Report on the

LAND ROVER PROSPECT

Cherry Creek Mining District

Pershing County, Nevada

By

Anthony L. Payne

November 12, 1965

COPY 5

ANTHONY L. PAYNE mining geologist

box 8063 university station reno, nevada FA 3-2081 Ext. 578

November 15, 1965

Mr. Harvey Durbin
Tri-Metals Company
Post Office Box 166
Winnemucca, Nevada

Dear Mr. Durbin:

Transmitted herewith are four copies of a report on the Land Rover Prospect, Cherry Creek (China Mountain) Mining District, Pershing County, Nevada, dated November 12, 1965.

The report describes the geology of the property, summarizes the results of geochemical soil sampling in one small area, and contains recommendations for exploration.

If you have any questions concerning the report, or if I can otherwise be of assistance to you in further exploration of this property, please be assured of my cooperation.

Yours very truly,

Anthony L. Payne

Anthony L. Payne
Mining Geologist

ALP:gc

Encl.

TABLE OF CONTENTS

	Page
Introduction	1
Location and Physical Features	2
Ownership	4
Development	4
Geology	6
General	6
Sedimentary Rocks	8
China Mountain formation	8
Favret formation	8
Panther Canyon formation	8
Augusta Mountain formation	8
Quaternary Land Slides	8
Quaternary alluvium	8
Igneous Rocks	9
Tertiary intrusive porphyry	9
Tertiary intrusive lamprophyre	9
Structural Geology	10
Thrust faults	10
Steep faults	10
Regional Patterns	10
Mineralization	11
Cave area	12
Recommendations	13
Conclusions	16
References	17

LIST OF MAPS

	Page
General Index Map of Land Rover Prospect	3
Geologic Map	7
Geochemical Map.	14

Report on the

LAND ROVER PROSPECT

Cherry Creek Mining District

Pershing County, Nevada

by

Anthony L. Payne

November 12, 1965

INTRODUCTION

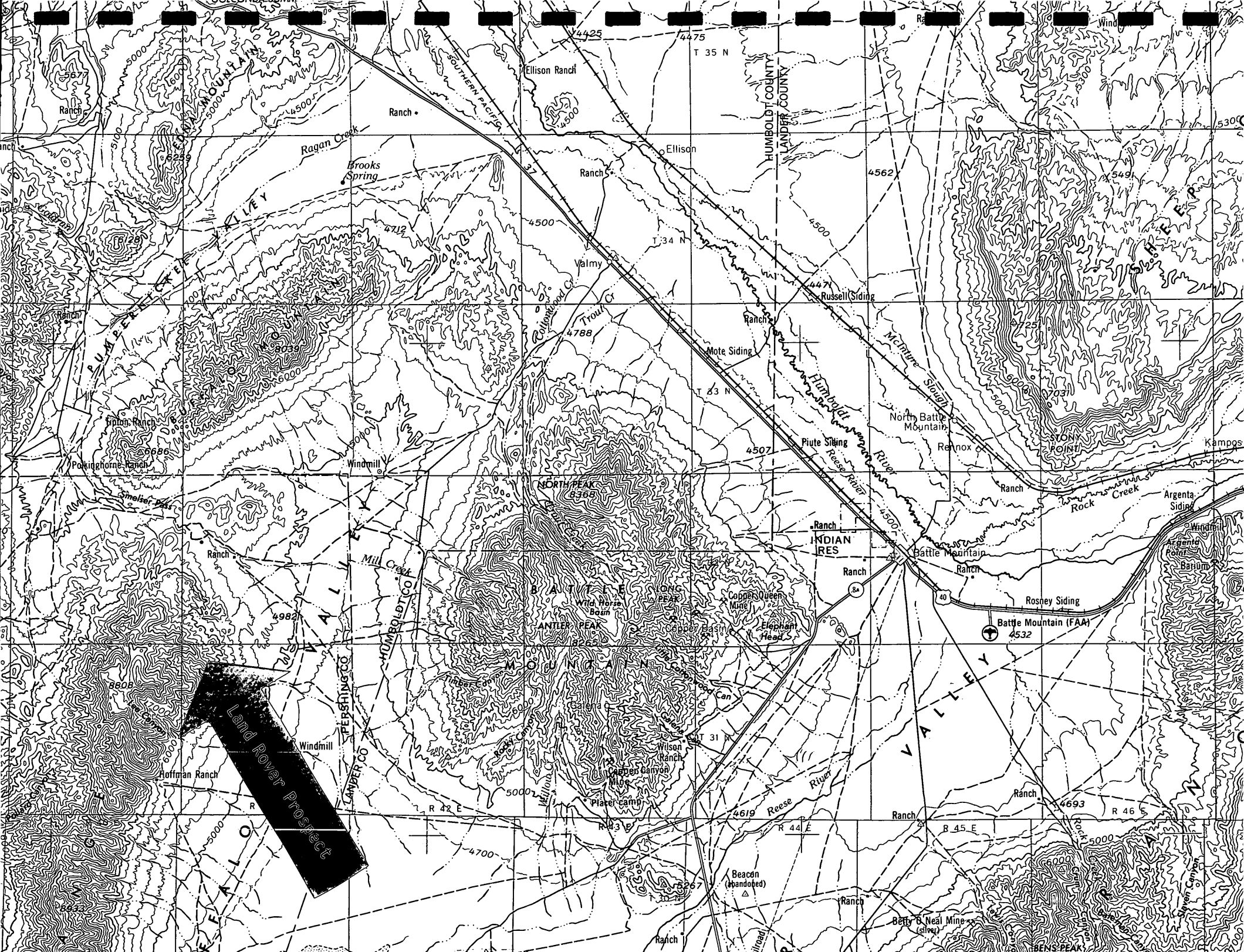
During the past year, bulldozer and slusher-scraper trenches were excavated on one of several prominent gossans on the Land Rover prospect, exposing partially oxidized silver-lead sulphides. A small shipment of ore was hand-sorted from the trenches and sent to the Tooele Smelter. Favorable results indicated the need for a more thorough study of exploration possibilities.

