

Shale gas extraction in the UK: a review of hydraulic fracturing

Ben Koppelman
Senior Policy Adviser

THE
ROYAL
SOCIETY



Shale gas extraction in the UK: a review of hydraulic fracturing

June 2012

THE
ROYAL
SOCIETY



Terms of reference

What are the major risks associated with hydraulic fracturing?

Can these risks be effectively managed in the UK? If so, how?

Headline messages

Yes....as long as operational best practices are implemented and enforced through regulation.

But...attention to how risks scale up

10 Recommendations

Cross-cutting issues

- Monitoring
- Data sharing

Impact

“I have also had the benefit of the comprehensive and authoritative review of the risks of fracking by the Royal Society...

... the Government accepts all the recommendations of the academies' report. Work is already in hand to implement these recommendations”

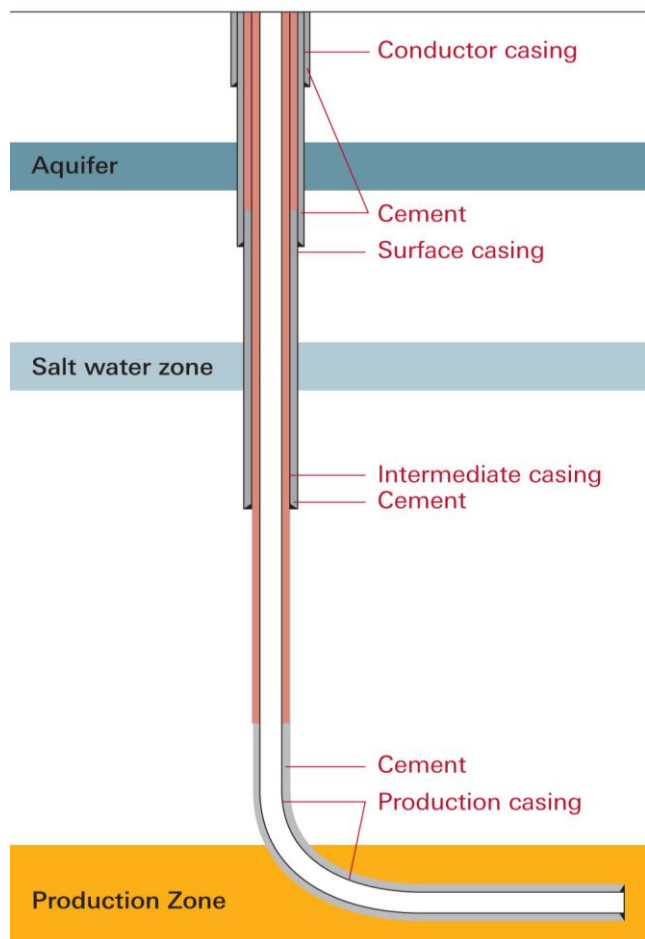
Government response to Royal Academy of Engineering and Royal Society report on “Shale Gas Extraction in the UK: a review of hydraulic fracturing”.

Version: Final A04 - 10th Dec 2012

Contents

Recommendation 1 - To detect groundwater contamination:	2
Recommendation 2 - To ensure well integrity:.....	3
Recommendation 3 - To mitigate induced seismicity	6
Recommendation 4 - To detect potential leakages of gas	8
Recommendation 5 - Water should be managed in an integrated way	9
Recommendation 6 - To manage environmental risks	10
Recommendation 7 - Best practice for risk management.....	11
Recommendation 8 - Regulation, Skills and Training.....	12
Recommendation 9 – Single Body	13
Recommendation 10 - Research	13

1 Ensuring well integrity



Improve UK's well examination scheme

- Clarify guidelines for independence
- Review well designs from health, safety and environmental perspective
- Onsite inspections as appropriate

