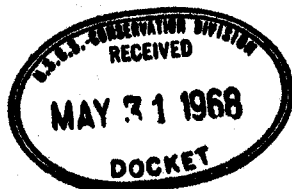


P-1541-1
August 1964
(Formerly A1-150)

UNITED STATES GOVERNMENT

Memorandum



3010 0020 (319)

IN REPLY REFER TO:

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Nevada Land Office
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89502

7.0
N-051126

DATE: May 27, 1968

TO : Director, U.S.G.S., Washington, D.C.

FROM : Assistant Manager, Branch of Minerals

SUBJECT: Mineral report from field examiner on mineral character of
Lands in Nevada

The following report regarding the mineral character of Lands in Nevada is submitted for use by your Conservation Division in its mineral classification function.

Geologist

Date

Lands Involved

H. W. Mallery

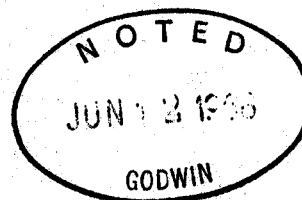
May 3, 1966

T. 21 N., R. 20 E.
~~MD Mer., Nevada~~
sec. 12: Within.

T. 21 N., R. 21 E.
MD Mer., Nevada
sec. 6: Within
sec. 7: Within.

Enclosure

Mineral Report N-051126



U. I. LEE

#4
Serial Number

N-051126

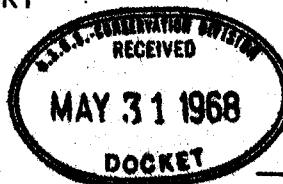
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

State Nevada

MINERAL REPORT

RECEIVED
Bur of Land Management
NEVADA LAND OFFICE

APR 3 1967 10:00
A. M.



NEVADA STATE OFFICE
RENO, NEVADA

Copper Hill Nos.
1 through 3 Lode
Mining Locations

Washoe County, Nevada
(Title)

LANDS INVOLVED

Mount Diablo, Meridian

T. 21 N., R. 20 E.,
Sec. 12

T. 21 N., R. 21 E.,
Sec. 6 and 7

May 3, 1966

(Date)

By H. W. Mallery

D. I. LEE

Approved

A handwritten signature in cursive script, appearing to read "Robert H. Mallery".

5-24-68

GPO 859488

31748

INTRODUCTION

In 1959 North American Aviation, Inc. of Los Angeles, 45, California, filed in the Nevada Land Office several applications for the private exchange of a large acreage of land in Washoe County. In general, the selected lands lay between the City of Sparks and Pyramid Lake and consist of typical basin and terrain---the offered lands are situated both in Washoe County and in other Nevada Counties.

The selected lands contain many mining claims held for a variety of minerals. A number of mineral examinations were made by several Bureau geologists and engineers and most of the mining location conflicts were resolved. Turnover in personnel, however, left a number of claims either unexamined, or unreported, or both and thus this report is concerned with a relatively few mining claims, a portion of the residue of the original case load in this matter.

The purpose of this report is to present an opinion regarding the validity of the mining locations concerned and the character of the lands with respect to their content for valuable mineral resources. For the most part the writer worked alone, but from time to time during the examinations, the writer conferred with Messrs. George Campbell and Lloyd LeMay, Reno representatives of the subject company.

The Copper Hill Nos. 1 through 3 lodes were examined on August 24, 1965 in the presence of Harve P. Nelson, professor of mining engineering at the University of Nevada, a co-claimant; the examinations continued on September 10, 14, 15, and 21, October 19, 20, 26, and 27, and November 2 and 3, 1965.

The claims encompass moderately rolling terrain lying generally immediately south of the corner common to sections 1 and 12 of T. 21 N., R. 20 E., and sections 6 and 7 of T. 21 N., R. 21 E.; this corner, a brass-cap monument, was found in the field.

