FIGURE 2. ISOMETRIC DIAGRAM OF MINE WORKINGS

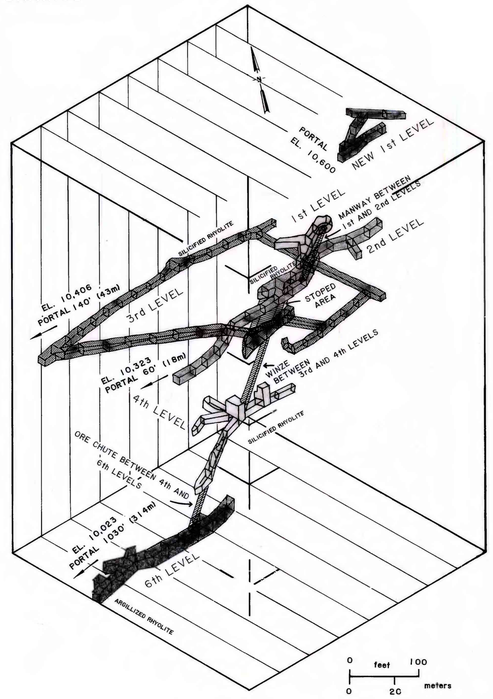


FIGURE 3. SCHEMATIC REPRESENTATION OF VEIN STRUCTURE

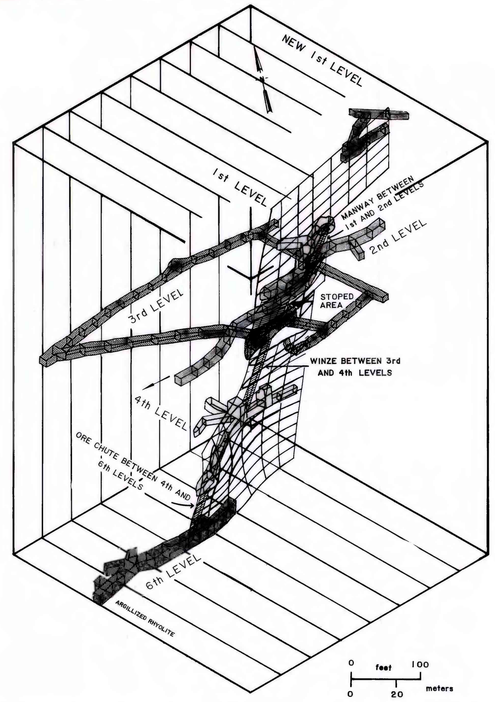
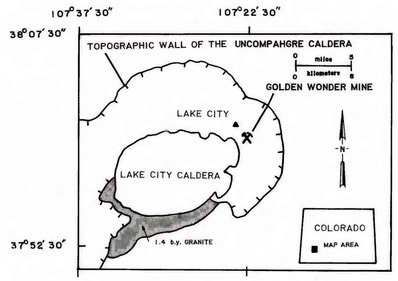


FIGURE 1. LOCATION MAP



DISCUSSION

The Golden Wonder Mine is a 'hot springs' type gold telluride deposit (Billings and Kalliokoski, 1982), near Lake City, Colorado. The ore occurs within a rhyolite flow-dome complex (Lipman, 1976) that was emplaced along the ring fracture of the Uncompahgre caldera (Billings and Kalliokoski, 1982). (Figure 1). Previous work also includes Slack (1976, 1980) and Slack and Lipman (1979) and reports by geologists for the various mining companies which have operated the property.

Figure 2 shows a three dimensional schematic diagram of the central portion of the mine workings. Data for inaccessible mine levels 2, old 1 and new 1 were taken from old mine and assay maps supplied by Norma Swanson of Lake City, Colorado, from the collection of her father, Lowell B. Swanson.

Figure 3 is a schematic diagram of the vein structure superimposed on the mine workings. The vein orientation between levels is a projection inferred from map data from the 3rd, 4th, and 6th levels and from old maps (c. early 1900's) of the upper levels. The structure along which the vein was emplaced is a zone of closely spaced, en echelon fractures probably related to cooling of the rhyolite dome complex.

