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Item 10

Report on The
Mud Spring Prospect
Churchill County, Nevada

by
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July, 1986

6 maps enclosed

INTRODUCTION AND LOCATION

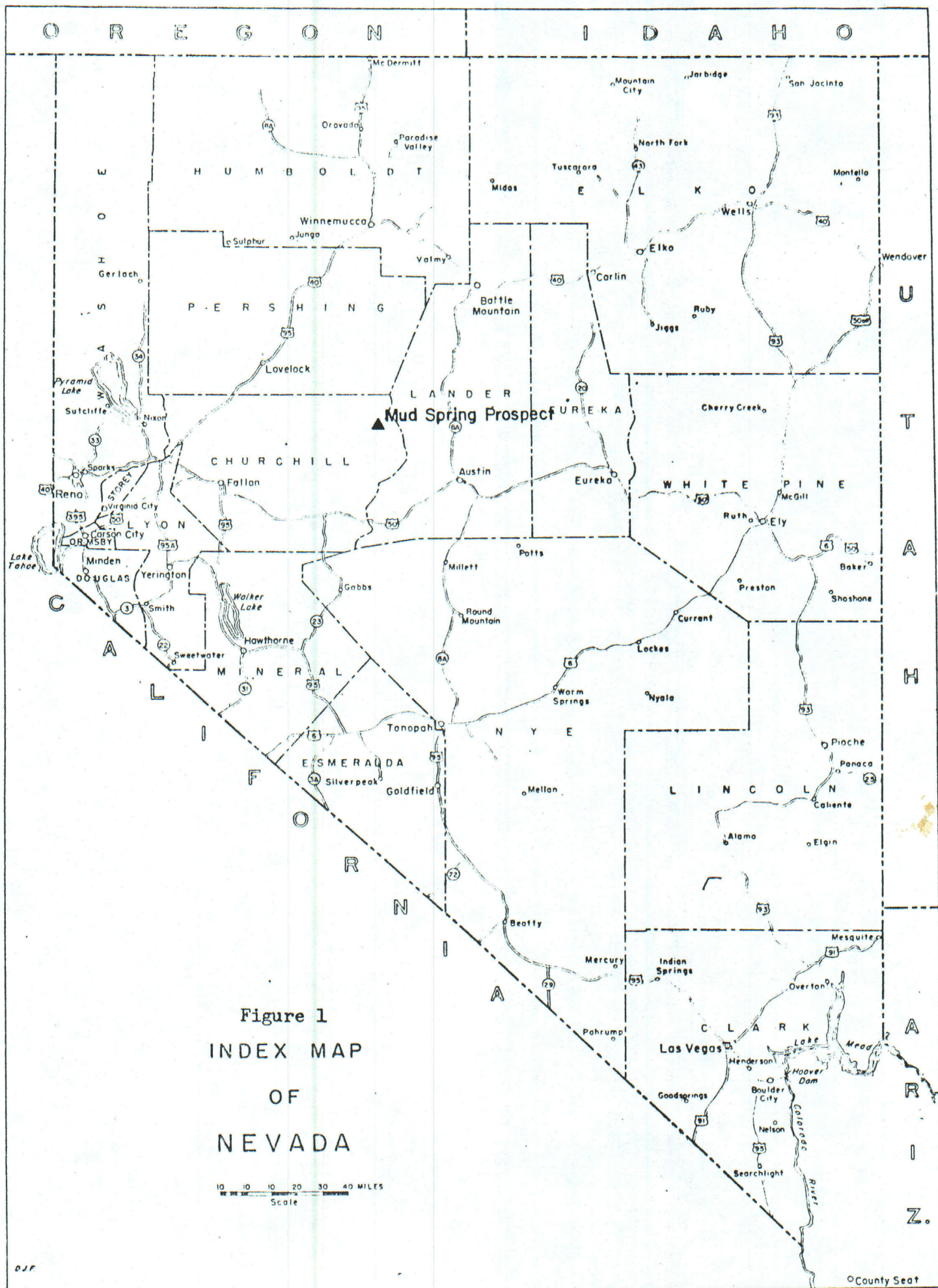
During the last part of May, 1986 ten lode mining claims were located in the Bernice Mining District in the northern part of the Clan Alpine Mountains, Churchill County, Nevada (fig. 1). These claims, the Jasper group, were located to cover several prominent outcrops of mineralized jasperoid. Most of the claims are located in the south half of section 36, T23N-R37E, but two of them extend into the north half of section 1, T22N-R37E.

Figure 2 shows a portion of the USGS Humboldt Salt Marsh 15' quadrangle map locating the area of the claims and the approximate location of the access route. Access to the claims is by way of a poor bulldozer road for the first 2 1/4 miles off the Dixie Valley road and then about 1 1/4 miles in the stream bed of Mud Spring Creek.

