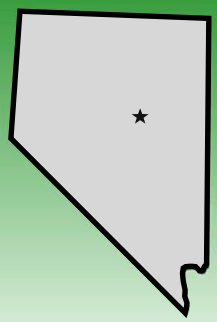


Locating Underground Mining Cavities for Infrastructure Site Planning

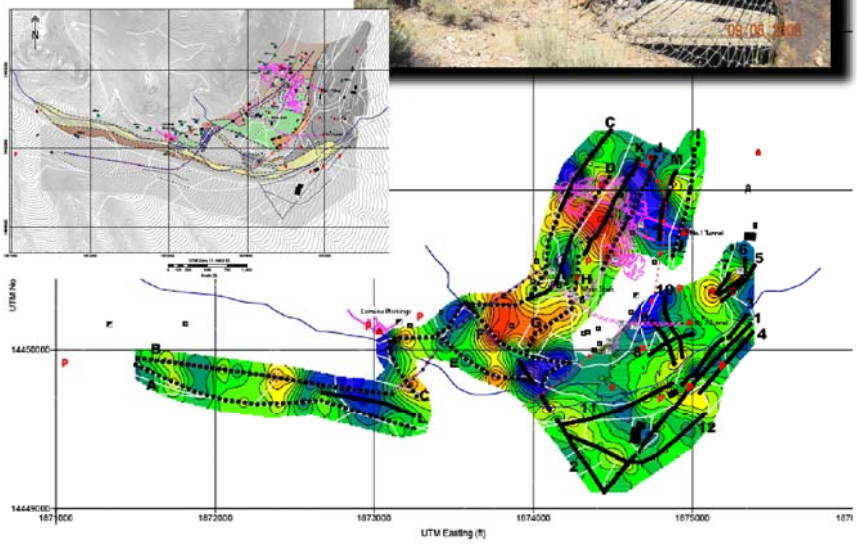
Mount Hope Mine, Eureka, Nevada

PROJECT DESCRIPTION

General Moly is in the design stages for a new molybdenum mine at the former Mt. Hope lead, zinc, and silver mine. Active from the 1870s to the 1940s, the Mt. Hope district employed shafts, drifts, and stopes to extract the mineralized veins. The locations of these long-abandoned underground cavities were only poorly recorded but some surface manifestations exist as open shafts and tunnels. As these cannot be safely entered and surveyed today to obtain better underground spatial locations, *Earth Consultants International,* teaming with ***Technos Inc.,*** were tasked by General Moly to undertake a program to better locate them using a combination of map research, geologic and geomorphic mapping, and geophysical surveying (ground penetrating radar, resistivity, and gravity). The project was driven by a concern for the stability and safety of the future mine's main haul road and crusher plant within the known area of shallow, under-mined ground, due to surface collapse of the old mine cavities from modern mine activities. Once located, the cavities could be either avoided or stabilized by caving and/or grout injection.

Mt. Hope is the site of the future General Moly molybdenum mine (left). The southern flank (shown) is proposed for mine infrastructure, but is undermined by old mine stopes (below).

Geologic map prepared to assist the geophysical interpretations (insert below).



Gravity anomaly map (above) showing probable locations of underground mine cavities (red colors) on the south flank of Mt. Hope.

SOLUTION

A multi-phased geological and geophysical study was designed to detect and map the underground cavities. The geological phase included research of old mining reports and surveys, detailed field mapping, and development of cross-sections based on geological core logs. This is a complex geologic environment, with volcanic porphyries and tuffs, limestone, shale, mineralized zones, talus, landslides, and alluvial deposits. These geologic data were used to constrain the geophysical models, and minimize their contribution in generating false anomalies.

Of the geophysical tools, Ground Penetrating Radar (GPR), and Resistivity Imaging were quickly determined to be ineffective and were discontinued: the GPR achieved insufficient penetration and the Resistivity generated too many false anomalies. Microgravity yielded the best result, producing good correlations between gravity anomalies and known stopes due to the method's ability to map lower-density void space within the complex rock mass. Ultimately, 638 microgravity measurements were made along 13 survey lines. Some of the anomalies were laterally shifted from the mapped mine locations, indicating an improvement from the old maps in the detection of the cavities. The next step will be to drill some of the anomalies to confirm or refute the cavity interpretations and determine their depths.

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