Two distinct ore assemblages occur along this structure; gold-bearing chert (chert type) and a pyrite-narcasite-sulfosalt assemblage (sulfide type) (Kalliokoski and Billings, 1982). The high grade gold-bearing chert assemblage occurs in isolated pods that are bounded by the fracture surfaces associated with the vein structure as well as by oblique fracture sets. Fractures are very numerous so the mine level maps have been simplified for illustrative purposes. The sulfide assemblage is found along the vein structure between the higher grade chert pods. Kaolinite and alunite occur along the vein as pods and stringers and as small veinlets in the wall rock. The sulfide assemblage appears to predominate in areas where the vein structure was more constricted whereas the gold-bearing chert assemblage formed where the hydrothermal waters could pond.

Figures 4, 5, 6 and 7 are geologic maps of the 3rd, 4th, winze and 6th levels, respectively. The vein structure has been simplified and exaggerated for clarity. Wall rock alteration has been tenatively subdivided into two groups, argillization and silicification. Silicification occurs close to the vein structure and is associated with both ore assemblages. The silicified rhyolite is dense and the primary flow foliation is, in some cases, obliterated. Kaolinite and alunite are also present. Argillized rock is found away from the vein structure, flow foliation is normally still apparent but the rhyolite is light colored and structurally incompetent. This argillized rhyolite consists primarily of kaolinite with alunite and relict primary quartz. Alteration zones appear to overlap spatially, consequently contacts are not always distinct or planar. Some of the alteration zones are bounded by "shears"-surfaces or zones along which some slight movement may have occurred.

Hydrothermal breccias are also simplified and exaggerated for clarity. Breccias in both argillized and silicified rock, occur as 'breccia dikes' (up to .5m in width) or as larger, irregular shaped bodies (up to several meters in width). Most of the breccias in the argillically altered rock are breccia dikes with clasts of argillically altered rhyolite supported by a dark, fine-grained matrix of kaolinite or alunite, ± minor pyrite. Breccia dike formation seems to have occurred in several episodes. These breccias do not contain gold. Breccias in the silicified rocks are more complex. Some appear to be of the type described above that have been locally silicified. Other bodies are distinctly different and contain fragments of the sulfide veins and the chert veins in addition to rhyolite fragments, alunite and kaolinite. This second type of breccia locally contains gold.

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EXPLANATION

- VEIN STRUCTURE, LOCALLY WITH HYDROTHERMAL BRECCIA
- CLAY VEINLET
- SILICA VEINLET
- CLAY AND SILICA VEINLET
- SULFIDE VEIN ASSEMBLAGE (WINZE ONLY)
- CHERT VEIN WITH GOLD TELLURIDES (WINZE ONLY)
- FOLD, SHOWING STRIKE AND DIP OF AXIAL PLANE, AND TREND AND PLUNGE OF AXIS
- TREND AND PLUNGE OF FOLD AXIS
- STRIKE AND DIP OF FLOW FOLIATION / STRIKE OF VERTICAL FLOW FOLIATION
- STRIKE AND DIP OF JOINT / STRIKE OF VERTICAL JOINT
- STRIKE AND DIP OF BEDDING
- SHEAR SHOWING STRIKE AND DIP
- SHEAR ZONE SHOWING DIP
- SILICIFICATION AND ARGILLIC ALTERATION SHOWING GRADATIONAL AND APPROXIMATE CONTACTS
- HYDROTHERMAL BRECCIA
- CONTACT, APPROXIMATELY LOCATED, BETWEEN FLOW FOLIATED RHYOLITE AND PYROCLASTIC TUFF
- SURVEY SPAD (6TH LEVEL ONLY)
- HEAD OF WINZE
- FOOT OF WINZE
- LAKE CITY MINES COORDINATE SYSTEM (19800 / 20000)

