

The potential water-conducting feature in sedimentary rocks at the Horonobe area, northern Hokkaido

Hironori Funaki[1]; Eiichi Ishii[1]

[1] JAEA

As a part of the surface-based investigations in the Horonobe Underground Research Laboratory project, studies were performed in the boreholes to identify and to characterize potential water-conducting features in the host Neogene sedimentary formations (Wakkanai and Koetoi Formations). The rocks of the Wakkanai and Koetoi Formations are composed of hard shale and diatomaceous mudstone respectively. Specifically, core observation and Electrical Micro-Imaging logging were carried out to characterize the spatial distribution and geometry of faults and hydraulic tests were conducted to define the hydraulic significance of the faults. In addition, data monitored during drilling were used to support the hydraulic interpretation.

Minor fault developing zones are densely distributed in both sedimentary formations. A density of 5 faults per 10 meters of strike-slip minor faults is determined to be characteristic of the fault zone. The minor faults cross the bedding plane at a high angle and strike N30E-EW-N60W, which is oblique or perpendicular to the axis of folding in this area. The hydraulic conductivities of the minor fault developing zones in the Wakkanai Formation are 1 to 4 orders of magnitude higher than that of background fractured rock whereas the hydraulic conductivities of the minor fault developing zones in the Koetoi Formation are similar to that of background fractured rock.

These results suggest that the minor fault developing zone is a potential water-conducting feature in the Wakkanai Formation but not in the Koetoi Formation. This could be due to that the degree of brittle failure associated with faulting is higher in the Wakkanai Formation.