

## Summary

### MERCURY / SULFUR / ALUNITE RECONNAISSANCE PROGRAM

August, 1980 to October, 1981

From: F. Dellachaie  
G. Maurath  
W. Teplow

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O'Brien Resources Corporation  
154 Hughes Road Suite 4  
Grass Valley, CA 95945

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## Summary

1. O'Brien Resources Corporation executed a geothermal reconnaissance program consisting of the examination of mercury/sulfur/alunite deposits in the western United States. The program was based on the strong correlation between mercury/sulfur/alunite deposits and known geothermal resource areas.
2. The reconnaissance program included the field examination of 308 prospects in Arizona, California, Idaho, Nevada, Oregon, Texas, Utah, Washington and Wyoming during the period of August, 1980 to October, 1981.
3. During the first phase of the program from August, 1980 to January, 1981, 83 prospects were examined in California, Nevada and Oregon. Seven of these prospects were selected for additional assessment work which included geologic mapping, mercury soil surveys and shallow gradient drilling (figure 1). Of the seven prospects drilled, four were found to exhibit anomalously high heat flow and two were subsequently leased by Amax.
4. During the second phase of the program from February, 1981 to October, 1981, 225 prospects were examined in Arizona, California, Idaho, Nevada, Oregon, Texas, Utah, Washington and Wyoming. From these prospects 5 were selected for additional assessment work consisting of geologic mapping and shallow gradient drilling (figure 2). The assessment work is planned for November and December, 1981.
5. Mine dump sampling and assaying were performed for most sites visited in order to indicate the presence of precious and strategic metal anomalies associated with mercury/alunite deposits.

Figure 1. Prospect Location Map - 1980 Program

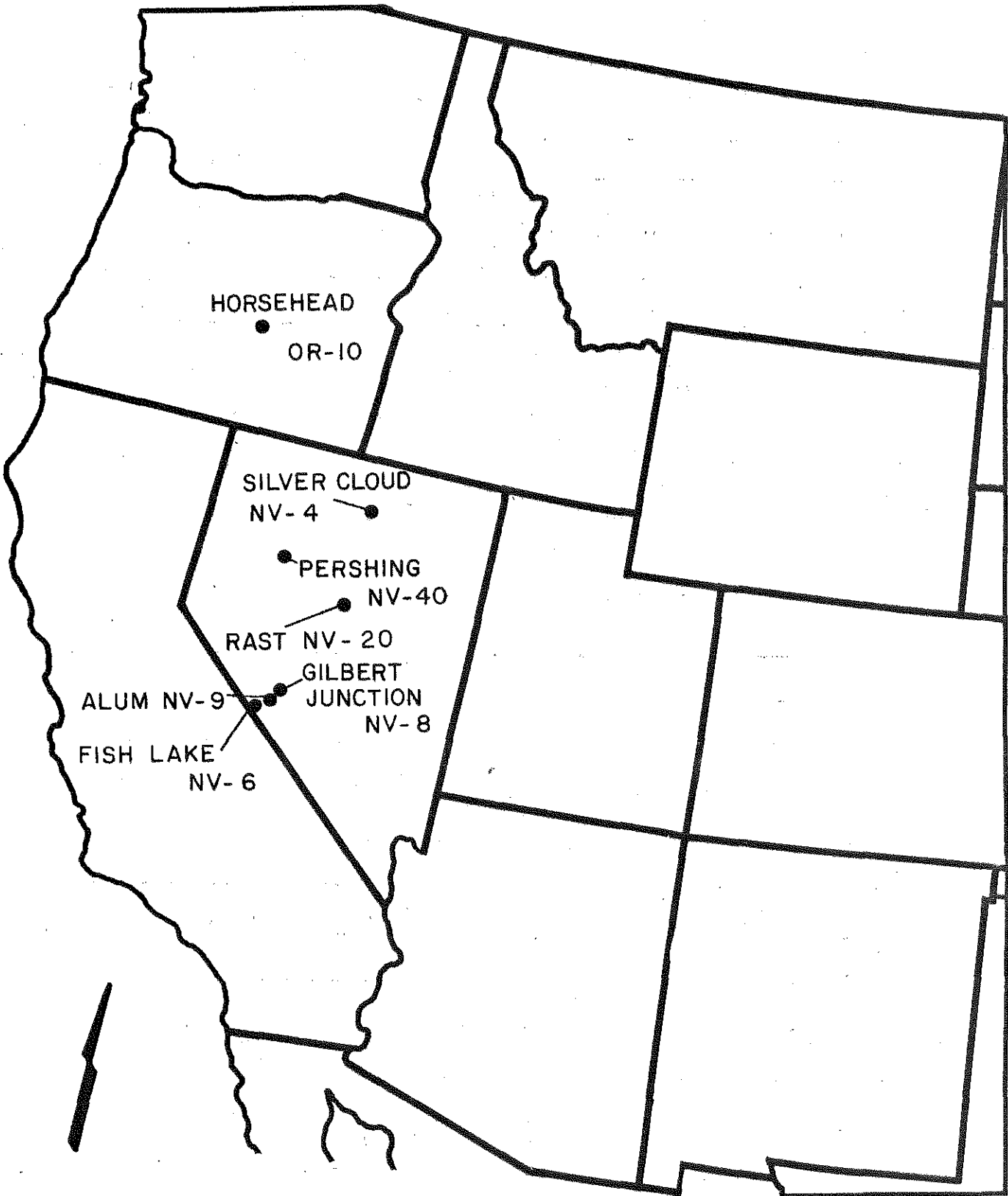
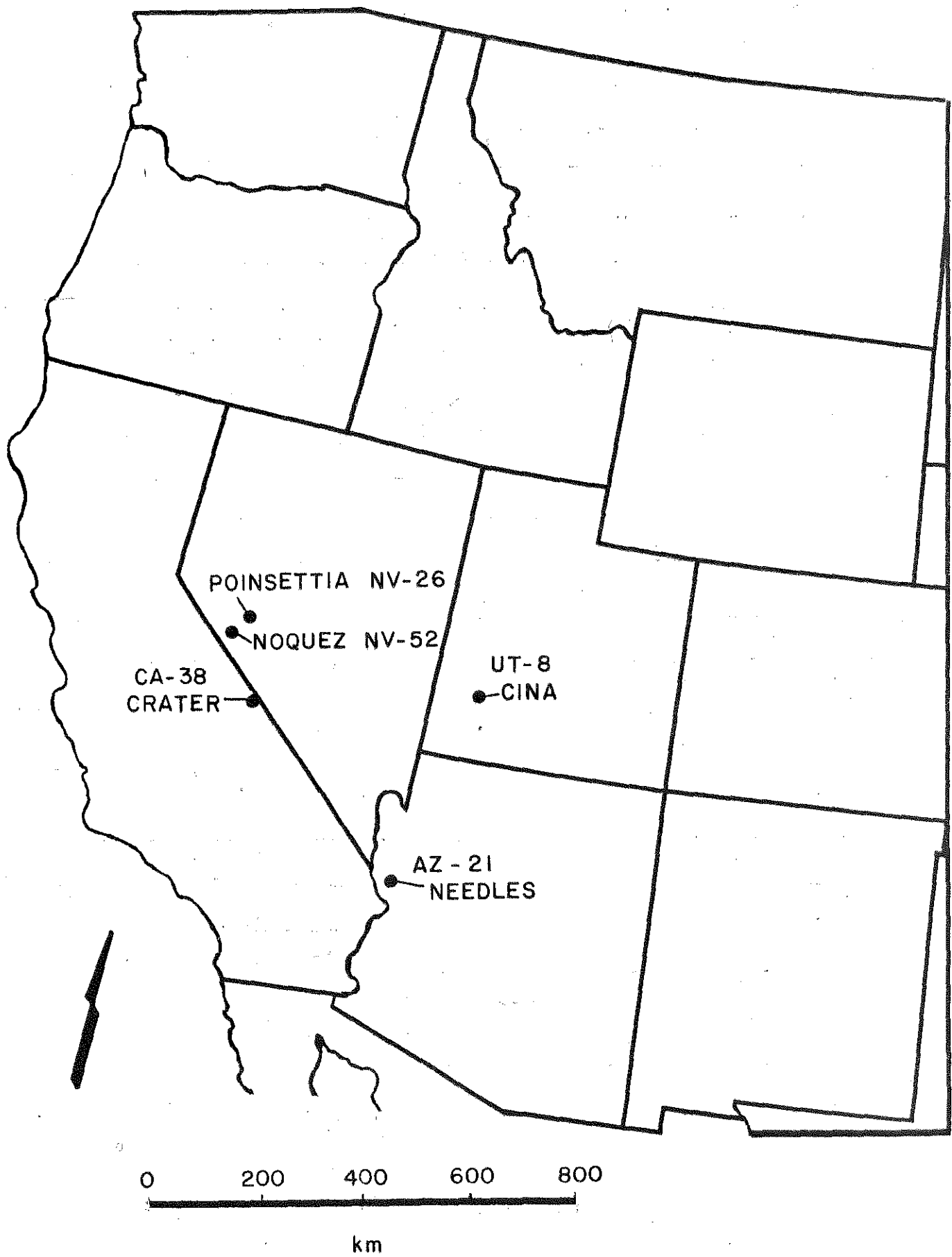


