



Fig. 8. Rig of ventilation shaft of the Rubtsovsky mine. February, 2009.  
Photo: Victor V. Levitsky.

Fig. 9. Industrial site of the Rubtsovsky mine. Store of the oxidized ore in the foreground. March, 2009. Photo: Igor V. Pekov .



The Rubtsovskoe deposit mined by *Siberia-Polymetals* OJSC is in the Rubtsovsk administrative district, southwestern Altai Krai (Fig. 2). This steppe area belongs to the northwestern Rudnyi Altai. The deposit is located 20 km East of the city of Rubtsovsk and 1 km North of village Poteryaevka. The latter caused that the Rubtsovsky mine is occasionally wrongly named the Poteryaevsky mine.

### Discovery and Exploitation

The deposit was discovered June 27, 1970, when rich base metal ore (Cu 7.4, Pb 8.6, Zn 26.2 wt.%) was intersected at a depth of 95.6 to 101.1 m as a result of structure drilling of the Rubtsovsk geological crew (senior geologist V.F. Mikhailov) to ascertain the nature of a negative magnetic anomaly. Shortly, a geophysical survey in a 1:10000 scale and drilling on a 200 x 200 m grid were carried out here that allowed the delineation of the ore bodies. Detailed exploration started in 1973 and it revealed that the Rubtsovskoe deposit is very rich. In 1974, reserves were calculated and it was decided to construct an underground mine with four operating levels and two trunk shafts down to 220 m (Doronin *et al.*, 1974).

The construction of the main trunk shaft of the Rubtsovsky mine was started in 1976 and finished in 1993. During this period, the industrial site was partly outfitted at the surface. Then, as a result of recession in Russia, the construction of the mine was interrupted and not reopened until after 1998

## ■ BRIEF INFORMATION ON GEOLOGICAL STRUCTURE, PRIMARY ORES AND GENESIS OF THE RUBTSOVSKOE DEPOSIT

The Rubtsovskoe base metal deposit belongs to the Rubtsovsk ore district and also involves the Stepnoe, Talovskoe, and Zakharovskoe deposits. Some occurrences are located in the large volcano-tectonic depression within ancient backarc at the northwestern Rudnyi Altai. The area of the deposit comprises lava, flow breccia, and tuff of rhyolitic porphyries of the Davydov Middle Devonian Formation, and clayey and calcareous-, cherty-, carbonaceous-clayey siltstone, arkose, tuffstone, and tuff of the Kamenevka Middle-Upper Devonian Lower Subformation. These sequences are intruded by Late Devonian subvolcanic rhyolitic and rhyodacitic porphyries. The Devonian sediments are overlapped by the Lower Carboniferous Bukhtarma Formation composed of conglomerate, gravellite, and polymictic sandstone at the bottom, which changes to limestone and carbonaceous siltstone upsection. Paleozoic rocks are covered by thick Neogene-Quaternary (80–100 m) sediments dominated by clay (Chinakov and Belyaev, 1973; Stroitelev *et al.*, 1996; Chekalin, 2002).

The deposit is confined to the northern limb of a gentle syncline. The economic mineralization is located in the lower part of the Kamenevka Subformation ( $D_{2gv}$ ); however wallrock alteration is beyond the outline of economic mineralization involving underlying volcanic rocks of the Davydov Formation. According to Chekvaidze *et al.* (1978), the zoning of wallrock alteration is as follows (downward): albitized, chlorite-carbonate-sericite-quartz, and sericite-quartz rocks. The rocks of the lower section of the Lower Kamenevka Subformation over cherty shale and chert are significantly altered. Therein, chlorite and sericite metasomatic rocks and

Fig. 12. Sketch of the geological section SW-NE of the Rubtsovskoe deposit (simplified after Yu.V. Vasil'ev and L.A. Zyryanova).

- Orebody;
- Overlapping clay sequence ( $N_2$ );
- Terrigenous and carbonate rocks, Bukhtarma Formation ( $C_1$ );
- Siltstone, sandstone, tuffstone, and tuff, Nezhnekamenevka Subformation ( $D_{2-3}$ );
- Rhyolitic porphyry, tuff, and breccia, Davydov Formation ( $D_2$ ).

