

Feature

Mine of the Month

Boss Mine



(Goodsprings District, NV)

Although finding lead/zinc deposits was the main objective of exploration in what was to become the famous Goodsprings District, the search inevitably revealed the presence of numerous other important precious- and base-metal deposits in the area, including gold, silver, copper, cobalt, vanadium, and uranium. One unique setting in particular sat apart from all others in the district.

Located originally as a source of copper in 1886, a group of claims that became known as the Boss Mine produced not only copper, but also lead, silver, and gold in its earliest years. Then, surprisingly, platinum and palladium were discovered in the ores in 1914. However, assays of selected platinum ores—a practice called high grading—gave the impression of a richer deposit than actually existed, generating considerable unwarranted and misleading publicity! Nevertheless, while operating intermittently from 1886 through 1937, the mine ultimately produced 568,099 lbs of copper, 735 lbs of lead, 7014 oz of silver, 1771 oz of gold, 594 oz of palladium, and 396 oz of platinum—mostly during the period of 1914 to 1920.

The property lies high on a ridge about 7 miles west of Goodsprings (~10 by road), and just a short distance east of the former mining community of Sandy Valley. The deposit was accessed by five adits and other workings totaling about 1 mile. The ore occurred along a fault zone separating the foot wall fashioned from the dolomitic Dawn Member of the Monte Cristo Limestone formation (Mississippian; about 360 MA) from the hanging wall composed of the Valentine Member of the Sultan Limestone (Devonian; about 380 MA), probably related in age to the Keystone Thrust system. The fault trends about N 50° E, and the beds northeast of the workings strike approximately 60° N to 80° E, and dip about 35° NW on average. Explorations down the dip indicate that there is apparently no extension of the ore shoot exploited by the mine workings.

The ore was derived mostly from a single continuous pipe-like shoot, mostly in the northwest side of the main fault zone. This pipe cropped out above the mouth of the 100-foot level adit. Once stoped, the excavation was about 200 feet long, 25 feet wide, and 25 feet high above the upper tunnel level.

The unoxidized ore body was an irregular mass of cellular quartz that carried a rich quantity of primary sulfides, such as chalcopyrite and, likely, pyrite. These minerals contained the unusual amounts of gold, platinum, and palladium found in the deposit. Oxidation produced such secondary minerals as platiniferous plumbojarosite, beaverite, malachite, azurite, and chrysocolla common throughout the mine.

According to some reports (Longwell, 1965; see reference on pg 8), no igneous rocks are exposed in the mine workings, on the surface, or present on the dumps; the deposit is possibly related to a granitic sill encountered at a prospect about 1,500 feet to the NE.

Observations and Comments

I count this mine as among my favorites. The mineralization is fascinating. The veins throughout are deeply oxidized into earthy, compact red-brown hematite surrounded by halos of greenish chrysocolla. Interestingly, much of the chrysocolla is in turn altered into what appears to be white gibbsite, the aluminum for its formation likely obtained from the chrysocolla. It is reported that these halos are radioactive as a result of residual uranium minerals, I presume from original uraninite. I have not yet been able to verify the radioactivity.

Besides nice specimens of radiating crystals of malachite imbedded in hematite (nice contrast), I have collected several interesting, and quite rare, minerals from the Boss. These include the black cobalt mineral "stainierite" (an Fe-Al variety of heterogenite) and the Pt-bearing plumbojarosite (a lead iron sulfate). The latter was the ore for platinum, palladium, and iridium. Another mineral, as yet unidentified, is of considerable interest to me. It is a hydrous carbonate containing Mg, Al, Cl, and Si; white with a silky luster; cauliform overall habit, but containing some clear prismatic xls; heavy for a carbonate, as if it contains Pb or Ba; and it fluoresces a greenish white. I've found it at only one location in the mine: in a crevasse at the very end of the 400-ft-level workings, situated on a block of limestone much the way that the flos ferri variety of aragonite forms. However, the rarest of all was a recent find that culminated a nearly thirty-year search, a truly spectacular specimen of my most highly coveted mineral, nissonite, a Cu-Mg phosphate that occurs at only four locations in the world!

I have been visiting this site since the early 90s, and some years ago a locked gate was installed half way up the path leading to the mine, though there did not appear to be any mining activity taking place. Since then the gate has been removed, and there was evidence that someone had taken up residence inside the mouth of the lower adit, but has since moved on. Home is where you lay your pick, I guess!