The Jasper claims overlie part of an earlier group of 17 claims called the Alice group located in 1979 by W. P. Johnston and R. B. Spitzer of Reno, Nevada. They allowed the claims to lapse in 1982.

The Jasper claims cover mineralized jasperoid outcrops of brecciated and silicified sedimentary rocks of Triassic and/or Jurassic age. In the area of particular interest boxworks derived from stibnite and pyrite have been seen in the outcrops. Stibnite and cinnabar have also been observed in float. The mineralized area has not been drilled.

The geologic and geochemical data presented in this report are the result of reconnaissance work and preliminary mapping.



PREVIOUS EXPLORATION

The area of the Jasper claims is about three miles north of the Hoyt Canyon and Bernice Canyon area which has produced antimony, mercury and silver in the past. Silver was discovered in the district in the 1870's and since then silver, antimony and mercury have been produced sporadically. Silver accounts for the bulk of the production, followed by antimony and mercury.

The earliest known exploration in the area of the Jasper claims resulted after a placer claim was located in the area of the scattered jasperoid outcrops on August 15, 1947 by W. F. Fisk and Marvin Cortiss. They dug a small prospect pit on the projection of one of the larger outcrops of jasperoid in the northwest corner of what is now the Jasper #6 claim.

Following location of the Alice group of lode claims in 1979 by Johnston and Spitzer Hanna Mining Company obtained an option and drilled six holes. All of the drill holes were collared in alluvium. Cuttings around the drill holes indicated that one of those drill holes (MC-4) was drilled in rhyolite and one (MC-5) was drilled in gabbro. Four of the drill holes were drilled apparently to test for mineralization along strike both east and west of the jasperoid hill at the east end of the Jasper #4 and #5 claims. It is not clear why the other two drill holes (MC-5 and MC-6) were drilled. None of the drill holes tested the area of mineralized jasperoid outcrops. The closest being MC-6 which might have penetrated a fault and drilled into the potentially favorable block of ground. The results of the drilling are not available.

The logical exploration target is the area of jasperoid outcrops associated with faulting at the east end of the Jasper #2 and #3 claims (see Preliminary Geologic Map). No drilling has been done in this area.

LAND

The prospect is on public domain lands administered by the Carson City District of the U. S. Bureau of Land Management. There is no fee land in the area.

The Jasper claim group is in a Wilderness Study Area. However, the portion of the Clan Alpine Mountains in which the claims are located was recommended in 1985 as nonsuitable for wilderness designation. It is therefore probable that this area will be determined unsuitable and returned to multiple use status.

GEOLOGY

Stratigraphy

The Mud Spring prospect is located near the southeast edge of the Humboldt Lopolith of Jurassic age as mapped by R. C. Speed (1976). Underlying the gabbroic rocks of the Humboldt Lopolith are the largely carbonate and shaly rocks of Triassic and Jurassic age. Overlying the gabbroic rocks is a sequence of Tertiary rhyolitic tuffs, flows and intercalated lacustrine sediments.

The Hoyt Canyon Formation of upper Triassic age has been described by Speed (1976) as " Alternating black thin-bedded micritic limestone and slaty silty mudstone, siltstone and minor sandstone; carbonate and clastic subunits 20 to 100 meters thick; conformable over Bernice Formation."

Overlying the Hoyt Canyon Formation is the Mud Springs Canyon Formation of upper upper Triassic and possible lower Jurassic age (Speed, 1976). The Mud Springs Canyon Formation is conformable over the Hoyt Canyon Formation and consists of "Massive- to medium-bedded limestone and dolomite and minor quartz sandstone".

The Boyer Ranch Formation of lower Jurassic age lies unconformably over the Mud Springs Canyon Formation (Speed, 1976). It consists of carbonate conglomerate and limestone in the lower unit and of quartz arenite in the upper unit.

The Mud Spring prospect is near the southeast edge of the Humboldt Lopolith of middle Jurassic age. The Humboldt Lopolith is an igneous complex of intrusive rocks of mostly gabbroic composition with a cap of basaltic rocks in the central part of the complex. In the area of the prospect the gabbro has been described by Speed (1976) as a polymict breccia which he believes are deposits from landslides that occurred at a time when the lopolith was topographically high.

The youngest rocks in the area are rhyolitic tuffs and intercalated sedimentary rocks of Oligocene and Miocene age. They have been described by Speed (1976) as ash-flow tuffs and tuff breccia with intercalated lacustrine sediments and alluvium.

Jasperoids

In Mud Spring basin there are a number of jasperoid outcrops ranging in size from a few feet to about 300 feet in length. One area on the Jasper #2 and #3 claims has a number of jasperoid outcrops, the most interesting of which are surrounded, or bounded on one side, by alluvium. Below is a photo of this area.



Photo 1. View looking west.

The other jasperoid outcrop is a roughly circular outcrop about 300 feet in diameter. It is about a quarter of a mile east of the jasperoid outcrops described above and on the east end of the Jasper #4 and #5 claims. It is also surrounded by alluvium.