Mr. Harvey Durbin, of Tri-Metals Company, Winnemucca, Nevada, requested the writer to make a geological examination of the property. An understanding of the geological relationships was believed to be a necessary prerequisite to planning effective exploration. The examination was made October 29-31, 1965.

LOCATION AND PHYSICAL FEATURES

The Land Rover prospect is located on the northeast side of China Mountain, in Sections 5 and 6, T. 31 N., R. 41 E., M.D.M., Pershing County, Nevada. The nearest shipping point is Valmy, Nevada, on the Southern Pacific Railroad and Interstate Highway 80, 20 miles airline to the northeast. Fair access to the property is by a county road from Valmy, down Buffalo Valley to north central T. 31 N., R. 41 E. From this point, 2-1/2 miles of rough jeep road was constructed by Tri-Metals Company during the past year to the Land Rover prospect. The total road distance from Valmy to the prospect is 23 miles. (See Index Map) If future developments are favorable the logical supply center and shipping point would be at Battle Mountain. From Battle Mountain the prospect can be reached by traveling 11 miles southwest on (paved) State Highway 8A, turning west 3 miles on the (paved) Natomas Camp road, and 14 miles west-northwest along the new gas pipe line to a junction with the Valmy road in north central T. 31 N., R. 41 E. The pipe line road would require gravel or other surfacing, for it is alternately too dusty or too muddy to use at this time.

The topographic relief throughout the general area is moderately abrupt, affording a variety of locations for suitable tunnel development. Water is available at an old abandoned ranch just east of Smelser Pass, 4 miles north of the Land Rover prospect. A water well in Buffalo Valley lies 3 miles to the southeast and water may be obtained during the winter season at Cherry Creek, one mile south of the Land Rover properties. There is no timber suitable for mine or camp use on the property.


Land Rover Prospect
Ellison Ranch
Ellison
Ragan Creek
Brooks Spring
Valmy
Russell Siding
Mote Siding
Piute Siding
North Battle Mountain
Rennox
Kampos
STONY POINT
Rock Creek
Argenta Siding
Argenta Point
Batium
Windmill
Tipton Ranch
Pokinghorne Ranch
Gimelier Pass
NORTH PEAK
8365
INDIAN RES
Battle Mountain
Rosney Siding
Battle Mountain (FAA)
4532
Copper Queen Mine
Elephant Head
Copper Basin
LONG PEAK
Wild Horse Basin
ANTLER PEAK
8265
BATTLE MOUNTAIN
Mill Creek
Timber Canyon
Galena Canyon
Wilson Ranch
Copper Canyon Mine
Placer camp
Hoffman Ranch
Beacon (abandoned)
Betty & Neal Mine (silver)
BENS PEAK
Reese River
Humboldt River
McIntyre Slough
Rock Canyon
Seven Canyon
HUMBOLDT COUNTY
LANDER COUNTY
PERSHING CO
HUMBOLDT CO
LANDER CO
SOUTHERN PACIFIC
T 35 N
T 34 N
T 33 N
T 31 N
R 42 E
R 43 E
R 44 E
R 45 E
R 46 E
EDNA MOUNTAIN
PUMPERNICKEL VALLEY
BUFFALO VALLEY
SHEEP RANGE

