EUREAU

EUREAU Initial POSITION PAPER on Exploration and extraction of unconventional natural gas (shale gas) reservoirs and the protection of drinking water resources

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Summary

Purpose of the initial position paper:

- *To express EUREAU concerns and position of more than 70,000 water utilities in Europe to ensure protection of drinking water resources, and safe and healthy drinking water supply for European citizens*
- *To ensure that on-going assessments by EU institutions[1] of the existing EU legislative basis for the exploration/extraction of shale gas in Europe will take into account the imperative need the protect water resources (drinking water resources in priority) before and during the exploration and extraction of unconventional natural gas (shale gas).*
- *To ensure that the existing legislation will be enhanced in a way that shale gas drilling will fall under the scope of the Environmental Liability Directive as a minimum and will be covered by the Environmental Impact Assessment Directive.*

1. The background: Fracking method

The economic development of unconventional natural gas reservoirs requires the use of the so-called “fracking” (hydraulic fracturing) method. The "artificial fracturing" of the rocks creates the necessary routes (permeability) for extracting the gas deposits. The method uses high pressures to introduce suspensions (fracturing fluids), which are used to ensure that the extracting routes that are created are retained during the entire extraction phase. Mixes of chemicals, which may contain substances that are hazardous to the water environment and human health (e.g. viscosity additives, biocides, anti-corrosion agents etc.) are added to the suspension. Methane and higher chain hydrocarbons linked with the shale gas exploration/extraction may contaminate waters and atmosphere causing potential explosion and climate change hazards.

There is a mixed evidence base on the magnitude of the risks involved but nonetheless there is acceptance that risks do exist[2]. Although water utilities in Europe would not wish to hinder economic development or the exploration of new energy sources, there is a view that the risks to water supplies

[1] e.g., EP study on the *Impacts of shale gas and shale oil extraction on the environment and on human health*, issued in June 2011, ref. IP/A/ENVI/ST/2011-07, PE 464.425

[2] EP report on the study on ”Impacts on shale gas and shal eoil extraction on the envirnment and on human health”, p.77, IP/A/ENVI/ST/2011-07, PE 464.425, June 2011

(and in particular drinking water supplies) and waste water treatment processes are real and need to be adequately addressed.

The impact on environment is potentially wide-ranging and may be also transboundary as it concerns groundwater reservoirs as well as surface water and soil (possible contamination caused by chemical substances contained into process water and residual soil.

2. Fracking and the protection of drinking water resources

In respect of the water resources for the supply of drinking water the fundamental questions that need to be addressed are:

- **Can the risks associated with the exploration and extraction of unconventional reservoirs be rated as controllable?**
- **Can the protection of the drinking water resources be guaranteed? and**
- **How are water management issues taken into account during the necessary approval procedures?**

3. Need for adaptation of the former official practice

Current projects in connection with the exploration and development of unconventional natural gas reservoirs are essentially assessed and approved according to mining law. However, as it is stated in the EP study, *"existing mining laws in Europe do not take care of the specific aspects of hydraulic fracturing"*[3]. So as to guarantee the security of water resources, the need to apply preventive water protection measures need to be adequately examined in the course of the approval procedures and, if necessary, need to be augmented with legal requirements on the company operating the gas extraction.

Within the scope of the official assessment of approval procedures, the interests of preventive water protection to ensure the safety of the water resources (and thus supply) should be incorporated as follows:

1. The protection of drinking water resources must be given priority to the extraction from unconventional natural gas reservoirs and an approval according to mining law must be withheld, if the protection of the drinking water resource cannot be guaranteed.
2. A risk assessment including an appraisal of the actual situation must be submitted and take public water supply into account as well as the surrounding environment and ecosystem. This must also incorporate a "summary effect" of possible dangers due to already existing boreholes. An environmental impact assessment, which has so far not been compulsory in mining / environmental law, must therefore become obligatory before the execution of initial exploration and extraction borings can be started.
3. Definition of sensitive areas, where the exploration and extraction of unconventional natural gas resources must not be permitted. Apart from the designated drinking water protection areas and water priority areas, the catchment areas of water abstraction plants must be taken into account

[3] EP report, IP/A/ENVI/ST/2011-07, PE 464.425, p.77,

and form a priority criteria. The sole restriction to designated protection and priority areas is not adequate.

4. Hydraulic short-circuits, such as those that can occur between separate multiaquifer formation during boring and damage to hydraulically effective geological barriers in the explored reservoir, in particular when applying the fracking method, must be prevented by suitable measures.

