Report to the Environment, Transport and Locality Services Select Committee

Title:	**Update Report: Recent developments concerning 'Fracking' for shale gas**
Committee date:	**4th February 2014**
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Report signed off by Cabinet Member:	**Councillor Lesley Clarke, Cabinet Member for the Environment**
Electoral divisions affected:	**All**

Purpose of Agenda Item

- This item is brought to the Committee in order to help them to be fully informed on the issue of 'Fracking' for gas.

Background

- Members received reports on 'Fracking' for gas at their meetings in September and November/December 2013. There have been further developments on this issue which are the subject of this report.

Summary

- The Government has offered financial incentives to planning authorities and communities to accept Fracking.
- A further round of Licensing by DECC is due to take place later in 2014.

- The County Council hopes to begin work on a new planning policy document on minerals and waste later in 2014.

Resource implications

- There are no financial or resource implications.

Recent developments concerning 'Fracking' for shale gas

1. In the Autumn Statement 2013, the Chancellor of the Exchequer announced changes to the tax regime in respect of shale gas exploration and production. This was intended to make it more favourable to invest in shale gas exploration, and covers both conventional and unconventional hydrocarbons. A French Company Total SA, subsequently announced that they had acquired a 40 per cent stake in two exploration licences in the East Midlands, in a geological basin known as 'the Gainsborough Trough' that is thought to be rich in gas. The other 60% interest in the exploration licences within Lincolnshire are owned by a number of smaller UK based oil and gas exploration companies.

2. In January 2014 the Prime Minister announced that local councils where shale gas fracking is allowed will be able to receive 100% of Business Rates from the operation, instead of the 50% at present. This will be a material consideration when the Mineral Planning Authority determines any applications for shale gas exploration or production. With respect to Buckinghamshire there have been no planning applications to date for shale gas exploration or production by 'fracking', and there are none awaiting determination at present.

3. Local communities affected by 'Fracking' for exploration or production are now being offered a compensation scheme. The industry has committed to a package for communities that host shale development. This includes:

- At exploration stage, £100,000 in community benefits per well-site where fracking takes place
- 1% of revenues at production will be paid out to communities.
- Operators will publish evidence each year of how they have met these commitments.
- The shale gas and oil industry has set out their commitment to community engagement in a Charter, which will be regularly reviewed.

The details of this compensation scheme have not been elaborated on since this announcement.

4. In October 2013, Public Health England published 'Review of the Potential Public Health Impacts of Exposures to Radioactive and Chemical Pollutants as a result of Shale Gas Extraction'. It considered the various chemicals involved with shale gas exploration using hydraulic fracturing ('fracking'), and the risks associated. The report concludes that: '*Although shale gas extraction and related activities have the potential to cause pollution to air, land and water, the currently available evidence indicates that the potential risks to public health from exposure to the emissions*

associated with shale gas extraction are low if these are subject to approval under pollution control regimes. Local planning authorities should assume that these regimes will operate effectively.'

5. If and when the County Development Control Committee has an application for shale gas exploration and/or production by 'Fracking' before it to determine, then it will need to take into consideration all relevant policy from the NPPF, including paragraph 122, as well as relevant policies from the Buckinghamshire Minerals and Waste Development Plan. It should be noted that 'Fracking' for exploration or production of shale gas would be regulated by the Environment Agency (in order to protect the water environment, and concerning waste disposal), and the Health and Safety Executive (in respect of site operations and the construction of the well). With respect to planning involvement in 'Fracking' for shale gas the National Planning Policy Framework (NPPF) at paragraph 122 states:

   In doing so, local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities should assume that these regimes will operate effectively.

6. The Buckinghamshire Minerals and Waste Development Plan consists at present of those policies 'Saved' from the Buckinghamshire Minerals and Waste Local Plan adopted in 2006, as well as those contained in the Minerals and Waste Core Strategy adopted in November 2012. The Government published Planning Practice Guidance for Onshore Oil and Gas (July 2013) states at paragraph 5:

   Paragraphs 142 to 149 of the National Planning Policy Framework 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 hydrocarbons and unconventional hydrocarbons such as shale gas and coalbed methane.