OWNERSHIP

The Land Rover property consists of seven unpatented lode mining claims, located by C. L. and Louise Jones of Elko, Nevada, on September 13, 1963:

Claim Name	Pershing County Book of Official Records No. 26 Page	File No.
Land Rover No. 1	392	57035
Land Rover No. 2	393	57036
Land Rover No. 3	394	57037
Land Rover No. 4	395	57038
Land Rover No. 5	396	57039
Land Rover No. 6	397	57040
Land Rover No. 7	398	57041

At the present time the Land Rover claims are leased to C. Garth Patterson and Roy Durbin, of Tri-Metals Company, Winnemucca, Nevada. The Lease and Option agreement is dated November 9, 1964, and is recorded in Pershing County Book of Official Records 30, pages 569-575. Affidavit of Annual Labor for the assessment year ending September 1, 1965, was filed by Roy Durbin on August 12, 1965, and is recorded in Pershing County Book of Official Records 34, page 162.

DEVELOPMENT

Several old shallow prospect workings explored the more obvious mineralized showings. Judging from the appearance of the dumps, and the style and condition of the hand tools left lying about, this work was done in the 1920's or early 1930's. In the "gossan" and "lower" adits (see geologic map), partially oxidized silver-lead sulphide ore of good grade was found, and it is not obvious just why such promising showings were not pursued. Experienced prospectors of the period were fully aware of the significance of oxidized gossans. It is possible that work was

abandoned because of the ruinous decline in silver prices during the post World War I - early depression period.

Year		Silver Price (high for year)
1920	1.09	$1.37 per Troy ounce
1921	1.00	.73 "
1922	1.00	.74 "
1923	.82	.69 "
1924	.67	.72 "
1925	.69	.73 "
1926	.62	.69 "
1927	.57	.60 "
1928	.59	.63 "
1929	.50	.57 "
1930	.39	.47 "
1931	.29	.37 "
1932	.28	.26 "

Most of the silver mines of the region were shut down and attention turned to the more attractive gold prospects of the region. While silver prices declined during the period tabulated above, gold had nearly doubled in value.

The mining reports and geological references of the region make no mention of mineralization or mining activity in the immediate area of the Land Rover prospect. A brief statement by Ferguson, et. al. (1952) is made concerning the "silver-lead" mine just to the south in Cherry Creek (see Index Map):

> "...(CHINA MOUNTAIN) Silver-Lead mine.--The Silver-Lead mine, on the eastern slope of China Mountain, has been intermittently active since the 1880's, but production has been small. The ore is galena, sphalerite, and pyrite in lenticular veins along faults striking north and dipping 60° to 70° W. Near the surface the galena is altered to cerussite....."

During the past year, Tri-Metals Company trenched one of the more prominent gossans of the Land Rover prospect, using bulldozer and slusher-scraper. Partially oxidized silver-lead sulphide ore was exposed in place, and a small

trial shipment of 946 lbs. of hand sorted ore was made to the Tooele Smelter during August:

