

Unconventional Oil and Gas Regulation Workshop

13 October 2016, Edinburgh

Note of Workshop

November 2016



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UNCONVENTIONAL OIL AND GAS REGULATION WORKSHOP

13 OCTOBER 2016, EDINBURGH

NOTE OF WORKSHOP

The Scottish Government is taking a cautious and evidence-led approach to Unconventional Oil and Gas (UOG). On 28 January 2015, the Scottish Government announced a moratorium on UOG so that further evidence could be gathered before holding a full public consultation.

On 8 October 2015 the Scottish Government published details of a comprehensive programme of research and the timetable for the consultation on UOG.

This workshop on regulation is part of this programme of evidence-gathering.

The evidence considered at the workshop included the review of UOG carried out by the [Independent Expert Scientific Panel](#), as well as the research projects commissioned in 2016, namely:

- Health Impact Assessment (Health Protection Scotland)
- Transport - Understanding and mitigating community level impacts (Ricardo).
- Decommissioning, site restoration and aftercare – obligations and treatment of financial liabilities (AECOM)
- Understanding and monitoring induced seismic activity (the British Geological Survey)
- Economic impacts (KPMG)
- Climate change impacts – (UK Committee on Climate Change)

The Independent Expert Scientific Panel report (2014) set out a comprehensive analysis of regulatory issues, and concluded that: “The regulatory framework is largely in place to control the potential environmental impacts of the production of unconventional oil and gas in Scotland, although there may be gaps to address.”

The purpose of the workshop was, without prejudice to the eventual outcome of the Government’s consultation and moratorium process, to:

- consolidate the range of examinations and considerations of the regulatory framework to date.
- consider the current regulatory framework in light of issues raised by the independent research, and how to approach improvements should it become necessary.
- agree how to help inform the public consultation.

The following organisations were represented:

- Scottish Government Energy and Climate Change, Environment and Forestry, and Local Government and Communities Directorates
- Scottish Environment Protection Agency
- Health and Safety Executive
- Health Protection Scotland
- British Geological Survey

- Scottish Natural Heritage
- Coal Authority
- Heads of Planning Scotland
- Local Authority Environmental Health Officers

For reference, a copy of the meeting agenda is attached at Annex A.

The draft paper “Overview of the current regulatory framework” was accepted as a comprehensive and correct description of the regulatory framework as it currently exists, subject to a small number of technical amendments.

Following presentations on the findings of the research projects and the Health Impact Assessment, it was agreed that the regulatory issues relating to UOG had been appropriately captured (Annex B), and that stakeholders have raised issues relating to protection of the water environment and wider wildlife interests. In discussion, the importance of the following points were emphasised:

- long term monitoring, record keeping and liability (noting that the research found the risk of an escape of fluids from a decommissioned well to be low);
- long term nature of UOG developments with early stages being exploratory;
- transparency and clarity for communities about the role of regulators and the protection that regulatory controls provide;
- community engagement;
- co-ordination and close working between the regulatory bodies;
- resourcing for any increased regulatory role.

In the event that Scottish Ministers wish the regulatory framework for UOG to be further explored, it was agreed that:

- the observations made by the independent researchers and noted at this workshop would form an appropriate basis for organising work to examine how regulation could be strengthened if that was to be required; and
- that an effective approach, in the event that it is required, to advancing such work would be the formation of an Expert Regulatory Group, chaired by the Scottish Government with representation from the organisations present at the workshop.

The group would require access to technical and legal resource, would make use of existing professional networks and would consider community impacts and involvement.

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ANNEX A

AGENDA

1. Welcome and introductions
2. Background and purpose
3. Presentations on research findings as they impact on regulatory considerations
 - Decommissioning, site restoration and aftercare
 - Induced seismic activity

BREAK (circa 11:10)

- Transport
- Public Health Impact Assessment

4. Questions and discussion on research presentations

LUNCH (circa 13:00)

5. Regulatory issues highlighted by the research

BREAK (circa 14:30)

6. The current regulatory framework
7. FAQs on UOG regulation
8. Framework for any future examination of regulatory issues

Please note that tea and coffee will be available from 9:30 and the workshop is expected to have come to a close by 17:00.

