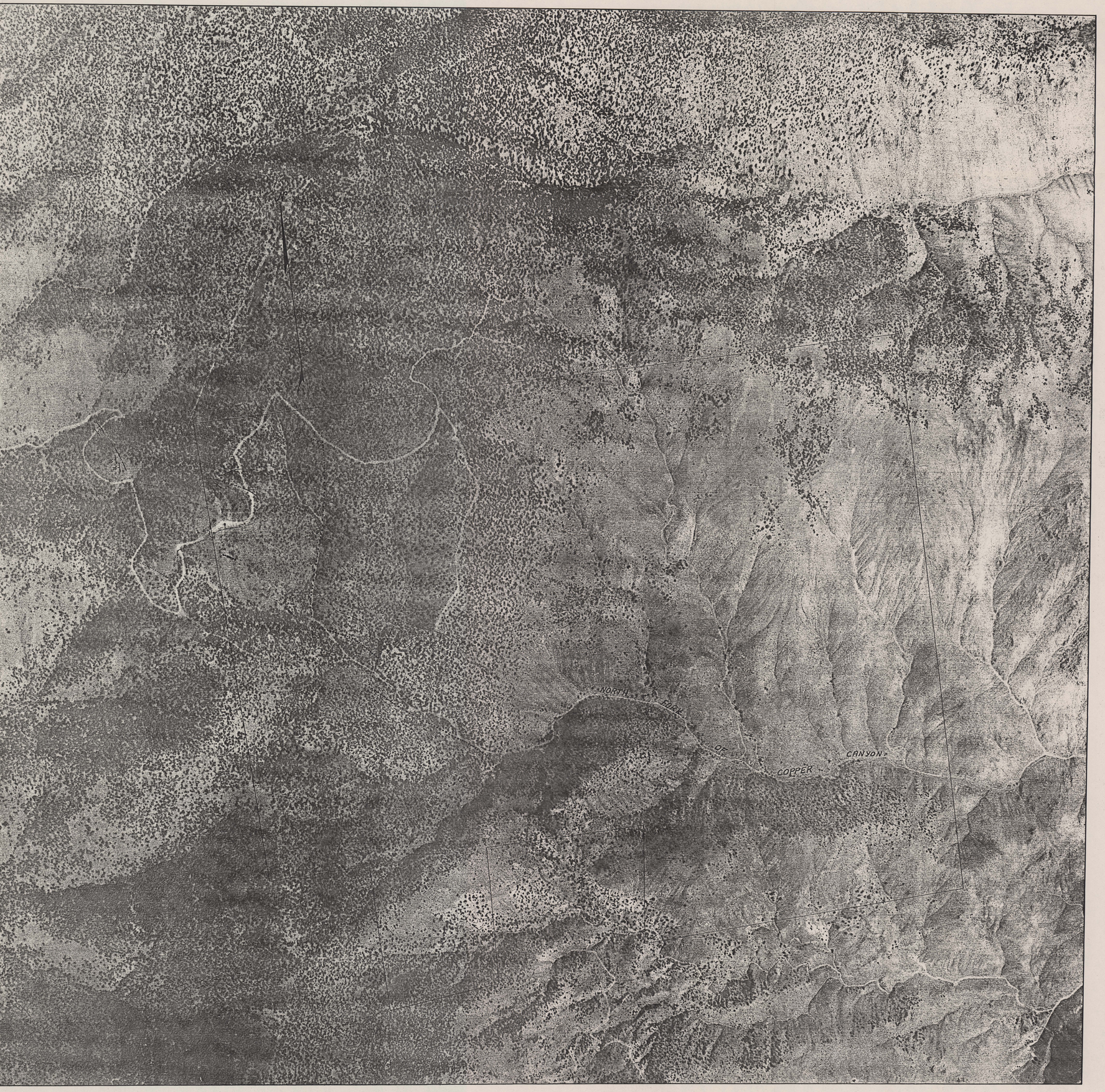

GEOLOGY

COPPER CANYON
Mineral County, Nevada

EXPLANATION

TERTIARY

Undivided Volcanic and Sedimentary Rocks

This unit consists mostly of volcanic flows and tuffs interlayered with a few tuffaceous sandstones and conglomerates. The stratigraphy of this unit and the petrography of the rocks it includes have not been studied closely.

The orientation of beds and flow bands indicates that it, and of course, older units as well, have been tilted westerly by as much as 90°

Breccia

This breccia consists of angular to subrounded fragments in a somewhat vuggy, iron oxide cemented matrix of finely crushed rock. The limonite cementing the matrix is believed to be transported. In many places it constitutes only a small portion of the outcrop area. In most outcrops where brecciated and unbrecciated rocks were observed, the breccia occurs as a thin tabular body and contains fragments identical to the surrounding outcrop.