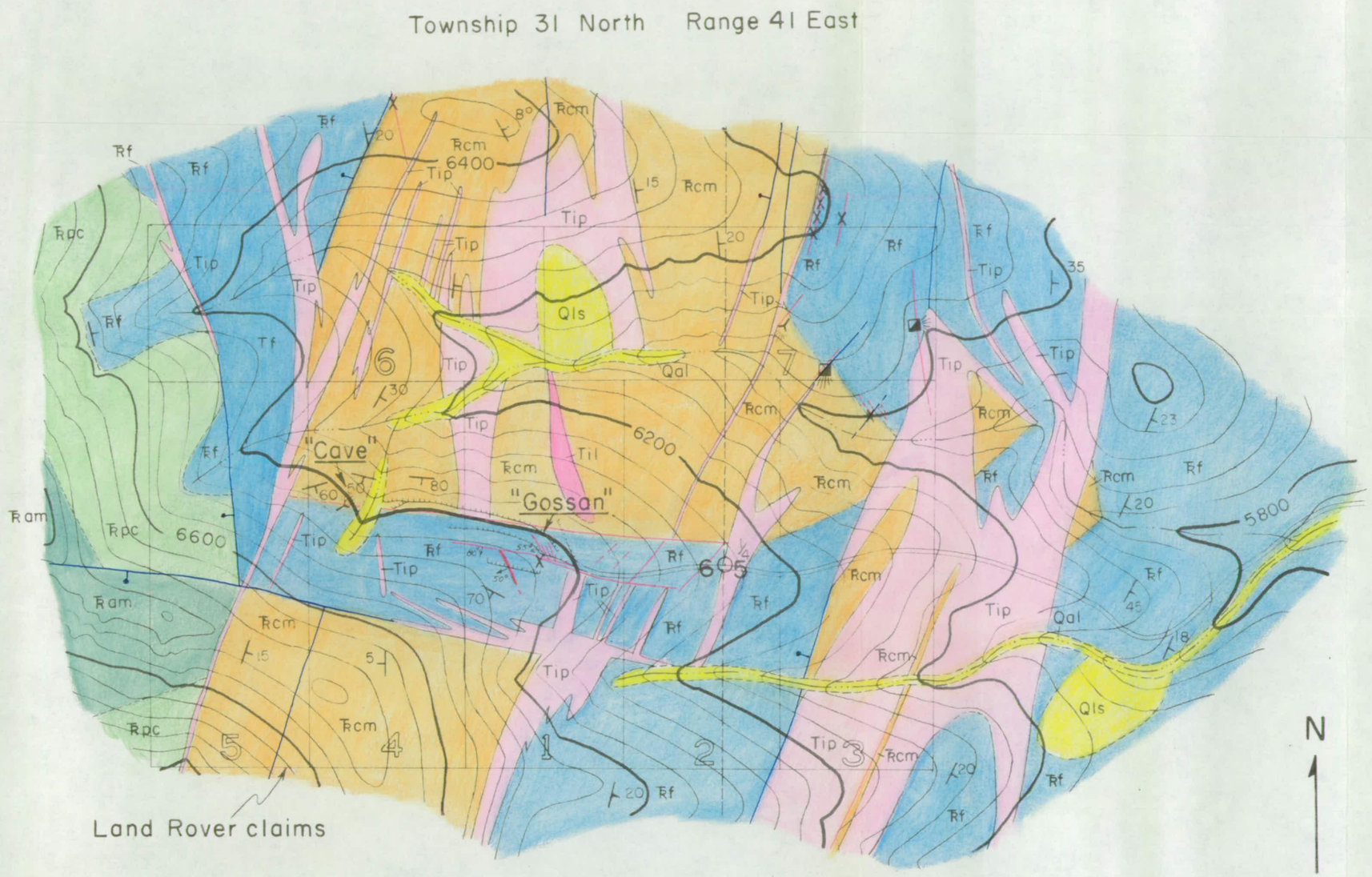
	Ounces
Silver.	10.84
Gold.	0.01
	Percent
Copper.	0.10
Lead.	47.6
Zinc.	0.5
Insoluble	24.0
Sulphur	6.1
Arsenic	0.05
Iron.	4.8
Lime.	1.2

Net smelter return (not including small lot handling charges) was made on the basis of $112.30 per ton.

GEOLOGY

General

China Mountain consists mainly of Triassic sedimentary rocks which were deposited in the great Cordilleran marine trough which existed in Nevada during most of Paleozoic and the early part of Mesozoic time. Regional geologic studies suggest that China Mountain is underlain by a series of Paleozoic siliceous sedimentary rocks that were originally deposited in the western portion of the Cordilleran trough, and have subsequently been folded, faulted, and moved eastward along the Roberts and Golconda thrust faults. The Triassic rocks exposed on China Mountain are relatively undisturbed, being broken only by Tertiary and Recent faulting. These late faults are often occupied by igneous dikes in the Land Rover prospect area, and at a few places the faults are mineralized (see geologic map).



EXPLANATION

QUATERNARY

- Qal — Alluvium
- Qls — Landslide

TERTIARY

- Tip — Porphyry
- Til — Lamprophyre

TRIASSIC

- Ram — Augusta Mountain formation
- Rpc — Panther Canyon formation
- Rf — Favret formation
- Rcm — China Mountain formation

60° vein, showing dip

85° fault, showing dip and downthrown side

20° dip and strike of beds

Note:

1. *Base map adapted from U.S. Geological Survey advanced topographic sheet Golconda 3 SW, 1:24,000, 1965.*
2. *Mapped by Anthony L. Payne assisted by Edward P. Jucevic, October 29-31, 1965.*
3. *Mean datum sea level*

Pershing County *Nevada*

TRI-METALS COMPANY

GEOLOGIC MAP

LAND ROVER PROSPECT

Cherry Creek (China Mountain) District

Scale: 1 inch = 500 feet

Anthony L. Payne *November, 1965*

Sedimentary Rocks

China Mountain formation.--The oldest formation exposed in the mapped area is the Triassic China Mountain formation, consisting of cream, brown, or maroon conglomerate; sandstone, shale, and impure dolomite. The thickness of the formation is about 500 feet.