Other excavations worth exploring in the immediate vicinity include the Platina, Copperside, Azurite, Ironside, and Highline Mines.

One important point of interest...with many hundreds of mines and prospects in this region, inaccuracies in reporting, identification, and mine descriptions are certain to occur. Original data are often scarce, destroyed, or non-existent. Consequently, researchers often rely on second-hand information. The trick, of course, is to figure out what is accurate and what is not. The Boss Mine serves as a good example (see map page 14). This mine is mislabeled on the Shenendoah Peak topo map! I cite the following evidence:

- A) **Size of the excavation:** the workings at the mine designated on the topo as the Boss are simply too small to account for the reported estimates of the values obtained.
- B) **Geology:** even to the untrained eye it is easy to see that none of the features described for the Boss exist in this mine. One such example is the lack of evidence of a single continuous ore shoot forming a roughly elliptical pipe more than 25 feet in diameter.
- C) **Mineralization:** this mine contains no evidence of the oxidized lenses surrounded by halos of chrysocolla. In fact, there is barely any mineralization at all in this mine or on the dumps.

All these features do exist at the mine located on the next ridge just north of the one labeled as the Boss. The path leading to this unnamed mine is conspicuous on the topo map, and indeed in actuality. This is undoubtedly the Boss. The mislabeled mine is, in fact, the Platina Mine. This only serves to make one wonder...what else is inaccurate on topo maps that we may not know about?

LOCATION

DISTRICT: Goodsprings Clark County, Nevada

TOPO MAP: Shenandoah Peak Quadrangle 7.5 minute series
Sec 27 T 24 S R 57 E

GPS: 35° 49' 9" N, 115° 34' 13" W

DIRECTIONS: From Las Vegas, south on I-15 28 mi to Jean (Exit 12). Head W 8 miles to Sandy Valley turnoff. Drive S about 9 miles. Look for well-graded dirt road heading N into mountains. Mine workings visible on ridge above an abandoned gravel operation at base of mountain. 4WD needed to drive close to the mine. Hike path up to mine entrance.

GEOLOGY

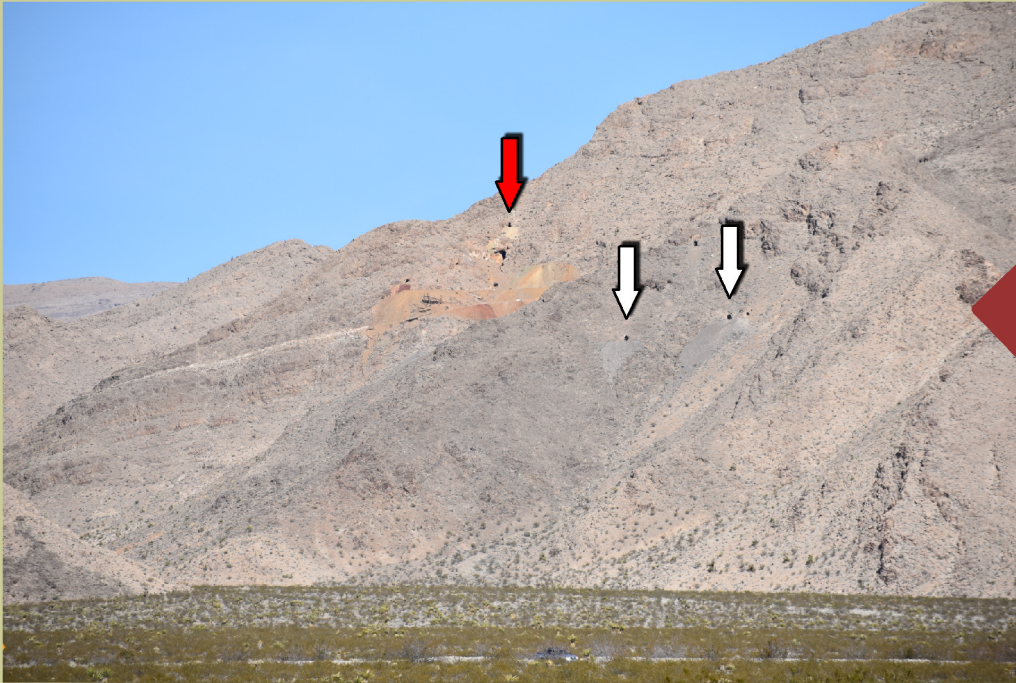
SETTING:

Ore body along minor fault zone separating dolomitized limestone of the basal Monte Cristo Limestone on the SE from the Valentine Member of the Sultan Limestone on the NW.

