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NBMG OPEN-FILE REPORT 81–4

SUMMARY REPORT, MINERAL INVENTORY OF THE WELLS RESOURCE AREA, ELKO DISTRICT, ELKO COUNTY, NEVADA

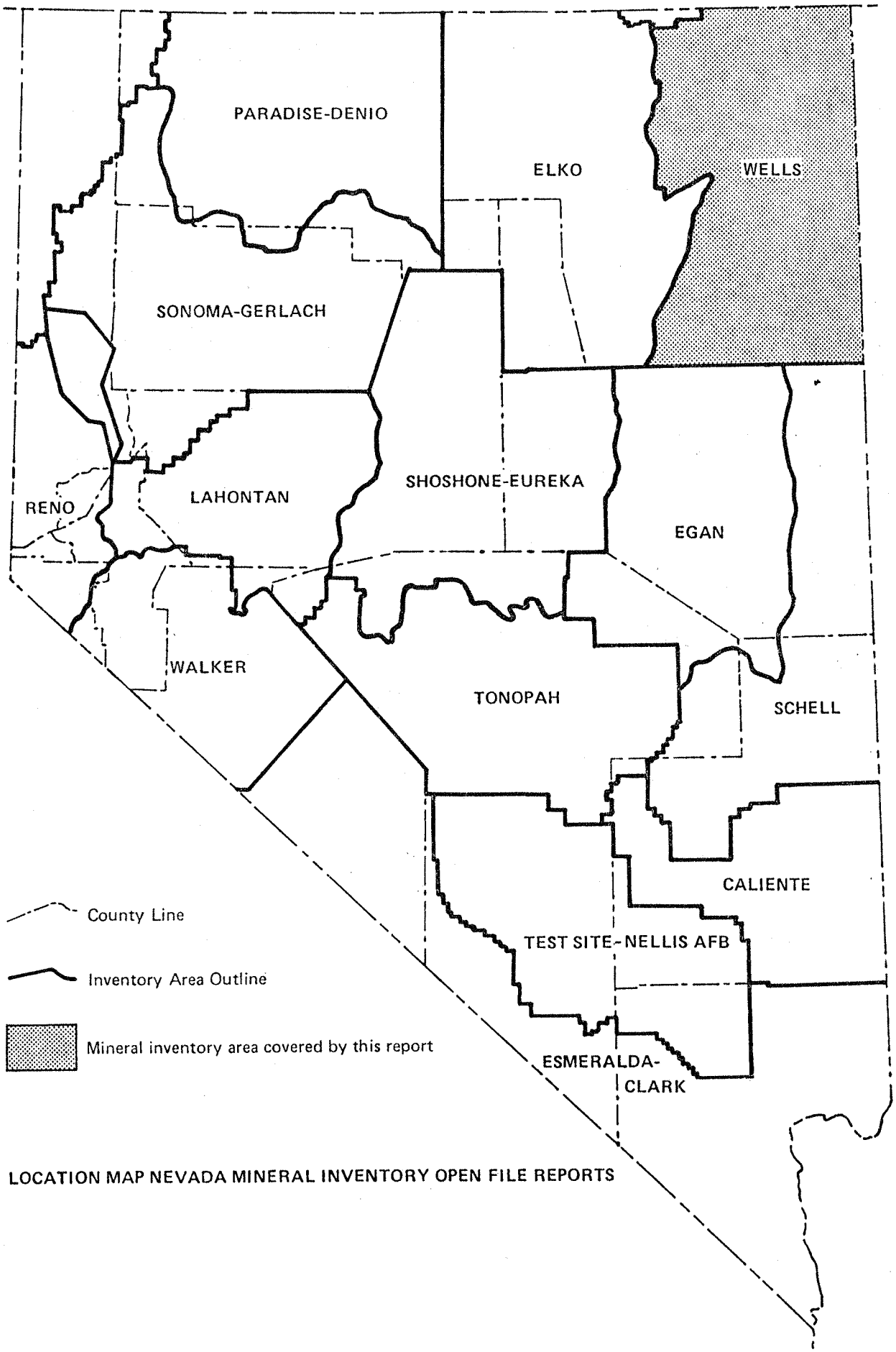
by Joseph V. Tingley

Prepared for the U.S. Department of the Interior, Bureau of Land Management, under Contract YA-512-CT9-159

This information should be considered preliminary. It has not been edited or checked for completeness or accuracy.

See NBMG 81–3 for Geochemical Sampling.

same index maps as NBMG Open File report 81-3



LOCATION MAP NEVADA MINERAL INVENTORY OPEN FILE REPORTS

Mining Districts

Wells Project Area

Black Mountain Area
Cherry Creek Area
Contact
Decoy
Delano
Delker
Dolly Varden
Elk Mountain
Ferber
Ferguson Spring
Harrison Pass
Jarbidge
Kinsley
Lafayette
Loray
Lucin
Montello
Moor
Mud Springs
Pequop
Pilot Peak
Proctor (Silver Zone)
Ruby Valley (Smith Creek)
Snake Mountain Area
Spruce Mountain
Tecoma
Valley View
Warm Creek
Wells
Wendover
White Horse

Summary Report

Mineral Inventory

Wells Resource Area

Elko District

Prepared for

United States Department of the Interior

Bureau of Land Management

Elko District Office

Elko, Nevada

Under Contract #YA-512-CT9-156

Prepared by

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Summary of Work Performed
Mineral Inventory Wells Resource Area
Contract #YA-512-CT9-156
Bureau of Land Management

Work was completed on the Wells Mineral Resource Inventory in two complimentary stages. First, a search of the literature was made, and data on mineral occurrences within the project area were compiled on short form Nevada CRIB forms. Courthouse records were then examined to obtain names and locations of active mining claims within the inventory area. All of the information was plotted on maps for field use. Folios were then prepared, organized by mining district, which included the CRIB forms, notes on mining claims, and pertinent references. This material provided the basis for planning the second stage of the inventory, the field examinations. Since time and budget would not allow all of the properties in the district to be field checked, the field work was planned to supplement literature data rather than verify known material. In this way the inventory could be more complete as knowledge of outlying prospects would be added and missing information could be filled in on these properties which were only casually mentioned in the literature, but were not fully described.