Favret formation.--The Triassic Favret formation conformably overlies the China Mountain formation, and consists of thin-bedded black bituminous limestone and shales with dark gray to brown massive dolomite at the base and top. The thickness of the formation is about 200 feet. Most of the mineralized showings of the Land Rover area are found in the Favret formation, particularly in the lower portion in limestone and dolomitic limestone beds.

Panther Canyon formation.--The Favret formation is conformably overlain by the Panther Canyon formation, about 250 feet of gray to brown and maroon shale, sandstone, and conglomerate interbedded with impure dolomite.

Augusta Mountain formation.--High up in the western portion of the mapped area, the base of the Augusta Mountain formation is exposed, overlying the Panther Canyon formation. The Augusta Mountain formation is a massive gray limestone and dolomite with some intercalated shale. The thickness of the unit is about 300 to 400 feet.

Quaternary Land Slides.--At several places, streams have steepened slopes and undercut them so as to induce slumping and sliding of weathered material into the arroyo bottoms. Two such slides are large enough to be separately shown on the geologic map.

Quaternary alluvium.--Stream gravels and slope wash have accumulated in wider portions of the arroyo bottoms. Where such deposits are large enough to be shown separately, they are portrayed on the geologic map.

Igneous Rocks

No coarse grained plutonic igneous rocks have been observed in the immediate area, but numerous porphyrytic dikes, considered in light of regional geology, suggest that this portion of China Mountain is intruded at depth by a granodioritic pluton of the Sierra Nevada type. Similar intrusions in the area to the northeast took place in Eocene or early Oligocene time (Roberts, 1964a). The many dikes seen in the mapped area are probably offshoots from this pluton.

Tertiary intrusive prophyry.--At a number of localities, dikes, sills, and irregular small plugs of intrusive porphyritic rocks are observed. These porphyries range in composition from intermediate to acid, and appear to be intimately related to the mineralization processes. Hydrothermal alteration and mineralization are clearly later than the porphyry, for mineralized veinlets and altered zones are found cutting through the intrusives.

Diabase dikes and sills are the most commonly observed porphyry, and they are found to cut all of the Triassic sedimentary formations of the district. Dikes of granodioritic and quartz monzonitic composition are also observed, with wide variety in the textures and intensity of alteration. Because of time limitations, it was not possible to separate the various dikes and sills on the geologic map.

Tertiary intrusive lamprophyre.--At one locality in the center of the mapped area, a large dike of fine-grained dark intrusive rock appears to be a lamprophyre, and has been shown separately on the geologic map. Intrusive lamprophyre dikes are found at many localities in north-central Nevada, and there is lack of agreement as to their significance with respect to mineralization.

Structural Geology

Thrust faults.--The Triassic rocks described above are part of the "overlap" assemblage of sediments that have been deposited over the various thrust faults which are known to pass beneath China Mountain. Inasmuch as these Triassic sediments represent a thick accumulation over the thrust plate(s), the much-publicized exploration targets in carbonate rocks of the lower plate are buried so deeply that they cannot here be given serious consideration.

Steep faults.--Two sets of steep faults predominate in the Land Rover area. One narrow zone of west-northwest faulting is crossed by a later series of north-northeast breaks. Both fault systems are intruded by porphyry dikes, and both contain mineralization from place to place. Steep faulting, igneous intrusions, and mineralization-alteration are all so intimately related that it is presumed that they took place essentially contemporaneously.

The early west-northwest system appears to drag fold and contort the bedding, and is confined to a narrow graben or down-dropped block, 300 to 400 feet wide, where a slice of Favret limestone is folded and faulted into a large fault block of China Mountain sandstones and conglomerates.

The north-northeast structures break the sediments cleanly without drag folding or other deformation of the bedding. Recurrent movement along the north-northeast system is suspected, as mineralization in these faults often shows slickensides and groovings. Also, young scarps along north-northeast faults are seen in the nearby areas, particularly near the eastern foot of China Mountain.

