

## Geology, alteration, mineralization and geochemistry of Khunik area, south of Birjand

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**Abstract:** Khunik area is located in eastern Iran, about 106 km south of Birjand. Preliminary prospecting in the area, using ASTER mineral mapping (SAM) for locating possible alteration zone in the area provided satisfactory results when checked with field observation. The area comprises outcrops of Paleocene to Eocene volcanics, which was intruded telescopically by several subvolcanic intermediate bodies. Alteration is related to some of these units. The main alteration types are propylitic, argillic and sericitic. Mineralization observed at the surface as disseminated and hydrothermal breccia. Maximum amount for distribution of gold, silver and arsenic are in places within stream sediments where upstreams alteration zone of propylitic, argillic-silicified and hydrothermal breccia are located. The range of variation for elements in the litho-geochemistry samples are as follows: Au from 2 to 46000 ppb, Ag from 40 to 9080 ppb, As from 7 to 134 ppm, Cu from 21 to 601 ppm, Pb from 4 to 1485 ppm. The highest Au and Ag anomalies are associated with hornblende monzodiorite porphyry and monzonite porphyry. Type of the mineralization, as disseminated and associated with hydrothermal breccia, the extent of alteration and its relation with lithology and structural geology indicate the presence of an epithermal gold deposit.

**Keywords:** *Alteration; hydrothermal breccia; epithermal gold; Khunik.*

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