

Geochemical evolution of deep groundwater in Cretaceous aquifer of the Southern Gobi, Mongolia

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In the Southern Gobi Region, water use by the mining industry, which is one of the important industries in Mongolia, depends on groundwater. The area is characterized by a dry climate. Although the average air temperature is around 7.5°C, the lowest temperature in the winter reaches -34°C, and the highest temperature in the summer reaches up to +43°C at Khanbogd soum. The total annual precipitation is approximately 85 mm, of which 90% falls as rain during the summer seasons and the remaining 10% as snow.

The Gunii khooloi aquifer is the most important water resource for Oyu Tolgoi Mine. The aquifer consists of Cretaceous sediments which comprise up to 150 m thick unconsolidated brown sands and gravels with minor interbedded units of clay and conglomerate. Recently, there has been growing concerns about droughts which might affect the groundwater recharge. However, despite this, extensive groundwater study in the Gobi region has yet to be carried out.

Our field survey took place in September 2016. Shallow and deep groundwater, springs and rain water were collected at a total of 70 points. Groundwater samples were taken from production and monitoring boreholes using existing pumping, portable mini pump or hand bailer. Temperature, pH, EC and alkalinity were measured at the field. Analysis of the water samples for major ions, hydrogen and oxygen stable isotopes, as well as tritium (8 samples) is underway at the laboratory in Tohoku University or AIST. Here, we will present the chemical and isotopic properties of water samples, and will introduce our future plan.

Keywords: Gunii khooloi aquifer, Groundwater recharge, Groundwater origin