Regional patterns.--Roberts (1964b, p. 5-7) has recently described a northwest-trending mineralized belt which extends from beyond Eureka, to

at least as far as the mining districts at Antler Peak immediately southwest of Battle Mountain. Roberts considers this broad belt of known ore deposits to be a favorable zone in which to prospect for new ore. Such belts are recognized at many other localities in the Cordillera of North and South America, as for example in central Colorado. This central Nevada belt, if extended to the northwest past Antler Peak, would pass just to the north of China Mountain, at Smelser Pass and Buffalo Hill. That is to say, the Land Rover prospect would lie along the southwest edge of the projected mineral belt.

It is possible that the west-northwest fault and graben shown on the geologic map is sympathetic to the central Nevada mineral belt trend, and might be a component of it.

MINERALIZATION

Most of the obvious mineralization on the Land Rover property is found in the center of the mapped area, in the graben of Favret formation. This west-northwest trending structure is blocked out by steep faults that are either mineralized or filled with intrusive porphyry dikes. Observed mineralization includes: jasperoidal alteration, barite, and iron oxides left after weathering of sulphide minerals. A west-northwest mineralized fault cuts through the graben itself, and several segments of vein-gossan branch away from it. To the north of this mineralized fault, 6 to 10 veins varying from a few inches to 3 feet in width strike N. 25° W. and dip 55° to the southwest. South of the mineralized fault, in a position offset to the west, a strong vein-gossan 7 ft. in width strikes N. 25° W. and dips 50° to the southwest. The veins to the north of the "Barite" vein are called the "lower gossan" veins, while the larger structure uphill to the south is called the "upper gossan" vein. The upper gossan vein has been trenched to

a depth of about 8 ft., and no unoxidized material was exposed. The Barite vein has only superficially been prospected, again without getting beneath the effects of surface alteration. The lower gossan veins have been extensively trenched, and unoxidized vein material is beginning to show in the floor of the exposure. Judging from the small amount of sulphide material that is seen here, the veins consist of argentiferous galena, some sphalerite, pyrite, barite, calcite, and quartz. Cerussite (lead carbonate) and cerargyrite (silver chloride; "horn silver") has formed in the oxidized zone near surface. More zinc sulphides may appear in depth, for zinc is usually more mobile in the surface zone, and the gossans appear similar to those over sulphide zinc-bearing ores in the surrounding region.

These vein gossans are all good strong structures that show every sign of strengthening in depth. They project downward in the basal carbonate portion of the Favret formation, just above the siliceous clastics of the China Mountain formation. This is the only stratigraphic zone in the district receptive to fissure or bedding replacement silver-lead mineralization, and the combination of structure and stratigraphy are felt to be the major favorable feature of the prospect.

Cave area.--About 500 feet west of the Gossan area, a peculiar topographic depression occurs where a cross fault and mineralized zone intersect in the Favret graben. Even before geologic relationships were fully understood, the writer's eye was attracted to this feature. It is completely unique to the Land Rover property. At the outset it appeared that it might represent collapse over an oxidized sulphide ore deposit. Detailed mapping substantiated this possibility, inasmuch as a favorable combination of stratigraphy and structure can be projected into the area, and there is