During the field stage of the project, every mining district within the Resource Area was visitied and selected properties were examined within each district. During the examination, emphasis was placed on collecting geologic information on the mineral occurrence and on noting current activity.

Photos were taken in each area to document activity, type of mine workings, and geologic relationships. In addition, a limited amount of sampling was done to augment the geologic examination. Sampling was usually confined to selecting the best, typical mineralization from dumps or ore piles, although some samples of intrusive rock and altered material were taken for comparison purposes. The purpose of the sampling was to provide basic information on element interrelationships within mining districts, and between the various districts. The sampling was not part of the original scope of this project, and was made possible by the cooperation of the Branch of Exploration Research, U. S. Geological Survey, Denver, Colorado, who performed all of the geochemical analyses.

Information collected in the field was compiled on prospect forms, and new CRIB sheets were prepared for those properties examined in the field (in some cases it was only necessary to change or add to an existing form).

The information collected during the course of the Wells project has been compiled and is presented in the following form:

1) Mining District folios:

   a) Prospect forms, sample descriptions, analysis sheets for properties examined in the field.

b) Completed CRIB forms.

c) CRIB forms which are incomplete due to lack of available information.

2) Slide Album, organized by mining district.

3) Maps

a) Planimetric maps, 30' Series, for project areas, showing location of Mining Districts, and sample locations.

b) USGS 7 1/2' and 15' topographic maps showing claim blocks, sample locations, and prospect names.

c) USGS 7 1/2' Orthophoto quads showing same information (these are supplied for those areas where no topographic coverage was available.

4) Geochemical Data

a) Sample description sheets

b) Analysis sheets

5) Summary report, a brief report including location, history, comments based on field observations, and some comments on geochemical results.

In addition to this information, field sample description sheets and field notes are on file at the Nevada Bureau of Mines and Geology. Also, splits of all the samples taken as well as selected hand specimens have been retained at the Nevada Bureau of Mines and Geology. This material may be useful for additional studies in selected areas.

In reporting on this project, no attempt has been made to compile detailed geologic information on the districts. Since this project was a mineral inventory, our efforts were confined to acquiring new information on prospects, and no time was available to collect new regional geologic data. This information can best be obtained directly from the published literature and is perhaps best summarized in the U.S.G.S. Open-file Report on Elko County by Smith (OFR 76-56).

Throughout the course of the project, emphasis was given to metallic mineral occurrences, and data was not compiled on geothermal resources, oil and gas, or sand and gravel.

Black Mountain Area

The Black Mountain Area is located about 18 miles northeast of Wells. Prospects are found on the east and southeast flanks of Black Mountain, a north-south trending ridge in the northern Windemere Hills. Mining activity has been centered in two areas in Sections 2 and 10, T39N,R64E. Trenches, pits, and shallow shafts are old, and explore gossanous jasperoid ores in breccia cover in limestone. Barite and calcite form cementing material in the breccia. Galena was noted present at all sample localities. No activity was noted at the time of the examination.

Rocks exposed in the area are mainly sediments of Devonian to Permian age. Dolomites of the Simpson and Sevy Formations are overlain by limestones of the Guilmette or Devils Gate Formation. Mississippian rocks are present as fault segments, and Permian rocks flank both sides of the main ridge that forms Black Mountain. According to Smith (1976) Permian rocks to the west of the ridge comprise the remnants of the upper plate of a thrust fault. No igneous rocks have been mapped in this locality.

Samples of jasperoid and sulfide-bearing material from prospect dumps showed trace amounts of silver to be present. Samples also shwoed anomalous geochemical values in lead, zinc, cadmium, strontium and barium.

Selected References:

MILS, Wells AMS File (1979) U.S. Bureau of Mines.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada.
U.S. Geol. Survey Open-file Rpt. 56.

Cherry Creek Area

The Cherry Creek area includes only that portion of the Cherry Creek Range which is within Elko County. The Cherry Creek mining district actually lies on to the south in White Pine County, and was not examined as part of this study.

Rocks exposed in the northern Cherry Creek Range are mainly Permian rocks of the Pequop Formation. Some rhyolitic to dacitic ignimbrite has been mapped in the north central part of the range. Northwest trending faults cut the rock outcrops.

Limited reconnaissance was done in this area and only one prospect, in S2,T28N,R62E, was described and sampled. A sample taken from a 10-foot thick breccia zone showed silver to be present along with anomalous values of cadmium, molybdenum, lead, and zinc.

Contact

The Contact mining district is centered around the old town of Contact near the Salmon River in northeastern Elko County. The district is large and includes the old districts of Alabama, Salmon, Kit Carson, Salmon River, and Porter (Portis). The first recorded activity in the area was in 1870, and small shipments of copper ore were made from the district beginning in 1880. According to Smith (1976) half of the district production was made during 1952-57 from the Marshall (Nevada-Bellevue) mine. Recent activity here has included exploration by Sunshine Mining Company at the Silver Stone property, work by Calta Mines and Phelps Dodge Company on their holdings in the western part of the old district near the town of Contact. Exxon Minerals conducted uranium exploration on a large block of claims east of Contact, and Homestake Mining Company holds a large block of claims surrounding the Volcan Mine in the eastern portion of the district. No work was in progress at any of these locations during the time this investigation was being conducted.

Mineral deposits within the Contact district are of two general types, copper in veins and metasomatic replacement deposits associated with a large granodiorite intrusive which crop out near the old town of Contact, and silver in veins and breccia zones in Paleozoic metasediments in the eastern part of the district.

The largest copper orebodies mined were in quartz veins along the contact on the north side of the granodiorite near its west end, and most of the other copper occurrences are associated with this western portion of the granodiorite contact. The granodiorite is coarse grained and appears unaltered except where it is cut by dikes of younger quartz monzonite and seyenite. Most of the dikes, veins and shear zones which cut the intrusive appear to trend N40° to 70°E, with some N45°W, and are near vertical. The

dikes are not quartz rich, but some contain large amounts of potassium feldspar. The dikes appear to be more closely spaced and alteration along the dikes seems more intense along the southeast side of the contact, toward the Salmon River.

Prospects examined in the Knoll Mt.-Blanchard Mt. quadrangles, east of Contact, show the same general structural trends noted within the main Contact district, with dikes and fault zones trending N40°-70°E, N40°W, all with weak copper oxide staining along them.

