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GOODSPRINGS DISTRICT

The Goodsprings mining district is perhaps one of the better described mining areas within the Esmeralda-Stateline project boundary. The properties, ore controls, and mineralization characteristics are well described in numerous publications. We have, therefore, confined our work at Goodsprings to compiling data from the literature and restricted our field reconnaissance to the collection of samples, mainly for comparison purposes.

Currently the Goodsprings (Yellow Pine, Potosi) mining district is centrally located around the town of Goodsprings, in the southern end of the Spring Mountain Range in T23, 24, 25, 26S; R57, 58E, in the western part of Clark County, Nevada. It is bounded on the west by the Pahrump and Mesquite Valleys, on the south by the California-Nevada state line, on the east by Goodsprings Valley, and on the north by Potosi Mountain. Access to the district from the east is by way of Interstate Highway 15, and then Nevada Highway 53; and from the west by way of U.S. Highway 95, then Nevada Highway 16. Access within the district is generally along excellent to fair paved and dirt roads, however, many of the workings are at higher elevations, requiring some hiking over rough terrain.

The ore deposits at Potosi Mountain were originally known to the Paiute Indians and Franciscan monks prior to 1855 (Lincoln, 1923). The earliest recorded mention of the district was in 1856 when Nathanial V. Jones was sent by the Mormon church to investigate lead occurrences at Potosi Mountain reported by the Indians and by Mormon pioneers returning from California in 1855. He was later returned by the church to develope the deposits and zinc ore was first smelted in 1857. The years following these initial developments produced no real activity other than claims staking. Between 1893 and 1905, interest shifted from the Potosi Mine area to the present center of activity and minor gold was produced at the Keystone, Boss and Clementia mines. Completion of the railroad in 1905 and the recognition of oxidized ores in 1906 greatly aided the development of the district and it became a major producer of lead and zinc for Nevada. In 1914, platinum and palladium were recognized in the ore at the Boss Mine which has been originally mined for copper and gold had been discovered 30 years earlier (Knopf, 1915). Barite was found in 1915 and vanadium was found and mined in 1917. Lead and zinc production peaked during WWI, after which the district was largely dormant except for a minor flurry of activity in the 1920's. The district again began to produce during WWII, but activity subsided after the war ended. Up to the present activity in the district has been minor and flunctuated widely in response to metal prices. By 1962, the district had produced in excess of $31,000,000, in zinc, lead, copper, gold, silver, cobalt, vanadium, platinum palladium, along with minor amounts of mercury, antimony, nickel, molybdenum, manganese, iridium, and uranium (Longwell, et al, 1965). The recent field inspection indicated that the rise in gold and silver values had produced an interest in the gold mines, the Red Cloud, Columbia, Chiquita, and Keystone; however, no evidence of recent production was observed. Many of these and other mine tailing piles appear to have been removed for milling of the residual minerals. A large staking operation west of the town of Goodspring was in effect in April,1983.

The rocks in the Goodsprings district are predominently Paleozoic and early Mesozoic carbonates and clastics that have been intruded and overlain by Tertiary igneous rocks and Cenozoic alluvium. No rocks of Cretaceous age have been noted. Hewett (1931) suggests that sometime between the Late Jurassic and the Middle Tertiary, the beds were folded and faulted in varying degrees, with the massive limestones of the Devonian and Mississippian developing open folds, and the Pennsylvanian beds forming closed folds. The stratified beds homoclinally dip westward at moderate angles and are complexly broken into thrust faults that parallel the bedding planes, and locally dip more steeply than the beds. The district is also cut by numerous, younger, high angles faults. Towards the end of the Mesozoic thrust faulting began with additional normal and low angle thrust faulting occurring. The area has undergone localized tilting after deposition of the Tertiary volcanics. South of the town of Goodsprings, remnant flows of Tertiary volcanics cap Table Mountain and randomly outcrop throughout the district. In and around Goodsprings, and southeast of Potosi Peak, the Paleozoic carbonates are thrust faulted over the Jurassic Aztec Sandstone (Longwell, et al, 1965). Devils Peak is an exposed Tertiary granite porphyry plug. Minor intrusive dikes are exposed west of Goodsprings, following northtrending thrust and high angle faults. Hewett (1931) suggests that these thrust faults provided structural controls for distribution of the intrusives. Small dikes, considered to be lamprophyres, have been encountered at depth in several mines.

After the stratified rocks were folded and faulted, the area was subjected to considerable erosion, and volcanic activity was renewed, probably coincident with the Middle Tertiary volcanism occuring elsewhere in Nevada.

Varying degrees of alteration have changed the county rocks, the most extensive being dolomitization. Locally, silicification occurs adjacent and related to the fault zones.

The Pb-Zn ore deposits are mainly confined to the Mississippian Monte Cristo Formation, with the uppermost member, the Yellowpine Limestone accounting for approximately 85% of the lead-zinc production and the Anchor Limestone member accounting for an additional 10% (Albritton, et al, 1954). These two members, being more massive than the other members, were considerably fractured during the period of faulting, and were dolomitized and silicified along the resulting shear and fractures. Mineralized solutions appear to have followed the same conduits resulting in the ore deposits.

Locally, breccia along the feeding fissures is mineralized; more commonly, the ore formed in the permeable ground that was marginal to the fissure (Albritton, 1954). The impermeable zones of mudstone and altered porphyry, along with films of clayey gouge along thrust planes, contributed to retarding the progress of fluids. The ore bodies are controlled by the dip of the beds. Ore bodies are generally lenticular and parallel to horizontal bedding, are flattish pipes, parallel to bedding or crosscutting it at low anges in the inclined beds. A few ore zones follow steep faults (Albritton, et al, 1954). The primary minerals were sphalerite and galena, which have been oxidized to hydrozincite, calamine, smithsonie, cerrusite, and less commonly, to anglesite (Longwell, 1965). Most of the workings exhibit an abundance of secondary copper minerals coating fractures and breccia surfaces, and disseminated in the altered carbonates. Much of the original sulfide ore has been oxidized to below the level of previous mining. Gangue minerals in the district include barite, calcite, and quartz.

Free gold was mined at the Keystone and Chiquita mines in the central part of the district. Here, gold occurs in altered granite porphyry plugs and dikes, or replaced in adjacent carbonates along fractures.

Copper mineralization occurs as primary and altered sulfides near but not in granite porphyry intrusives and as secondary alteration minerals, e.g., carbonates, silicates, and sulfates, in Devonian or older carbonate beds (Hewett, 1931). Oxidized cobalt minerals occur with the copper deposits, and have resulted in minor shipments of cobalt.

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