ROCHESTER DISTRICT

LOCATION

The Rochester district is located in the southern part of the Humboldt Range in T28N,R33 and 34E. It is accessible via Nevada State Highway 400 and several dirt roads.

HISTORY

The main mines in the Rochester district were not discovered until 1912, but several small gold mines were located in the area in the period from 1860-1880. Prospects were located on Nenzel Hill in the district in 1905, but no ore was produced until 1912 when a small shipment of silver ore from the prospects started a rush to the district. As a result of the rush, numerous mines were opened in the district on Nenzel, Lincoln, Packard, and Independence Hills. The main Rochester mines were located on Nenzel Hill.

The main Rochester mines were worked continuously from 1913-1929, the Nevada Packard Mine from 1913 to 1923. Other mines in the district, including the Lincoln Hill, Looney and the Buck and Charley have been worked intermittently from 1913 to the 1970's.

The Rochester district has produced over 78,000 ounces of gold and nearly 9 million ounces of silver, together with subordinate production of copper, lead, and zinc. In recent years an intensive exploration program centered on Nenzel Hill and conducted by ASARCO and Coeur d'Alene mines has resulted in the delineation of 112 million tons averaging 0.007 ounces of gold and 1.5 ounces of silver per ton.

In addition, a heap leach operation for silver and minor gold was conducted at the Nevada Packard Mine in the early 1980's. The property is currently idle.

GEOLOGIC SETTING

The main rocks exposed in the Rochester district are a complete sequence of the units of the Koipato Group of Triassic age, Limerick Greenstone, Rochester Rhyolite, Weaver Rhyolite, intrusive rhyolite porphyry and leucogranite. The Koipato Group is overlain unconformably by clastic and carbonate rocks of the Lower and Middle Triassic Prida Formation in the western part of the district. The Mesozoic rocks are unconformably overlain by Tertiary basalt flows and by Quaternary alluvial deposits. The Mesozoic rocks are folded into a broad, complexly faulted anticline. The anticline and most of the faults trend northerly.

ORE DEPOSITS

The main ore deposits of the Rochester district occur in rhyolitic rocks of the Koipato Group, the Rochester and Weaver Rhyolites. The important silver deposits on Nenzel Hill are confined to the Weaver Rhyolite. Three main types of precious metal deposits are present in the

district, the silver-bearing quartz veins with base metals at Nenzel Hill, the Buck and Charley and similar deposits elsewhere in the district, the silver-bearing, quartz stockworks at the Nevada Packard Mine and the gold-tourmaline veins on Lincoln Hill.

The Rochester mines have been recently studied in detail by Vikre (1981). The main mines on Nenzel Hill worked two main structures, the East and West veins. The East vein trends N5°-20°E and the West vein N45°E. The veins dip to the west and averaged nearly 2 m thick. The veins are predominantly in the Weaver Rhyolite. Several other veins are present on Nenzel Hill and the area between the main veins contain stockwork of quartz veinlets which help form the bulk-minable silver deposit at Rochester.

Most of the ore was partially to thoroughly oxidized and contained silver haloids and variable amounts of acanthite. Sulfide ore contains pyrite, sphalerite, tetrahedrite, galena, chalcopyrite, arsenopyrite, covellite, chalcocite, stromeyerite, polybasite, pyrargyrite, pyrrhotite, teallite and owyheeite (Vikre, 1981). Minor electrum is present.

The veins also contain quartz K-feldspar and sericite. The wallrocks adjacent to the veins and veinlets are altered to a quartz-sericite-pyrite assemblage.

Although earlier workers suggested that supergene enrichment was an important factor in producing ore grade silver mineralization at Nenzel Hill, Vikre (1981) states that supergene enrichment of silver is negligible at Rochester.

The Nevada Packard Mine on Packard Hill is a quartz stockwork in Weaver Rhyolite. The main workings, open pits and stopes follow a N20°E,75°SW dipping zone of sheeting in the rhyolite. Quartz-K-feldspar sulfide stockworks occur in the sheeted zone. The rhyolite is sericitized, locally highly so.