Samples of mineralized rock from dumps in the main Contact district usually showed copper to be present associated with some silver. Individual samples showed anomalous tin, tungsten, cobalt, nickle, and molybdenum (not all elements were anomalous in the same samples).

Silver values were higher in the eastern part of the district, and some of these were also high in tin, tungsten, and arsenic.

Selected References:

Schrader, F. C. (1912) A Reconnaissance of the Jarbidge, Contact, and Elk Mountain Mining Districts, Elko County, Nevada, U.S. Geol. Survey Bull. 847-A.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Decoy

The Decoy district covers a very small portion of the western flank of the central Toano Range. The district contains only two properties, both of which cover one occurrence located on a small hill west of the range front. Small amounts of manganese ore were shipped from the property in 1917-18 and again in 1952.

Host rocks for the manganese ore are limestones and dolomites of Ordovician age (Pogonip group). Ore consists of psilomelane, pyrolusite, and wad which occur as bedding replacements in the sediments along a N10°W zone along bedding. Stopes extend down-dip 55° to the southwest along this zone. A N05°E, 60°SE dipping shear zone cuts the sediments, and may be an ore control feature. Along outcrop to the north, the mineralized structure can be traced by iron-manganese gossan and jasperoid.

Geochemical analysis of samples selected from dumps on the property showed, in addition to manganese, anomalous values in barium, arsenic, cobalt, nickle, and silver to be present.

There were no signs of activity on this property at the time of the examination.

Selected References:

Granger, et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada, U.S. Geol. Survey Open-file Rpts. 76-56.

Delano

The Delano district is centered around Delano Peak in the northern Delano Mountains. Included within the district are the main Delano mining area north of Delano Peak, the Indian Springs tungsten area to the southeast, and the Emmigrant Springs area to the northwest. Also included in the Delano district is the Goose Creek area which extends from Delano north and east to the Idaho and Utah borders.

Thompson and West describe a Goose Creek district, organized in 1872, which fits the description of this area, but the name Delano was not applied until sometime prior to 1881.

The first recorded production was in 1908 from the Cleveland and Argyle mines. Tin was discovered in the district in the 1950's, but no tin has been produced. Exploration at the Indian Springs tungsten deposit was first done by Arizona Land and Cattle Company, then by Placer Amax, Union Carbide Company, and Utah International. Utah still holds the property, but no work was in progress at the time of this examination.

In the Emmigrant Springs area, Mine Finders, Inc. of Colorado, recently explored a large claim block for molybdenum(?). Logs of their drill core, and some of the core, are on file with the Nevada Bureau of Mines and Geology in Reno. The property was not active in 1980.

At Delano itself, claim staking, geologic mapping and sampling work was being done during 1980 by Noranda Mines, and a small Canadian Company, Richfield Resources of Vancouver, was reported to have acquired the Gold Note property.

Mineralization within the Delano District occurs as bedding replacements along shears and fault zones in Permian sediments in the northern parts of the district. To the south, at Indian Springs, tungsten-molybdenum mineralization occurs associated with the contact zone of a Cretaceous intrusive.

At Delano, mineralization appears to be strictly bedding controlled, alteration is not intense. Where exposed, the limestone above the replacement horizon is not highly altered. Outcrops of the replacement horizon are marked by massive, brown jasperoid which is normally vuggy and laced by late-stage silica veinlets.

Mineralization exposed at Emmigrant Springs is not as strong as that seen at Delano Camp, but may be similar in nature. The sediments are of the same age, and the same stratigraphic horizon which has served as the ore horizons at Delano may be present at Emmigrant Springs. Old workings in the Emmigrant Springs area explore jasper-silica cemented rubble zones along steep faults which cut the limestone section.

Geochemical results showed similar results in both the Delano and Emmigrant Springs portions of the district. Fairly high silver values are associated with high lead, zinc, copper, bismuth, arsenic and tin. Tungsten and molybdenum showed up in samples from the Indian Springs area, and tin values, although present, were considerably lower.

Selected References:

Granger, A. E., et al., (1957) Geology and Mineral Resources of Elko County, Nevada, NBMG Bull. 54.

Olsen, D. R. (1960) Geology and Mineralogy of the Delano Mining District and Vicinity, Elko County, Nevada. PhD Thesis, Univ. of Utah.

Slack, J. F. (1972) Structure, Petrology and Ore Deposits of the Indian Springs (Delano Mts.) Region, Elko County, Nevada. M.S. Thesis, Miami Univ.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Delker

The Delker district covers the West Buttes area, an isolated north-trending ridge which lies to the northwest of the northern Cherry Creek Range.

Copper ores were first discovered on the northern tip of the West Buttes (Delker Hill) about 1894, and a small tonnage of copper ore was shipped from the Delker Mine during 1916-1917. Very little mining has been done in the district since that time, but several companies have explored the district for copper during the 1960's and 1970's. At the time of this examination, Gold Creek Corp., of Ely, was drilling in the district.

The West Buttes are composed of quartz monzonite which has intruded limestones and quartzites of the Permian Park City Group. The core of Delker Hill is quartz monzonite, and the sediments exposed on the west and northwest flank of the hill have been metamorphosed to garnet tactite. Copper mineralization occurs in shear zones and along fractures in the tactite near the intrusive contact.

To the south, on the north side of the main West Butte, a jasperoid-gossan zone associated with an altered fine-grained, K-feldspar rich intrusive has been explored by trenching and drilling. No copper minerals were seen in this area, but drill cuttings samples were very high in pyrite.

Geochemical results from samples taken showed anomalous copper and bismuth to be present in the skarns on Delker Hill. Two samples, one on Delker Hill and one from the gossan sampled at the southern area showed anomalous arsenic values.

Selected References:

Hill, J. M. (1916) Notes on Some Mining Districts in Eastern Nevada.
U. S. Geol. Survey Bull. 648.

Mining and Scientific Press, v. 115, Sept. 29, 1917, p. 481.

Garside, L. J. (1973) Radioactive Mineral Occurrences in Nevada. NBMG Bull. 81.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada.
U.S. Geol. Survey Open-file Rpt. 76-56.