Figure 2. Prospect Location Map - 1981 Program



## Introduction

O'Brien Resources Corporation undertook a geothermal reconnaissance program from August, 1980 to the present (Dellechiaie, F., Maurath, G. and Teplow, W., Interim Results of Mercury and Sulfur Reconnaissance, October 31, 1980; Maurath, G. and Teplow, W., Mercury and Sulfur Reconnaissance Program, February 9, 1981). The program was based on the geothermal evaluation of known mercury/sulfur/alunite deposits in Arizona, California, Idaho, Nevada, Oregon, Texas, Utah, Washington and Wyoming. The reconnaissance phase of the program is now complete. As a result of the program, seven of the prospects examined to date have undergone preliminary assessment. These are (Figure 1):

Alum, Esmeralda County, Nevada  
 Fish Lake Valley, Esmeralda County, Nevada  
 Gilbert, Esmeralda County, Nevada  
 Horsehead, Harney County, Oregon  
 Pershing, Pershing County, Nevada  
 Rast, Lander County, Nevada  
 Silver Cloud, Elko County, Nevada

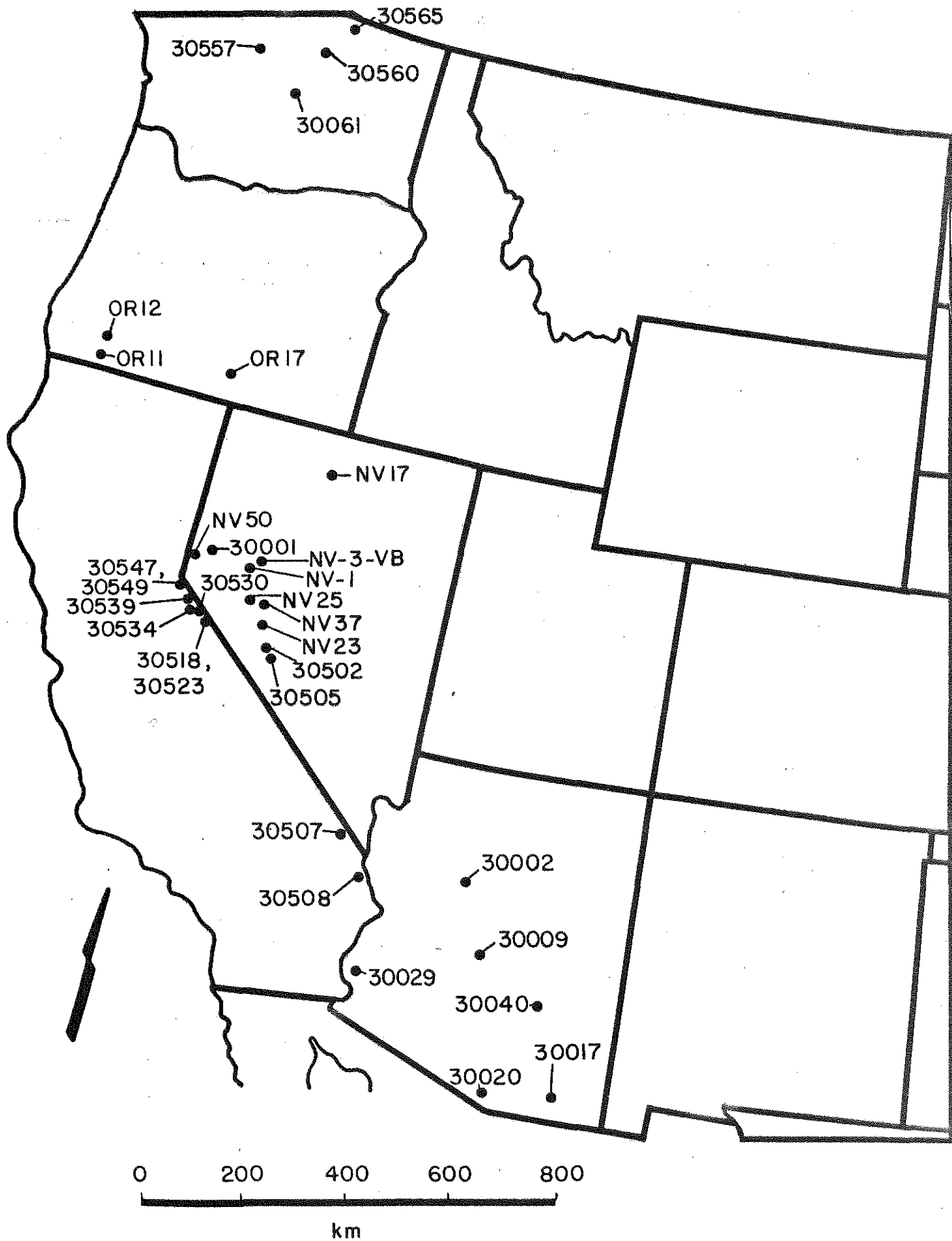
The assessment program for each of the seven prospects consisted of geologic mapping, mercury soil surveying and drilling of one to four shallow gradient holes.