There are 27 workings within a linear distance of 3700 feet on the three claims. Of these, 5 are vertical shafts, 4 are adits, and 18 are open cuts. Most of these are very old in age but one adit displayed evidence of a small amount of new work. In general, the workings lie at an elevation of about 5000 feet and are accessible by truck.

Mr. Nelson designated a working on each claim as point of discovery and said that the claims were being held for copper although traces of gold and silver had also been found. He remarked that he and his associates, Messrs. R. C. and J. C. Schenk (a metallurgist and mining engineer, respectively) hoped to mine and leach the copper existing in the deposit. He added that the deposit averaged 1.0 to 1.1 percent copper and that plans had been made to mine approximately 200 tons per day and to leach in open piles of about 10 to 15 thousand tons each for approximately six days; he said that tests had shown

that 90 percent of the copper could be recovered in this manner (on scrap iron) provided the ore was crushed to minus 3/4 inch. He quoted cost figures and estimated that a profit could be made "if the price of copper was \$0.33 or even less." (April E. and M. J. quotes domestic produced copper at 36.124 cents per pound.)

Mr. Nelson's ore reserve computations indicated a minimum of 300,000 tons of ore existed on the three claims. He added that he had done no drilling to date but that he planned a limited footage in the future. He admitted that at the present time limitations in both land and water restricted development of the property as the claims are surrounded by private land and no water is readily available.

RECORD DATA

The Copper Hill Nos. 1 through 3 lode mining locations were made on July 17, 1955 (Copper Hill Nos. 1 and 2), and November 11, 1955 (Copper Hill No. 3); the certificates are recorded in Book 13 at Page 9, and Book 16 at Page 242 of the Washoe County records. The claims were located by:

H. P. Nelson
1235 Palisade Ave., Reno, Nevada

James Schenk and
R. C. Schenk
825 Lodge Ave., Reno, Nevada

An amended location notice, dated March 11, 1960, is recorded in Book 24 at Page 211. The records indicate the following interest:

Harve Nelson	32/100
James Schenk	32/100
R. C. Schenk	32/100
Guild, Busey and Guild, Attorneys	4/100

On December 28, 1965, North American Aviation, Inc. acquired title to these three mining locations. This transaction is recorded in Book 155 at Page 759.

The claims are situate in $N\frac{1}{2}NE\frac{1}{4}$ of section 12, T. 21 N., R. 20 E., and $S\frac{1}{2}S\frac{1}{2}SW\frac{1}{4}$ of section 6 and $N\frac{1}{2}NE\frac{1}{4}$ of section 7, T. 21 N., R. 21 E., MDM, Washoe County, Nevada. A nearby brass-cap section corner provided positive identification of the lands concerned (see map of the Copper Hill claims).

LOCATION, ACCESS AND PHYSICAL FEATURES

The subject mining claims lie on the east side of the Sparks - Pyramid Lake highway in Washoe County and are approximately 15 miles by road from Sparks, Nevada. Access to individual claims is via several range roads which lead

into the area located. (The U.S.G.S. topographic map of the Spanish Springs Valley quadrangle plainly indicates the roads referred to--all are passable by pick-up truck or old model automobiles.)

Topographically, the lands involved range in elevation from 4800 to 5200 feet; are moderately rolling to steep, and are devoid of all trees except for scattered patches of pinion pine and juniper. Ground cover consists of grasses and sage brush.

GENERAL GEOLOGY

Tertiary volcanic rock consisting of agglomerates, tuffs, ignimbrites and lavas, and interbedded sedimentary rocks underlie wide areas in Western Nevada. The volcanic and sedimentary units have suffered from structural disturbances since their creation and thus now lie in blocks of various sizes and orientations bounded by major faults and broken by lesser faults and fractures. In general the volcanics are relatively dark-colored, fine-grained rock, ranging from rhyolite to andesite in composition. In contrast the interbedded sediments are generally light-colored rocks consisting of fine-grained tuffs and siltstones, and coarser-grained sandstone and conglomerates.

