



Assessing potential shale gas impacts on groundwater resources: recommendations for groundwater monitoring and definition of baseline conditions

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Exploitation of shale gas by hydraulic fracturing (fracking) is highly controversial and concerns have been raised regarding induced risks from this extraction technique. The SHEER project, an EU Horizon 2020-funded project, is developing best practice to understand, prevent and mitigate the potential short- and long-term environmental impacts and risks of shale gas exploration and exploitation. Three major potential impacts were identified: groundwater contamination, air pollution and induced seismicity. This presentation will deal with the hydrogeological aspect.

As part of the SHEER project, baseline and operational groundwater monitoring was carried out at an extraction site in Wysin, Northern Poland. Baseline monitoring was carried out from December 2015 to June 2016 in four monitoring wells intercepting the main drinking water aquifer located in Quaternary sediments. Fracking operations occurred in two deviated horizontal wells in June and July 2016. Monitoring continued for 1.5 years post-fracking although no significant gas production occurred during this period. Collected data include measurements of groundwater level, electrical conductivity and temperature at 15-min intervals, field measurements of groundwater physico-chemical parameters and frequent sampling for laboratory analyses. Groundwater samples were analysed for a range of constituents including dissolved gases and stable isotopes.

This presentation will provide an overview of the monitoring results and the ensuing recommendations for groundwater monitoring in the context of shale gas exploitation. These recommendations relate to: (1) site characterisation prior to any activity, (2) baseline and on-going groundwater monitoring, and (3) relationships between regulators, operators and general public. During the presentation, we will particularly focus on the monitoring methodology and establishing accurate background values for key parameters for baseline monitoring, including suggestions on how to clearly communicate the information to the general public. We will conclude on techniques to identify deviations from baseline values.

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