Further exploration has resulted in five additional prospects which warrant further investigation. These prospects are (Figure 2):

Needles, Mojave County, Arizona  
 Crater, Inyo County, California  
 Noquez, Mineral County, Nevada  
 Poinsettia, Mineral County, Nevada  
 Cina, Iron County, Utah

There is a correlation between mercury/alunite and gold/silver occurrences which is significant though not as striking as the mercury-sulfur/geothermal occurrences previously mentioned. Samples were taken from most of the prospects evaluated for geothermal potential. Figure 3 depicts the location of some of the gold/silver anomalies identified to date. Additional assay results for the states of Idaho, Utah, Wyoming and portions of California will be available in the near future.

Figure 3. Precious Metal Anomaly Location Map





### Methodology

The mercury/sulfur/alunite reconnaissance program was executed by three staff geologists such that each geologist assessed only part of the prospect included in the program. To ensure a uniform and consistent framework for comparing prospect descriptions made by different staff members, it was mandatory to develop a standard set of criteria for rating the geothermal merit of each prospect. The ratings of all the prospects were then compared in order to choose prospects which warranted further assessment work. The criteria were chosen for their applicability to the limitations of time, analytical equipment and manpower within which the program was conducted. Mineralogy and lithology were determined by megascopic and hand lens observation. Structure and age of host rocks were determined by field examination and regional geologic literature. Heat flow data was gathered from mineral holes and mine tunnels where available.

The criteria described below were applied to the aforementioned observations to produce a relative geothermal merit rating on a scale of 1 to 10 for each prospect (Tables 1 and 2). Comparison of the rating for each prospect determined which of the prospects would be retained for further assessment work. The criteria are listed in order of decreasing significance:

- 1) Heat flow
- 2) Presence of hydrothermal activity
- 3) Age, type and extent of mineralization
- 4) Age of host rock
- 5) Age and type of nearby extrusive rocks

During on-site investigation, chip samples were collected from various portions of the mine dump(s) at each prospect. Samples were collected in such a manner as to provide a whole rock assay representative of the average ore grade. When possible, hand samples were collected from the face of

Table 1  
Observations sufficient for assigned rating

<u>Rating</u>	<u>Heat flow</u>	<u>Current Hydro-thermal activity</u>	<u>Age, Type, extent of mineralization</u>	<u>Age of host rock</u>	<u>Age and type of nearby extrusives</u>	<u>Type of deposit</u>
8,9,10	5.0 HFU	Hot springs Hot wells Fumaroles	---	Quaternary	---	---
5,6,7	2.5-5.0 HFU	Warm springs Warm wells	Massive or extensive opalite deposits Intense and extensive argillization. Rating decreases with increasing age.	Pliocene- Pleistocene	Quaternary-Late Tertiary acid volcanics. Rating decreases with age and mafic content.	S and Hg
1,2,3,4	2.5 HFU	Cold springs	Alteration is non-silicious, local and incomplete.	Tertiary	Early and Middle Tertiary	Hg

fresh workings. Samples were obtained from outcrops in the vicinity of the reported mercury/sulfur occurrence if there were no mine workings. Samples of adjacent country rock were collected to establish background levels of precious metals.

Table 2 is a summary of all mercury/sulfur prospects evaluated during this exploration program. Sample numbers refer to samples collected for precious metal analysis. Reference numbers refer to the mine evaluation reports listed in Appendix A and the map numbers in figures 1 and 2 and plates 1 through 8.

#### Recommendation of Further Assessment Work

Two prospects in Nevada and one prospect each in Arizona, California and Utah were chosen for further assessment work. Prospects were chosen according to the geologic and geothermal criteria described earlier in this report.

The assessment program for each of the six prospects will consist of:

1. Geologic mapping of approximately four square miles surrounding the prospect at a scale of 1:12,000 with particular emphasis placed on faulting and structure which may control convective heat flow.
2. Drilling and logging of 1-3, 100-300 meter gradient holes in close proximity to the prospect site (figures 5, 7, 9, 11 and 13).

The above assessment program will be completed in December, 1981.

The geology and geothermal features of the five selected prospects are described on the following pages.

Needles, AZ-21

The Needles kaolinite prospect is in Mojave County, Arizona, in Section 35 of Township 17 North, Range 19 West (Figure 4). The prospect is located ten kilometers southwest of Yucca, Arizona and 34 kilometers east of Needles, California. Access is by graded road from Franconia Siding on Interstate 40.

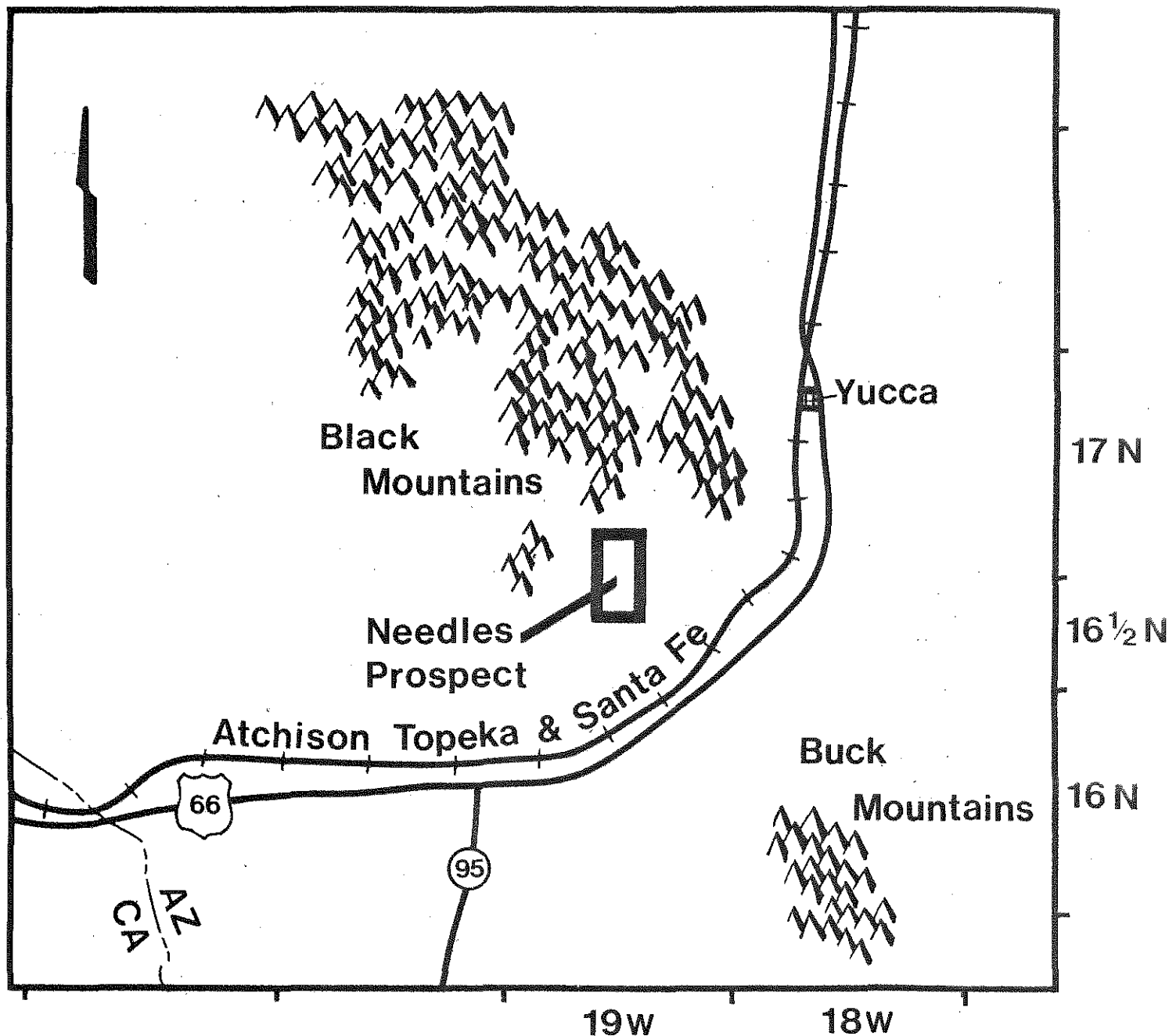
The prospect is at the southern extent of the Basin and Range. Country rock consists of Quaternary olivine basalt, and Cretaceous andesite and rhyolite. Photolinears cross the prospect trending northeast and northwest intersecting at approximately  $45^{\circ}$ . Oatman hot springs, 10 kilometers to the northwest, is in a region of reportedly high chemical geothermometers.

