

The impact of waste waters in a small watershed: a view through Lithium isotopes

Romain Millot, Anne-Marie Desautly

► **To cite this version:**

Romain Millot, Anne-Marie Desautly. The impact of waste waters in a small watershed: a view through Lithium isotopes. Goldschmidt 2016, Jun 2016, Yokohama, Japan. hal-01281906

HAL Id: hal-01281906

<https://hal-brgm.archives-ouvertes.fr/hal-01281906>

Submitted on 3 Mar 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Please ensure that your abstract fits into one column on one page and complies with the *Instructions to Authors* available from the Abstract Submission web page.

The impact of waste waters in a small watershed: a view through Lithium isotopes

R. MILLOT¹, A.M. DESAULTY²

¹ BRGM, French Geological Survey, Laboratory Division, Orléans, France, r.millot@brgm.fr

² BRGM, French Geological Survey, Laboratory Division, Orléans, France, am.desaulty@brgm.fr

The contribution of human activities such as industries, agriculture and various domestic inputs, becomes more and more significant in the chemical composition of the dissolved load of rivers. Human factors act as a supplementary key process. Therefore the mass-balance for the budget of catchments and river basins include anthropogenic disturbances. It is well known that Li has strategic importance for numerous industrial applications including its use in the production of batteries for both mobile devices (computers, tablets, smartphones, etc.) and electric vehicles, but also in pharmaceutical formulations.

In the present study, we investigate waste water releases by tracing its impact by the use of Li isotopes in a small river basin near Orléans in France (l'Egoutier, 15 km² and 5 km long). As case study, we decided to monitor this small watershed which is poorly urbanized in the Loire river basin. Its spring is located in a pristine area (forested area), while it is only impacted some kilometers further by the releases rich in metals coming from a hospital water treatment plant. A sampling of these liquid effluents as well as dissolved load and sediment from upstream to downstream was realized and their concentrations and isotopic data were determined.

Lithium isotopic compositions are rather homogeneous in river waters with $\delta^7\text{Li}$ values around $-0.5\text{‰} \pm 1$ along the main course of the stream (n=7). The waste water sample is very different from the natural background of the river basin with Li concentration being twice of the values without pollution and significant heavy lithium contribution ($\delta^7\text{Li} = +4\text{‰}$). These preliminary results, combined with data for sediments, will be discussed in relation with factors controlling the distribution of Li and its isotopes in this specific system and compared with the release of other metals such as Pb or Zn.