   Mineral Planning Authorities (such as Buckinghamshire) are expected to include in their Mineral Local Plans:

- Petroleum Licence Areas on their proposals maps;
- Criteria-based policies for each of the exploration, appraisal and production phases of hydrocarbon extraction. These policies should set clear guidance and criteria for the location and assessment of hydrocarbon extraction within the Petroleum Licence Areas.

The level of detail that Minerals and Waste Local Plan policy should contain about oil and gas exploration and production will be a matter for the initial consultation on the new Minerals and Waste Local Plan. The representations received in response to that initial consultation will provide a considerable amount of information concerning the issues to be addressed and the direction of travel of the new Plan.

7. Although the Buckinghamshire Minerals and Waste Local Development Scheme has not yet been amended, it is hoped that work can begin on a new Minerals and Waste Local Plan later in 2014. The existing development management policies from the Minerals and Waste Local Plan adopted in 2006 may need to be revisited, amended, or replaced so as to be fully compliant with the NPPF, to be more effective, and to take into consideration changes in circumstances within the County.

8. There is at present only a single existing Petroleum Exploration Development Licence (PEDL 236) which lies partly within the County area. This licence is for land mostly beneath Windsor Castle, and lies within the administrative areas of Windsor and Maidenhead, and Slough Councils. However licence PEDL 236 will expire in June 2014 if a well is not drilled, and if the licensees have not been successful in finding a location to drill. Of greater significance is that there is due to be a further round of issuing licences for onshore exploration and production later in 2014. A Strategic Environmental Assessment has been undertaken and published, and the consultation on this runs until the 28th March 2014. In particular, the new Minerals and Waste Local Plan will need to take into account the presence of any PEDL licences within Buckinghamshire. It will be prudent to take onboard the results of the 14th licencing round when available later in the year.

9. In summary, it remains the situation that because of the geology of the County that 'fracking' for shale gas remains unlikely in Buckinghamshire in the near future.

Next steps

- The Government is to undertake a further round of licensing for onshore oil and gas exploration later this year. The Council should wait this Licensing round and at that time review whether ant new Licences may affect Buckinghamshire.
- The Council as Minerals Planning Authority will be developing a new planning policy document- the 'Minerals and Waste Local Plan' (MWLP). This will provide the opportunity to have a robust policy or policies with which to determine any planning applications for 'Fracking' for shale gas that may arise in the future.

Report to the Environment, Transport and Locality Services Select Committee

Title:	Briefing Note on Fracking and Shale Gas
Committee date:	25th September 2013
Author:	Policy, Strategy and Development Team
Contact officer:	Stephen Walford
Report signed off by Cabinet Member:	Janet Blake
Electoral divisions affected:	All

Purpose of Agenda Item

As the local planning authority for minerals and waste matters, Buckinghamshire County Council is the determining authority for any planning applications submitted for oil or gas exploration development.

This briefing note provides a review of published information regarding Shale Gas extraction and applies this to the Buckinghamshire context to identify whether there is a reasonable likelihood for Shale Gas to occur in Buckinghamshire. It describes the licensing and planning processes for Shale Gas development and outlines what the current situation is in Buckinghamshire with regard to these processes.

1. Background

1.1. Shale gas comprises methane recovered from mudrocks and shales which have previously been considered too impermeable to allow economic recovery of gas. This and other forms of 'unconventional' hydrocarbons are now being considered in the UK as alternatives to conventional oil and gas production, in response to concerns relating to the UKs growing reliance on imported Natural Gas.

1.2. Shale gas is formed by thermal maturation (heating within the Earth) of organic rich shales (thermogenic methane), or by methanogenic bacteria acting on shales rich in

organic matter (biogenic methane). Biogenic methane is important in shale prospects elsewhere in the world but has not yet been shown to have occurred in the UK[1].