Extensive hydrothermal alteration occurs locally throughout a  $4 \text{ km}^2$  area. Kaolinite has been mined exposing outcrops of  $100 \text{ m}^2$  and  $25 \text{ km}^2$ . These areas of alteration may be fault controlled.

The prospect is located on unpatented federal land. Proposed drill sites are shown in figure 5.

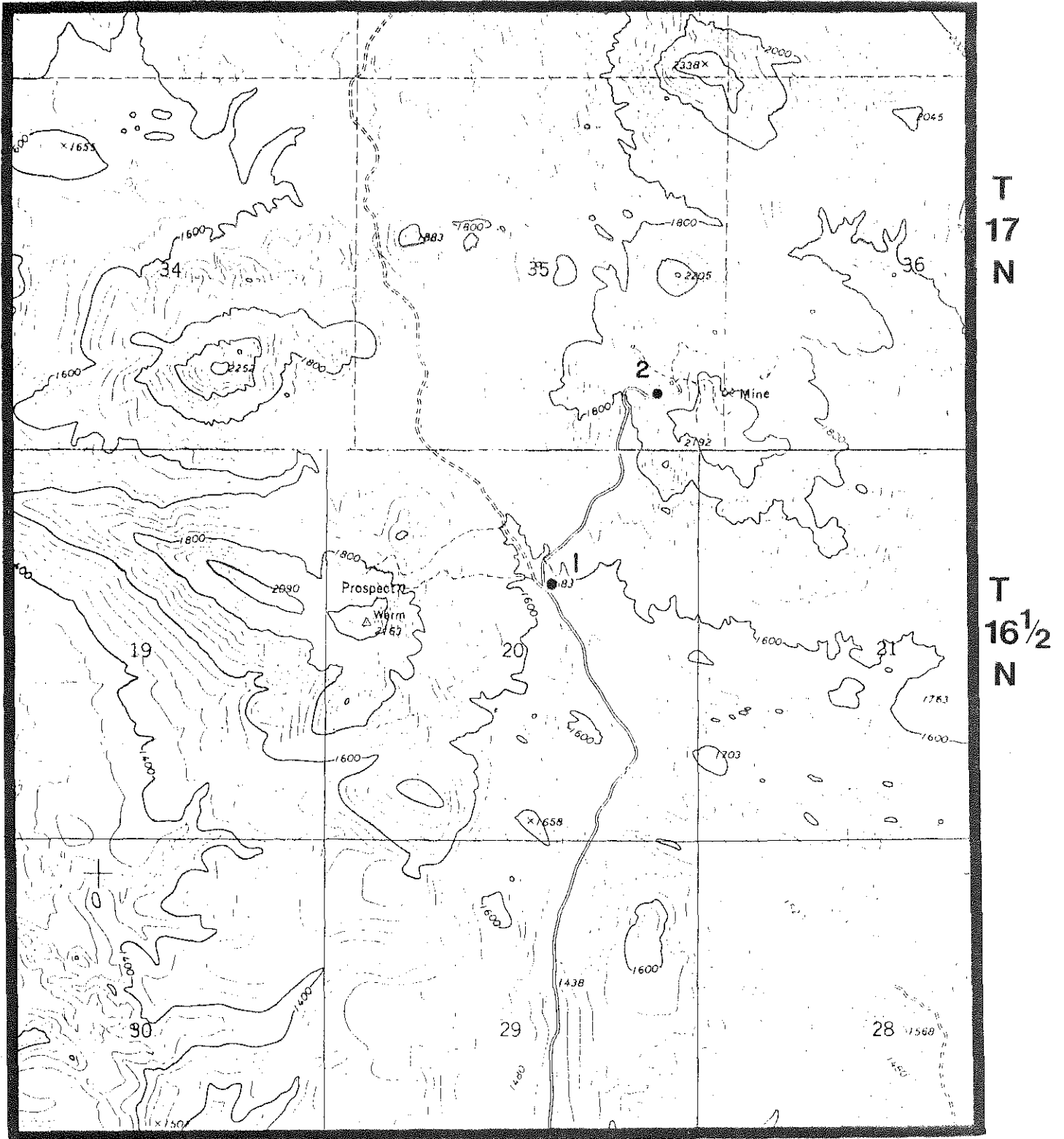
Figure 4. Location Map - Needles, AZ

Mojave Co., Arizona



1:250,000

Figure 5. Drill Hole Location Map - Needles, AZ



R 19W



km

Crater, CA-38

The Crater sulfur mine is in Inyo County, California in Sections 33, 34, 35, Township 8 South, Range 39 East (Figure 6). The mine is located 56 kilometers east of Big Pine, California in the central part of the Last Chance Range. The mine is located in a shallow depression on the crest of the Range at an elevation of 1585 meters. A graded county road leading from Big Pine runs through the prospect.

