Conference Report

European Federation of Bottled Waters AISBL (EFBW)

EFBW Conference

Fracking and the Protection of Underground Water Resources

17th June 2015

Theatre of the Cultural Centre, Spa, Belgium

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The report is based on conference transcripts and speaker presentations.

About EFBW

The European Federation of Bottled Waters (EFBW) is the voice of the bottled water industry, dedicated to promoting the unique qualities of natural mineral and spring water among EU institutions and international organisations. EFBW is a registered international not for profit trade association with a membership base of national trade associations and direct company members. In total, EFBW represents almost 600 natural mineral and spring water producers in Europe. EFBW offers expertise in regulatory issues, scientific and technical affairs as well as matters relating to health and the environment.

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1. Introduction

On the 17th of June 2015 the European Federation of Bottled Waters (EFBW) hosted the conference ***Fracking and the Protection of Underground Water Resources***, in conjunction with its Annual Meetings in the town of Spa in southern Belgium, home of Spa natural mineral waters.

Shale gas exploitation via hydraulic fracturing (short: fracking) is a controversial topic, with large differences in the level of public and political acceptance across the EU. **'Fracking'** refers to the exploitation of oil and gas from deep geological layers of shale rock using the method of 'hydraulic fracturing'. The boom in shale fracking in the USA over the past decade has encouraged European countries to start assessing its potential in Europe.

In January 2014, the European Commission adopted a **Recommendation** setting out minimum principles for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing (2014/70/EU). The Commission is currently assessing the effectiveness of the Recommendation and will decide by the end of 2015 whether it is necessary to update the Recommendation's provisions and/or to put forward legislative proposals with legally binding provisions on the exploration and production of hydrocarbons using high-volume hydraulic fracturing.

The **European Federation of Bottled Waters** (EFBW) is the voice of bottled water industry and represents through its membership more almost 600 natural mineral and spring water producers in Europe. According to European law, natural mineral waters are characterised by their microbiological wholesomeness, their original purity and their specific nature. They must originate from protected underground water resources, may not be chemically treated and springs must be protected from any risks of pollution (Directive 2009/54/EC).

The main **objectives of the conference** were to obtain objective and credible information on hydraulic fracturing, to discuss the risks associated with shale gas exploitation via this technology as well as to exchange views on how future EU regulation should tackle this issue in the context of the protection of underground water resources.

2. Event Schedule & Conference Programme

Structure of the event

13:30-14:30 | Guided Visit of Spa's protected natural water springs area 'The High Fens of the Belgian Ardennes'

15:30-17:30 | Conference on "Fracking and the protection of underground water resources", Theatre of Spa's Cultural Centre

Conference agenda

15:30 Conference Opening & Welcome

Mr. Jean-Pierre Deffis, EFBW President

15.40 Introduction: Shale gas exploitation via fracking

Mr. Serge van Gessel, Chair Geo-Energy Expert Group, EuroGeoSurveys; Senior Geoscientist, TNO

16:00 Interactive Panel Discussion

Mr. Philippe Charlez, Member of the Shale Gas Committee, International Association of Oil & Gas Producers (IOGP)

Mr. Patrick Jobé, Group Environment & Hydrogeology Manager, Spadel Group

Dr. Jim Marshall, Policy and Business Adviser, Water UK

Mr. Serge van Gessel, Chair Geo-Energy Expert Group, EuroGeoSurveys; Senior Geoscientist, TNO

Mr. Christian Wimmer, Policy Officer, Resource Efficiency & Economic Analysis, DG Environment, European Commission

Moderation by Ms. Valerie Flynn, Editor, ENDS Europe

17:00 Questions & Answers

17:20 Conclusions

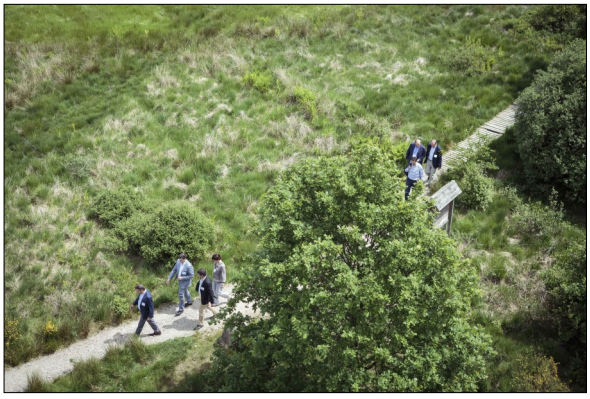
3. Proceedings

3.1. Visit of the High Fens

Conference speakers and participants joined a guided visit of Spa's protected natural mineral water catchment areas.