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ANNEX B

SUMMARY OF OBSERVATIONS ON REGULATION FROM INDEPENDENT RESEARCH

This annex summarises regulatory gaps and issues that are being identified through the independent research reports commissioned by the Scottish Government. All text in *italics* are quotations from the referenced reports.

INDEPENDENT EXPERT SCIENTIFIC PANEL

In 2014, the Scottish Government established an Independent Expert Scientific Panel (the Panel) to examine the evidence on UOG. The Panel presented its findings in 2015. The final report can be read at:

<http://www.gov.scot/Resource/0045/00456579.pdf>

As part of their review of scientific evidence relating to UOG, the Panel reviewed the legislative and regulatory framework associated with UOG in Scotland, and made a number of observations on the framework and potential gaps or issues. A summary is provided below.

The regulatory framework for UOG

The Panel concluded that:

The regulatory framework is largely in place to control the potential environmental impacts of the production of unconventional oil and gas in Scotland, although there may be gaps to address.

A regulatory framework already exists in Scotland, which covers the vast majority of activities requiring control and monitoring as part of unconventional oil & gas developments. This is generally well-coordinated between the main regulatory bodies (DECC, HSE, Local Authorities, SEPA, the Coal Authority).

Air quality and fugitive emissions

The Panel identified a set of specific potential issues in how fugitive emissions and air quality would be regulated under the current framework:

- *Where an activity named in Schedule 1 of Pollution Prevention and Control (Scotland) Regulations 2012 (PPC), such as refining, is not carried out, typically during the exploration or appraisal phase, then there may be a gap in regulation. This applies particularly, but not exclusively, to flaring and venting.*
- *The Management of Extractive Waste (Scotland) 2010 Regulations (MEW), enforced by the planning authority, may include a requirement for waste gases (e.g. fugitive methane emissions) to be managed; however these may not always be engaged. Where neither a PPC named activity nor an extractive waste activity is being carried out, fugitive emissions at any treatment facility or wellheads may not be regulated.*
- *Where neither PPC nor MEW applies, there will be a gap in the regulation of monitoring and management of air quality within the gas extraction site.*

Decommissioning and aftercare

The Panel noted that:

- *Post-production long term monitoring and responsibility is another potential gap; and*
- *A lack of guaranteed financial coverage, should an operator go bankrupt, would lead to regulatory uncertainty.*

Planning and Environmental impact assessment

The panel made the following observation on planning and environmental assessments:

It is recognised that the Environmental Statement and the EIA [Environmental Impact Assessment] process, when applied to unconventional gas development, must be comprehensive with total awareness of all possible short and long-term, local and regional impacts.

HEALTH IMPACT ASSESSMENT

Health Protection Scotland have undertaken an independent assessment of potential health impacts of UOG.

<http://www.hps.scot.nhs.uk/enviro/unconventionalgas.aspx>

Health Protection Scotland make a series of observations on potential regulatory gaps or issues. A summary is provided below.

Community engagement

Health Protection Scotland observe that in view of the importance of community engagement on UOG developments, consideration should be given to:

- *requiring measures and mechanisms to provide communication with the local community and to report operational activities and development progress to the local stakeholders (e.g. town-hall-type liaison meetings).*
- *requiring site hazard monitoring systems to be developed with community participation and agreement, creating openly accessible data to permit community scrutiny of operational activities and conformance to agreed safety standards.*

Health Impact Assessments

Health Protection Scotland observe that:

Health Impact Assessment (HIA) is not currently a mandatory requirement for all planning proposals, including those relating to UOG, although it is partly addressed via the requirement to carry out an Environmental Impact Assessment (EIA) on some development proposals, depending on their scale. Although, EIA guidance encourages an element of HIA to be incorporated, as a matter of good practice, EIA as a process is not specifically designed from a HIA perspective.