REFERENCES:

Longwell, C.R. and others, 1965, *Geology and Mineral Deposits of Clark County, NV*, Nevada Bureau of Mines and Geology; Bulletin 62

Photo of Mines and Minerals



Ground Floor View

Northward view of the workings. The red arrow indicates the actual Boss Mine on the middle ridge, which is misidentified on the topo map (see pg 14). Location marked on the map as the Boss is actually the Platina Mine (white arrows), located on a spur ridge to the south!

Penthouse View

View, to the southwest, of Sandy Valley from the lower adit of the Boss Mine. The mountain ridge in the center background is the Kingston Range that hosts numerous iron and talc mines, which will be reviewed in a later issue of Discover Minerals.



Photo of Mines and Minerals



Deluxe Accommodations

Miners often used local materials to build temporary shelters while waiting for permanent housing to be built. Sometimes, this was all they ever got! This structure could also have served as a bunker to store explosives and protect them from the heat of the desert. Take your pick!

Road to Riches

Building paths/roads to a mine was no easy task in itself. This one wound its way rather steeply about half a mile from the base of the ridge. In this case, the rewards ultimately claimed were well worth the laborious effort.



Surficial Geology

The Valentine member of the Sultan Limestone hosts the valuable metals recovered from the Boss Mine. These middle Devonian rocks (~380 MA) rest atop the younger beds of the Mississippian-aged (~360 MA) Monte Cristo Limestone as a result of the Laramide thrust faulting that created the famous Keystone Thrust system.

Photo of Mines and Minerals

Telltale Clues

Green staining of country rock, as seen at the entrance to this adit, is often a reliable indication of buried treasure. Malachite forms by the combination of copper liberated from primary minerals (e.g. chalcopyrite), and carbon dioxide obtained from the dissolving of surrounding carbonate host rocks by acidic water.



Glory Hole

View of the entrance to the stope where the bulk of the ore was mined . . . a cavernous excavation several hundred feet in girth that looks more like a cave than a mine.

Three's Not a Crowd

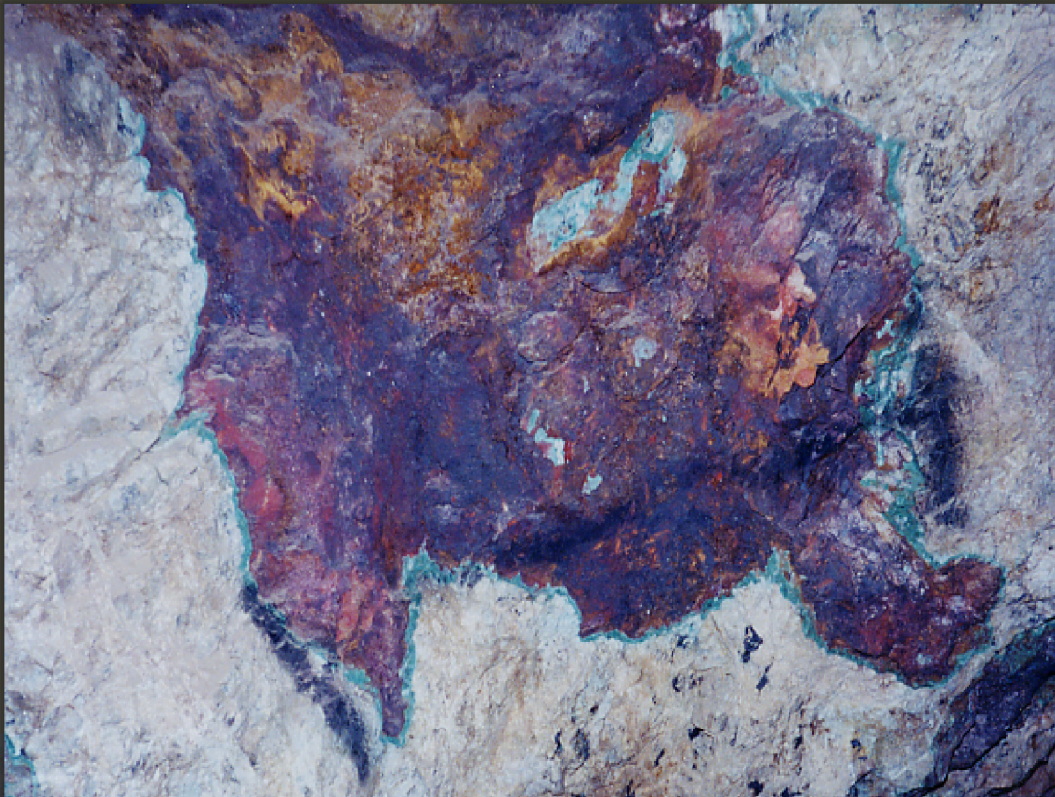
Typical of many mines, adits were driven into the host rock downslope of the original discovery outcrop to reach buried portions of the same vein. Digging upwards into the ore facilitated ease of mining by allowing gravity to do the hard work, thus relieving the miners of having to hoist the heavy ore up out of the hole.