Less common rocks in this area consist of pre-Eocene (Jura-Triassic?) metamorphosed volcanic and sedimentary sequences, and intrusive granitic rocks of Mesozoic and possibly post-Mesozoic age. In general the Tertiary units blanket older rocks but the combination of extensive faulting, great topographic relief, and vigorous erosion have resulted in a complex outcrop pattern.

The Pyramid Mining District lies a few miles north of the claims. This is the closest mining district to the subject lands. It is an old, small district and is presently inactive.

Overton, in Mineral Resource in Douglas, Ormsby, and Washoe Counties (1947) writes:

"Briefly, the mineralized areas in southern Washoe County are similar in character to those in Ormsby. Small areas of remnant Mesozoic and Paleozoic sediments contain base metal deposits carrying some gold and silver values...

"Extending northward along the first basin range, Tertiary eruptives are the prevalent formations in which vein deposits containing gold and silver occur at Wedekind and Olinghouse, while in Pyramid district the ores contained silver-bearing copper minerals...

"The Pyramid district is situated 32 miles north of Reno in Mullen's Pass...

"The mineralization of this district occurs in veins in Tertiary volcanics and usually the older andesite formation incloses the more productive areas. The ores originally worked in this region contained silver-bearing copper minerals with a trace of gold. In more recent years several small properties have been opened in this district which show gold, silver, copper, antimony, manganese, and tungsten minerals, some of which have been shipped to the smelters.

"Claims were located in the district as early as 1863 and the district was officially organized April 12, 1866. Whitehill (1876) reports that about ten distinct veins were discovered and locations made upon them. All of the veins trend northwesterly and vary greatly in size..."

Very little production (\$87,100) has been credited to this district.

MINERAL VALUES AND DEVELOPMENTAL IMPROVEMENTS

On August 24, Mr. Nelson and the writer examined the geological features of the area, walked portions of the mineralized outcrop, entered most of the accessible workings, and discussed sampling of the claims.

A brief report by Starr Hill, Jr., dated November 22, 1960, (N-048452) is the only known reference to these claims. He writes:

"The Copper Hill No. 1, No. 2, and No. 3 are located along the strike of a fault bearing N 75° E. The fault occurs along the south edge of a metamorphosed and silicified zone, at its contact with granodiorites. In Copper Hill No. 1 this zone is exposed for a width of 300 feet. The northern edge of this zone is overlain by talus from a subsequent rhyolite flow to the immediate north.

"Copper mineralization is evident at intervals along the fault and consists of oxides and silicates of copper. There are many old cuts, tunnels and shafts along this mineralized zone, most of which are inaccessible because of caving. The present locators have apparently dug several cuts, cleaned out one old shaft for a depth of 8 feet and drilled one diamond drill hole. The core was not available for examination.

"There is no recorded production for this area and apparently very little, if any, ore was ever shipped.

"The three claims were sampled in the presence of Harve Nelson and R. C. Schenk, two of the locators.

Copper Hill No. 1

"The claim was sampled near the west end and a sample was cut across a nine foot mineralized, silicified zone. The assay of this sample showed a copper content of 2.01%.

"The copper content considered with the geologic structure at this point on the claim constitutes a discovery of valuable mineral. The Copper Hill No. 1 is a valid lode mining claim.

Copper Hill No. 2

"A sample was taken near the center of the claim across a mineralized zone of 30 feet. Assay results showed a copper content of 0.83%.

"This mineralization considered with the geologic structure where sampled, constitutes a discovery of a valuable mineral. The Copper Hill No. 2 is a valid lode mining claim.

Copper Hill No. 3

"A sample was cut across a mineralized, silicified zone for a width of four feet. The assay showed a copper content of 0.97%.

"The copper content and geologic structure constitute a discovery of a valuable mineral. The Copper Hill No. 3 is a valid lode mining claim."