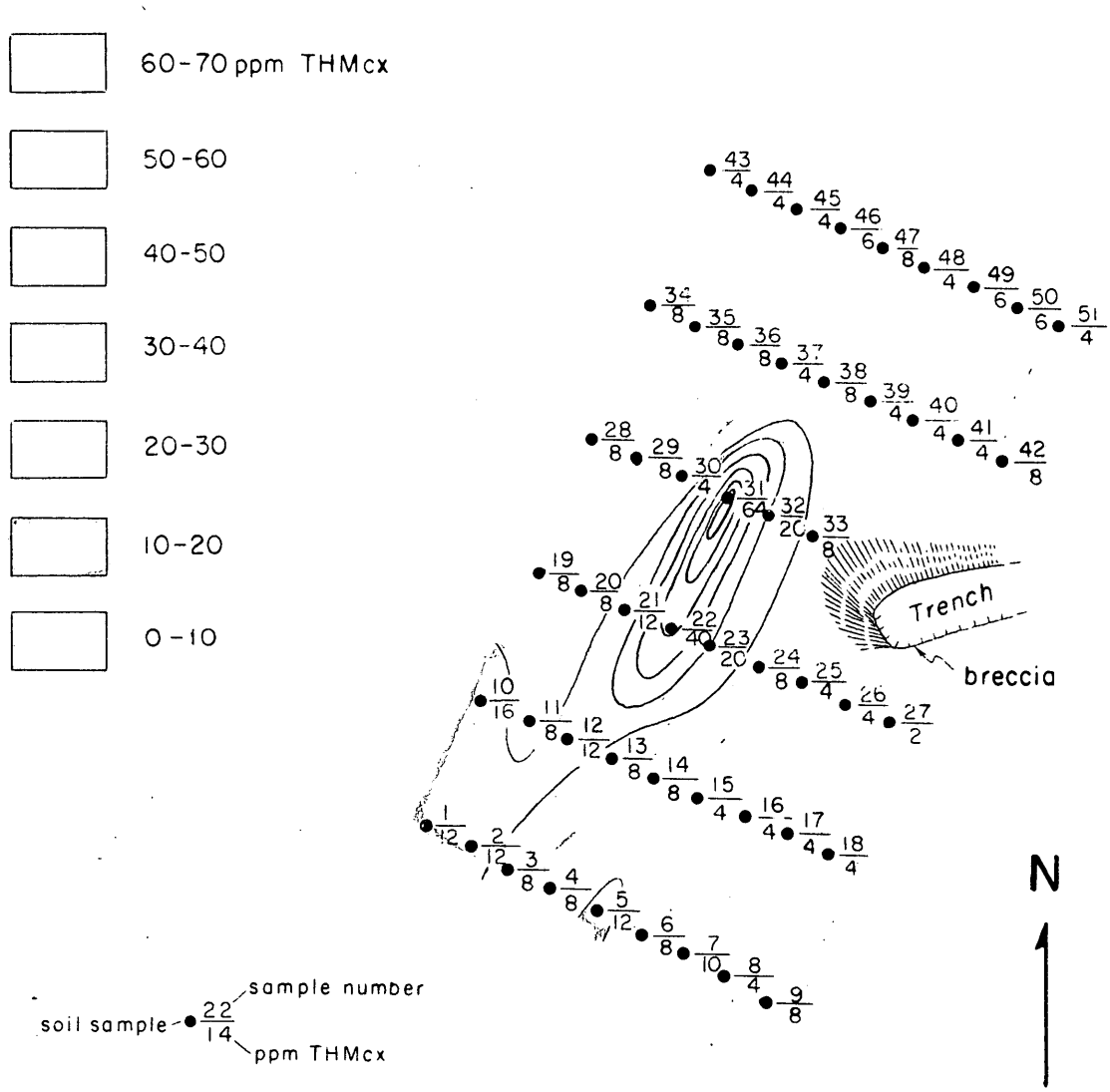
abundant evidence of sulphide mineralization in the bed rock exposures surrounding the depression.

Tri-Metals Company began to excavate a bulldozer trench into this depression (see Geologic and Geochemical Maps), but did not finish the work when it became apparent that additional testing should await a geological appraisal of exploration possibilities. The end of the bulldozer trench is in thoroughly brecciated and broken limestone, very similar in appearance to a talus slide. Scattered through this loose breccia are fragments of gossan and other mineralized material. It is possible that this deeply incised depression may be cutting down into some kind of old landslide or talus cone. It might also be due to a soft zone, such as an altered porphyry dike. With a view toward minimizing exploration risks, a grid of geochemical soil samples was collected over the soil-covered center of the depression, as shown on the Geochemical Map. Analysis was made in the laboratory for ammonium citrate soluble Total Heavy Metals (Copper, Lead, and Zinc). This rapid geochemical test has served as a guide to soil-covered silver-lead replacement mineralization elsewhere in Nevada, although the method is by no means an infallible indication of ore. The accompanying geochemical map reveals a precise anomolous pattern over the center of the depression. It is believed that a modest amount of physical exploration is justified on the basis of these results.

RECOMMENDATIONS

It is recommended that a program of (1) crosscutting underground be undertaken in the "gossan" area, and that a short (2) drift be driven in the "Cave" area.

The Gossan work should be given priority because? for exploration risk hinges primarily upon one factor. That is, if the gossan showings are underlain



Note: samples analyzed November 5, 1965, using Bloom's method

Bloom, Harold, 1955, "A field method for the determination of ammonium citrate soluble heavy metals in soils and alluvium", Econ. Geol., vol. 50, no. 5, p. 533-541.

Analyses by David L. Stevens

Pershing County *Nevada*

TRI-METALS COMPANY

GEOCHEMICAL MAP "CAVE" AREA

LAND ROVER PROSPECT

Scale: 1 inch = 100 ft.