Health Protection Scotland conclude that consideration should be given to:

- *a mandatory requirement for all future UOG developments, irrespective of their scale [to have local HIA]. From an environmental health protection perspective, this would be a useful and reasonable measure and could be either integrated into EIA requirements or require a standalone HIA.*
- *commission guidance for those completing HIAs of specific UOG proposals; and guidance for public authorities to scrutinise the HIA reports.*

Planning and Regulations

Health Protection Scotland observe that:

The planning system is one principal mechanism to set conditions on the approval of any proposed UOG development. The planning system and other regulatory statutes such as HSE legislation, PPC etc., may be used to set specific conditions appropriate to a specific site.

Health Protection Scotland outline the following recommendations aimed at improving the effectiveness of the planning and regulatory system to mitigate against potential UOG-related hazards:

- *Establishment of appropriate setback distances, based on empirical evidence, in order to minimise risks to residents and to address risk perception issues.*
- *Increased transparency with respect to public availability of data relating to chemicals used by the industry.*
- *Revision of existing, or creation of new, regulatory instruments to consider both general and UOG-specific health risks.*

Health Protection Scotland also recommend that the development of clear guidance for regulators in relation to the specific application of legislation to UOG activity should be prepared and should address the issues outlined above and the following issues that have been raised in reports published in other jurisdictions:

- *site preparation issues (limiting construction noise, vehicle movements, thresholds for air pollution etc.);*
- *limitations to drilling operations, particularly in order to minimise noise and light pollution;*
- *limits to hydraulic fracturing operations, including restrictions on preparatory work associated with supplying and storing water and proppant raw materials, and removal of waste including produced waters;*
- *limits to other site operation activities likely to generate nuisances e.g., limits to noise, artificial light, air pollution etc. from machinery etc.;*
- *traffic movement issues; limits to the frequency and hours of operation, avoiding night time nuisance generation; actions to prevent traffic accidents; requirements to use vehicles conforming with the highest EU emission control standards, emitting the lowest possible air pollution, or where practical zero emission (electric powered) vehicles;*
- *driver training issues; ensure hazard awareness including the generation noise and air pollution hazard from transport and machinery and mitigation techniques;*
- *site security issues e.g. preventing unauthorised access especially by children and the consequent potential for accidents;*
- *stipulations on site decommissioning and restoration, to minimise potential legacy issues creating long-term community concerns;*
- *setting of hazard threshold exceedence limits to determine criteria for operational shut down;*
- *establishing fail-safe options and automated shut down mechanisms in the event of any excessive hazard release, excess fugitive emissions, operational errors etc.;*
- *establishing site emergency response plans, including local community alerting mechanisms;*
- *development of specific standards and/or guidance in relation to setback distances for UOG activity, to minimise the potential impact on local communities.*

Monitoring and Evaluation

Health Protection Scotland note that:

A standard component of a HIA is to provide recommendations on monitoring and evaluation in order to assess the efficacy of any additional mitigating actions. Both baseline and ongoing monitoring and evaluation are necessary examined

Health Protection Scotland make a number of specific recommendations in relation to monitoring and evaluation based on their review of the peer-reviewed literature:

- *Collection of baseline environmental data in order to better estimate the relative contribution of UOG-related contaminants in environmental media;*
- *Where baseline monitoring has not been conducted, e.g. in US, development and application of more sensitive source-apportionment techniques;*
- *Improved occupational health and safety surveillance to improve understanding of UOG-specific workforce risks;*
- *Increased transparency with respect to public availability of data relating to well-barrier failures and compliance issues.*

Health Protection Scotland also note that

a series of recommendations in relation to monitoring and evaluation have also been proposed in reports produced for other jurisdictions, several of which reinforce the findings from the literature review. These recommendations are consistent with a precautionary approach and should be considered in the event that UOG should proceed in Scotland.