1.3. The term 'unconventional' relates to the type of reservoir within which the gas is found rather than the methods by which the gas is extracted. Unlike conventional gas, which collects in porous rocks and can be released simply by drilling boreholes into those rock formations, shale gas is locked in the matrix of less porous rocks. It can only be accessed by a special technique called hydraulic fracturing or "fracking"[2]. Hydraulic fracturing can also be used as part of conventional gas production.

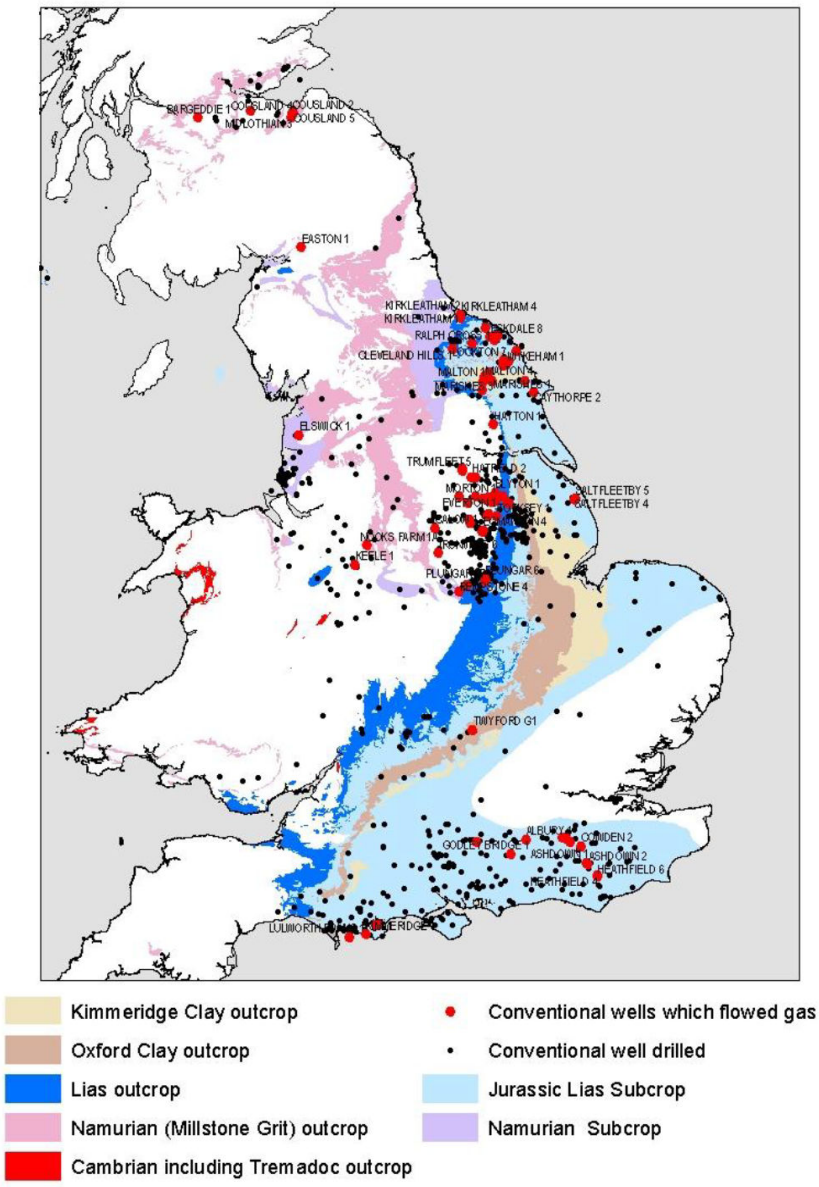
1.4. Hydraulic Fracturing is a process whereby the gas flow and yield in less porous gas-bearing rock is increased by fracturing the rock. This is achieved through the injection of water, sand and chemicals into horizontally drilled boreholes causing the rock to crack. The sand 'props open' the fractures once formed. These fractures make the rock more permeable, enabling the released gas to flow at commercial rates.