Dolly Varden

The Dolly Varden district covers all of the Dolly Varden Mountains, and includes the old silver-lead occurrences on the southeast flank of the range, the copper property at Victoria, and the gold prospects on the north end of the range near Mizpah Spring.

The earliest activity in the district was at the Dolly and Keystone Mines in 1869. Copper was discovered at Victoria in 1872, and the Mizpah Spring gold veins were discovered in 1905. Most of the district's production has come from the Victoria copper property which has operated intermittently from 1872 to the present. At the time of this visit, Day Mines Company was operating the Victoria Mine and Mill, and mill concentrates were being sent to Kennecott's McGill smelter for treatment. In addition to the Victoria mining operation, exploration was being done in 1980 by Noranda Mines on claims surrounding the Dolly Varden Spring (Keystone-Dolly Mine area) silver area.

Most of the mineral occurrences in the Dolly Varden district are associated with the Melrose stock and its contact area. The Victoria Mine is a breccia filling deposit at the contact of the stock and limestone of the Permian Pequop Formation.

Several small copper prospects occur along the western contact of the Melrose stock on the west side of the range north and south of the Currie road.

To the southeast, near Dolly Varden Spring, silver, lead, copper mineralization occurs in replacement lenses in limestone associated with steep fault zones. Outcrops of these deposits are marked by vuggy, siliceous gossans with jasperoid.

Near Mizpah Spring on the north end of the range, gold-bearing quartz veins cut the Melrose Stock. The vein outcrops are stained with hematite and copper carbonates, and contain jasper, calcite, and quartz.

Most of the geochemical samples taken showed high copper values to be associated with anomalous bismuth. Some samples were high in silver, arsenic, and antimony, and anomalous gold was detected in one sample from the Mizpah area.

Selected References:

Whitehill, H. R. (1975) Biennial Report of the State Mineralogist of the State of Nevada, 1873 and 1874. Carson City.

Hill, J. M. (1916) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Hunt, S. F. (1936) Mining Geology Outlined. Reno, Nevada.

Granger, A. E., et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Snow, G. G. (1963) Mineralogy and Geology of the Dolly Varden Mountains, Elko County, Nevada. University of Utah Ph.D.

Garside, L. J. (1973) Radioactive Mineral Occurrences in Nevada. NBMG Bull. 81.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Elk Mountain

The Elk Mountain district is located on the northern border of Elko County, just south of the Idaho state line, and includes the area of Elk Mountain and White Elephant Butte. The district is just west of the eastern boundry of the Humboldt National Forest.

Schraeder (1912) mentions that copper minerals were found in the district as early as 1890, but little work was ever done, and no production is recorded from the district.

Most prospects in the district are related to the contact zone surrounding a granodiorite intrusive. The intrusive forms the major portion of the southwestern slopes of White Elephant Butte, and has intruded Cambrian sediments, which extend to the northeast. The contact zone extends between White Elephant Butte and Elk Mountain.

Prospects in the district explore veins occurring along faults in granodiorite, Cambrian quartzite and limestone and tactite occurring in the contact metamorphic zone. Small tungsten occurrences have been explored north of White Elephant Butte, and a small mill was constructed in the district. Production, if any, is unknown. During the late 1960's, exploration for copper was conducted by several companies including Bunker Hill Company and Union Pacific Railroad (Minerals Division).

The Robinette molybdenum prospect has received considerable prospecting attention, but no activity was evident at the time of this examination.

Geochemical values from the district were generally low, but did confirm the presence of tungsten and molybdenum at Robinette and one other property.

Selected References:

Schraeder, F. C. (1912) A Reconnaissance of the Jarbidge, Contact, and Elk Mountain Mining District, Elko County, Nevada. U.S. Geol. Survey Bull. 497.

Selected References: (continued)

Granger, A. E. et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Mathais, D. E. (1959) Geology of the Northern Elk Mountains, Elko County, Nevada, unpublished M.S. thesis, Univ. of Oregon.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Ferguson Spring

The Ferguson Spring district covers Ferguson Mountain, a peak east of the southern portion of the Goshute Range, and part of Ferguson Flat to the east. Copper-silver deposits are said to have been discovered in the district prior to 1880. Most of the past mining activity has centered around the Dead Cedar Mine in the western part of the district, but a massive manganese-iron gossan has been explored by shallow cuts and adits near Ferguson Spring, and small prospects in limestone have been explored on the east side of Ferguson Mountain. No activity at any of these locations was noted at the time of this examination.

Outcrops at the Dead Cedar and Ferguson Springs workings are marked by prominent manganese-iron gossans. The gossans contain jasper, are laced with silica veinlets and clots of white barite crystals.

The old prospects on the east flank of Ferguson Mountain explore narrow jasper replacement cones in limestone along northeast trending fault zones. A kaolinized porphyry dike was noted in the footwall of the fault zone near the easternmost prospect shaft.

Selected References:

Hill, J. E. (1916) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Ferber

Ferber district covers portions of Ferber Flat and White Horse Flat on the Utah border in southeastern Elko County. Mineralization was discovered in the area about 1880, and some production of copper-lead ores is recorded prior to 1914. Most of the production has been from the Martha Washington claims.

Ferber Flat is underlain by a large quartz monzonite stock which has weathered to form the basin area. Copper mineralization occurs along shear zones and in replacement bodies in silicated limestone near the intrusive contacts on the north and south margins of the basin.

Samples taken of ore material from two separate locations show anomalous copper, lead, silver, arsenic, and bismuth. The bismuth values are similar to those obtained in the Dolly Varden district to the west.

Selected References:

Hill, J. E. (1916) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Granger, A. E., et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Harrison Pass

The Harrison Pass district covers the east slope of the Ruby Mountains immediately north and south of the Harrison Pass road. The district is mostly within the Humboldt National Forest. Scheelite was discovered here in 1916, and tungsten ore was produced in the district during 1941-44 and 1952-53.

At the Star tungsten property, the largest of several small properties, scheelite occurs in tactite lenses which formed along bedding in limestone near its contact with a large granodiorite intrusive. The intrusive contains pyrite and clots of silicate minerals in the contact zone. Contact silicate zones do not extend for great distances into the intruded limestones, and the scheelite-bearing garnet tactite lenses are small and irregular.