There appears to be differences in the two jasperoids. On the Preliminary Geologic Map (in map pocket) those jasperoids are shown by different symbols to distinguish between them. The jasperoid outcrops on the #2 and #3 claims were formed along fault zones and by selective replacement of limestone beds in the Hoyt Canyon Formation.

Silica in the large jasperoid outcrop on the east end of the #4 and #5 claims has almost completely replaced the original sedimentary section. More complete replacement by silica might indicate that the formation replaced was not Hoyt Canyon. Also, the unreplaced portions of the original sedimentary rocks do not appear to be a part of the Hoyt Canyon Formation. The conglomeratic appearance of some of the unreplaced rocks within the jasperoid suggests that they may be from the lower part of the Boyer Ranch Formation.

Faulting

Faulting has played an important role in the development of the jasperoids and in the development of the topography in Mud Springs Basin. There are at least four north-south faults in the mineralized area. Jasperoid has formed between two of those faults on the west side of the mineralized area on the east end of the #2 claim, providing evidence that the north-south faults are related to the silicification and mineralization.

The jasperoid outcrop on the east end of the #4 and #5 claims is surrounded by alluvium, but it is suspected that there is some north-south faulting associated with that outcrop as well. The topography in that area also suggests that there is a northwest-striking fault along Mud Spring Creek that is not shown on the Preliminary Geologic Map.

Mineralization

Mineralization observed in addition to silicification consists of stibnite, boxworks derived from stibnite, cinnabar, limonite after pyrite and boxworks derived from pyrite. Mineralization has been observed in limestone as well as in the jasperoid.

The age of the silicification and mineralization is presumed to be late Tertiary and is probably related to the rhyolitic rocks which are present in much of the Clan Alpine Range. The rhyolitic rocks are Oligocene and Miocene in age and have been dated in the range from 22.0 to 29.7 m.y. (Speed).

GEOCHEMISTRY

A map showing the sample locations and sample results on the Jasper group of claims is included in the map pocket. Eight outcrop samples and three soil samples were taken.

The three soil samples show decreasing amounts of arsenic, antimony and mercury from west to east which probably reflects an increasing soil depth in the same direction. Sample S-3 is adjacent to a jasperoid outcrop while sample S-1 is near the top of a fault scarp which has exposed a thickness of alluvium in excess of 30 feet.

The outcrop samples all contain anomalous amounts of arsenic, antimony and mercury. Arsenic ranges from 34 ppm to 0.32%, antimony from 50 ppm to 2000 ppm and mercury from 313 ppb to 53 ppm.

Samples from the silicified outcrops do not contain anomalous amounts of gold and silver, although one sample, number 5051, does contain 140 ppb gold and 1.1 ppm silver. The lack of gold and silver may be the result of a paucity of sample data or indicative that precious metallization has been stripped out of solution and deposited at depth. The presence of anomalous arsenic, antimony and mercury in structurally controlled settings where silica replaces selective carbonate horizons is encouraging.