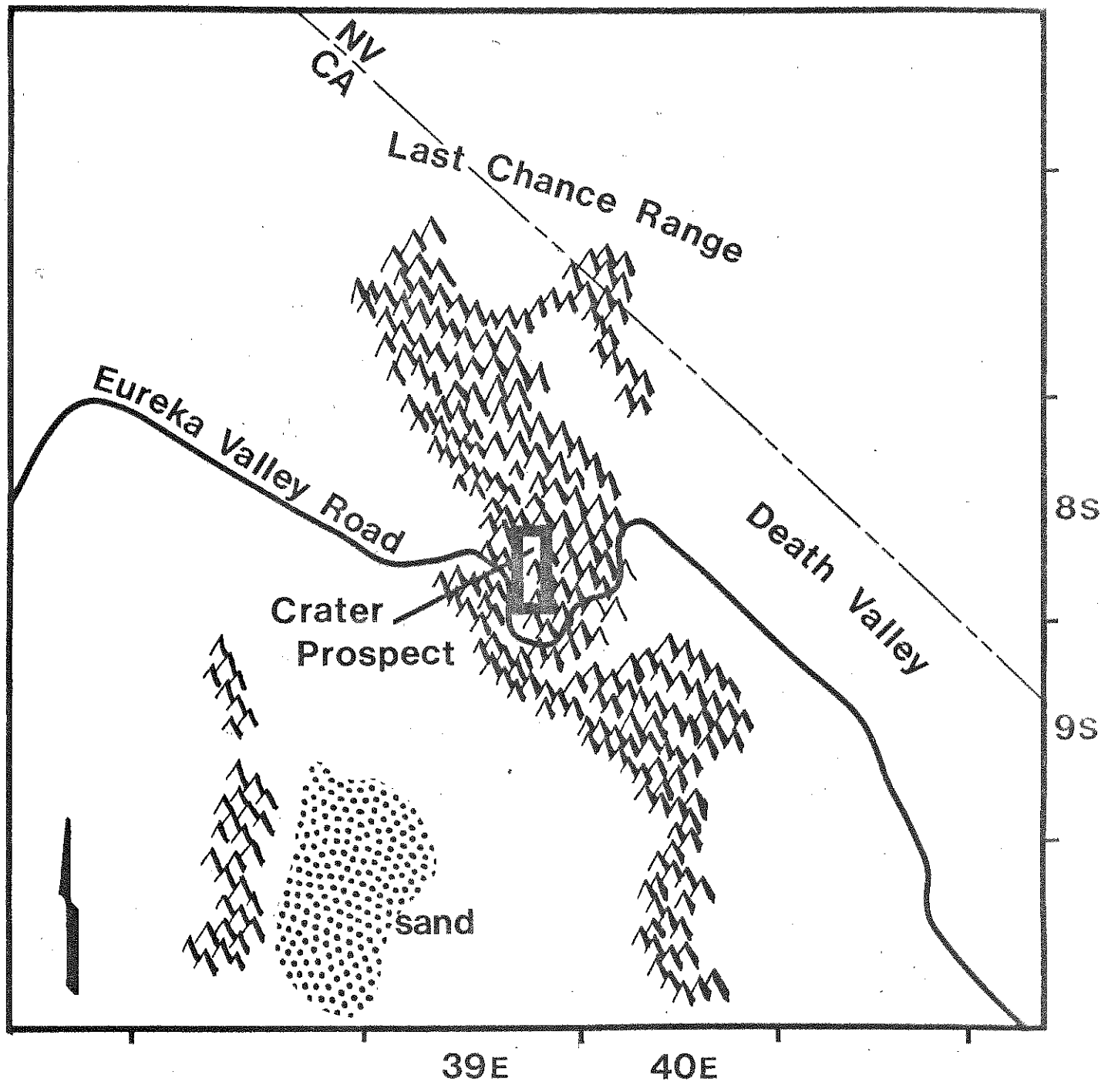
The Last Chance Range is typical of the Basin and Range Province. It consists of a block faulted section of Lower Paleozoic limestone and quartzite overlain by Tertiary andesite and pyroclastics. The Paleozoic units are steeply dipping and intensely folded and faulted. The Tertiary volcanics exhibit only moderate deformation. The range is bordered on the east by the Furnace Creek Fault zone which is a major and currently active right lateral strike-slip fault of large horizontal displacement.

Alteration in the mine area covers approximately one square kilometer and is very intense. It consists of complete argillization of tuffs and underlying andesite. Abundant massive silicification occurs in quartzite breccia zones. Large quantities of native sulfur are found throughout the argillized and silicified units. A mercury mine with massive cinnabar in gypsum is located two and one-half kilometers north of the sulfur mine.

Three mineral holes were probed to a depth of 50 to 100 meters and produced linear gradients of  $30^{\circ}\text{C}/\text{km}$  yielding heat flow values of 1.0 to 1.5 HFU (Gradients 1 and 2). The local geological and mineralogical phenomena are most impressive. The heat flow values are not consistent with these surface geological features. The heat flow values are thought to result from topographic and microclimatic effects.

The prospect is located on unleased federal land with mineral rights retained by mine operators. The mine is currently inactive. Proposed drill sites are shown in figure 7.