2. Potential for Shale Gas Exploration in Buckinghamshire

2.1. The Department of Energy and Climate Change (DECC) in association with the British Geological Survey (BGS) have produced reports looking at the potential of unconventional gas energy reserves in the UK, including the potential for production of Coal Bed Methane and Shale Gas. *'The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas*[3]*'* report examines the potential for shale gas exploration in the UK, and identifies geographic areas with the best and potentially the lowest risk onshore shale gas potential, including the Upper Bowland Shale of the Pennine Basin, the Kimmeridge Clay of the Weald Basin and possibly the Lias of the Weald Basin (see figure 1). A further report providing an estimate of the shale gas resource occurring in geological basins in central England was published by BGS and DECC in 2013[4], and studies are currently being undertaken in relation to the Weald Basin in the south of England.

Figure 1: Main Areas of Prospective UK Shale Formations (taken from DECC 2012)

[1] Alternative Fossil Fuels, Mineral Planning Factsheet, DCLG and BGS 2011
[2] Alternative Fossil Fuels, Mineral Planning Factsheet, DCLG and BGS 2011
[3] The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas, DECC 2012
[4] The Carboniferous Bowland Shale Gas Study: Geology and Resource Estimation, DECC 2013



2.2. Shale gas exploration is currently proving successful in the USA, where it is at least 30 years ahead of the rest of the world[5]. By comparison, the UK shale gas industry is in its infancy, with only one company (Cuadrilla) actively carrying out shale gas exploration in Lancashire. Therefore, ahead of production testing there are no reliable indicators of potential productivity in the UK, and for this reason resource estimates have been made by comparison with shale gas developments (known as 'plays') in America, although these analogies may ultimately prove to be invalid.

2.3. The main criteria for successful shale gas plays in the USA include, but are not limited to, factors such as organic content and thickness of the shale, depth from the surface to the shale, the chemical composition of the shale (petrography) and the

[5] The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas, DECC 2012

amount of structural deformation the shale has undergone[6]. The Shale Gas Plays currently identified in the USA are all associated with Basin formations.

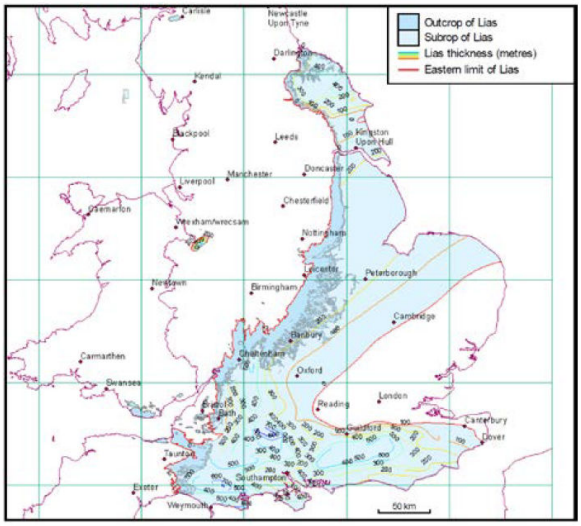
2.4. The geological formations of interest for shale gas potential identified in the 2012 DECC report are shown in Figure 1. Although some of these formations, including the Oxford and Kimmeridge Clays and the Lias are shown to pass through Buckinghamshire, they are unlikely to be prospective for Shale Gas. Figure 2 shows that within Buckinghamshire, the majority of these formations occur as outcrops (near the surface) which could be indicative that they have not been subject to the geological processes experienced within the basin centres considered to be most likely to be exploited for Shale Gas in the UK.