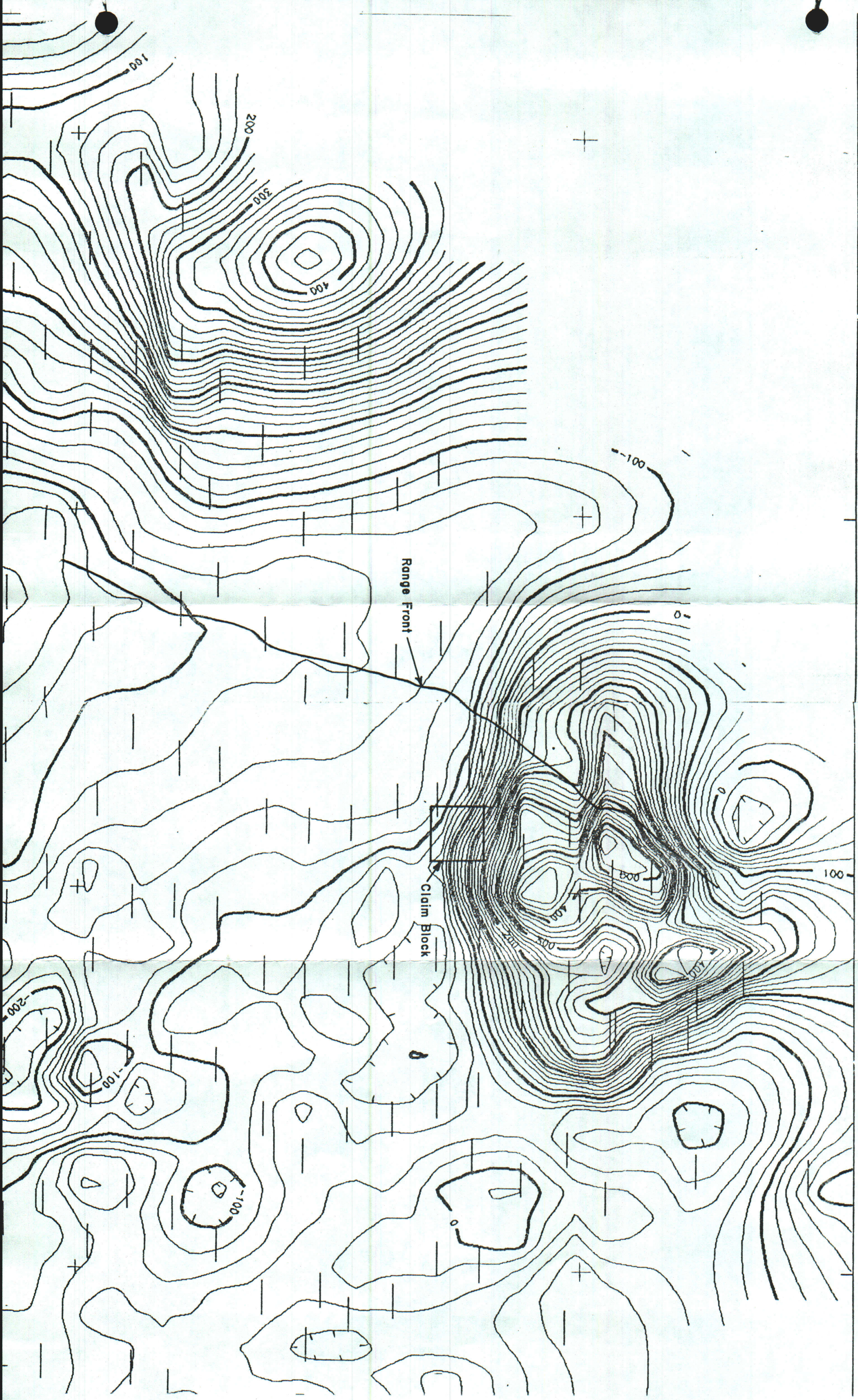
GEOPHYSICS

The only geophysics known to have been done in the area is an aeromagnetic survey by the U. S. Geological Survey (Map OF 85-0752) which recently became available. A portion of this survey which includes the Mud Spring prospect is shown on the following page.

117°50'

From USGS aeromagnetic map OF 85-0752

117°40'



EXPLORATION POTENTIAL

The area suggested for exploration is outlined with a circle on figure 3. There are several reasons for suggesting this area:

1. The outcrops of jasperoid are mineralized (stibnite, cinnabar and boxworks derived from stibnite and pyrite).
2. The area is structurally favorable. There are at least four north-south faults through the area which could provide a fractured zone about 500 feet wide and at least 800 feet long for possible mineralization.
3. The southernmost jasperoid outcrops are brecciated which suggests bedding-plane faults along the south side of the favorable-looking area.
4. Samples of the outcrops show highly anomalous amounts of mercury, antimony and arsenic. Arsenic is particularly anomalous with assays as high as 0.32%.
5. Multiple stages of brecciation and silicification are evident, suggestive of good structural preparation for mineralizing fluids.
6. The presence of up to 53 ppm mercury suggests that these rocks occur in the highest levels of an epithermal system in carbonate rocks. The combination of a strong trace element signature, slightly anomalous gold and silver, intense silicification and brecciation, and the structural association of the jasperoid provide compelling evidence that a precious metal system may be present at depth. At least one sample is slightly anomalous in gold and silver, providing evidence that the system contains precious metals.