FIGURE 4.
GEOLOGIC MAP OF 3rd LEVEL

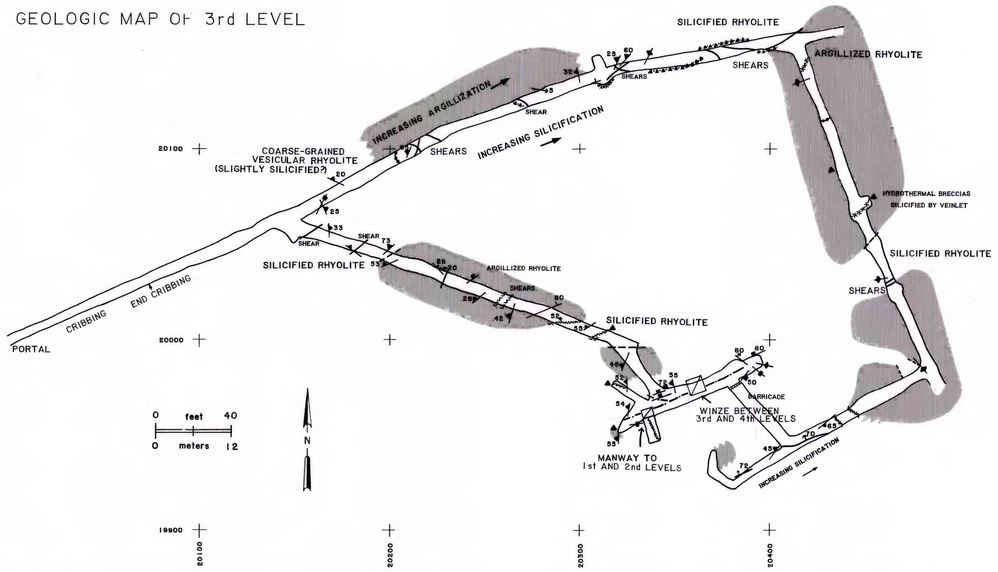


FIGURE 5.
GEOLOGIC MAP OF 4th LEVEL

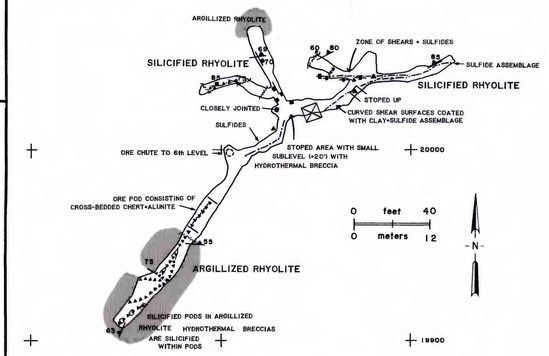
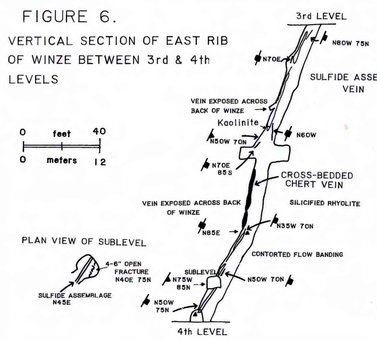
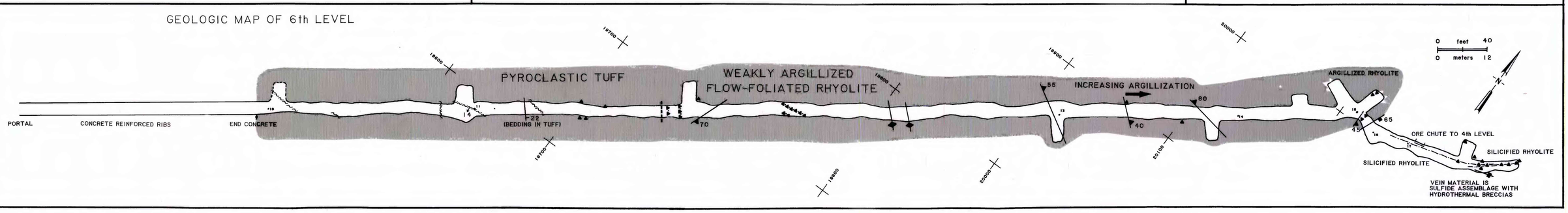


FIGURE 6.
VERTICAL SECTION OF EAST RIB OF WINZE BETWEEN 3rd & 4th LEVELS



GEOLOGIC MAP OF 6th LEVEL



UNDERGROUND GEOLOGIC MAPS OF THE GOLDEN WONDER MINE, LAKE CITY, HINSDALE COUNTY, COLORADO

by

Patty Billings

1983

GEOLOGY BY PATTY BILLINGS ASSISTED BY CHARLES WEST, G.O. JONES, S.D. LUDINGTON AND J.O. KALLIOKOSKI, 1981 AND 1982.

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature