

BRIEFING PAPER – Impacts of the exploration for and extraction of shale gas on water and waste water service providers

Water UK and its members do not support or oppose the exploitation of shale gas. This position paper outlines our understanding of possible impacts on water and waste water services.

As with any activity of this nature there are inherent risks. Evidence suggests that these risks can be mitigated given proper enforcement of regulations, primarily by environmental and health and safety regulators.

Introduction

The UK water industry acknowledges the risks of the country's growing dependence on imported gas and recognises the arguments for government policy on shale gas extraction. The UK water industry also acknowledges that there are inherent risks associated with any activity of this type and scale which need to be fully understood, regulated and mitigated.

This briefing paper is regularly reviewed and updated to reflect the latest research and guidelines.

Regulatory framework

There is a robust framework of planning, environmental permitting and health and safety regulation in place in the UK. A petroleum exploration and development licence (PEDL) is required along with drilling consents, environmental permits and planning permission in order to drill or fracture a shale gas well. This regulatory framework provides a firm foundation from which to manage the possible risks to water from shale gas exploration and production.

Risks

The impacts of shale gas on water and waste water service providers can be considered in three broad categories – water quality, water quantity and waste water management.

The extraction of shale gas poses possible risks to the quality of the water environment, particularly groundwater, from three sources: the surface spillages of chemicals, diesel and other materials at a drilling site; poor well design and construction with subsequent failure; and the hydraulic fracturing process, including the use of biocides and chemical friction reducers in fracturing fluid.

The report by the Royal Society and Royal Academy of Engineering¹ concluded that risks can be managed given a properly implemented and enforced regulatory framework. In particular it concludes that the probability of well failure is low if it is designed, constructed and abandoned according to best practice and that the risk of fractures propagating from shale formations to reach overlying aquifers is very low. In addition, chemicals added to the fracking fluid (for example biocides and friction reducers) are subject to approval by the Environment Agency.

A greater risk would appear to be from surface spillages of chemicals and other materials. It is therefore important that on-site storage of chemicals is managed by proper site practices. The report published by Public Health England² considers these specific risks and concludes that “*good on-site management and appropriate regulation of all aspects....are essential to minimise the risk to the environment and public health*”.

The shale gas extraction process uses pressurised water to hydraulically fracture the gas-bearing shale strata. The quantities of water needed to do so vary by site and throughout the gas exploration and production process, but the demand could have an impact on local water resources. This demand may be met from a number of sources including from the public water supply, from direct abstraction, from water transported by tanker from other areas or from recycling and reuse of treated flowback or produced water.

The pressure on local water resources will depend in part on the pace and extent of shale gas extraction, although the potential to reclaim and reuse large proportions of water from each site promises to significantly mitigate the risks to local water resources.

However, where water is in short supply there may not be enough available from public water supplies or the environment to meet the requirements for hydraulic fracturing. Shale gas companies should therefore engage with water companies as early as possible to ensure their needs can be met without reducing the security of supply to existing customers. A report commissioned by the water industry (UKWIR³) provides more information to water companies on the likely demands for water during the exploration and extraction process. The report concludes that that there are inherent risks associated with exploration and extraction of unconventional oil and gas but that with proper regulation these risks can be mitigated.

Waste water companies may also be asked to accept discharge of effluents recovered from the process for treatment at waste water treatment works. This flowback water can contain minerals, high concentrations of salinity and low amounts of naturally occurring radioactive material (NORM). The feasibility of treating this water at a waste water treatment works will depend on the volume and concentration of the flowback in relation to the size of the treatment works and the concentrations of NORMs present. This matter is currently being explored in further water industry research due for conclusion later in 2014.

Engagement and dialogue

The water industry believes that timely and constructive consultation and engagement by operators and regulators is essential to aid planning. These discussions will be key to understanding water and wastewater services requirements in the short and longer term, as well as helping to identify and resolve potential issues.

Key areas of interest for these discussions will include:

- The extent of baseline monitoring being proposed to assess impacts on the quality and quantity of local water resources;
- Plans relating to site water management, especially in relation to water reuse to improve understanding of local impacts;
- Shale gas company development plans including scenarios for expansion within a local area and what this means for short and longer term demand for water at specific locations;
- The expected volumes and chemical and biological composition of waste water as well as preferred disposal routes.

This dialogue will allow water and waste water service providers to make informed decisions about potential solutions, as well as risks and any mitigation required, to ensure that the provision of services to shale gas companies does not adversely impact water resources or the natural environment more generally.

To reinforce and underpin this dialogue Water UK urges government and devolved administrations to consider introducing legislation to ensure that water undertakers in the UK are statutory consultees in the planning process for onshore oil and gas exploration and development. This would ensure that water companies receive vital information about proposed extraction sites and would give time to engage with regulators and gas licence holders to ensure that development plans are fully understood, the associated risks are addressed and that the protection of water resources and the environment are considered as a priority.

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Version 4 – 26 November 2013

¹ http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/projects/shale-gas/2012-06-28-Shale-gas.pdf

² http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1317140158707

³ <http://www.ukwir.org/site/web/content/home>