Photo of Mines and Minerals

Typical Mineralization

These mineralized lenses are typical of the Boss Mine. Red-brown areas are composed of a compact to pulverulent hematite; yellow ochre is a limonitic mixture of goethite with jarosite and platiniferous plumbojarosite. A halo of blue-green chrysocolla completely encircles the lenses. Altering to a white mineral (possibly gibbsite), this halo is the source of anomalous radioactivity from residual uranium minerals deposited in the original solutions.



Mineralizing solutions permeated through fault conduits related to the famous Keystone Thrust. The ore zone explored by adits required very little drifting in barren host rock, unlike the case in most mines of the district.

The original sulfides in the vein, probably chalcopryrite and pyrite, contained unusual amounts of gold, platinum, palladium, and iridium. All are now completely oxidized to gossan material that hosts the valuable metals.

Photo of Mines and Minerals



XI 78 C

Nissonite

Unusually large aggregate of minute, very rare, diamond-shaped crystals.

Specimen 3 x 2 inches



VII 59 C

Malachite

Typical occurrence of sprays of silky crystals in gossan matrix.

Specimen 4 x 2.75 inches



IV 10 C

Heterogenite

Crystalline coating of minute crystals on rocky matrix.

Specimen 3.25 x 2.5 inches



X 120 C

Beaverite

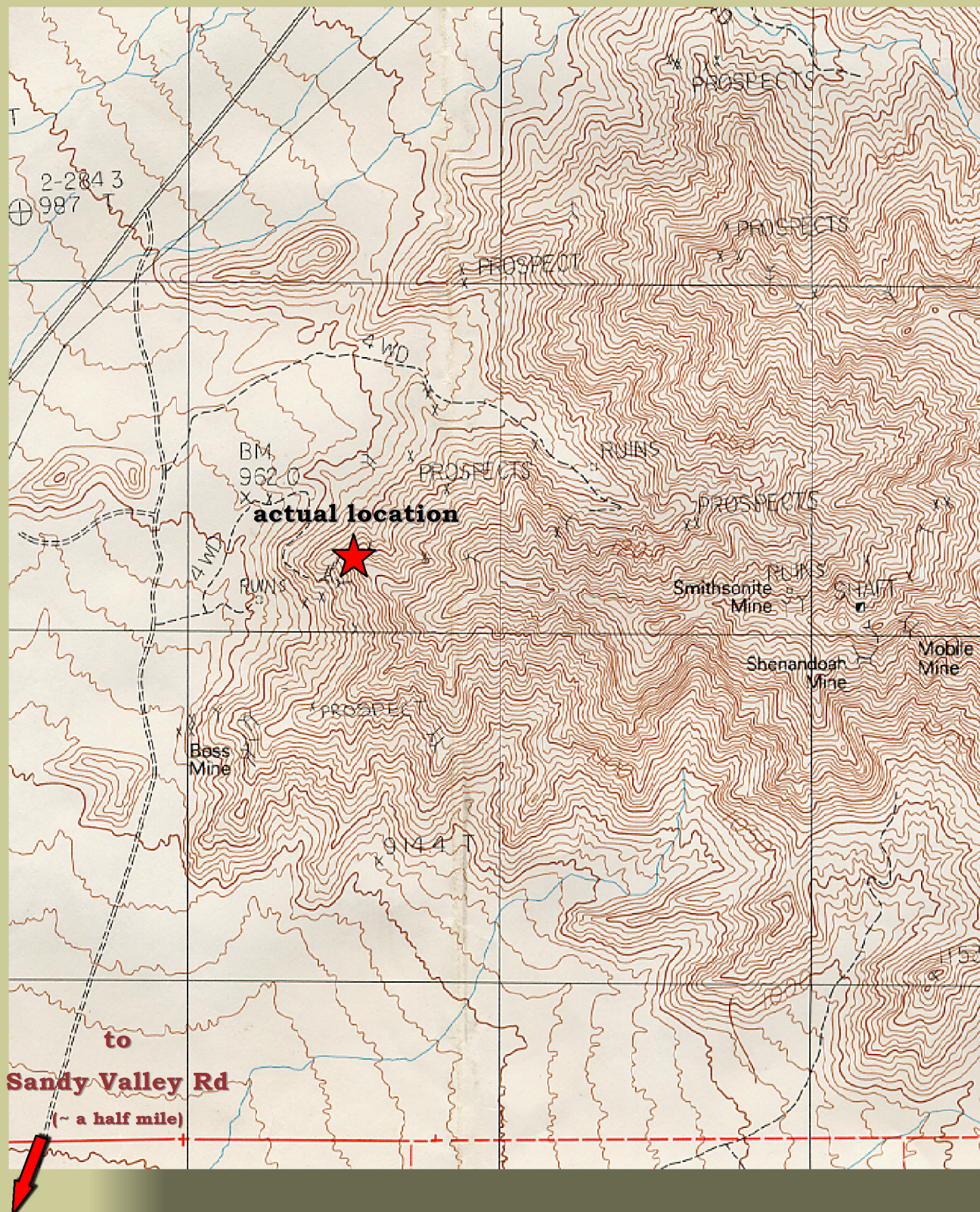
Pulverulent aggregates of minute hexagonal platelets.

Specimen 2.25 x 1.38 inches

A visitor to the Boss Mine can expect to find some of these minerals.

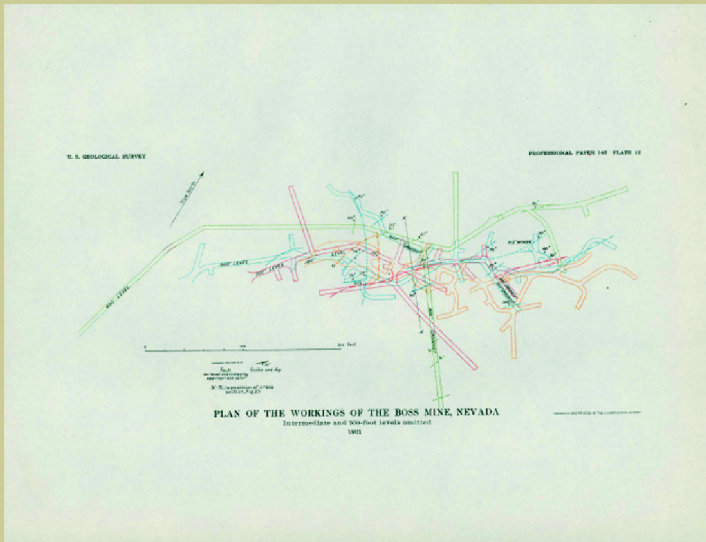
All specimens from the G. Miles Lehman Collection

Topographic Map



This scan is a rastered image of the USGS 7.5 minute topographic map of the Shenandoah Peak Quadrangle.

Map of Workings



No more mineralization.

One of many raises.

Exploratory drift
driven to the right
of the main portal.

Halos of chrysocolla
surrounding lenses of
mineralized vein.

End of the line.

Timbering can be
unpredictably weakened
by time and weathering.

At the crossroad of
intersecting
passageways.

Exploratory drift.

Timbering above winze
driven beside main
passageway.

Epsomite efflorescence;
Mg obtained from the host
dolomitic limestone.

Adit to 200-foot
level workings.

Sketch map of the 200-foot level of the Boss Mine