Anthony L. Payne *November, 1965*

by a quantity of mineable silver-lead ore at reasonable depth. A large portal area should be excavated by bulldozer at the level of the lower trench, to the north and downhill from the gossan outcrops. This portal site should be prepared slightly in the footwall of the lower vein system, and a crosscut should be driven on a bearing of S. 45° W. for a distance of 250 feet. This crosscut would have the following objectives:

1. Cut the several veins in the lower gossan area nearly at right angles and at sufficient depth to evaluate the material beneath the leached gossans.

2. Pass through the west-northwest barite vein structure at about a 50° angle, again checking the persistence and character of mineralization beneath the surface oxidized zone.

3. Intersect the large upper gossan vein at a depth of about 100 ft., near the end of the crosscut. If this structure persists and is strongly mineralized, it should contain silver-lead of ore of sufficient width and grade to be profitably mined.

Another advantage of such a crosscut heading is that a good representative section of basal Favret formation can be examined for evidence of bedding replacement ore. If bedded ore occurs along any of the above structures, an important oxidized secondary ore deposit might be developed. Bedded replacement ores in deposits of this type appear to oxidize to form bonanza occurrences much more often than replacement ore along fissures similar to that observed at the surface on the gossan outcrops. At several places on the Land Rover claims, feeble bedding replacement mineralization is observed, indicating that under ideal circumstances an important ore deposit might occur.

Upon completion of the crosscut, detailed geologic mapping and sampling should reveal which, if any, of the structures represents the most attractive exploration possibility. Approximately 50 ft. of additional work should be

done on the most attractive showings, either by drift, raise, or winze.

The "Cave" area should be trenched as deeply as possible with bulldozer, at the same time preparing a portal site square in the center of the depression, in the middle of the geochemical anomaly. A 50 foot drift should be driven into the center of the anomaly, on a heading of S. 25° W., preferably along mineralized structures that might be revealed by bulldozing.

(3) A third, relatively minor exploration possibility is the small tunnel shown at the base of the Favret formation north-northeast of the Gossan area, across the arroyo. If additional bulldozer work is done as described above, it would be worthwhile to trench out this tunnel and expose the mineralized showing along the porphyry dike. It might be possible to expose sulphide silver-lead mineralization in place and get a better idea of the character and strength of the mineralization at the base of the limestone formation.

CONCLUSIONS

Several promising gossans occur on the Land Rover claims, and an interesting topographic depression might represent oxidation collapse over massive sulphide ore. One of the gossans has been trenched deeply enough to expose silver-lead sulphides, indicating the possibility of mineable ore, should mineralization improve in depth. Ore localization is along northerly trending fractures in a faulted block of limestone which appears to be the only rock receptive to replacement mineralization in this area. The vein structures appear strong and they dip into the hill in such a manner as to intersect the favorable carbonate beds. On the basis of the shallow testing done thus far, the veins appear to strengthen in depth, and there is every reason to expect good strong veins below the oxidized zone. If any of the beds of the Favret formation should have been massively replaced by bedded

ore, a truly significant ore occurrence might develop. (1) A program of cross-cutting, followed up by a small amount of drifting, raising, or winzing, can effectively explore these possibilities at a cost commensurate with the risks involved.

(2) At the topographic depression to the west of the gossans, a modest program of surface trenching and underground drifting is felt justified on the basis of the possible significance of the physiography, the mineralization in surrounding outcrops, and the favorable results of geochemical soil sampling.

Respectfully submitted,

Anthony L. Payne

Anthony L. Payne
Mining Geologist

November 12, 1965
Reno, Nevada

REFERENCES

Ferguson, H. G., Roberts, R. J., and Muller, S. W., 1952, Geologic Map of the Golconda Quadrangle, Nevada, U. S. Geol. Survey, Scale, 1:125,000, with text.

Gilluly, James, and Gates, Olcott, 1965, Tectonic and Igneous Geology of the Northern Shoshone Range, Nevada, U. S. Geol. Survey Prof. Paper 465, 153 p.

Roberts, R. J., 1964a, Stratigraphy and Structure of the Antler Peak Quadrangle, Humboldt and Lander Counties, Nevada, U. S. Geol. Survey Prof. Paper 459-A, 93 p.

Roberts, R. J., 1964b, Exploration Targets in North-Central Nevada, U. S. Geol. Survey Open File Report, 8 pages.

Roberts, R. J., and Arnold, D. C., 1965, Ore Deposits of the Antler Peak Quadrangle, Humboldt and Lander Counties, Nevada, U. S. Geol. Survey Prof. Paper 459-B, 94 p.