The three lode claims cover a portion on a contact zone between Jura-Triassic (?) metasedimentary rocks and Mesozoic intrusive rocks. This zone exhibits strong alteration of the metamorphics and evidence of faulting is manifest. The fault zone trends N. 75° E., dips 50-60° SE, and appears to form the contract between dark-colored, fine-grained biotite schist on the north and light-colored, medium-grained granodiorite on the south. To the north the older rocks are capped in part by Tertiary volcanics consisting principally of light-colored, fine-grained felsites.

The fault zone is strongly silicified and on the surface is colored with carbonates (and possibly sulfates and silicates) of copper: The gossan stands out vividly against the hillside strikingly reflecting the presence of the mineralized zone. All of the workings are in or adjacent to this zone and for the most part all expose copper mineralization in varying degrees. Not all of the workings were accessible; Mr. Nelson, in fact, contended that the best showing was in a drift at the bottom of an 88-foot shaft, a working not then safe to enter because of the age and condition of its timbering.

None of the workings exposed primary, or unoxidized mineralization, although an occasional bleb of chalcopyrite was seen in some. Malachite, derived from the weathering of primary minerals, was very abundant, however.

Each working except the 88-foot shaft was entered and examined (measured and described; geology mapped or noted) and selected ones were sampled, and the entire 2600-foot long outcrop zone was carefully traversed, the geology mapped, the mineralization described, and selected sections were sampled. In addition, a reconnaissance-type survey was made of the geology and structure of the surrounding area and all prospect holes therein were examined.

After this work had been done, it was learned that the subject applicant purchased the three claims. Apparently this was done in order to expedite and facilitate transfer of title to these lands by the Government. Spokesmen for the applicant have stated that it will relinquish title and interest to the three claims at the proper time; they have not stated what the purchase consideration amounted to, however. In view of this development, the question of validity of the claims is moot; a determination is necessary, however, regarding the mineral character of the ground and if mineral-in-character of the monetary values which attach to the mineral estate.

In brief, the writer's sampling disclosed the following:

(See Following Table)

Sample No.	Claim No.	Working No.	Cut Width	True Width ^{1/}	% Copper	% x Width
191065-HWM-1	CH-2	1	24 ft.	10.0 ft.	0.58	5.8
-2	do.	2	27	13.0	0.80 ^{2/}	10.4
-3	do.	3/	80	10.0	1.20	10.2
031165-HWM-1	CH-3	23	4/ (42 ft.)	(20.0 ft.)	0.42	8.4
-2	CH-1	11	4/ (15 ft.)	(7.0 ft.)	0.74	5.2
-3	do.	13	4/ (5.5 ft.)	(3.0 ft.)	1.78	5.3
				63.0		45.3

1/ Expressed as width normal to strike and dip of vein.

2/ Mr. Hill's sample across this same exposure ran 0.83 percent.

3/ Taken across outcrops between workings of 1 and 2.

4/ Dump sample; workings exposed widths indicated.

Note: A composite sample of the above six samples assayed a trace each in gold, lead, and zinc, 0.88 percent Cu and 0.2 ounces per ton in silver. A spectrographic analysis of the composite did not disclose the existence of any other valuable elements.

WEIGHTED AVERAGE: 0.80% Cu for first three samples; 0.72% Cu for all six samples.

The assay results confirm that copper is present at the points sampled. These data plus an analysis and evaluation of the geology and structure provides a basis for inferring that the silicified zone carries copper-bearing minerals having a tenor of slightly less than 1 percent copper (the weighted average of the six samples is 0.72 percent); that the zone is mineralized over a lateral distance of about 2700 feet and over out-crop widths of up to 70 feet; but that the true width (considering degree of slope and dip of vein) probably ranges between 20 and 35 feet.

