

# The Horonobe Underground Research Laboratory Project -Hydrochemical property of groundwater in the Neogene sedimentary rocks (II)-

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The Japan Nuclear Cycle Development Institute (JNC) is undertaking geological investigations in Horonobe Town, northern Hokkaido. The main aim is to develop a generic methodology that could be used in future, to characterize sedimentary rock sites elsewhere that may be selected for the geological disposal of high-level radioactive wastes.

The studied area is about 10km square and surrounds the planned underground research laboratory (URL) site. Eleven boreholes (HDB-1~11) in the area intersect Pliocene diatomaceous argillaceous rocks of the Koitai and Wakkanai formations. The Ohmagari fault may run the middle of the area and may control groundwater flow and groundwater chemistries.

The studies of geological modeling are useful to develop a method for estimating the groundwater flow and the distribution of geochemical properties.

In this study, the M3 (Multivariate, Mixing and Mass-balance) method developed by SKB (Laaksoharju et al., 1999) was applied to identify different origin of waters and to infer the mixing ratios in space. As the results, it was shown that most of the aqueous concentrations of the major components are well explained by two-component mixing model of precipitation and deep saline water. In order to explore the deviation from the mixing model, we are performing chemically reactive transport simulations.