The fabulous history of the natural mineral waters of Spa is linked to an exceptional geological phenomenon which gave rise to springs which have long been considered as miraculous. Indeed, it is thanks to the astonishing combination of rocks and the flow of special waters that the waters of Spa owe their origin, their original purity and their unique quality. In the Spa region of the High Fens, the fortunate matching of special geological layers and the development on the surface of specific ecosystems has contributed to the formation over thousands of years of unique natural filters capable of retaining and purifying water coming from snow and rain which cover them in abundance. The water which filters through the different underground layers (moss, peat, sand and rocky massif) carries very few mineral salts. The waters of Spa therefore have a very low mineral content.

The area of protection of the natural resources at Spa today covers 13,000 ha (= 26,000 football fields) and is one of the biggest in Europe. Since 1967, the Public Private Partnership for protection of the natural resources has put in place very strict measures to preserve the purity and the quality of the waters of Spa, as well as the ecosystems.



3.2. Conference Opening & Welcome

The conference was opened by EFBW President, Jean-Pierre Deffis, who provided a brief overview of recent shale fracking developments and why they create concern for the European natural mineral and spring water producers. Mr. Deffis made strong reference to the directly preceding field visit to the water catchment zones of the Spa natural mineral water, in the Haute Fagnes (High Fens), south of the town of Spa. The visit highlighted the substantial efforts and investments to protect a sensitive water resource, typical for the thousands of natural mineral water and spring water sources across Europe.

3.3 Introduction to Shale Gas Exploration via Hydraulic Fracturing

An introductory presentation was given by Serge van Gessel of EuroGeoSurveys (EGS) who provided an overview of the technique involved in shale gas fracking.

Mr. van Gessel pointed out that many of the known natural hydrocarbon reserves are sourced from organic rich shale layers. Over geological time the organic matter in these layers is converted into hydrocarbons after being buried under several kilometres of sediment. He noted that conventional reserves are defined by oil and gas that is trapped and accumulated in deep porous and permeable layers. Hydrocarbons within conventional reservoirs are generally able to move freely through the interconnected pores. Therefore extraction is often feasible without extensive drilling campaigns and high volume hydraulic fracturing procedures (although this may be applied at a smaller scale when permeability is low). Mr. van Gessel explained that shale gas and shale oil still reside in the almost impermeable shale layers in which they were formed. The absence of larger, interconnected pores in these rocks hampers free flow by natural means and therefore the creation of artificial flow pathways through the process of hydraulic fracturing is essential. Even with the fractures, gas and oil will only be extracted from a limited extent around the borehole and therefore many wells are needed to efficiently exploit an entire shale gas or shale oil resource. Hence, the nature of the host rock and required extraction strategies determine why the hydrocarbon resource is unconventional; not the resource itself.

According to Mr. van Gessel, since the early 2000's it has been demonstrated in the US that large-scale exploitation of shale gas and shale oil resources is technically and economically feasible through the use of extensive high volume hydraulic fracturing in combination with horizontal drilling techniques. By drilling horizontally into the shale layers over distances of one to three kilometres, larger volumes of shale can be drained efficiently by one well. This reduces the need for drilling large numbers of vertical wells, thus resulting in fewer surface operations.

Mr. van Gessel pointed out that in Europe shale gas development is still in a very early stage and to date there is no commercial production ongoing. Although hydrocarbon bearing shales are known to be present, the quantity and potential techno-economic recoverability of the oil and gas resources are still largely unknown. Pan-European integration of geological knowledge from the national geological surveys, and incorporation of new information from exploration wells will help to reduce the significant uncertainties in resource estimates and improve the identification of prospective areas.