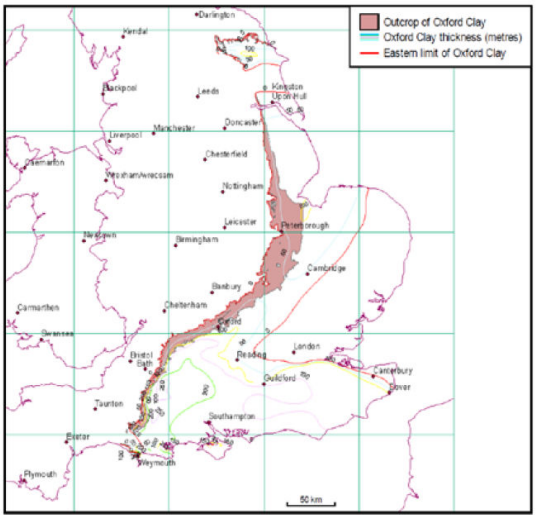
2.5. This is supported by existing literature which indicates that the areas likely to be of greatest interest would be those associated with basin formations, particularly the Pennine, Wessex, Weald and Cleveland Basins[7] [8] [9]. In conventional oil and gas accumulations, shales are the source rock from which hydrocarbons are generated following burial, and through time these hydrocarbons migrate from the source rock towards 'reservoirs' at the margins of the basin centres. In the case of unconventional hydrocarbon accumulations such as Shale Gas, shales act as both the source and the reservoir rock and therefore the basin centres are the exploration targets[10].

2.6. In addition, a report of the Royal Society also notes that *"Shale Gas is likely to be extracted at a depth of many hundreds of metres, or even several kilometres to ensure reservoir pressures sufficiently high to allow gas flow to surface… Extracting Shale Gas from much shallower shales is unlikely since reservoir pressure would be too low for gas to flow at commercial rates[11]."*

2.7. The 2012 DECC report also notes that a well in Calvert in Buckinghamshire discovered gas in 1911, possibly from Cambrian-age strata[12]. Although this well was deepened and another well drilled farther east, there were no further signs of gas. Another sub-economic gasfield was found by BP to the north at Twyford in the 1960's. The source of these gas shows has not yet been identified, although existing literature acknowledges that potential sources could include underlying Tremadoc shales[13] or Westphalian strata in Oxfordshire to the west[14].

[6] The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas, DECC 2012
[7] The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas, DECC 2012
[8] The Carboniferous Bowland Shale Gas Study: Geology and Resource Estimation, DECC 2013
[9] Smith, N; Turner, P; Williams, G (2010) UK Data and Analysis for Shale Gas Prospectivity, Smith et al 2010
[10] The Carboniferous Bowland Shale Gas Study: Geology and Resource Estimation, DECC 2013
[11] Shale Gas Extraction in the UK: A Review of Hydraulic Fracturing, The Royal Society and The Royal Academy of Engineering 2012
[12] The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas, DECC 2012
[13] UK Shale Gas: The Story So Far, Selley 2012
[14] The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas, DECC 2012





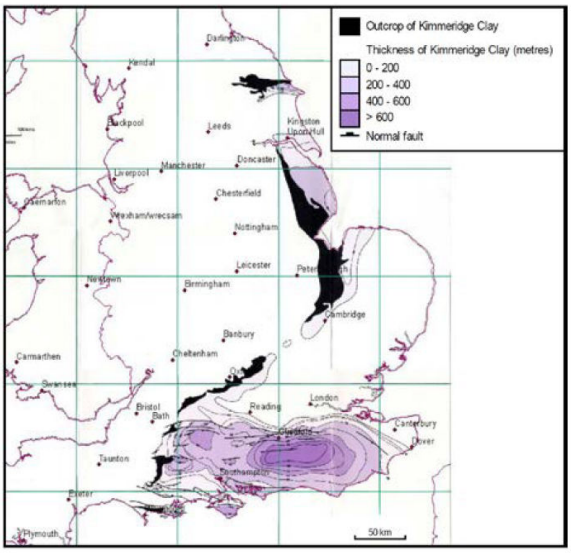


Figure 2: Outcrop, sub-crop, and thickness of Lias Formation (top left), Oxford Clay (top right) and Kimmeridge Clay (left). (Taken from DECC 2012)

2.8. These previous gas shows at Calvert and Twyford may also indicate the presence of conventional gas within Buckinghamshire. A report commissioned by the BGS in 2003 concluded that *"the county appears to have limited oil and gas prospectivity, although the possibility for the discovery of (small) gas accumulations may still exist*[15]*."*

2.9. It is therefore possible that some Cambrian age shales extend at depth beneath Buckinghamshire. However, the 2012 DECC report also advises these to be a 'higher risk' target as the Upper Cambrian has not sourced conventional hydrocarbon fields[16]. It could therefore be concluded that any such reserves of shale gas that may exist within Buckinghamshire would be unlikely to be exploited in

[15] Mineral Resource Information in Support of National, Regional and Local Planning Buckinghamshire and Milton Keynes, BGS Commissioned Report, Benham et al 2003

[16] The Unconventional Hydrocarbon Resources of Britain's Onshore Basins – Shale Gas, DEC 2012

the near future, until more favourable, lower risk areas have been exhausted, and the industry matures within the UK.

