

## **Cause of groundwater contamination in Jakarta alluvium volcanic fan deduced by sulfate and strontium isotope ratios**

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**Abstract** Sulfate and strontium isotope ratios were analysed in groundwater, river water, and spring water samples in order to examine the groundwater quality under the Jakarta volcanic fan watershed. On the basis of sulfate isotopic comparison with possible source materials, it is suggested that anthropogenic materials such as chemical fertilizers are responsible for the pollution of groundwater. Moreover, strontium isotopic signatures with ions concentrations data clearly suggest that the groundwater nitrate pollution is occurring in an area where aquifer sediments originated from volcanic rocks other than the sedimentary rocks. This study demonstrates the usefulness of sulfate and strontium isotopes in understanding the cause of groundwater deterioration under the Jakarta volcanic fan watershed. Detailed pollution status and deterioration mechanisms with sufficient water samples need to be investigated in future research.

**Key words** sulfate isotope; strontium isotope; groundwater; environment; Jakarta