Submit results of well tests and reports of well examinations to DECC

Government response

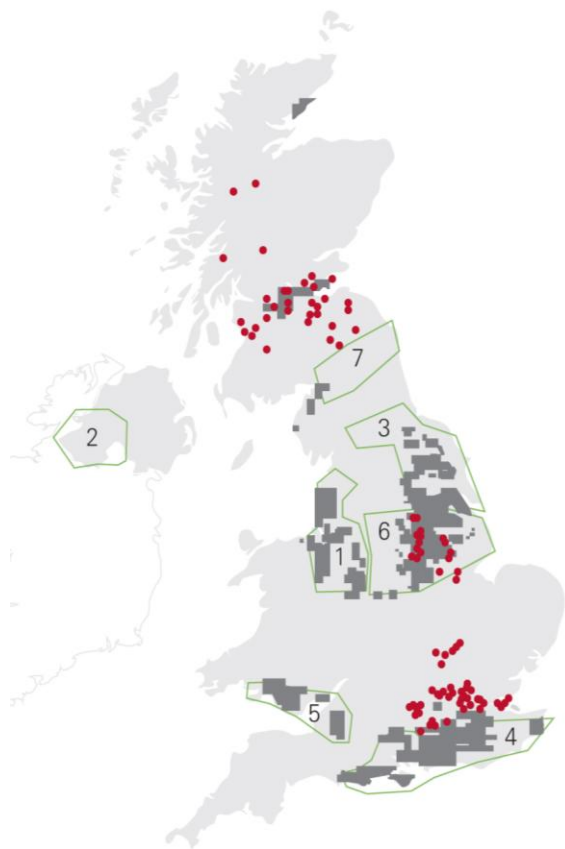
Option for in-house well examiner still open

New industry guidelines: well examiner or separate contractor to assess well integrity from environmental perspective

Operators to ask well examiners to make onsite visits at discretion of examiner (public confidence)

Well integrity tests to be made available to DECC

2 Detecting groundwater contamination



National baseline surveys

Site-specific monitoring
before, during and after
operations

Monitoring arrangements for
abandoned wells need to be
developed

Government response

EA and BGS: national baseline

Operators: site specific

Abandoned wells: Cuadrilla trying specific measures

Monitoring data: Upload onto operators website

3 Mitigating induced seismicity



National surveys (BGS or others)

Site-specific surveys (operators)

Traffic light monitoring systems

- Monitor before, during and after
- Feed back data to allow mitigation

DECC should consider how induced seismicity is to be regulated

Operators should share data with DECC and BGS to establish a national database

Government response

BGS to carry out regional, not national surveys

Operators to carry out seismic risk assessment as part of a new Fracturing Plan

- Draw on BGS' regional data
- Site specific data before, during and after
- Details of mitigation (traffic light system)
- DECC to regulate seismicity by overseeing Frac Plan

4 Detecting potential gas leakages

Site-specific monitoring before, during and after operations

Submit data to the appropriate regulator, to inform wider assessments (e.g. carbon footprint of shale gas extraction)

Government response

EA reviewing existing regulation to consider existing controls for methane leakage

Industry guidelines to draw on EA review

Data onto websites and shared with EA and DECC

5 Integrated water management

Minimise water use and reduce abstracting pressures

Recycle and reuse wastewater where possible

Construction, regulation and siting of any future onshore disposal wells need further investigation

Government response

Industry guidelines to minimise water use

Onshore disposal wells not considered good practice in UK

6 Managing environmental risks

Environmental Risk Assessment (ERA) should be mandatory for all shale gas operations, involving participation of local communities at the earliest possible opportunity

ERA should assess risks across entire lifecycle, including disposal, well abandonment and seismic risks

Government response

Comprehensive ERA to become best practice: Caudrilla carrying out a ERA

Cranfield University helping to develop ERA guidelines for shale gas

7 Best practice for risk management

Goal-based risk assessments according to ALARP principle (As Low as Reasonably Practicable)

UK regulators should work together to develop guidelines specific to shale gas

Industry mechanisms to collect and share data to inform risk assessment

Government response

Industry to develop guidelines

Some confusion:

- Does onshore shale gas need a safety case?

Data sharing: DECC will discuss with industry

8 & 9 Regulation

Ensure regulatory co-ordination: a single body should take the lead

Ensure regulatory capacity

Government response

DECC's new Office of Unconventional Oil and Gas

Internal reviews of regulatory system for exploration and possible production phases

10 Research priorities

Public acceptability

Wider policy context: energy, economy, climate change

Government response

DECC study on methane leakage

To find out more, visit
royalsociety.org

THE
ROYAL
SOCIETY

Ben Koppelman
Senior Policy Adviser
Ben.koppelman@royalsociety.org