The fact that no drilling has been done makes valuation of a deposit such as this more difficult than usual. But, by judiciously applying the principals and practices commonly utilized in the industry, it is possible to compute that 450,000 tons of mineralized rock running about 0.7 percent copper exists within the three claims to a depth of 60 feet vertically (7500 ton per vertical foot), or 100 feet down the inclined vein. (A tonnage factor of 11 cubic feet per short ton was used in the calculations.)

It is interesting to note that Mr. Nelson's figures--(300,000 tons at 1.1 percent)--are essentially the same as the above if the grade and tonnage he used is adjusted to that determined by the writer, and neither engineer has included rock below a nominal depth. Actually it is conceivable that the carbonate mineralization may extend several hundreds of feet down dip, and below that an enriched zone may exist, although not much evidence for this was seen on the outcrop.

Regarding valuation of ore deposits, Young, in Elements of Mining, (1946), writes:

"The value of a partially developed deposit is problematical, since both the quantity and value of the undeveloped portion are unknown. The important question to the engineer is the probable extent of the ore bodies. The experience of the engineer and his knowledge of ore deposits, together with a detailed study of the geological conditions of the ore body in question, serve to give commercial validity to his predictions.

"Too many engineers are prone to adopt rigid rules in arriving at the valuation of partially developed mines and prospects, and as a consequence reject properties that eventually become in time active mines. The fact that every prospect is a potential mine until proved otherwise should not be overlooked.

"Deposits that show a reasonably large quantity of mineral but values too low to admit of a profit under the existing conditions, or for which a market is absent or where railroad rates to the nearest market are prohibitively high, cannot be termed valueless. The term 'speculative value' is applied to such a deposit. Time,

developments in ore treatment, expansion of markets, new markets due to increase in population, and increased transportation facilities are the factors that change speculative value into real value. There are no fixed rules for determining speculative value. A careful study of all the conditions that in time might create a market for the mineral, an estimate of the prediction of the future selling price might enable a rough approximation of the present speculative value."

On the basis of the favorable geological relationships and structure, the presence of alteration and mineralization, and of the assay results obtained, the writer concludes that the lands are mineral in character, and that it is reasonable to assign a value of \$60,000.00 to the mineral estate. This value was arrived at as follows:

1. Method of Mining: Open pit and cut
 2. Estimate of Reserves^{1/} : 450,000 short tons containing 0.7 per cent copper per ton.
 3. Ore to Waste Ratio^{2/} : 1 to 0.7
(Waste: 450,000 x 0.7 = 315,000)
 4. Cost of Mining^{3/} : \$0.40 per ton, or \$306,000.
 (450,000 + 315,000) x 0.40
 5. Cost to Crush^{4/} : \$0.75 per ton, or \$303,750.
(405,000 x 0.75)
 6. Cost of Stack, Leach, and Precipitate: \$1.35 per ton, or
\$546,750. (405,000 x 1.35)
 7. Overhead Expenses: \$0.15 per ton, or \$114,750.
(765,000 x 0.15)
 8. Cost of Transportation and Freight^{5/} : \$39,500.

Truck	- Mine to Fernley	\$ 2.50
Railroad	- Fernley to Tacoma	<u>\$10.00</u>
		\$12.50
- TOTAL COST: \$1,310,750.

^{1/} Based upon geological appraisal of ore body.

^{2/} Based upon engineering design of an open pit.

^{3/} Contemplates utilization of leased equipment and services.

^{4/} Assumes 90% recovery of ore.

^{5/} 3160 tons precipitate to smelter (405,000 tons ore @ 0.7% Cu = 2835 tons Cu; 2835 tons @ 90% leaching recovery = 2551 tons Cu; 2551 tons Cu and 5% Fe contamination = 2685 tons dry weight, or 3160 tons in total assuming 15% moisture content.)