- *gather baseline environmental and health status data in advance of any development to enable future comparisons, and allow the identification of environmental and health impacts;*
- *establish site hazard monitoring systems with community participation and agreement, creating openly accessible data to permit community scrutiny of operational standards;*
- *monitor conformance to regulatory requirements and provide regular feedback on compliance to local communities;*
- *consider establishing systems to independently monitor evidence of adverse health impacts supported by dedicated surveillance systems, directed at monitoring the occurrence of health impacts suspected as being potentially associated with UOG activity.*

Health Protection Scotland also note that:

whilst several of these issues may already be addressed in best practice guidance, translating best practice into requirements through either regulation or planning conditions, and monitoring of the implementation of these on an ongoing basis by the relevant authority, would provide an opportunity to build public trust.

UNDERSTANDING AND MONITORING INDUCED SEISMIC ACTIVITY

The British Geological Survey have undertaken an independent assessment of the induced seismic activity from UOG developments.

<http://www.gov.scot/ISBN/9781786523952>

The study was asked to examine lessons on monitoring and regulating induced seismic activity from UOG developments. In doing so, the study examined the existing UK regulatory framework, which is largely implemented through the Petroleum Exploration and Development licencing regime. This regime is being devolved to the Scottish Government through the Scotland Act 2016.

British Geological Survey make the following observations on the current UK regulatory framework:

- *Regulations contain specific measures for the mitigation of earthquake activity; monitoring seismic activity during and after fracturing,; and using a traffic light system that controls whether injection can proceed or not, based on the seismic activity.*
- *The current [UK Government] traffic light system requires the cessation of operations if events with magnitude of 0.5ML¹ or greater are induced. However, the existing monitoring networks are not capable of reliable detection and location of these low magnitude levels.*
- *Reliable monitoring and measurement at much lower levels will be required to implement such a system successfully. Denser networks of sensors are required to allow reliable detection and location of low magnitude earthquakes and reduce the measurement uncertainties that may affect the operation of such a traffic light system.*
- *Improved understanding of the hazard from induced earthquakes and the successful implementation of regulatory measures to mitigate the risk of induced seismicity are likely to require additional data from a number of sources.*

The British Geological Survey also note that:

Recent increases in earthquake rates and significant earthquakes in many areas of Central and Eastern United States have been linked to wastewater injection in deep disposal wells rather than hydraulic fracturing, and provide a considerable body of evidence that this activity has a non-negligible contribution to the seismic hazard.

¹ The BGS note that earthquakes with magnitudes less than 2ML are generally too small to be felt.

TRANSPORT - UNDERSTANDING AND MITIGATING COMMUNITY LEVEL IMPACTS

Ricardo have undertaken an independent assessment of transportation impacts and mitigation.

<http://www.gov.scot/ISBN/9781786523983>

Ricardo make the following observations on the current regulatory framework:

The framework for assessing UOG developments would be through the existing regulatory and planning framework. Each UOG development would be subject to an Environmental Impact Assessment (known as EIA). Mitigation measures can be implemented through planning conditions or in accordance with Section 75 of the Planning etc. (Scotland) Act 2006.

Ricardo make the following observations on improving the mitigation of impacts from transport:

- *National, regional and local plans should set policies to guide the development of UOG resources, in the event that the moratorium is lifted.*
- *All planning applications for UOG development will require an Environmental Impact Assessment. This will include an assessment of impacts relating to traffic movements and the identification of appropriate mitigation measures, such as avoidance of transportation of water to and from the site by road, where possible.*
- *A Traffic Management Plan should be required to support planning applications for UOG sites. Discussions should take place between the developer and the local authority with regard to the provision of a Roads Condition Survey and provision of an appropriate financial bond to cover any required road repairs, potentially supported by planning condition.*
- *At appropriate sites, an Enforcement Officer should be appointed to ensure that mitigation measures are enforced and management throughout the life of the project.*
- *It is understood that the oil and gas industry is developing a set of key principles in relation to transportation. These should be given appropriate consideration in the planning process.*

DECOMMISSIONING, SITE RESTORATION AND AFTERCARE – OBLIGATIONS AND TREATMENT OF FINANCIAL LIABILITIES

AECOM have undertaken an independent assessment of the decommissioning, site restoration and aftercare for UOG developments.