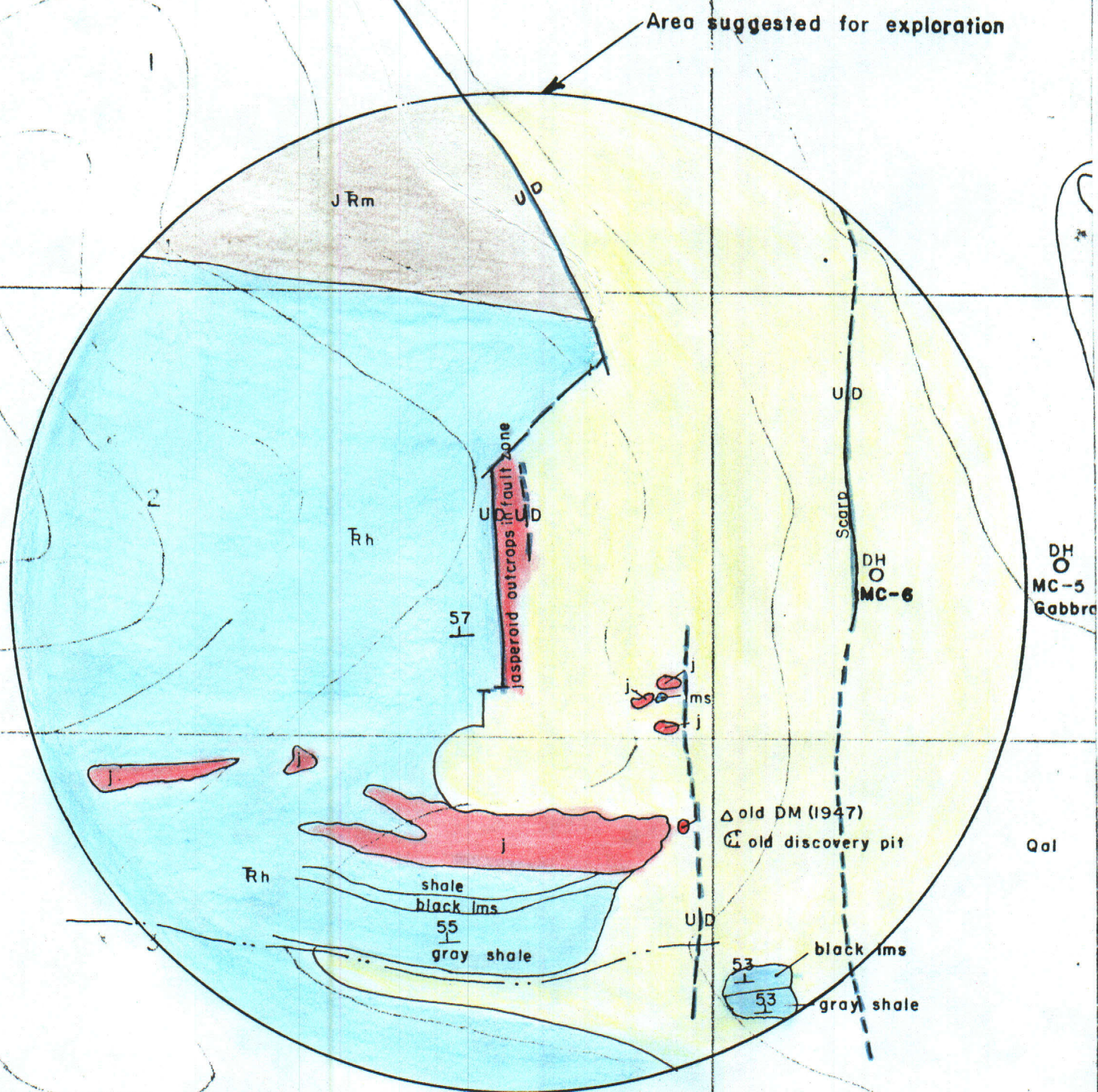


Figure 3. Area suggested for exploration.

Jasperoid outcrops combined with several faults suggest that a block of ground favorable to the deposition of minerals might be present on the east end of the Jasper #2 and #3 claims. Below is a photo of one of those jasperoid outcrops.



Photo 2. Jasperoid outcrop in southeast corner of #2 claim.

Jasperoid has selectively replaced one or more beds of the east-west striking Hoyt Canyon Formation for a distance of about 800 feet at the south end of this block. To the north jasperoid has formed in a north-south fault zone for a distance of about 250 feet. The remainder of the area considered a favorable exploration target area is covered by talus and soil except for five small outcrops of jasperoid and altered limestone which contain boxworks derived from stibnite and pyrite. In addition, these outcrops contain anomalous amounts of arsenic and mercury as well as antimony. This suggested area of exploration is large enough to contain several million tons of potentially economic mineralization.

SUMMARY

An attractive prospect for discovering precious metal mineralization is present along Mud Spring Creek in Section 1, T22N-R37E and in Section 36, T23N-R37E, Churchill County, Nevada.