1. Years to Mine: 10 years.
2. Initial Investment Required: \$100,000.
3. Cash Value of Precipitate: \$1,708,659.
(2551 tons x \$669.80 ^{1/})
4. Smelting Charges: \$15,800.
(3160 tons x \$5.00 ^{2/})
5. Total Cash Value: \$1,692,859.
6. Salvage Value: None.

TOTAL INCOME: \$1,692,859.

SUMMARY:

Total Income:	\$1,700,000	(rounded)
Total Costs:	<u>1,300,000</u>	(rounded)
	\$ 400,000	
Less Initial Investment:	<u>100,000</u>	
Overall Profit:	\$ 300,000	

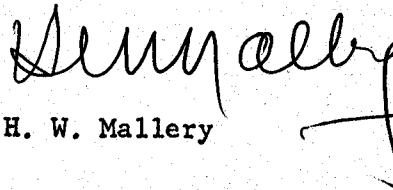
Indicated Present Value^{3/} \$ 120,000

$$\begin{aligned}
 \text{I.P.V.} &= \frac{\text{Total Profit}}{1 + (\text{Years to mine} \times \text{interest rate})} \\
 &= \frac{300,000}{1 + 10 (.15)} \\
 &= \$120,000
 \end{aligned}$$

- ^{1/} Smelter schedule: Pay assay (100% Cu) less 1.5% or 98.5% which in terms of pounds = 1970 pounds per ton. At 36 cents per pound copper, smelter deducts 2 cents and pays 34 cents, or \$669.80 per ton.
- ^{2/} Smelter charges \$5.00 per ton general treatment cost on total tonnage received.
- ^{3/} Computed using formula (1), Page 723, YOUNG, Elements of Mining, 1946, assuming a 15 per cent rate of return.

As the present value of a mineral property is basically a sum of money representing the assumed future earnings from the property, and as generally properties with less than 15 to 20 years reserves are categorized as speculative in nature, the writer believes the present value of the mineral estate of the subject lode claims, as of May 3, 1966, is one-half the indicated present value or Sixty Thousand Dollars (\$60,000.00).

Respectfully submitted,


H. W. Mallery

- 1/ Speculative because of lack of definitive data concerning extent and character of mineralization; information which could be obtained by core drilling. Generally less speculative properties are those which have been drilled or which have a much greater known extent of mineralization.

ADDENDUM:

Cost data concerning certain industrial metallurgical processes are difficult to obtain. Thus, the figure stated in Item 6, Page 9, although believed to be representative, is not based upon actual full-scale operating experiences.

The following persons were contacted in an attempt to obtain the best information available concerning these costs:

- F. L. Wideman, Copper Specialist, U.S.B.M., Washington, D. C.
- H. W. Sheffer, Mineral Specialist, U.S.B.M., Salt Lake City, Utah
- D. H. Baker, Supv. Metallurgist, U.S.B.M., Reno, Nevada
- J. L. Brixuis, Mineral Specialist, U.S.B.L.M., Denver, Colorado
- H. F. Susie, Mineral Specialist, U.S.B.L.M., Phoenix, Arizona
- J. H. Schilling, Acting Director, Nevada Bureau of Mines, Reno, Nevada
- F. W. Bowdish, Metallurgist and Chemical Engineer, University of Nevada, Reno



Photo No. 1. View, looking N. 60° W., showing collar to 88-foot shaft in foreground and outcrop of mineralized structure in center background.



NOV • 65

Photo No. 2. View looking S. 80° E. (nearly along strike of mineralized structure), illustrating surface expression of the "Vein", and nature of the terrain in background.

T 21 N
R 20 E 11 6 R 21 E
12 7

COPPER HILL - 1

COPPER HILL - 2

COPPER HILL - 3

BRUNTON COMPASS MAP

COPPER HILL GROUP

1" = 200'

3 MAY 66

200'

88-foot shaft

- ROADS
- VEIN
- FAULTS
- CUTS
- ADITS
- SHAFTS

-B.M.-USGI-H.M.-

3010 0020