Figure 1 ► Major unconventional natural gas resources in Europe

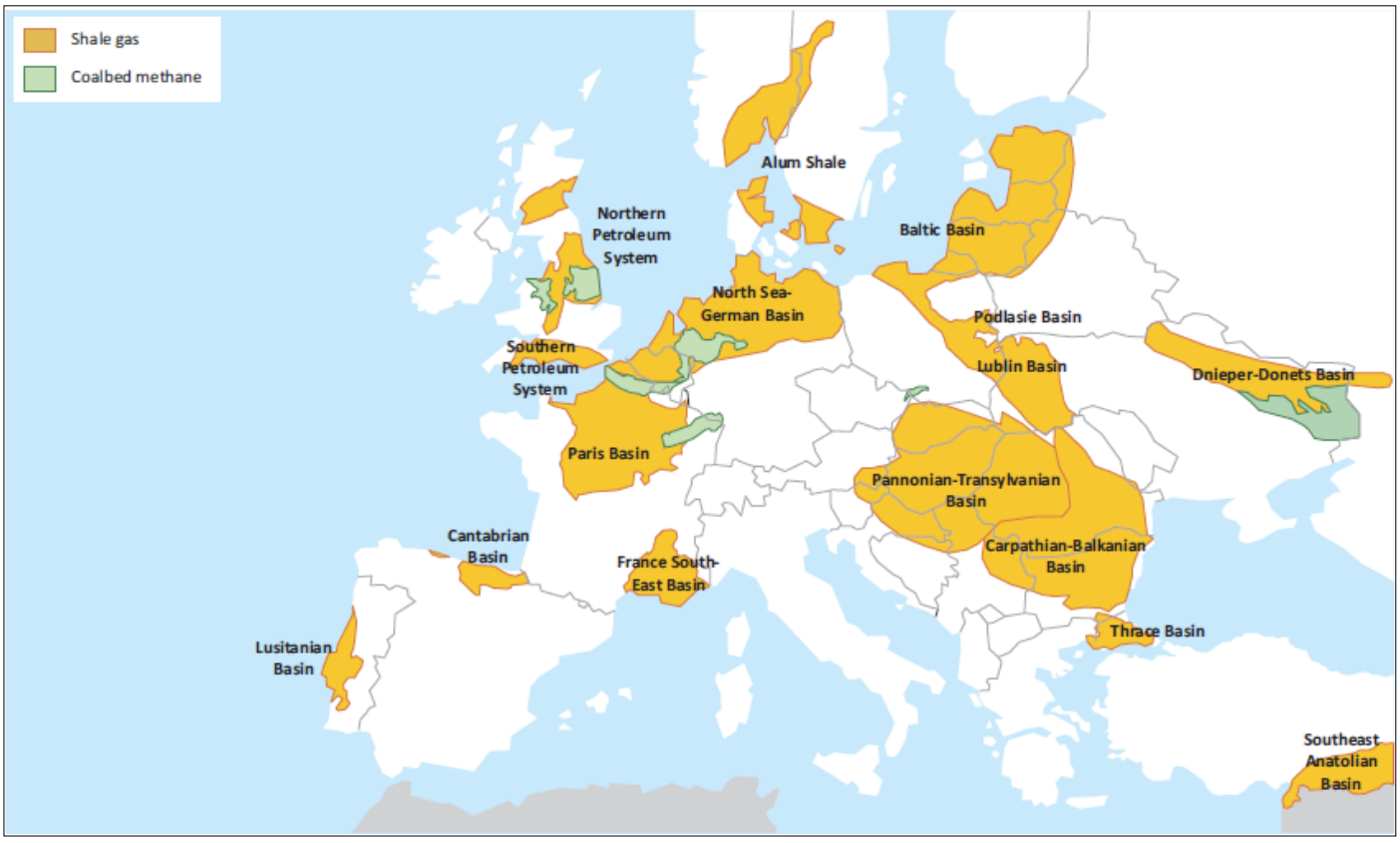
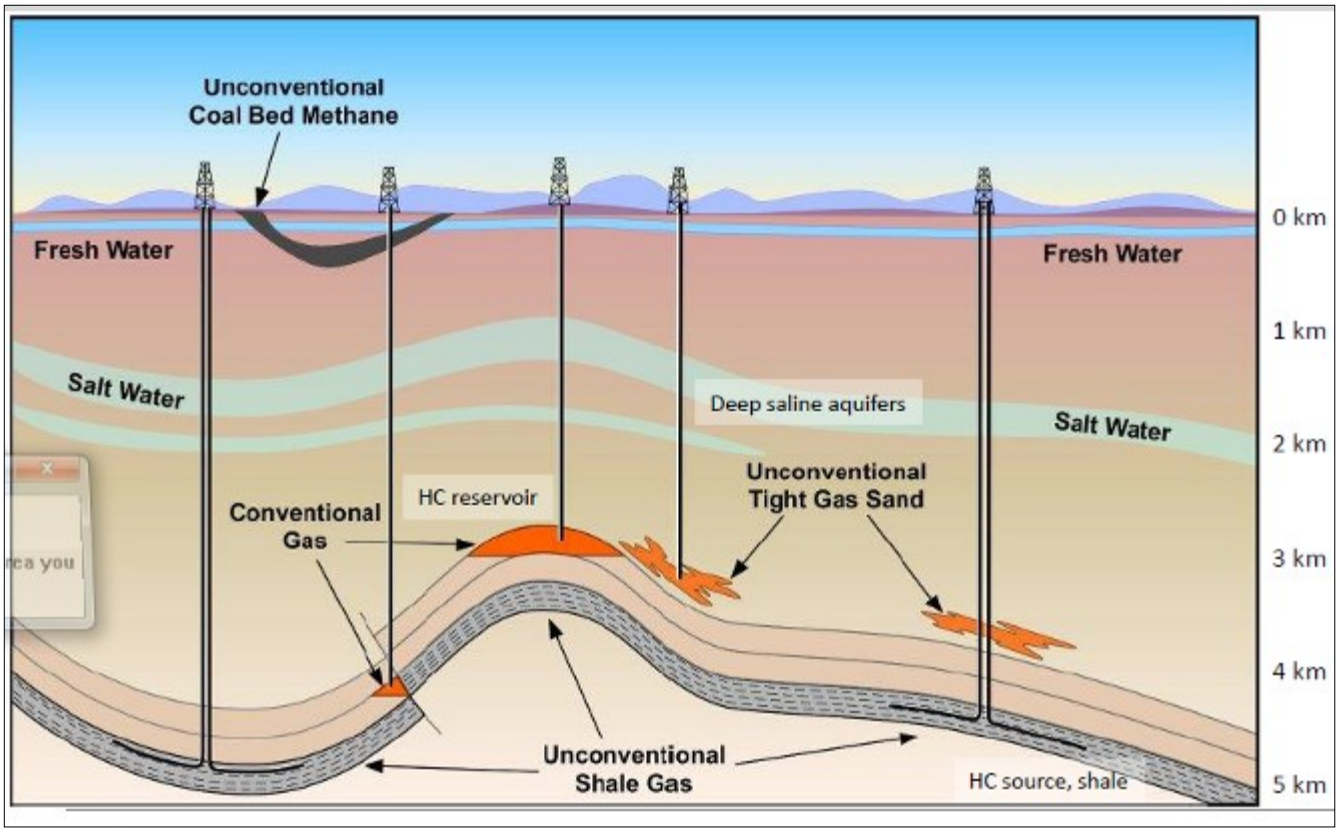