3. Licensing Regime

3.1. Licensing for both conventional and unconventional hydrocarbon exploration is currently regulated by the Department of Energy and Climate Change (DECC) and is essentially the same process whether the well is targeted at conventional or unconventional gas. A Petroleum Exploration and Development Licence (PEDL) under the Petroleum Act is required from DECC, which grants exclusive rights to explore, drill and produce within a small, specified area. However, DECC's licence does not remove the need to comply with planning, health and safety or environmental regulation.

3.2. PEDLs are awarded through a system based on open Licensing Rounds. Before a licence can be awarded, the applicant must satisfy DECC of the competence of its proposed operator, and each member of the applicant group must satisfy DECC of its financial viability and financial capacity. A PEDL does not grant permission for specific operations.

3.3. Drilling of Wells:

- A PEDL must be granted by DECC.
- The operator must then seek planning permission from the Mineral Planning Authority (MPA) to drill a well or conduct an Extended Well Test. The MPA will consult with the Environment Agency (EA) as a statutory consultee as part of the planning application process.
- The operator must then notify the Environment Agency of its intention to drill, at which time the Environment Agency will advise on any requirement for control or permitting under the relevant environmental protection legislation.
- The operator must then apply to DECC for Well Consent, demonstrating that they have gained the necessary planning permissions.
- If well testing operations are expected to last longer than 96 hours, the operator will also have to apply to DECC for Extended Well Testing, demonstrating that this is necessary and that they have the relevant planning permissions and consents in place from the MPA and EA.

3.4. Field Development and Production:

- Once the commercial viability of a project has been established by exploration and appraisal work, the operators will need to gain further planning permission(s) from the MPA for production, in consultation with the EA as statutory consultee in the planning application process.
- The EA will also assess the need for any abstraction licences and/or an environmental permit under the relevant environmental protection legislation.
- The Operator must then seek Field Development Consent from DECC.

3.5. Each development well will require specific consent from DECC and the HSE must be notified of all wells and significant activities at the site. For each part of the process, the operator will also need to obtain access rights from landowners.

4. Hydrocarbon Licenses in Buckinghamshire

4.1. Figure 3 shows that there is currently one existing PEDL licence which falls partially within Buckinghamshire (PEDL236 shown in purple). This relates to an existing licence for oil exploration beneath Windsor Castle which will expire in June 2014 if a well is not drilled prior to this date.

4.2. The areas shown in pink in Figure 3 are those that have been included in the Strategic Environmental Assessment (SEA) for the 14th Round of Onshore Licensing. These areas *may* be offered up under the 14th Round of Onshore Licensing currently anticipated in 2014, and the SEA may also feed into future onshore licensing rounds. The SEA has undergone a 12 week consultation and DECC are now considering the consultation responses.

