Geophysical Research Abstracts
Vol. 17, EGU2015-1811, 2015
EGU General Assembly 2015

PFAS – A threat for groundwater and drinking water supply in Sweden?

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Perfluoroalkyl substances (PFAS) are a group of anthropogenic environmental pollutants that are widely distributed in the global environment. They have multiple industrial uses, including water repellents in clothing, paper coatings and firefighting foam. According to a study released by the Environmental Directorate of the OECD, they are persistent, bioaccumulative and toxic to mammalian species (OECD, 2002).
In some municipal drinking water wells in Sweden, measured concentrations of PFAS found to be several hundred times higher than the allowed threshold values. This has created a huge public concern and has recently attracted much media attention in Sweden (e.g. Afzelius et al., 2014; Bergman et al., 2014; Lewis et al., 2014).
PFAS findings raised questions such as “What can we do to solve the problem?” When it comes to drinking water, there are a number of techniques that can ensure that PFAS levels are reduced to acceptable levels. This may be a costly challenge, but from a technical point of view it is possible. To ensure the safety of drinking water from a public health perspective is obviously a top priority.
However, international experience shows that the cost of cleaning up PFAS in groundwater may be significantly higher than continuously treat drinking water in water works.
Approximately fifty percent of Sweden’s drinking water comes from groundwater. As a result, there are several ongoing and planned PFAS-related environmental and drinking-water investigations in Sweden. Many aquifers that supply municipal water plants are located in areas of sand and gravel deposits. Such soils have relatively high permeabilities, which permits extraction of large volumes of water. However, the downside to high permeabilities is that they also allow dissolved contaminants as PFAS to spread over large areas.
If one disregards the health risks linked to its presence in drinking water, PFAS have an impact on three of Sweden’s national environmental quality objectives, namely, A Non-Toxic Environment, Flourishing Lakes and Streams and Good-Quality Groundwater. Although the survey of PFAS in our groundwater supplies will take time, it is feasible. Much research in the field of hydrogeology and geochemistry remains before a viable and cost-effective groundwater remediation method can be operational. Until then, it is essential that measures are taken to identify the present distribution and magnitude of PFAS in groundwater and prevents its further spread in our most important aquifers.

Afzelius, H. et al., 2014. Vågar vi dricka kranvattnet? (Do we dare drinking tap water?), Svenska Dagbladet.
Bergman, Å., Hansson, S.O., Hellsten, E., 2014. En miljöskandal av historiska mått (An environmental scandal of historic proportions), Svenska Dagbladet.
Lewis, J. et al., 2014. Kartlägg det förorenade dricksvattnet (Survey the contaminated drinking water), Svenska Dagbladet.
OECD, 2002. Hazard Assessment of Perfluorooctane Sulfonate (PFOS) and its Salt.