Figure 2 ► Shale Gas and Shale Oil vs Conventional Oil & Gas



Like most industrial activities there are always certain risks and impacts associated with the exploration and production of oil and gas. The exploitation of conventional resources has been ongoing with little controversy for years and in many countries risks are satisfactorily addressed through a combination of well-evolved best practices and firm regulations. The procedures and nature of risks related to drilling and exploitation of shale gas and shale oil are largely comparable to those that apply to production of conventional resources. The major differences are 1) the necessity for and higher intensity of high volume hydraulic fracturing, and 2) the overall larger intensity of drilling operations. Both these aspects may result in an accumulation of risks and possibly greater surface impacts. The main risks for adjacent ground water resources mostly appear to be associated with well integrity issues (leakage along the well casing) and potential spills at the surface drilling and production site. Risks should be adequately managed among others by safety regulations, good practices, impact studies and baseline monitoring. In this regard, site specific investigations are essential in order to perform hydrocarbon operations, including shale gas production at acceptable risk levels. Innovations such as alternatives for hydraulic fracturing and cleaner drilling and production technologies, will further help to reduce risks and environmental impacts.

3.4. Panel Discussion

Panelists & Moderator

FLTR: Phillip Charlez, Patrick Jobé, Valerie Flynn, Jim Marshall, Christian Wimmer, Serge van Gessel

The panel discussion was moderated by Valerie Flynn, editor of ENDS Europe. Key comments and positions of each member were as follows:

Philippe Charlez

Member of the Shale Gas Committee

International Association of Oil & Gas Producers (IOGP)

"*It is not credible that any oil or gas operations could happen in a zone like here in Spa where natural mineral water is abstracted. An oil and gas producer would never take such a risk.*"

According to Philippe Charlez the risk of contamination of shallow groundwater from the deep fracking zone is negligible, with no single recorded incident from 150,000 wells drilled in the USA. He said the main risk to groundwater is from surface spills and leakage from the upper parts of wells, a risk not specific to shale gas. Mr. Charlez is confident the risks are manageable with good regulation and practices. Baseline and operational monitoring will ensure any problems can be detected and acted on, including a halt to operations if necessary. No responsible oil and gas operator would drill in a natural mineral water protection zone.

