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Reconnaissance study of the mining waste from the Gold Quadrilateral of the Apuseni Mountains (Romania) - data from SUSMIN project

Marian Munteanu, Mihaela Elena Cioacă, Daniel Ion, Constantin Rusu, Nelu Floria, Raluca Maftei, Constantina Filipciuc, and Elena Tudor

Geological Institute of Romania, Bucharest, Romania (marianmunteanu2000@gmail.com)

The Gold Quadrilateral of the Apuseni Mountains contains numerous epithermal Au-Ag deposits and porphyry Cu-Au deposits. Most mines are now closed. A reconnaissance investigation has been made on samples from the waste rock dumps at Bucium, Stănija, Valea Arsului, Ruda Barza, Larga, Haneş, Radeş-Runcu, Dealul Fetii, Valea Lungă and Caraci, and from the tailing ponds at Ţărăţel and Ribiţa (Brad mining field), Valea Săliştei and Gura Roşiei (Roşia Montană).

Mercury shows the most elevated values (close to 0.8 ppm) at Ruda Barza and Haneş. Copper and Zn have contents of tens to hundreds ppm, while Pb can reach thousands ppm. Arsenic has highest values at Ruda, Haneş and Larga (150-280 ppm). Gold and silver contents vary from 0.1 ppm to 0.8 ppm and from 1 ppm to 23 ppm, respectively. For comparison, the rocks in the porphyry Cu-Au deposits at Bolcana, Bucium, Rovina, Roşia Poieni and Valea Arsului showed contents of 0.1-1.3 ppm Au, 0.2-8.5 ppm Ag, 4-278 ppm Pb, 0.2-105 ppm Te and 20-26 ppm As (Cioacă et al., 2014). The samples of sulfide-rich waste from the former processing plant at Bucium showed Te contents of 200-400 ppm. The material in the tailings ponds at Ribiţa and Ţărăţel is dominated by quartz, followed by clay minerals and gypsum $\pm$ calcite. At Valea Săliştei and Gura Roşiei, K-feldspar is dominant, followed by quartz and clay minerals. At Valea Săliştei and Gura Roşiei (> 9% K2O), potassium is significantly higher than it is at Ribiţa and Ţărăţel (< 2.5% K2O). Hg, Cu, Zn, As, Te and Bi are one order of magnitude higher at Ribiţa and Ţărăţel than they are at Valea Săliştei and Gura Roşiei. The gold content is ca. 0.3 ppm at Ţărăţel, 0.4 ppm at Valea Săliştei and Gura Roşiei and 0.8 ppm at Ribiţa.

The results encourage further investigations for the assessment of the economic potential of the mining waste in the Gold Quadrilateral.

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Reference

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