



Surface and Ground Water Quality in Köprüören Basin (Kütahya), Turkey

Şebnem Arslan (1), Mehmet Çelik (1), Uğur Erdem Dokuz (2), and Berihu Abadi Berhe (2)

(1) Ankara University, Department of Geological Engineering, Ankara, Turkey (sarslan@eng.ankara.edu.tr), (2) Ankara University Graduate School of Natural And Applied Sciences, Ankara, Turkey

In this study, quality of the water resources in Köprüören Basin, located to the west of Kütahya city in western Anatolia, were investigated. The total catchment area of the basin is 275 km² and it is located upstream of Kütahya and Eskişehir plains. Therefore, besides 6,000 people residing in the basin, a much larger population will be impacted by the quality of surface and groundwater resources. Groundwater occurs under confined conditions in the limestones of Pliocene units. Groundwater flow is from north to south and south to north towards Kocasu stream, which flows to Enne Dam. The surface and ground water quality in this area are negatively affected by the mining activities. In the northern part of the area, there are coal deposits present in Miocene Tunçbilek formation. Ground waters in contact with the coal deposits contain low concentrations of arsenic (up to 30 µg/l). In the southern part, the only silver deposit of Turkey is present, which is developed in metamorphic basement rocks, Early Miocene volcanics and Pliocene units near Gümüşköy (Gümüş means silver, köy means village in Turkish). The amount of silver manufactured annually in this silver plant is huge and comprises about 1% of the World's Silver Production. The wastes, enriched in cyanide, arsenic, stibnite, lead and zinc, are stored in waste pools and there is extensive leakage of these heavy metals from these pools. Therefore, surface waters, soils and plants in the affected areas contain high concentrations of arsenic, stibnite and lead. The As, Sb, Pb and Zn concentrations are up to 733 µg/l, 158 µg/l, 48 µg/l, and 286 µg/l in surface waters (in dry season), 6180 ppm, 410 ppm, 4180 ppm, 9950 ppm in soils and 809 ppm, 399 ppm, 800 ppm, 2217 ppm in plants, respectively. Today, most of the As, Sb, Pb and Zn are absorbed by the soils and only a small part are dissolved in water. However, conditions might change in future leading to desorption of these contaminants. Therefore, necessary precautions should be undertaken immediately to protect the environment in the area.