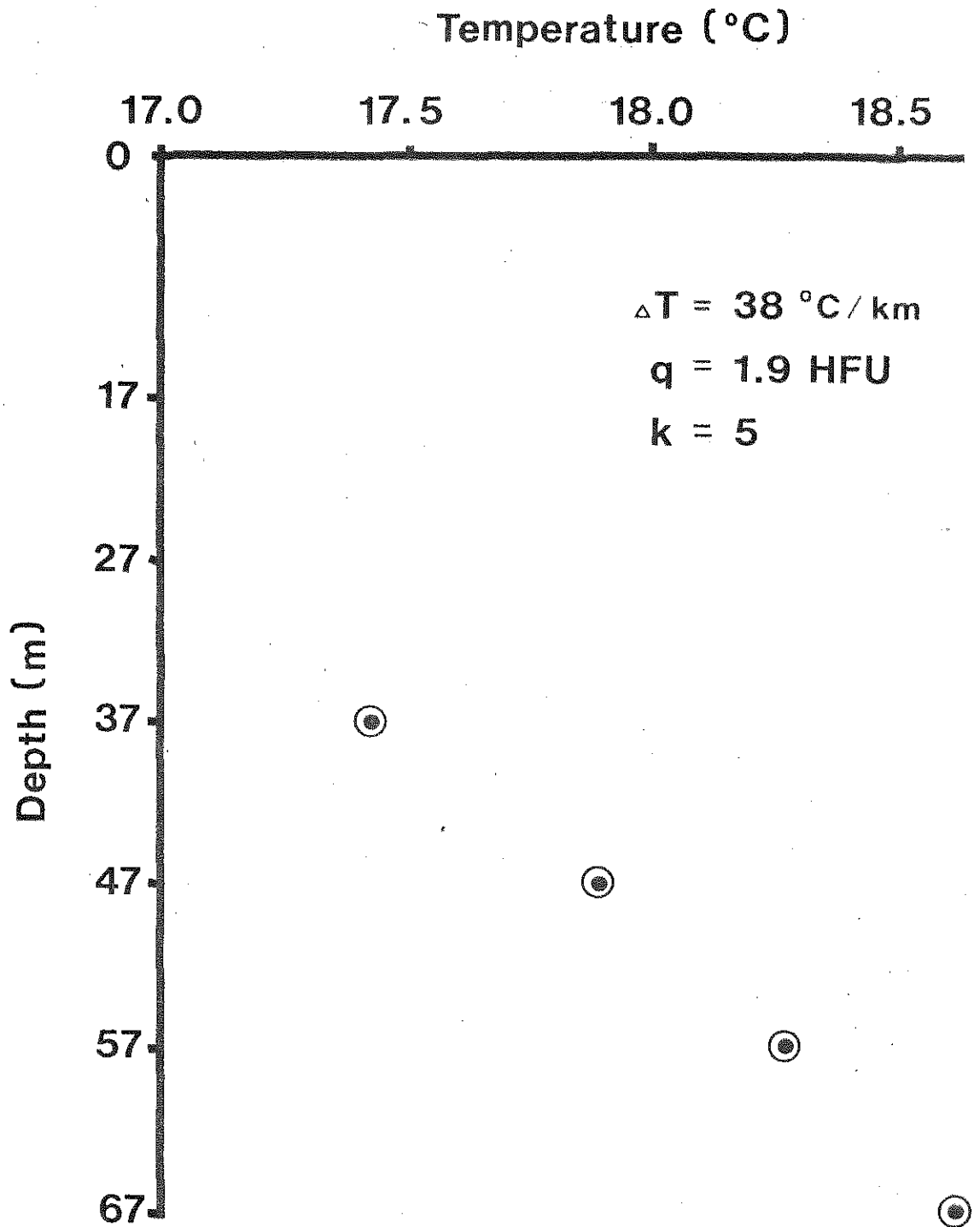
Figure 6. Location Map - Crater, CA



1:250,000

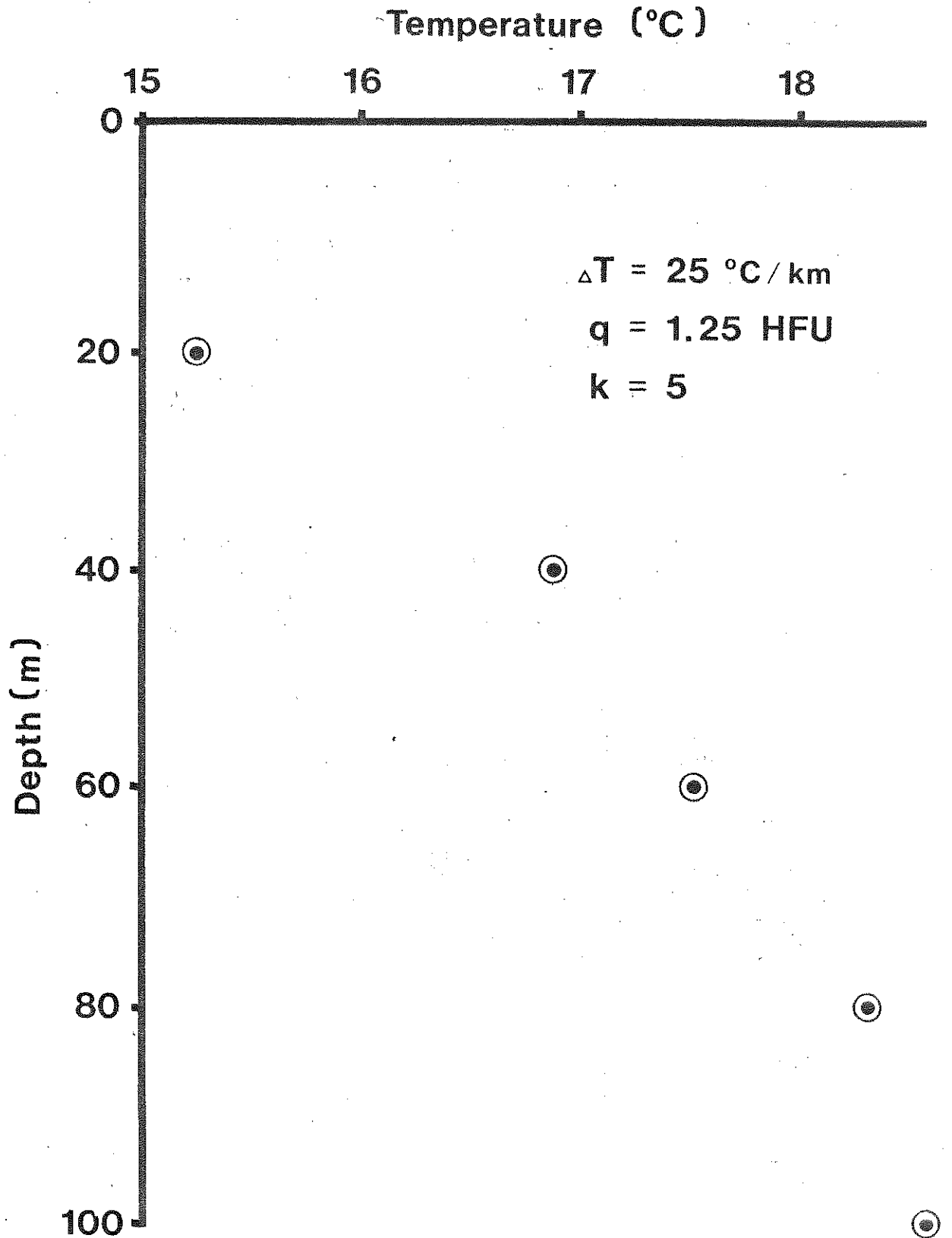
Inyo Co., California





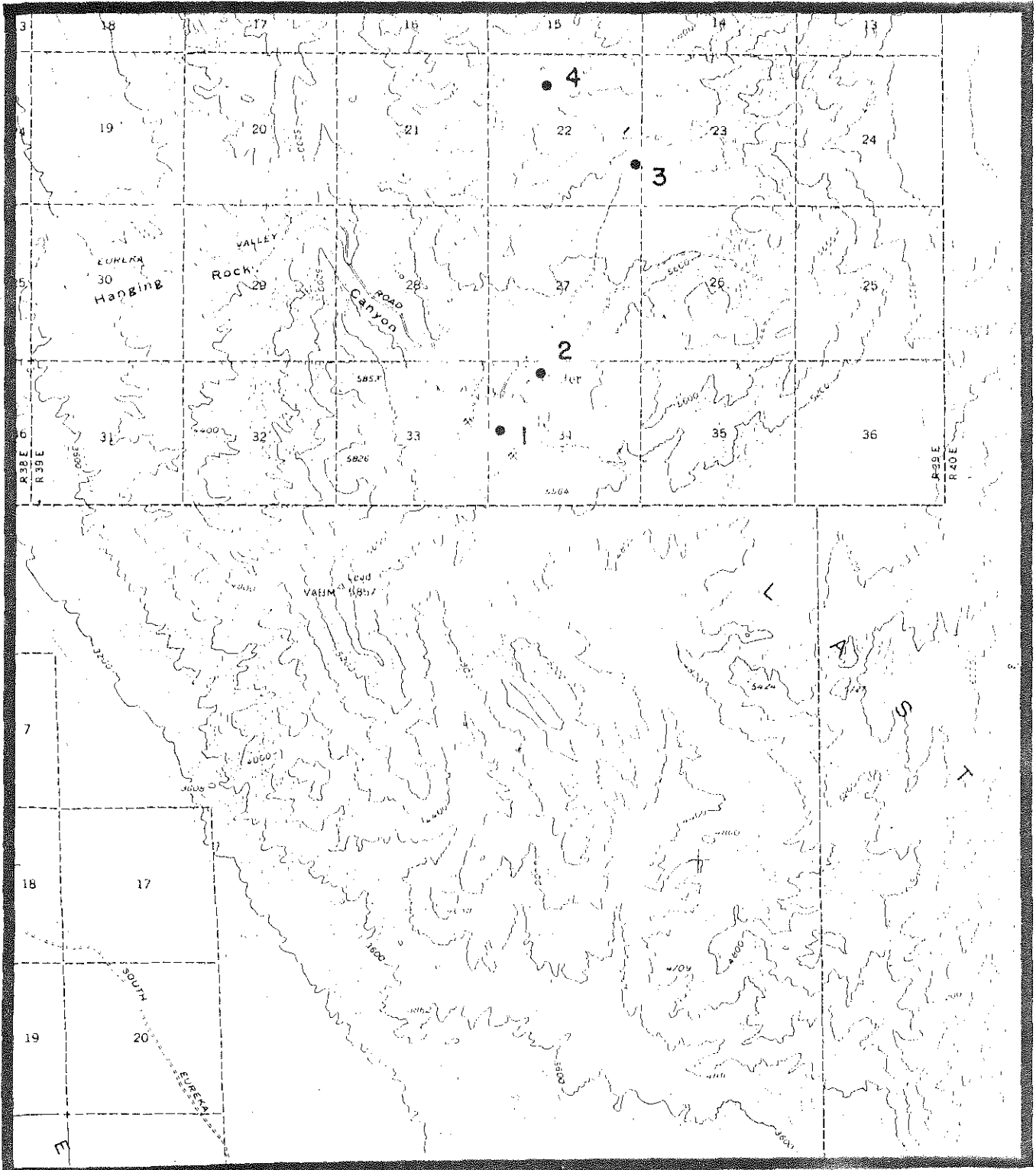
Crater 1 CA-38

October 11, 1981



Crater 2 CA-38

Figure 7. Drill Hole Location Map - Crater, CA



R 39 E



km



Noquez, NV-52

The Noquez mercury prospect is located in Mineral County, Nevada in Section 36 of Township 3 North, Range 32 East. The prospect lies at an elevation of 2040 meters at the western end of the Candelaria Hills which separate the northern terminus of the White Mountains from the Excelsior Range to the north. The prospect is 50 kilometers east of Mono Lake and 10 km northwest of Basalt. The prospect is reached by graded road from Highway 10 which leads from Mina to Basalt (Figures 8,9).

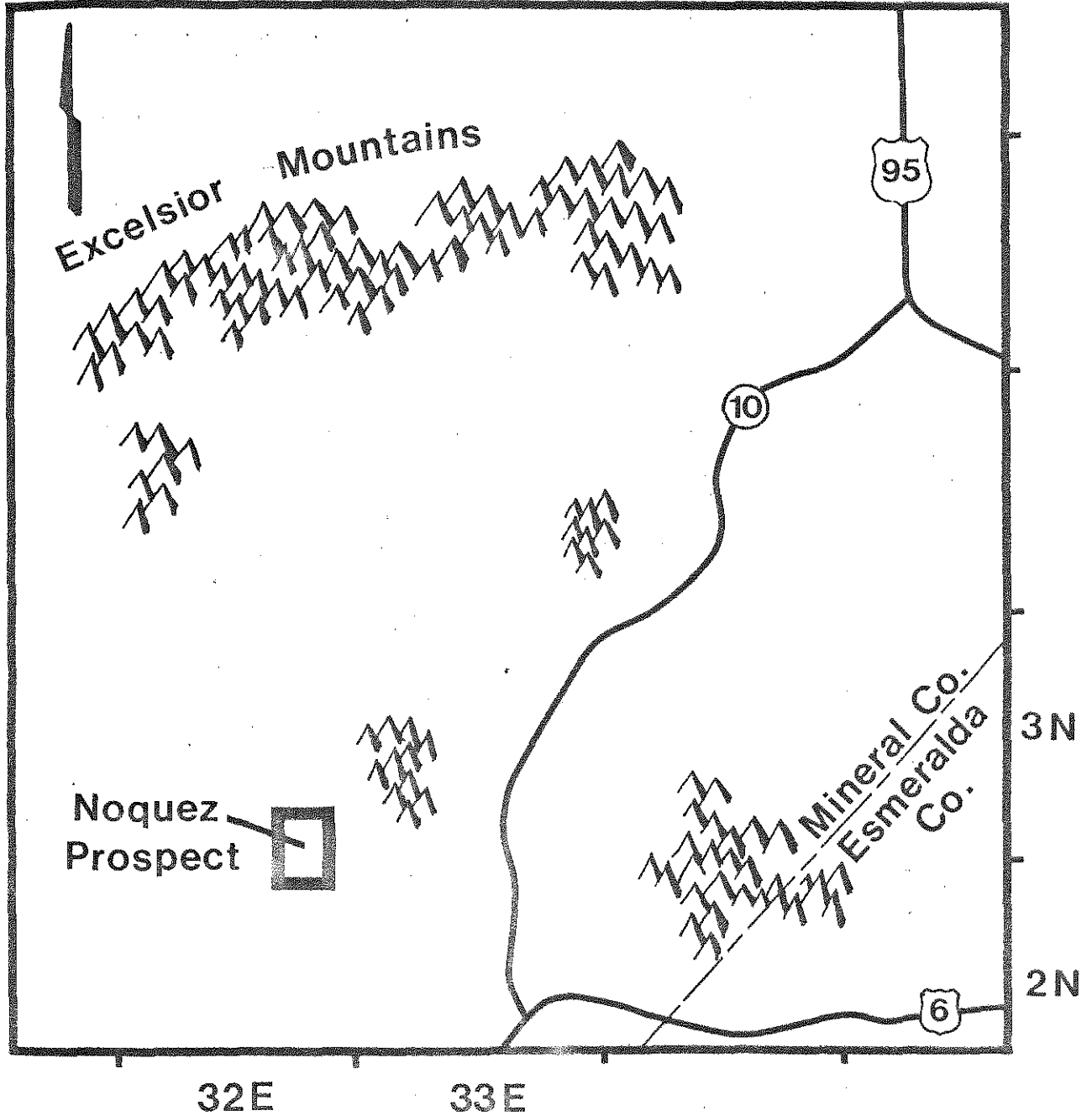
The hills of moderate, rolling topography in which the prospect is located consist of flat lying or slightly tilted Pliocene silicic volcanics overlain by Quaternary olivine basalts. Small outcrops of Ordovician quartzite and silicic shale are exposed along high angle faults with up to several hundred meters of displacement. The main fault system trends NNE.

Alteration in the prospect consists of intense argillization and limonite staining in the Pliocene volcanics. The adjacent Ordovician quartzite exhibit cinnabar and mercury chloride mineralization in fault breccias.

A heat flow of 10 H.F.U. was measured in a drill hole 300 meters south of the mine site. The 110 meter drill hole penetrates ortho-quartzite and siliceous siltstone over its entire depth and has a gradient of  $100^{\circ}\text{C}/\text{km}$  (Gradient 3). A conductivity of 10 TCU was assigned to the rock. The bottom hole temperature was  $23.90^{\circ}\text{C}$  at 110 meters. The high absolute elevation of the prospect and its close proximity to the ridge crest of the surrounding range indicated that the heat flow measurement has been significantly reduced by topographic influence.