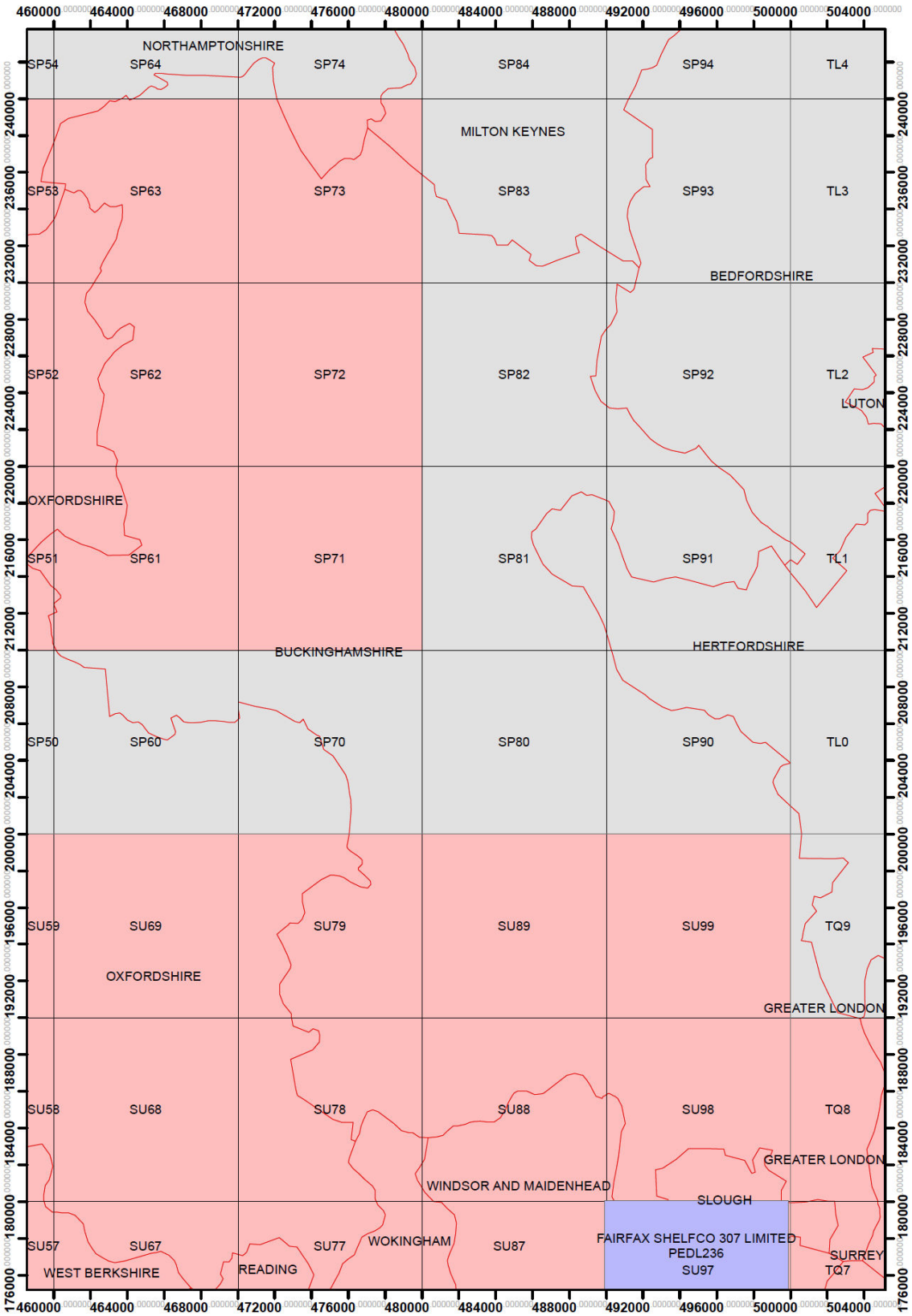
4.3. The SEA covers the Scottish Midlands, North and South Wales, and most areas of England with the exception of the extreme South West. The SEA also notes that large areas of the UK are not prospective for oil and gas, that many of the blocks under consideration for inclusion in the Landward Licensing Round are only marginally prospective and that a proportion will either not be applied for or, following evaluation, will not be explored further[17].

4.4. To date, no producing oil or gas fields have been discovered in Buckinghamshire, with the last hydrocarbon well drilled at Tring on the border with Hertfordshire in 1965. However, as recently as 1998 the Twyford area was covered by the PEDL 15 licence, operated by CANUK, although this appeared to have been relinquished by the 10th Onshore Licensing Round in 2002[18].