Most of the ore was oxidized and the main silver minerals were probably silver haloids and argentojarosite. The ore grade mineralization apparently died out at depths of 10 m or less. The hypogene mineralization consists of sulfide and quartz stockwork veinlets containing pyrite and minor chalcopyrite. Recent heap leaching operations were conducted on mineralized rock reportedly averaging between one and two ounces of silver per ton.

The Looney Mine is located in a quartz vein 1/3 m wide, that trends N60°W and dips 50°NE. The vein cuts Weaver Rhyolite which is sericitized and schistose adjacent to the vein. The wallrock is also tourmalinized. The vein contains pyrite, galena, sphalerite, tetrahedrite and chalcopyrite. The mine has been idle for many years.

The Buck and Charley Mine is located on quartz veins which cut silicified Rochester Rhyolite. The veins contain pyrite, sphalerite and minor galena. There is abundant fine-grained pyrite in the silicified rhyolite adjacent to the veins. The property has been idle since the 1960's.

The Lincoln Hill Mine is located on a zone of quartz veining, stockworks and silicification 1-2 m wide in Rochester Rhyolite. The zone trends N45°E and dips 65°SW. The zone contains abundant tourmaline and pyrite and sparse sphalerite. An attempt to mine and heap leach low grade ore from this property was made around 1980. Some drilling was also done at this time.

The Plainview Group, worked for gold, is located on a zone of quartz stringers and veinlets in Rochester Rhyolite. The stockwork zones are

located on E-W and N-S trending, steeply dipping fractures in the rhyolite. The quartz contains abundant iron oxides after pyrite. There is no evidence of base metals in the vein quartz. These deposits and similar prospects nearby, probably supplied the gold for the placer deposits in Limerick Canyon, such as the Panama Placer.

The Panama Placer occurs in Limerick Basin which is a broad upland basin, formed in the Pleistocene. Limerick Canyon has a steep gradient and is rapidly downcutting into the basin. The gold in the placer gravels was deposited in a sinuous stream channel of Pleistocene age. Placer gravels in Limerick Canyon, currently being worked on a small scale, were derived from erosion of gravels in Limerick Basin.

The so called Hamilton Beryl Mine is located on quartz veins and jasperoid developed in shaly carbonaceous limestone of the Prida Formation. The main structure strikes N10°E, dips 80°E and is up to one meter wide. It occurs along the margin of a large jasperoid body. The veins contain tetrahedrite, and malachite and azurite. No beryl minerals were observed.

GEOCHEMISTRY

A sample of vein quartz from Nenzel Hill is highly anomalous in silver (1500 ppm) and anomalous in arsenic, copper, lead, antimony, and zinc. It contains 0.65 ppm gold. The Looney Mine ore is highly anomalous in silver (1500 ppm) and is anomalous in boron, bismuth, copper, lead (>2 percent), antimony, and zinc. It also contains 6 ppm gold.

Ore from the Nevada Packard Mine is highly anomalous in silver (>30 ounces per ton), and is anomalous in arsenic, barium, copper, molybdenum, lead, and antimony. One sample contained 1.0 ppm gold. Ore from the Buck and Charley Mine is anomalous in silver, manganese, bismuth, cadmium, copper, lead (>2 percent), and zinc (>1 percent). It contains 7.9 ppm gold.

A sample from the Lincoln Hill Mine is anomalous in manganese, silver, boron, barium, beryllium, lead, antimony, tungsten, and zinc. It also contained 37 ppm gold, more than one ounce per ton.

A sample from the Plainview Group is anomalous in manganese, silver, barium, lead, tin, and zinc. It also contained 5.4 ppm gold.

The sample from the Hamilton Beryl Mine is anomalous in silver, boron, cadmium, copper, molybdenum, lead, antimony, and zinc. The sample also contained more than 1000 ppm tin, a very anomalous value, and essentially no gold.

SELECTED REFERENCES

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