

TMO Sludge collector No. 1

East Kazakhstan region

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Location: Sludge pond No. 1 of the crushing and pre-enrichment shop in heavy environments (hereinafter referred to as CPP) of the beneficiation plant of the Ridder Mining and Processing Plant (RGOK) is administratively located on the territory subordinated to the Ridder city maslikhat of the East Kazakhstan region. The sludge pond is located 16 km from the city of Ridder on the industrial site of the Tishinsky mine of the RGOK of TOO Kazzinc and 104 km from the regional center - Ust-Kamenogorsk.

Brief geological characteristics: The filling of Sludge Accumulator No. 1 with sludge from washing sulphide polymetallic ores of the Tishinskoye deposit during their processing in the crushing and partial enrichment shop in heavy environments was carried out in the period 1982-2002. The accumulated sludge, containing significant amounts of non-ferrous metals, was subjected to oxidation processes under the influence of natural factors. Atmospheric precipitation, seeping through technogenic mineral formations (TMF), dissolves and carries non-ferrous metals into groundwater and into the surface runoff of the Ulba River.

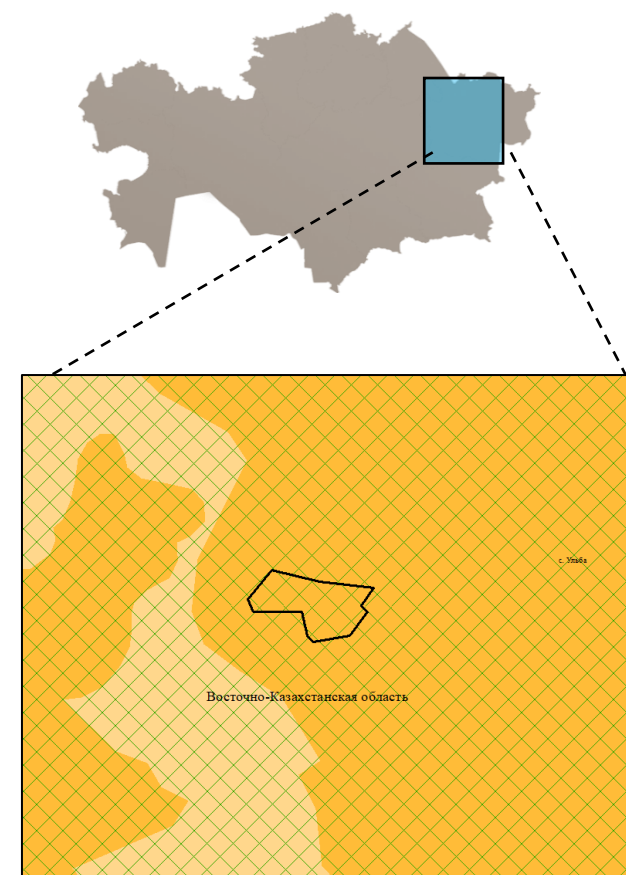
Geological exploration work at Sludge Accumulator No. 1 was carried out in 2003 and 2011 by drilling wells from the surface of the stored sludge.




The mineralogical composition of the sludge is fahlore -galena-chalcopryrite-sphalerite-pyrite and is generally similar to the original ore of the Tishinskoye deposit. Of the non-metallic minerals, quartz, carbonate, sericite, and chlorite predominate. Of the rare minerals, gold with a size of 0.003×0.015 mm was found. Technogenic impurities in the sludge include ferrosilicon, magnetite, granulated slag , cement, and charcoal. Cement significantly complicates the flotation of sludge, forming cement sludge during regrinding, which acts as depressants and reduces the flotation of galena.

At the same time, the sludges have an increased amount of oxidized forms of minerals, which is not typical for primary ores and is associated with the long presence of stale sludges in dumps. In general, stale sludges are characterized as difficult-to-enrich raw materials.

Extract from the state inventory records as of 01.01.2024.

Useful component	Balance reserves	Off-balance sheet reserves
Gold	A+B+C1 – 536.0 kg	-
copper	A+B+C1 – 2.8 thousand tons	-
silver	A+B+C1 – 7.2 tons	-



-  - the outline of the TMO Shlomonakopiteli No. 1 deposit , included in the PUGFN for solid mineral extraction, for auction
-  - license for GIN
-  - settlement of the village of Ulba