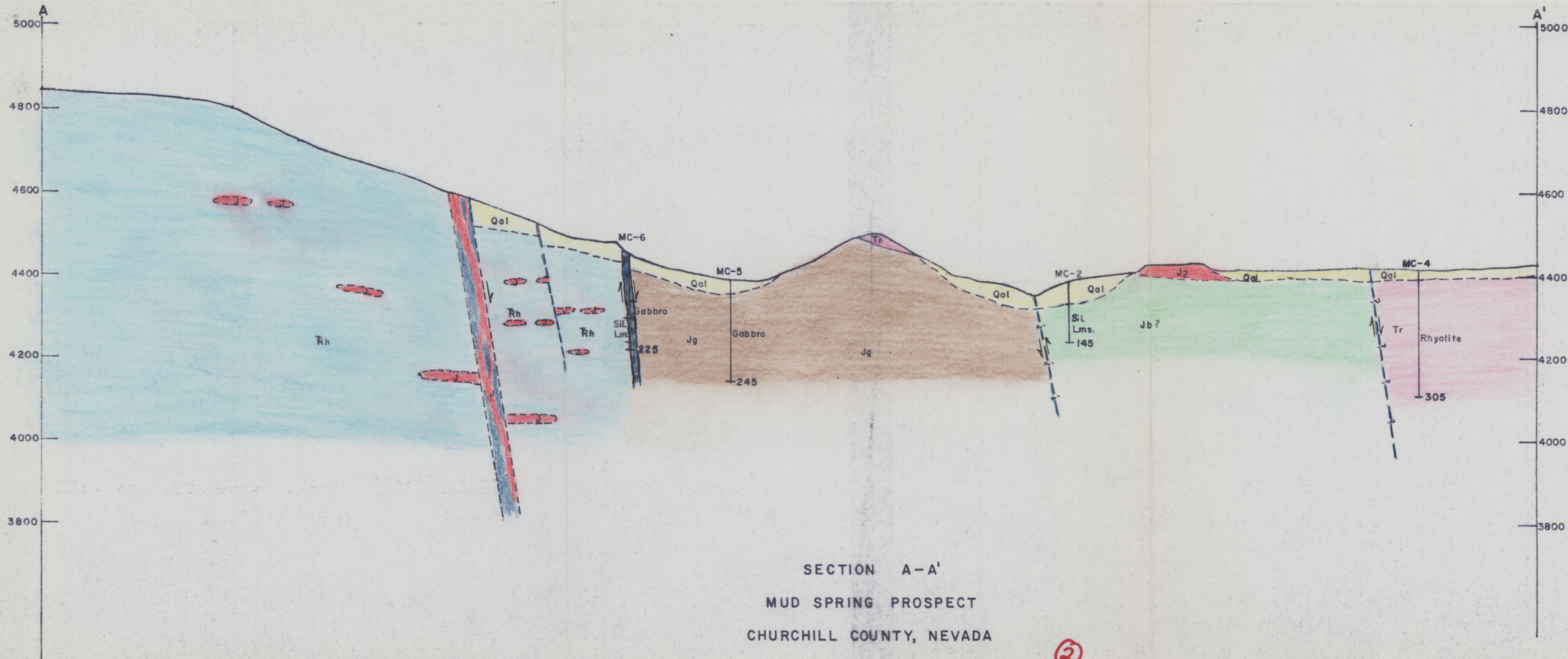
Jasperoid outcrops occur as replacements of favorable carbonate beds of the Hoyt Canyon Formation of Triassic age and in a north-south fault zone cutting the Hoyt Canyon Formation at a right angle to the strike of the bedding. The jasperoid contains anomalous amounts of the indicator elements arsenic, antimony and mercury.

The prospect is on public domain administered by the Carson City District of the U. S. Bureau of Land Management. Although the claims are in a "Wilderness Study Area" it is likely that the land will be returned to multiple use.

The anomalous amounts of the indicator elements arsenic, antimony and mercury in jasperoid, favorable calcareous host rocks, and a favorable structural setting combine to provide compelling evidence of potential gold-silver mineralization at depth in a sequence of rocks which as yet have not experienced the intense exploration attention of other carbonate sequences in Nevada.

REFERENCES

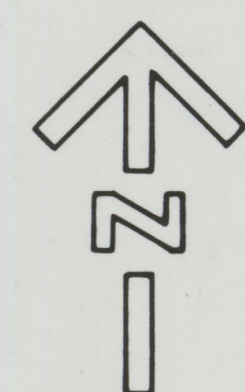
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SECTION A-A'
MUD SPRING PROSPECT
CHURCHILL COUNTY, NEVADA

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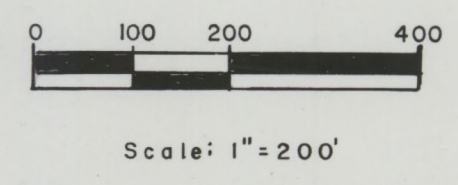


- Quaternary
- Qal Alluvium
- Tertiary
- J Jasperoid. Brecciated and silicified sedimentary rocks of the Hoyt Canyon Formation.
 - J2 Jasperoid. Brecciated and silicified sedimentary rocks. Original formation not known.
 - Tr Rhyolite flows & tuffs
- Jurassic
- Jg Gabbro of the Humboldt Lapolith
 - Jb Boyer Ranch Formation. Conglomerate, limestone and quartz arenite
- Triassic
- JRm Mud Springs Canyon Formation. Limestone, dolomite & sandstone.
 - Rh Hoyt Canyon Formation. Limestone, dolomite & shale.

