

Mechanisms of Ground and Surface Waters at "Balapan" Site of Semipalatinsk Test Site

The present work provides results of determining mechanisms of origin of water objects, including revealing of water exchange between different types of underground waters (fracture and ground waters), and their interrelation with surface waters. It was found that fracture waters (-121.6 ‰ for $\delta^2\text{H}$ and -16.6 ‰ for $\delta^{18}\text{O}$) are formed by means of feeding by local atmospheric precipitation of winter period. Ground waters, (-110.4 ‰ for $\delta^2\text{H}$ and -14.9 ‰ for $\delta^{18}\text{O}$) are fed from both fracture waters, and surface water bodies. The "Atomic" lake is characterized by the heavies isotopes, as related to global line of meteoric water [Craig H., 1961]. Dex values – excessive deuterium content [Dansgaard, 1964] in the lake are negative (-2.4 to -10.6 ‰). This means that fractionation of the water body isotopes is attributed to evaporation process, where ^2H and ^{18}O heavy isotopes are condensing in remaining water. So it was found that the reservoir is not fed from entry of ground waters of any kind. In Shagan river sites (5 km, 28 and 50 km) corresponding to ratio values of stable isotopes of contaminated fracture waters of "Balapan" site (see above) were found and localized.

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