5. An agreement with the responsible authorities must be concluded, with the involvement of water suppliers concerned, unless excluded by definition in accordance with clause 3 above, at all stages of the approval procedure according to mining law. In this connection, the applicant/operating company must set forth information that would usefully include:
   a. how the greatest possible impermeability of boreholes, in particular in aquiferous layers, is guaranteed and how no longer required boreholes are filled and sealed, so that no contamination of the water-bearing strata from the surface or from below ground can take place at a later stage.
   b. which substances that are hazardous to the water environment and human health are introduced in which quantities into the subsoil.
   c. information on hazardous substances in waste fracking-fluid that may be released from deeper earth layers.
   d. how the recovery of these substances form the subsoil, as well as the necessary disposal, is guaranteed and which quantities will possibly remain in the subsoil.
   e. how monitoring of drinking water resources is ensured during the exploration and extraction phases.
   f. those measures would be taken in the event of a contamination of drinking water resources.
   g. those treatment methods that are effective in addressing any contamination that may occur.
   h. how the adjustment of claims by the operating company/originator is ensured.
   i. which countermeasures are taken to prevent a long-term impairment of the drinking water resources.

6. Account must be taken of the discharge of recovered hydraulic fluids in terms of the discharge consents that would be required either for environmental disposal or disposal to a drain or sewer

7. Account must be taken of the potential impacts of seismic activity on water or waste water assets

4. Need for adaptation of the legal framework

Publicly available and detailed analysis of the European legislative framework relating to shale gas exploration and extraction, including in connection with the protection of water resources has not been yet developed. However, the existing EU regulatory framework is partially covering the mining / shale gas extraction issues, in parallel with water-related legislation. Those are: Water Framework directive (2000/60/EC)[4], Groundwater Protection directive (2006/118/EC)[5], Drinking Water directive (98/83/EC)[6], Directive on Environmental Quality Standards (2008/105/EC)[7], Industrial Emissions

[4] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:327:0001:0072:EN:PDF
[5] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF
[6] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1998:330:0032:0054:EN:PDF
[7] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:348:0084:0097:EN:PDF

directive (2010/75/EU)[8], REACH regulation (EC No.1907/2006)[9], Environmental Impact Assessment directive (85/337/EEC)[10], Directive on Environmental Liability (2004/35/EC)[11]. But none of these individual pieces of legislation will cover the eventual risks arising from shale gas exploration/extraction.

The EP study indicates nine major gaps in current EU legislation regarding specific potential risks for the environment, water and human health associated with hydraulic fracturing[12].

With respect to the Council Directive on the assessment of the effects of certain public and private projects on the environment (85/337/EEC, known as "Environmental Impact Assessment" – EIA-Directive) projects (listed in Annex II) like the extraction of natural gas shall be made subject to an assessment where Member States consider that their characteristics so require. "*However the present EU legislative framework requires an environmental impact assessment only when the production rate of the well in question exceeds 500 000 m^3 per day. This limit is too high and ignoring reality of shale gas wells which typically produce in the order of several ten thousand m^3 per day in the beginning*"[13]. Since current projects are essentially approved only according to mining laws or comparable regulation of the Member States the regulatory framework for the assessment of environmental implications in the context with the shale gas drilling has to be reconsidered involving public participation as a mandatory measure for the environmental impact assessment procedure, and ensuring safe drinking water supply sources. Furthermore, "*regional authorities should possess the right to exclude sensitive areas (e.g. drinking water protection zones) from possible hydraulic fracturing activities*", as it is stated in the EP report on shale gas[14], as experience from the other countries, as USA, shows that in practice accidents may happen.

In addition it is necessary to ensure that shale gas drilling fall, as a minimum, under the scope of the Environmental Liability Directive (2004/35/EC).

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[8] http://europa.eu/legislation_summaries/environment/water_protection_management/ev0027_en.htm
[9] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:396:0001:0849:EN:PDF
[10] A consolidated version of the EIA directive with all amendments is available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1985L0337:20090625:EN:PDF
[11] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:143:0056:0075:EN:PDF
[12] EP report, IP/A/ENVI/ST/2011-07, PE 464.425, p.48, and p.79,
[13] EP report, IP/A/ENVI/ST/2011-07, PE 464.425, p.78.
[14] EP report, IP/A/ENVI/ST/2011-07, PE 464.425, p.78.