- Fault (inferred where dashed)
- DH Drill hole

R37E	R38E	
36	31	T23N
1	6	T22N

PRELIMINARY GEOLOGIC MAP
MUD SPRING PROSPECT
CHURCHILL COUNTY, NEVADA

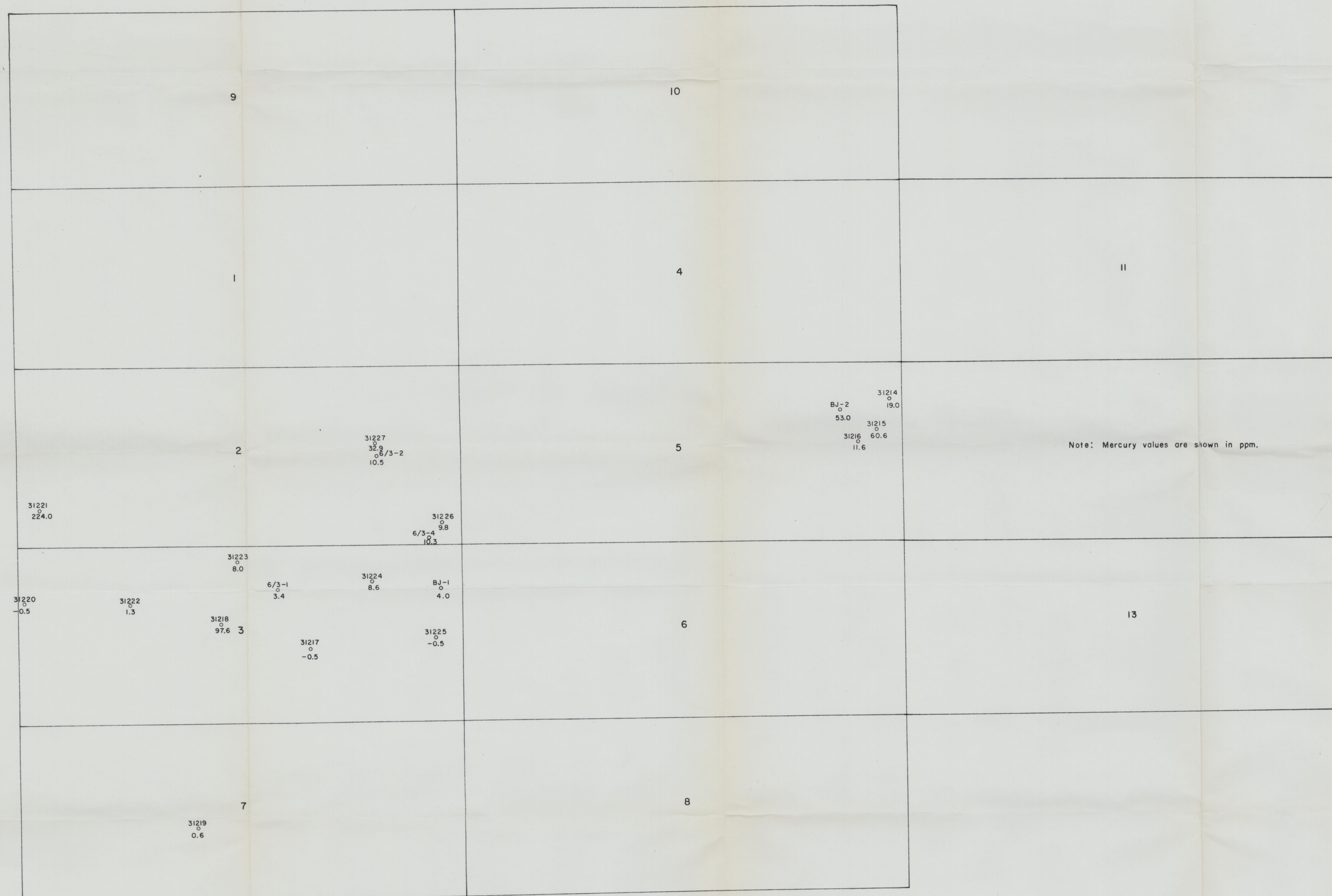
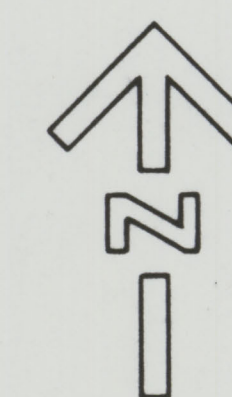


Contour interval 80 Feet
Contours adapted from USGS Humboldt Salt Marsh 15' Quadrangle Map