In addition to tungsten, the tactite contains anomalous amounts of beryllium, tin, molybdenum, and bismuth.

Selected References:

Granger, A. E., et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Johnson, A. C. and Benson, W. T. (1963) Tungsten Resources of Nevada. U.S.B.M. Unpub. Report.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Jarbidge

The Jarbidge district includes the northern portion of the Jarbidge Mountains, as well as parts of the Granite Mountains and Copper Mountains to the west. All of the district is within the Humboldt National Forest. Two district centers of mineralization are included within the district, the precious metal deposits localized in volcanics near Jarbidge and contact tungsten deposits at the Coon Creek and Batholith Mines to the southwest. With the exception of a few tons of tungsten ore and some barite, essentially all of the district's production has come from precious metal mines at Jarbidge. The rush to Jarbidge took place during 1909-10, and the main period of gold-silver production extended from 1917-32. Tungsten ore was mined from the Batholith (Mission Cross) Tungsten Mine sometime during the period 1940-1957, but the amount is not recorded.

The gold-silver ore bodies at Jarbidge occur as stringers and veins of calcite partly or wholly replaced by quartz and/or adularia which are located in sheared, brecciated, altered zones along faults in rhyolite. The rhyolite is silicified on each side of the veins, and more intense clay alteration occurs nearer the veins. Silicified outcrops in the district resemble breccia pipes, angular rhyolite fragments cemented by vuggy white quartz, calcite, and adularia. Other areas display stockworks of vuggy, cockscomb quartz veinlets cementing rhyolite fragments.

Geochemical results from samples taken in the main Jarbidge district s owed fairly high gold values associated with some silver. Other elements were almost conspicuously absent. Arsenic, antimony, lead and zinc values were all very low. Beryllium values, while not extremely high, seemed anomalous for this type of gold-silver occurrence.

There was evidence of recent claim staking activity in the area east of Jarbidge, but no work was in progress on claims at the time of thie examination.

Selected References:

Schrader, F. C. (1912) A Reconnaissance of the Jarbidge, Contact, and Elko Mt. Mining Districts, Elko County, Nevada. U.S. Geol. Survey Bull. 497.

Schrader, F. C. (1923) Jarbidge Mining District, Nevada. U.S. Geol. Survey Bull. 741.

Granger, M. B. et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Coats, R. R. et al. (1977) Mineral Resources of Jarbidge Wilderness and Adjacent Areas, Elko County, Nevada. U.S. Geol. Survey Bull. 1439.

Kinsley

The Kinsley district covers the southern part of the Kinsley Mountains in southern Elko and northern White Pine Counties. Most of the mineral occurrences in this district are associated with a quartz monzonite stock which has intruded the limestone section and created a rather large zone of contact silicates and marble. Along the northeastern, eastern and southeastern margins of the stock, small replacement ore bodies in the contact silicate zone were mined for copper, lead and tungsten. Along the southern contact, in the White Pine County portion of the district, several areas in the contact zone were quarried for marble.

The district was discovered and oragnized as the Antelope district in 1862, but was renamed the Kinsley district in 1865. The earliest mining probably took place on copper-lead-zinc rich gossan outcrops along the northeast and southwest margins of the district. A small amount of tungsten ore was mined during 1942-45 from a deposit on the northeast contact zone of the stock. The marble deposits were not developed until 1966, and this activity was short lived. Other than some recent claim staking, no activity was noted in the area at the time of this examination.

Most of the samples taken in the Kinsley district showed high copper values associated with lead, zinc, and silver. Some samples were anomalous in arsenic, antimony, molybdenum, tungsten, bismuth, and cadmium.

Selected References:

Mill, J. M. (1916) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Smith, R. M. (1976) Mineral Resources of White Pine County, Nevada, Part II of Geology and Mineral Resources of White Pine County, Nevada, NBMG Bull. 85.

Lafayette

The Lafayette district covers the lower slopes of the southeastern flank of the Wood Hills northeast of Tobar. There is little known concerning the history or production from this district, and it includes only a handful of small prospects.

The prospects are located on northeast-trending faults and shear zones which cut dolomite limestone. Near some of the prospects, the limestone has been slightly marbelized, and brecciation and veining extend into the wall rock for short distances away from the mineralized structures. Smith (1976) reports that the dolomitic limestone exposed along the southeast slopes of the range form the upper plate of a thrust sheet. Some of the brecciation noted could be related to the thrusting. If mineralization exposed in the old prospects post dates the time of thrusting, there could be unexplored mineral occurrences either along or beneath the thrust sheet.

Geochemical values from samples taken at the prospects show anomalous values in chrome, antimony and arsenic. Two samples were high in nickle. The presence of chrome and nickle seem strange for the geologic setting, although mariposite (chrome-rich mica) was seen at one location in the district.

Selected References:

Southern Pacific Co. (1964) Minerals for Industry, Northern Nevada and Northwest Utah, Vol. I, Southern Pacific Company.

Erickson, R. L., et al. (1966) Geochemical Reconnaissance in the Pequop Mts. and Wood Hills, Elko County, Nevada. U.S. Geol. Survey Bull. 1198-E.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Loray

The Loray district covers the northern part of the Toana Range in the general area between Castle Park well in Pilot Creek Valley and Loray, a siding on the Southern Pacific Railroad. Hill (1916) reported that copper-lead occurrences were known in the district as early as 1913, and production was recorded for the periods 1917-21, 1934-46, and 1954-58. Volcanic ash (pumicite) was mined from deposits near Cobre during the 1940's.

The northern Toano Range is composed of Paleozoic limestone, dolomite, and quartzite which dips to the west and is complexly faulted. On the east side of the range, south of the Castle Park mine, the sediments have been intruded by a granodiorite intrusive. Granodiorite underlies the basin south of the Castle Park Mine, and porphyry dikes associated with mineralization at several small prospects nearby may be related to the granodiorite. Contact effects of the intrusion are not pronounced and marbelization extends into the limestone only a short distance away from the contact areas.

Prospects in the eastern area are marked by gossan zones along shears in limestone and quartzite. Samples showed copper to be present in anomalous amounts associated with lead, zinc, arsenic, and minor silver. High tungsten was noted in one sample, and anomalous gold was found in four samples.

