

**Innovative assessment of impacts from industrial activities on the groundwater body quality for improved regional groundwater management**

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Groundwater Directive 2006/118/EC (Daughter to Water Framework Directive 2000/60/EC) establishes specific measures in order to prevent and control groundwater pollution. It specifically requires to assess plumes originating from punctual sources such as those due to industrial activities, in order to check if they do not spread and degrade the chemical state of the groundwater bodies. In this context, BRGM (French Geological Survey) supported by the AERMC (Water Agency on the Mediterranean Rhone River basin) has developed an innovative methodology to assess the impact of industrial activities on the quality of groundwater body. This methodology has been tested and applied on the whole Rhone River basin which covers one quarter of France, five regions and thirty counties. The assessment methodology includes three phases: 1) Inventory of industrial pressures and identification of targeted industrial areas; 2) Assessment of groundwater quality body with respect to industrial contaminants; 3) Assessment of industrial pressures and their impact on the groundwater body. These phases result in technical factsheet on each targeted industrial zone and a proposition for groundwater quality status of each groundwater body of concern. Overall, 57 targeted industrial areas were selected and studied. The assessment of groundwater quality in these zones enabled to identify compounds or groups of compounds causing groundwater degradation. Sixty-five percentage of studied areas were impacted with contaminants (those being by order of importance metals, hydrocarbons, HVOCs and BTEX) originating from around 420 sites. An impact rate (None /local / wide) was attributed for each site / contaminant couple. This "pressure/impact" method enabled to combine industrial data and groundwater data and to give an unprecedented assessment of groundwater quality at the regional scale (contaminated land being mostly managed at the site level in France). It processed numerous groundwater data. The deployment of this innovative methodology at the Mediterranean Rhone River basin scale required a strong engagement with numerous stakeholders (local authorities, regional water agencies, etc.), which in turn fed in the project by providing data and their points of views on the regional-scale project results. The outcomes of this project were used by the AERMC to report groundwater state and quality (with respect to impact from punctual pressures) in compliance with the groundwater directive. The findings enabled to define priority areas where further innovative methodology on regional groundwater body management - encompassing eg multi-sources management, less stringent groundwater objective setting - is currently being developed.