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Modern geoecological situation of "Crystal" peaceful underground nuclear explosion vicinity (Siberian Plate)

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Modern geoecological situation of "Crystal" peaceful underground nuclear explosion (PUNE) area basing on the geochemical and the geophysical sounding data is considered. New data of the contents of radionuclides in surface and underground waters are obtained.

Geophysical transient electromagnetic sounding, in other words - time-domain electromagnetic sounding method (TDEM) along two profiles above the epicentre of PUNE was applied. The revealed geoelectric layers conform to the geological structure of the area. There is a local geotechnogenic anomaly under the epicentre of the explosion: it is a sharp rise of the aquifer levels by 260-300 m up to the cavity of PUNE.

The destabilization of geotechnogenic system «"Crystall" cavity –geological environment –surface ecosystems» is caused by the mining of the kimberlite pipe "Udachnyi" at a distance of 3.5 km to southwest from the "Crystal". Deepening of the open-cast mine and its drying promoted the formation of a great cone of depression around the mine. Radioactive underground brines from the zone of the explosion moved to this depression, mixing with the brines of underlying horizons in the cone of depression.

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Keywords: peaceful underground nuclear explosion (PUNE), Yakutia, geotechnogenic system, permafrost, underground waters, brines, radionuclides, tritium, time-domain electromagnetic sounding method (TDEM), ecological risk

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