In the western part of the district, on the west slope of the range, silver mineralization occurs in quartz veins which cut the limestone section. The veins trend north-south and northeast. At the Betty Lou and Golden Ray areas, the vein systems are wide and can be traced for several hundred feet along strike.

At the time of this examination, no exploration activity was noted on the east side of the range, but the western area had recently been covered by an I.P. (induced polarization) survey.

Selected References:

Hill, J. M. (1916) Notes on Some Mining Districts in Eastern Nevada, U.S. Geol. Survey Bull. 648.

Granger, A. E., et al. (1957) Geology and Mineral Resources of Elko County, Nevada, NBMG Bull. 54.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Lucin

The Lucin district covers the northern Pilot Range along the Nevada-Utah border east of Montello. Most of the productive part of the district lies to the east in Utah. The district was discovered in 1871, and mining of lead ores began shortly after that date. Copper ores from the district were exploited beginning in 1886. Most, if not all, of the production of this district originated in Utah, but lead ores were smelted at Buell, within Nevada. At the time of this examination, Union Oil Co. held a large group of claims in the district and was doing some rotary drilling.

Old workings on the Nevada side of the district exposed gossan lenses which formed in limestones along shear zones. Altered granite containing fine-grained sulfide along mine veins was seen on the lowest dump of the Tecoma claim area.

Selected References:

Blue, D. M. (1960) Geology and Ore Deposits of the Lucin Mining District, Box Elder County, Utah and Elko County, Nevada. MS University of Utah.

Granger, A. E. (1957) Geology and Mineral Resources of Elko County, Nevada, NBMG Bulletin 54.

Schilling, J. H. (1968) Molybdenum Resources of Nevada. NBMG unpub. Open-file Rpt.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Montello Phosphate Area

The Montello phosphate area covers the southern part of Murdock Mountain east of Montello. The area includes Immigrant Canyon on the north and extends south to the northern boundry of the Loray district. Prospecting for phosphate was done during the early 1970's, but no activity was in evidence at the time of this examination.

Only one prospect, in Immigrant Canyon, was visited within the area. At that location, an old shaft and connecting adit explored narrow calcite veins in shale and limestone. No mineralization was obvious from either the examination or from results of samples taken there.

Selected References:

Garside, L. J. (1973) Radioactive Mineral Occurrences in Nevada.
NBMG Bull. 81.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada.
U.S. Geol. Survey Rpt. 76-56.

Moor

The Moor district is located in the north end of the Wood Hills, covering the area south of Interstate 80 at Moor Summit. Numerous small prospect pits and shafts explore small showings of vein quartz and calcite with minor lead, zinc and copper mineralization. Little is known concerning the history or past production of the district. Deposits of limestone and silica have been reported, and decorative marble occurrences have been explored within the district.

Outcrops of gossan and jasper occur at the small lead prospects immediately south of Moor Summit.

There was no activity within the district at the time of this examination.

Selected References:

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Southern Pacific Co. (1964) Minerals for Industry, v. I, Southern Pacific Co.

Mud Springs

Mud Springs (or Medicine Springs) district covers the northern end of the Medicine Range in the area between Delcer Buttes and Ruby Valley.

Lead-silver ore was discovered in the district in 1910, and the first production was recorded in 1915. A small tonnage of ore was treated at a mill at Medicine Springs during 1950-51, but no production has been recorded from the district since 1956. There are several groups of mining claims in the district, and there may be current exploration activity. No work was in progress at the time of this examination, however.

Rocks exposed in the northern Medicine Range are mainly Permian limestones-dolomite, and siltstones. These rocks are similar in many ways to older Paleozoic rocks which are known to be favorable host rocks for disseminated gold deposits elsewhere within Nevada.

The Permian sediments are cut by many normal faults that strike north to northeast. Rocks in the blocks between the steep faults dip gently northeast or northwest. Mineralization in the district appears to be related to veins which occupy the north-trending structures. The limestone adjacent to the veins is usually iron-stained, and is laced by numerous small quartz and calcite veins. The ore minerals are galena, sphalerite and lead and zinc carbonates and sulfates. The major gangue mineral is white, crystalline barite.

Only two locations within the district have workings extensive enough to have had even moderate production, the Silver Butte Mine, and the mine at sample location 044.

Geochemical results from samples taken in the district show silver values associated with lead, zinc, strontium, barium. Some samples also showed anomalous arsenic, antimony, and cadmium. Gold was not detected in any of the samples taken.

Selected References:

Hill, J. M. (1961) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Lincoln, F. C. (1923) Mining Districts and Mineral Resources of Nevada. Nevada Newsletter Publishing Company, Reno, Nevada.

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Granger, et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Smith, R. M. (1976) Geology and Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Pequop (Pequop Phosphate)

The Pequop district, referred to in Smith (1976) as the Pequop Phosphate district covers the south end of the Pequop Range, east of Spruce Mountain. In this report, the area of the district has been expanded to include the entire Pequop Range, including that portion extending north of Interstate 80.

Essentially no mining activity has occurred within this large area, and its most important feature remains to be the presence of phosphate-bearing sediments. Barite is also reported to be present at two localities. No exploration activity was evident at the time of this examination.

Selected References:

Southern Pacific Company (1964) Minerals for Industry, Northern Nevada and Northwest Utah. Vol. I, Southern Pacific Company.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Pilot Peak

The Pilot Peak district is located at the mouth of Miners Canyon on the southeast flank of Pilot Peak in the Pilot Range about one mile west of the Utah-Nevada border. Prospect shafts in the district appear to be quite old, but the first recorded production was not until 1936. Production of gold-silver ore was minor, and no activity has been recorded since 1938.

The prospects are concentrated in Paleozoic limestone which crops out along the lower eastern flank of Pilot Peak, the Peak itself is composed of Cambrian Prospect Peak quartzite. Mineralization appears to be concentrated along N35°E fracture zones in the limestone. The limestone shows complex folding and faulting, but it not altered to any great extent. Lenses of brown, limonitic jasperoid occur along the fracture zones and thin, white calcite veinlets occur in the limestone parallel to the fracture zones.

Geochemical results from samples taken from mine dumps in the district showed high lead and zinc, some silver, and one sample showed anomalous arsenic values.