Although this unit is strongly stained with iron oxide in many places, no boxworks after sulfide have been observed in the breccia matrix. However, such boxworks can be found in some of the breccia fragments. Quartz veins which cut across breccia fragments do not continue into the matrix and are therefore pre-breccia in age.

Because of its distribution pattern, multiple nature, and the lack of relic sulfides or quartz in its matrix, this unit is considered to be (1) of tectonic origin and (2) postmineral in age.

Undivided Felsic Aphanitic Intrusives

Rocks included within this unit appear to be devoid of phenocryst. Rock colors range from dark to light grey. These rocks may or may not constitute a time unit. A few rocks fitting this description occur as thin dikes cutting across the felsic porphyritic intrusives and the Mesozoic diorites. A few outcrops contain disseminated pyrite, but none are known to contain anomalous amounts of copper. Although this unit is poorly understood, it is believed to be of postmineral age, and may be closely related in time to the felsic porphyritic intrusives.

Undivided Felsic Porphyritic Intrusives

This unit includes at least three and probably more separate intrusives. Sharp intrusive contacts were observed in many outcrops. Most of these rocks contain only phenocryst of plagioclase and mafic minerals. In most places the mafic mineral is biotite but in a few places it is amphibole. A few of the rocks in this unit contain quartz phenocryst in addition to the phenocryst of plagioclase and mafic minerals.

One or more of the intrusives is believed to be genetically related to the sulfide mineralization. At least two of the intrusives are mineralized and are therefore premineral in age. One or more intrusives may be postmineral in age.

This unit, as outlined on the map, includes small areas of other rock units which, for simplicity, are not shown. Phenocryst sizes measure from about one millimeter to a few millimeters in diameter. Groundmass grain sizes range from aphanitic to fine-grained.

Intermediate Intrusives

Medium to dark grey and greenish-grey rocks of probable intermediate composition occur as dikes and small irregular bodies cutting members of the felsic porphyritic and diorite units. Some of these rocks are porphyritic and some are aphanitic. They contain anomalous amounts of copper in many places and are therefore believed to be, at least in part, premineral in age. Some of them are known to be closely related in time to the felsic porphyritic intrusives. Rocks of this type constitute only a small fraction of most outcrops in which they occur. For simplicity they have been omitted from the geologic map.

Fine to Medium Grained Granite

These equigranular rocks contain only quartz and potassium feldspar in most places. In many places this rock displays an incipient graphic texture. The graphic texture and mineral composition suggest that it may not be of normal magmatic origin. It is similar to large aplite bodies which accompany some large stock or batholithic scale intrusives. Although very unlikely, this unit could represent a zone which has undergone intense potassic alteration, related to hydrothermal activity.

MESOZOIC

Metavolcanics

This unit consists mostly of hard, well-consolidated flows and tuffs which appear to have undergone green schist facies metamorphism. Most of them are felsic but a few may be of intermediate composition. Distinctly layered tuffaceous conglomerates are interlayered with the volcanics in a few places. Orientations on these beds are similar to those of the younger Tertiary age sedimentary rocks of the "Undivided Volcanic and Sedimentary Unit."

Granodiorite

Many outcrops of granodiorite were observed along the base of the Copper Canyon North Fork and Copper Canyon proper east of the map area, but only one such outcrop is recorded. This outcrop, as well as many other similar ones contains an abundance of xenoliths which appear to have been derived from the diorite unit.

Diorite

This equigranular intrusive is fine to medium grained. Its color ranges from medium to dark greenish. Although this unit contacts well mineralized felsic porphyries, it does not appear to have accepted important mineralization.

Medium Grained Quartz Monzonite

This equigranular intrusive contains plagioclase, potassium feldspar, and biotite. In most places it is light grey or pink.

Symbols

Strike and dip of sedimentary layers or flow bands in extrusive volcanics

Accurate — Approximate

Possible Important faults

Significant Gouge Zones — Approximate Trace of Possible Fault — Fault Breccia Moderately Well Cemented by Iron Oxide

Contact accuracies

± 30 feet — ± 50 feet — ± 100 feet

Cities Service Minerals Corporation
November 1977

Geology by: C. N. Upchurch, F. N. Holabird, Larry Weis, Chi-I Huang, and R. D. Mulhollen, August and September, 1977

Scale Range

One Inch = 326 feet to 362 feet

1:3912 to 1:4344

Bar Scale Drawn to One Inch = 348 Feet

1:4176

0 — 1000 — 2000 Feet

3210 0053

map 3 of 4

N. of 203