<http://www.gov.scot/ISBN/9781786523945>

AECOM make the following observations on the current regulatory framework:

- *We consider that Scotland, in common with the rest of the UK, has a framework for the regulation and control of decommissioning and aftercare of UOG development comparable with good regulatory systems in other countries.*
- *The devolvement of the OGA's petroleum licensing powers to the Scottish Government provides an opportunity to fine-tune the licensing system to the particular requirements of Scotland. For example, it may be possible to strengthen the powers relating to the provision of financial guarantees by operators that already exist under the petroleum licensing system.*

AECOM also observe that *there is potential for improvement in existing provisions whilst operators are licensed, and set out the following specific observations:*

- *There is currently no power to require specific arrangements for on-shore well decommissioning and aftercare if a company proves to be failing the financial tests after a well consent is awarded by either the OGA or the future Scottish licensing authority.*
- *A relatively simple solution could be for the licensing authority to re-apply the existing financial strength tests regularly for operators and to ensure that the well costs used in the tests include sufficient allowance for the operator's sub-surface decommissioning and restoration liabilities.*
- *If a company fails the financial strength tests, under the existing regulations the future petroleum licensing authority in Scotland would have the power to compel operators to take specific further action.*
- *This could include provision of Parent Company Guarantees, insurance, bonds or letters of credit or payment into escrow accounts - depending on the reasons for failing the tests. It is clear that both the liabilities for individual wells and the financial robustness of individual operators will vary. The licensing authority therefore needs to be able to compel specific action to match the individual circumstance.*
- *There is a low risk of post-decommissioning well failure, but should it occur it is most likely to happen within a few years of well abandonment and decommissioning. It could therefore be expected that the licensing authority should only accept surrender of the PEDL when all environmental authorisations and restoration obligations have been complied with. During this period, the licensing authority could continue to apply the financial tests and require specific financial action should significant liabilities be identified by the regulators.*

AECOM observe that after licence surrender:

- *The likelihood of long-term failure of decommissioned UOG wells, which are well constructed and abandoned, is low. In the event that a failure does occur after licence surrender, long-term insurance products could cover such risks. Alternatively, a mutual fund could be established to cover the costs of repairing leaking orphaned wells in the future. As an example, an annual levy on consented wells raised through the licence fee on each PEDL could be used for this purpose.*

AECOM provide a table summarising issues gaps and options, which is reproduced below.

Key Issue	Uncertainties	Options
Management of Risks		
Well Integrity	How can risks of emissions from failed wells be minimised?	Well designed and constructed wells at low risk of leakage. Well construction plans approved by an independent well examiner. Regular well inspections by independent well examiner. Well abandonment plans approved by independent well examiner. Baseline, operation and post decommissioning monitoring with the later continued as long as required by SEPA.
Near Surface contamination	How can risks of surface contamination and shallow groundwater contamination be minimised?	Managed through planning conditions and if necessary Scottish contaminated land regime. Operator's environmental liability insurance.
Surface restoration	How can risks of sites remaining unrestored be minimised?	Restoration conditions in planning permission, enforced and supported by financial provisions through legal agreement.
Regulatory System		
Licensing	How does the Scottish petroleum licensing system compare to that other countries or industries?	Comparable to good practice in EU and worldwide. Opportunities to modify and improve under devolved powers particularly in relation to regulation of financial instruments.

Key Issue	Uncertainties	Options
Planning System	Is planning system adequate to manage decommissioning particularly restoration.	Planning system robust and able to control surface restoration through planning agreements. Ability of local authorities to manage financial instruments will be improved if recommendations in Opencast Coal Task Force implemented across those authority areas with UOG development
Other regulation	Is Scottish regulatory system adequate to manage decommissioning?	The regulatory system in Scotland is reported to be “generally well-coordinated between the main regulatory bodies” (Independent Scientific Expert Panel, 2014). The Panel has only identified one regulatory gap namely the absence of any mechanism requiring for long-term monitoring and responsibility for wells. However, this report considers that existing post-decommissioning monitoring required by SEPA should be sufficient to identify wells at risk of well integrity failure. In relation to long-term responsibility, the Expert Panel recognised that “operators have an open-ended liability to remediate any ineffective abandonment”.
Management of Financial Liabilities		
During licensing	How to manage risk of operators abandoning sites before decommissioned. How to ensure post-decommissioning liabilities are managed by operators.	Use of appropriate financial instruments to mitigate risks, e.g. bonds.

Key Issue	Uncertainties	Options
Post licensing (not orphaned)	How to manage risks post-decommissioning where operator is in existence.	Managed through use of operator's Environmental Impairment insurance.
Post licensing (orphaned)	How to manage risks post-decommissioning where operator is no longer in existence.	Mutual Fund created through licensing system and managed by licensing authority

CLIMATE CHANGE IMPACTS – (UK COMMITTEE ON CLIMATE CHANGE)

The UK Committee on Climate Change (CCC) have undertaken an independent assessment of potential climate change impacts from UOG.

<http://www.gov.scot/ISBN/9781786523976>

The CCC made the following observations on the current regulatory framework:

Unconventional oil and gas exploitation at scale would have unique characteristics. The Scottish Government has recognised that stronger environmental regulations may need to be put in place during the moratorium period. This strengthening is essential before production can commence. The current regulatory framework in Scotland for greenhouse gas emissions from UOG lacks clarity over the responsibilities and roles of the various actors and may have gaps relating to regulation of emissions to air including fugitive methane emissions.

There is clear evidence that regulation of shale production can lead to significant reductions in its greenhouse gas footprint.

The CCC then state that:

Our assessment is that exploiting unconventional oil and gas by fracking on a significant scale is not compatible with Scottish climate targets unless three tests are met.

One of these test is in relation to regulation, on which the CCC make the following observations:

Test 1: Well development, production and decommissioning emissions must be strictly limited. Emissions must be tightly regulated and closely monitored in order to ensure rapid action to address leaks.

- *Strengthening of the regulatory system is essential before production can commence. Much greater clarity is necessary over the respective roles of different actors in this system, entailing full coverage of greenhouse gas emissions (i.e. including strict limiting of both CO₂ and methane from all sources, covering not just the production site but also associated infrastructure before the point of grid injection or delivery to end user);*
- *A range of technologies and techniques to limit methane emissions should be required, including ‘reduced emissions completions’ (also known as ‘green completions’), liquid unloading mitigation technologies (e.g. plunger lift systems) and vapour recovery units should these be needed, as well as flaring of methane rather than venting it;*
- *A monitoring regime that catches potentially significant methane releases early is essential in order to limit the impact of ‘super-emitters’;*
- *Production should not be allowed in areas where it would entail significant CO₂ emissions resulting from the change in land use (e.g. areas with deep peat soils);*

- *The regulatory regime must require proper decommissioning of wells at the end of their lives. It must also ensure that the liability for emissions at this stage rests with the producer.*

The CCC also recognised that the recent EU referendum result could have implications for the UOG regulatory framework:

“More recently, the recent EU referendum result has raised questions in this area. We have not considered in detail the possible implications of that result for our analysis, but to the extent that the eventual impacts include weakening of the regulatory framework on UOG production in Scotland then domestic regulations will be required to ensure that a strong system of regulation exists in Scotland for UOG exploitation.”

“The Committee will consider the implications of the EU referendum result in more detail over the coming months.”



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This publication is available at www.gov.scot

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The Scottish Government
St Andrew's House
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Published by The Scottish Government, November 2016

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA
PPDAS82758 (11/16)

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