No recent exploration activity was noted in the area.

Selected References:

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada.
U.S. Geol. Survey Open-file Rpt. 76-56.

Proctor (Silver Zone)

The Proctor, or Silver Zone district covers the central Toano Range, north and south of Silver Zone Pass. The district was discovered in 1872, and was the scene of a small scale mining rush at that time. Production figures from this early period are not known, and the first recorded production was in 1917. Later, during 1942, a small amount of tungsten ore was produced from a deposit just northeast of Silver Zone Pass. Marble has been quarried from deposits south of the Pass, on the east side of the Toano Range, but no mining activity was noted there at the time of this examination.

The oldest (1872) activity is thought to have been centered around the shafts midway along the border of Secs. 8 and 9, T35N,R68E. These workings are the largest in the district, and are in an area of granodiorite outcrop which is laced with numerous parallel quartz veins, an area which may well have been named "Silver Zone" by early miners. It is difficult from the descriptions, however, to match property names from the literature with any specific property seen during field examination.

To the south of Interstate 80 and the W.P. tracks, workings expose quartz veins which cut marbelized limestone.

Geochemical values showed some samples taken to be high in lead, zinc, and silver. One sample was high in arsenic. Although tungsten was reported to have been produced from this district, none of the samples taken showed tungsten to be present.

Selected References:

Lincoln, F. C. (1923) Mining Districts and Mineral Resources of Nevada. Nevada Newsletter Publishing Company.

Johnson, A. C., and Benson, W. T. (1963) U.S. Bureau of Mines unpub. report.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Ruby Valley (Smith Creek)

The Ruby Valley (Smith Creek) district covers the Battle Creek-Smith Creek drainages on the east slope of the central Ruby Mountains. Most of the district is within the Humboldt National Forest.

The district produced lead-zinc=silver ore intermittently between 1908 and 1967. Tungsten ore was mined at one property, the Battle Creek during 1944-46. No recent activity was noted during this examination.

Selected Reference:

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada.
U.S. Geol. Survey Open-file Rpt. 76-56.

Snake Mountains Barite

The Snake Mountains barite district lies 15 to 30 airline miles north of Wells. Barite occurs on both sides of the mountains, but the principal development has been on the east flank. Part of the barite is on land supervised by the Bureau of Land Management and part is on private ranchland. Barite was first recognized in the area in 1955 when the Jungle lode claims were staked at the extreme north end of the district. Little work was done until the early 1970's when there was a great increase in demand for Nevada barite; this led to additional discoveries and some small production. In the late 1970's Chromalloy American Corporation began extensive exploration and the area has become a major barite-mining district. At the present time about 6 open-pit mines are in operation, serving 3 processing plants.

The barite occurs as bedded deposits in rocks of Ordovician age. The associated rocks include black chert and argillite, shale, chert conglomerate, and limestone locally. Generally the rocks have low to moderate dips. Structural deformation is common and this, combined to the discontinuous character of the barite units, limits the strikelength of the individual deposits. The barite units, which are conformable with bedding, range from a few feet to approximately 40 feet in thickness. All of the ore is processed by jigging or heavy-media separation to remove associated or included country rock. The barite is very-thin to thin-bedded, dark gray due to abundant organic matter, and fine grained. Other than country rock, interstitial quartz and secondary iron oxides are the principal contaminants.

Selected References:

Gardner, D. H. (1968) Structure and stratigraphy of the northern part of the Snake Mountains, Elko County, Nevada: Ph.D. thesis, Univ. of Oregon;

Papke, K. G. (1981) File information, Nevada Bureau of Mines and Geology.

Selected References: (continued)

Peterson, B. L. (1968) Stratigraphy and structure of the Antelope Peak area, Snake Mountains, Elko County, northeastern Nevada; M.S. thesis, Univ. of Oregon.

Spruce Mountain

The Spruce Mountain district covers the north flank and summit of Spruce Mountain and part of Spruce Mountain Ridge to the north. Spruce Mountain and Spruce Mountain Ridge form a somewhat isolated spur between the Pequop Range on the east and Clover Valley on the west. The district was discovered in 1869, and production of lead-silver ores is recorded for the years 1869-1873, 1889-1909 and 1915-1949.

Rocks exposed in the district consist of Paleozoic pediments which dip gently to the east. The sediments have been intruded by a granite porphyry dike which cuts across the north side of Spruce Mountain in a northeasterly direction. This porphyry, where seen near the Kille Mine and east of the Black Forest Mine, is bleached, kaolinized, contains sericite, euhedral quartz phenocrysts (some are smoky in appearance) and some fine-grained sulfides.

Most of the mines and prospects in the district occur along the trend of this porphyry dike. Replacement deposits in limestone and skarn occur near the center of the district, and fissure filling, stockwork deposits occur in limestone, skarn, and porphyry. To the northeast, at the Humbug Parker and nearby prospects, outcrops of gossan and jasperoid occur in siliceous breccia along a shear zone in limestone.

Results of geochemical analysis of samples taken from dumps in the central part of Spruce Mountain district showed high tin values. Most samples also showed high arsenic and antimony as well as high lead, zinc, copper, and silver. Tungsten and molybdenum were present in some samples, but the values were low. The highest gold value obtained was associated with high arsenic and antimony values in gossan material from the Humbug Parker Mine.

This district was being actively explored at the time of the examination. Amax Exploration has a field camp established on the property, and were conducting a program of diamond drilling, and geologic mapping. Access to the

district was limited by the Amax project manager, and only one quick reconnaissance trip across the district was made.

Selected References:

Raymond, R. W. (1973) Statistics of Mines and Mining in the States and their Territories West of the Rocky Mountains for 1872.

Schrader, F. C. (1931) Spruce Mt. District, Elko Co., Univ. of Nevada Bull. XXV, no. 7.

Wilson, C. L. (1937) The Geology of the Black Forest Mine ARea, Spruce Mt., Nevada. MS University of Arizona.