June, 1986

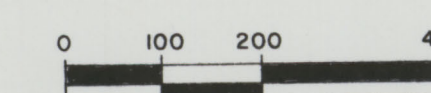
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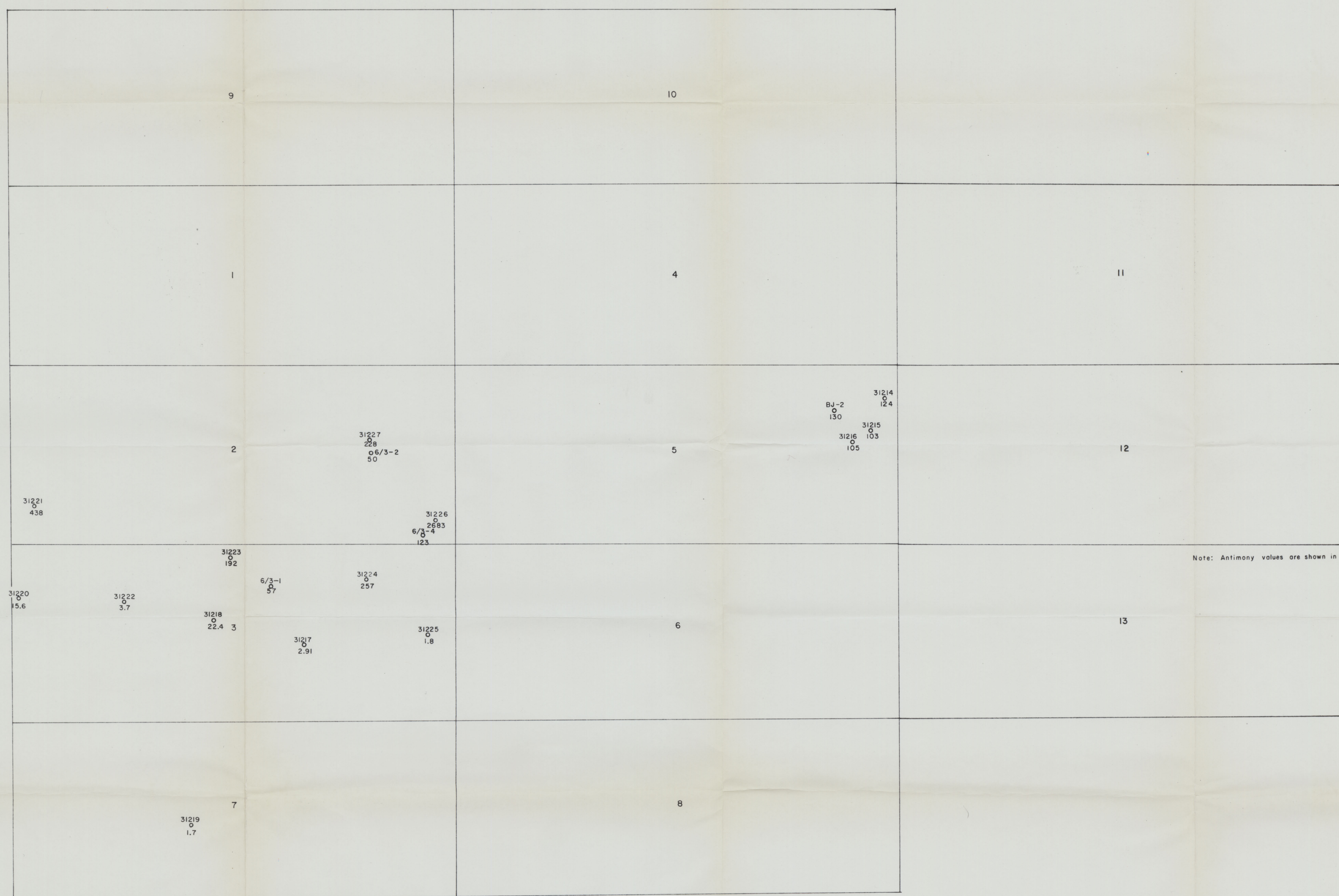
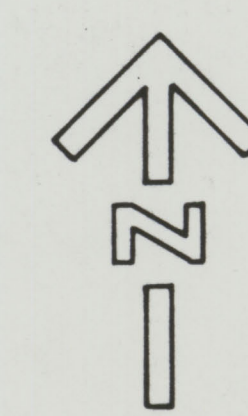
Note: Mercury values are shown in ppm.

MERCURY IN ROCK SAMPLES
MUD SPRING PROSPECT
CHURCHILL COUNTY, NEVADA



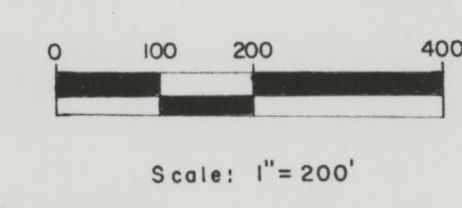
Scale: 1" = 200'

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Note: Antimony values are shown in ppm.

ANTIMONY IN ROCK SAMPLES
MUD SPRING PROSPECT
CHURCHILL COUNTY, NEVADA



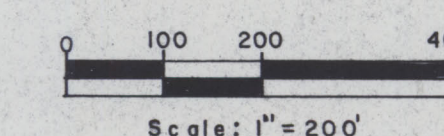
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Note: Sample numbers with an "S" indicate soil samples. All other samples are outcrop samples.

R37E	R38E	
36	31	T23N
1	6	T22N

SAMPLE MAP
MUD SPRING PROSPECT
CHURCHILL COUNTY, NEVADA



Contour Interval 80 Feet

Contours adapted from USGS Humboldt Salt Marsh 15' Quadrangle Map

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