[17] Onshore Oil and Gas Licensing, Strategic Environmental Assessment for a 14th and Subsequent Onshore Oil and Gas Licensing Rounds, Environmental Report, DECC 2010

[18] Mineral Resource Information in Support of National, Regional and Local Planning Buckinghamshire and Milton Keynes, BGS Commissioned Report, Benham et al 2003

Figure 3: Existing PEDL licences (purple) and areas subject to Strategic Environmental Assessment for the 14th Round of Onshore Licensing (pink), in Buckinghamshire



4.5. At the current time, no operators have approached the County Council for pre-application discussions for hydrocarbon exploration, whether conventional or unconventional.

5. Minerals Planning Policy and Determination of Planning Applications

5.1. Buckinghamshire County Council is currently progressing its Minerals and Waste Local Development Framework (MWLDF) as a successor to the existing adopted Buckinghamshire Minerals and Waste Local Plan 2004-2016. The MWLDF includes the Minerals and Waste Core Strategy, Minerals Local Plan and Waste Local Plan. The Minerals and Waste Core Strategy was adopted by the Council in November 2012 and contains the strategic planning policies and framework for minerals and waste development in the County, as well as the strategic site allocations for certain waste developments critical to the delivery of this strategy. The Minerals and Waste Local Plans will contain preferred areas for minerals extraction and site allocations for certain waste developments, and the detailed development management policies required to determine planning applications for minerals and waste developments in the county.

5.2. Until such time as the Minerals Local Plan is adopted planning applications for Minerals development, including hydrocarbon exploration, would be determined in accordance with the Minerals and Waste Core Strategy, relevant 'saved' policies in the Buckinghamshire Minerals and Waste Local Plan 2004-2016, and other relevant local and national planning policies.

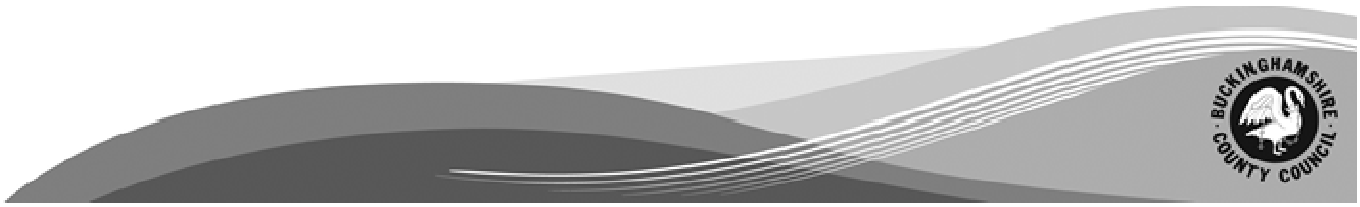
5.3. Acknowledging that hydrocarbon exploration licences have been issued in the past, the Buckinghamshire Minerals and Waste Local Plan 2004-2016 currently includes a policy (Policy 9) relating to hydrocarbon development, which states:
"Applications for exploratory works for oil and gas will be considered against all relevant policies of this plan. Proposals for appraisal drilling will be approved provided that the local environmental impacts are not of such a scale as to override the national interest associated with oil exploration. Particular regard will be made to the long-term suitability of the site for commercial production and distribution[19]."

5.4. This policy is due to be replaced by an appropriate policy or policies in the forthcoming Minerals Local Plan.

6. Recommendations

6.1. Based on information presented by DECC and BGS Buckinghamshire is unlikely to be a strong candidate for the extraction of Shale Gas. Therefore specific planning policies relating to Shale Gas extraction would not be required within the forthcoming Minerals Local Plan. However, in light of the inclusion of parts of Buckinghamshire in the SEA for the 14th Round of Onshore Licensing, it is prudent

[19] Buckinghamshire Minerals and Waste Local Plan 2004-2016, Buckinghamshire County Council, Adopted June 2006



to consider the inclusion of a policy or policies in relation to general hydrocarbon exploration and production in replacement of the existing Policy 9 of the Buckinghamshire Minerals and Waste Local Plan 2004-2016. If required, this may include the preparation of a Hydrocarbons topic paper in support of the Minerals Local Plan.

7. References and Further Reading:

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