Granger, A. E., et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Johnson, A. C. and Benson, W. T. (1963) Tungsten Resources of Nevada. USBM unpub. rept.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Tecoma

The Tecoma district is located on the Nevada-Utah State line about 13 miles northeast of Montello. Most of the district is wihin Nevada, but several small prospects lie across the state line in Box Elder County, Utah. The Jackson claims were lcoated in July 1906, and production of lead-silver ore from the Jackson Mine is recorded for the years 1907-22 and 1948-55. Limestone along the western part of the district, where the Jackson and Nora Mines are located, strike northwest, dip to the northeast. The limestones are not visibly altered, but are moderately recrystallized and display considerable calcite veining. The main fracture directions are N10-15°W and M10-15°E. Mineralized outcrops are marked by siliceous gossan and jasperoid, both highly iron-stained. Specimens of kaolinized dike rock were noted on two mine dumps.

The area was covered by recently staked mining claims, but no sign of activity was noted at the time the area was visited.

Geochemical results of samples taken at the prospects visited generally were high in lead, zinc, and silver. Most were also high in arsenic and antimony and gold was detected in four samples. One sample was also high in tin.

Selected References:

Hill, J. M. (1961) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Granger, A. E., et al. (1957) Geology and Mineral Resources of Elko County, Nevada. NBMG Bull. 54.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Valley View

Valley View district covers part of the eastern slope of the Ruby Range north of Harrison Pass. The district is almost entirely within the Humboldt National Forest.

Mineral deposits in the district are associated with pegmatites which cut older granitic intrusives and schists. Some tungsten ore has been shipped from the district, and there has been exploration for mica and beryl.

There has been no activity in the district for some time, and none was noted at the time of this visit.

Selected References:

Hill, J. M. (1916) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Hunt, S. F. (1936) Mining Geology Outlined, Reno.

Olson, J. C. and Hinrichs, E. N. (1960) Beryl Bearing Pegmatites in the Ruby Mountains and other Areas in Nevada and Northwestern Arizona. U.S. Geol. Survey Bull. 1082-D.

Johnson, A. C., and Benson, W. T. (1963) Tungsten Resources of Nevada. U.S. Bureau of Mines Unpublished Reprot.

Garside, L. J. (1973) Radioactive Mineral Deposits of Nevada. NBMG Bull. 81.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Warm Creek

The Warm Creek district covers the east flank of the south end of the East Humboldt Range and is located entirely within the Humboldt National Forest. The production of the district has been mainly from one mine, the Polar Star. This property was staked in 1912, and produced zinc ores during the period 1912-43. Small amounts of lead-silver were produced from adjacent properties.

Outcrops at the Polar Star are of gossanous jasperoid along faults and shear zones which cut dark grey, recrystallized limestone. The limestone is brecciated along these structures, and is cemented with calcite. The major structure at the Polar Star strikes N70°W and dips 30° to the southwest. On the ridge which extends northwest of the Polar Star, many small trenches, pits, and shallow prospect shafts are alligned more or less along the major N70°W bedding-shear zone.

There was no activity in the district at the time of this examination.

Selected References:

Hill, J. M. (1916) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Lincoln, F. C. (1923) Mining Disricts and Mineral Resources of Nevada. Reno Nevada Newsletter Publishing Company.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Wells

The Wells district includes the low hills surrounding Oxley Peak, north of Wells, and the hills on both sides of Clover Valley just south of Wells. The major activity in this district has been at the Wells tungsten property on the west side of Clover Valley, south of Wells, although some sandstone has been quarried for building stone in the hills east of Clover Valley. At the time of this examination, most of the active areas, both tungsten and picture rock, were not accessible due to locked gates and posted restrictions on access.

The main property within the Wells tungsten area is located on Southern Pacific property, but other prospects nearby are on BLM administered land. The scheelite occurrence at the Wells property is interesting in that ore minerals occur in a schist in areas along the margins of pegmatitic rocks. Some tactite occurs in limestone horizons, but the highest grade portion of the ore zone appeared definitely related to the dikes.

During the summer of 1980, mining was being done at the tungsten property, and a mill was under construction east of U.S. Highway 93, near the intersection of U.S. 93 and the access road leading to the property.

Selected References:

Couch, B. F., Carpenter, J. A. (1943) Nevada's Metal and Mineral Production 1857-1940. NBMG University of Nevada Bulletin v. 37, no. 4.

Southern Pacific Co. (1964) Minerals for Industry, Northern Nevada and Northwestern Utah, v. I.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Rpt. 76-56.

Wendover

The Wendover district covers the south slopes of Leppy Peak, north of Wendover, and an area south of Wendover just west of the Bonneville Salt Flats. Tungsten production has been reported from the district, and decorative stone has been quarried from the area south of Wendover (Hill 5275).

Leppy Peak is composed of Paleozoic limestone, and the southern flank is overlain by coarse-grained reddish porphyritic rhyolite. The lower flanks of the range have been terraced by Lake Bonneville, and some fine-grained sediments fill areas that were basins along the shore of the ancient lake.

The only activity noted at the time of examination (June 1981) in the Leppy Peak area, north of Wendover, was some new markings on old posts on the Wendover Queen claims. Of the several old cuts noted within the claim area, one was in rhyolite, and two others were dug in lake sediments. No mineralization was seen anywhere during the examination, and no work was in progress.

Selected References:

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada.
U.S. Geol. Survey Open-file Rpt. 76-56.

White Horse

The White Horse district covers that portion of the southern Coshute Range south of White Horse Pass. The properties are mainly west and south of White Horse Mountain, and are located in the contact zone of a large granitic mass which forms the southwest portion of the mountain. Small patches of tactite occurring on the northwest contact zone have been mined for tungsten. On the south, near the southern intrusive contact, a massive, black jasperoid zone has formed in brecciated limestone and shale. The structure trends N80°E, is twenty or more feet across in outcrop, and is iron- and manganese-stained. Many old, small prospect pits along strike show evidence of prospecting in the past. Several new claim blocks cover the jasperoid and area of alluvial cover to the south.

One geochemical sample taken from the jasperoid area was high in arsenic, antimony, and silver. Another was high in lead-zinc-silver. The tungsten skarn to the west contained high values in tin, as well as tungsten.

Selected References:

Hill, J. E. (1916) Notes on Some Mining Districts in Eastern Nevada. U.S. Geol. Survey Bull. 648.

Smith, R. M. (1976) Mineral Resources of Elko County, Nevada. U.S. Geol. Survey Open-file Report 76-56.

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