Patrick Jobé

Group Environment and Hydrogeology Manager

Spadel Group

"*We have no plan B. […] We have to keep our natural mineral water away from all risks of pollution. It is written in the law. For us, a very low risk is already too much.*"

Patrick Jobé of Spadel and representative of the bottled water industry stressed that natural mineral water aquifers are a sensitive natural heritage whose 'original purity' must be fully protected. Once polluted, natural mineral waters may not be treated, and licenses for abstraction will be withdrawn, along with causing the plants to close down with accompanying economic losses. With no option of a 'Plan B', the 'very low risk' claimed by the oil & gas sector, is already too high. There must be a clear ban on fracking operations in catchment areas of natural mineral and spring water, important for both protection and public confidence.

Dr. Jim Marshall

Policy and Business Advisor

Water UK

"*We need to be the guardians of the sources from which we abstract*."

Dr. Jim Marshall acknowledged water treatment, or switching to alternative sources are options should drinking water sources become contaminated. But, the additional costs and increase use of resources, such as energy would be undesirable. Dr. Marshall stressed that transparency, awareness and ongoing dialogue between the water industry, energy operators and other actors are key for mitigating the risks. According to Dr. Marshall, a pragmatic approach based on integrated water management is the most efficient step to be taken at operations level.

Christian Wimmer
Policy Officer
Resource Efficiency and Economic Analysis
Directorate General for the Environment, European Commission

"*The protection of drinking water resources must be given priority to the extraction of unconventional natural gas reservoirs.*"

Christian Wimmer noted that the first question from concerned citizens is "will my drinking water be safe?". According to the Treaty for the Functioning of the European Union, Member States have the right to determine the conditions for exploiting their energy resources. The same Treaty obliges Member States to respect the need to preserve, protect and improve the quality of the environment to protect human health and to aim for a prudent and rational utilisation of natural resources. The Commission Recommendations on shale gas exploitation give strong direction on application of the Precautionary Principle, that protection of drinking water must be a priority, and that all information and data should be publically available.

Serge van Gessel
Chair Geo-Energy Expert Group, EuroGeoSurveys
Senior Geoscientist, TNO

"You always need to act in a responsible way. […]
We need to put emphasis on identifying all the risks."

Serge van Gessel stressed the fact that the exploration and production of hydrocarbon resources is like any other industrial activity, characterised by certain risks and impacts. The extent and impacts of these risks are very much depending on the site specific situation. National and EU guidelines should cover all relevant aspects necessary to assess possibilities for safe and responsible exploitation of resources on a local level. Catchment areas of natural mineral waters – such as the protected zone in Spa - are much more vulnerable as impacts are greater than in many other areas. For these sensitive areas additional binding regulation may be needed.

3.5. Questions & Answers

Finally, the panel responded to questions from the audience from which some key points arising were as follows:

- It is not feasible to define a general 'minimum distance' between fracking operations and sensitive features; a case-by-case assessment is more appropriate.
- We need much more information and data to better understand the potential and risks of shale gas exploitation in Europe.
- The volume of water required for fracking will remain very small compared to the total of all water uses, but there may be concerns in some water scarce areas.
- The management and treatment of wastewater needs to be carefully addressed (surface risks).
- The reputation of natural mineral and spring water producers as well as water supply companies is at risk if fracking activities take place in catchment areas.
- Terminology needs to be clear and unambiguous. For example, any definition of sensitive water bodies must include 'natural mineral and spring waters' in addition to 'drinking water supply' or cover 'underground water resources' in the broadest way.

4. Conclusions

The conference provided a valuable and timely discussion on a controversial subject. While some clarity on the potential risks associated to hydraulic fracturing was provided, differences in perspective and priorities remain. It was generally agreed that open and transparent dialogue between stakeholders is essential, of which this conference was a good example.

The main risks are from leakages from the upper sections of fracking wells, surface spillages of chemicals and wastewater – for which appropriate regulation and best practices are essential. There should be clear requirements for baseline, well construction as well as operational and post-operational monitoring.

Natural mineral and spring water producers remain concerned and request a clear ban on fracking operations in catchment areas around underground water resources, to protect aquifers and to maintain public confidence.