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Bazman epithermal gold-silver mineralization, Sistan and Baluchestan province, Iran Bazman epithermal gold-silver mineralization, Sistan and Baluchestan province, Iran

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The study area is located 160 km northwest of Iranshar in Sistan and Baluchestan province, southeast of Iran. The area is geologically located in the SE-trending part of the Central Iran magmatic arc zone known as Sahand-Bazman magmatic zone. This zone extends to Turkey to the northwest and to Pakistan to the southeast. The Arabian Plate was subducted and collided beneath Eurasian plate to form a few arc-trench systems in Turkey, Iran and west of Pakistan from Cretaceous to recent days. Among them is the active Makran subduction zone formed by the convergence of the Arabian plate and Lut block in Iran and Helmand block in Afghanistan. The Neogene volcanoes of Bazman, Taftan in Iran and Sultan in Pakistan have spatial link with this subduction zone. Epithermal mineralization occurs in Sahand-Bazman magmatic zone of Iran as a result of the Neogene volcanism and related processes. The study area is located in the northeastern slopes of Quaternary Mount Bazman. Geology of the mineralized area consists of andesite, andesitic basalt, basalt, olivine basalt, and pyroclastic rocks that had all been erupted from the Mount Bazman. Preliminary studies revealed considerable potential of gold and silver mineralization in the area. Mineralization occurs in a vast area and ore grade is high (up to 16 ppm Au and 120 ppm Ag). The mineralization mainly occurs in and around a few veins. The mineralized veins strike N 25 to 35 E and vary from 50 cm to 2 m in width and from 500 m to over 1000 m in strike length. The veins are generally crustiform banded to brecciated with colloform to cockade banding. Pure white and milky quartz and chalcedony occur in central part of the veins (along axial line of the veins). The volcanic rocks close to the milky pure quartz and chalcedony veins (seems as halo) are brecciated and strongly silicified and contains abundant pyrite. Phyllic, argillic and propylitic alteration occur peripheral to the veins. Mineralization is associated with the pyrite-rich brecciated parts around the axial line of the veins. Other sulfides are chalcopryrite, covellite, silver-rich covellite, galena, sphalerite, tetrahedrite and an unknown Ag-rich phase. Quartz is main gangue mineral and occurs as large euhedral to microcrystalline grains. Chalcedony occurs with quartz periodically in crustiform banded veins. Other gangue minerals are adularia, calcite and phyllosilicates. The brecciation is first stage followed by silica precipitates as cockade structure. Finally crustiform quartz and chalcedony were formed along central part of the veins. Pyrite is the most common sulfide. It occurs in every rock samples. Chalcopryrite and Ag-minerals occur as late veinlets. Gold (less than 1 micron up to 2-3 microns) occurs in the hydrothermal breccias of final phase. This paper will discuss many data that obtained by polarization microscope, XRD, XRF and EPMA. Keywords: Bazman deposit, epithermal gold-silver mineralization, Neogene volcanism, hydrothermal breccias, XRD, XRF and EPMA