underground Coal Gasification (UCG). Where a UCG proposal follows a planning permission for coal extraction only, a separate planning application will be required for development related to UCG.

Coal

Planning applications for coal extraction will only be granted where;

- the proposal would not have any unacceptable social or environmental impacts; or, if not
- it can be made so by planning conditions or obligations; or, if not
- it provides national, local or community benefits which clearly outweigh the likely impacts to justify the grant of planning permission.

For underground coal mining, potential impacts to be considered and mitigated for will include the effects of subsidence including: the potential hazard of old mine workings; the treatment and pumping of underground water; monitoring and preventative measures for potential gas emissions; and the disposal of colliery spoil. Provision of sustainable transport will be encouraged, as will Coal Mine Methane capture and utilization.

The adopted Cumbria Minerals and Waste Development framework documents can be found on the County Council website at: http://www.cumbria.gov.uk/planning-environment/policy/minerals_waste/mwdf/AdoptedDocuments.asp