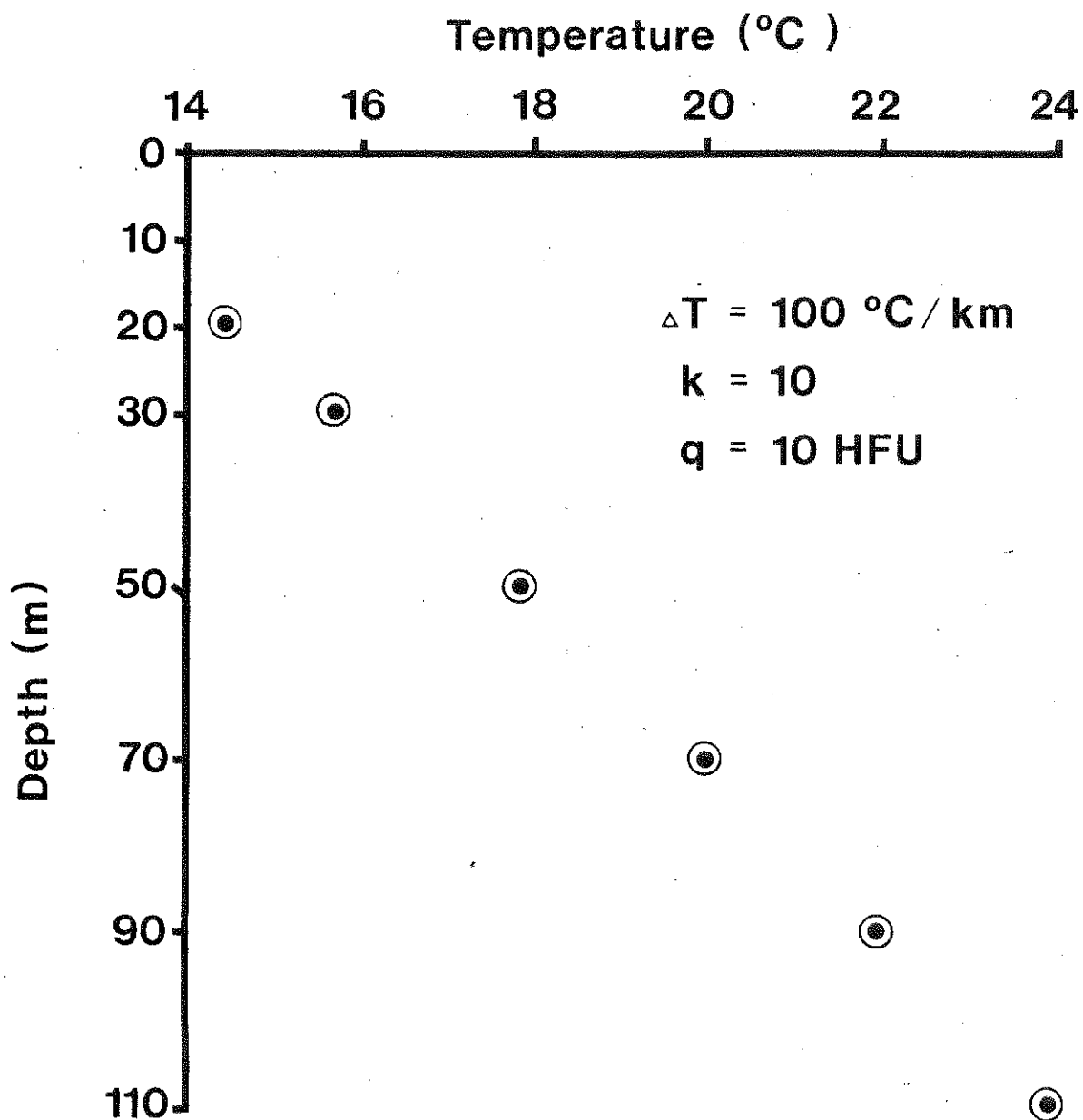
The prospect is located on unpatented and unleased BLM land.

Figure 8. Location Map - Noquez, NV



1 : 250,000

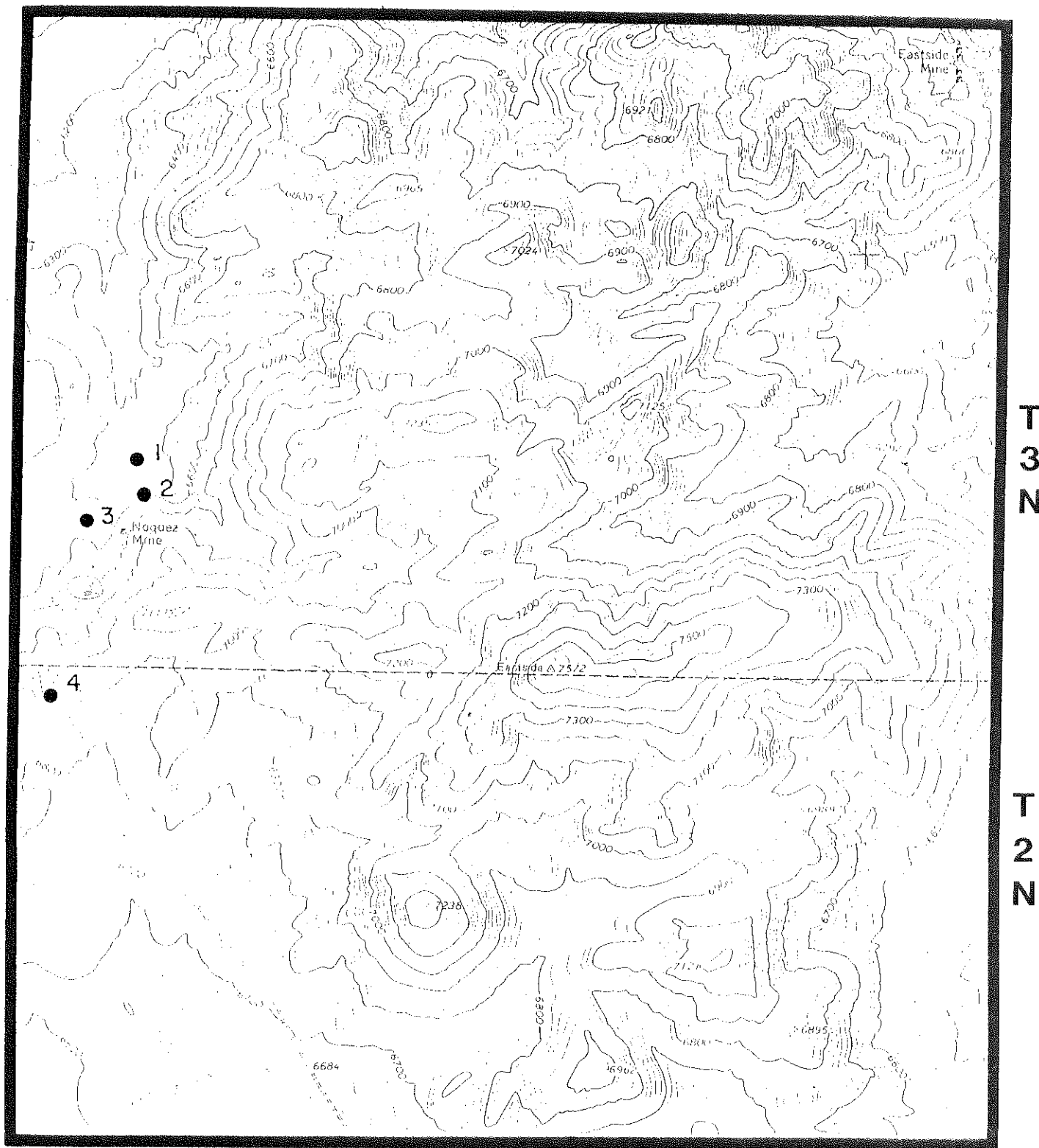
## GRADIENT 3



Noquez NV - 52

October 20, 1981

Figure 9. Drill Hole Location Map - Noquez, NV



T 3 N

T 2 N

R 32 E

0 1  
km

Poinsettia, NV-25

The Poinsettia mercury mine is located in Mineral County, Nevada in Section 34 of Township 11 North, Range 33 East. The prospect is located about ten kilometers southeast of Dead Horse Wells in the northeast end of the Gabbs Valley Range at an elevation of 1615 meters (Figures 10,11).

The Gabbs Valley Range in the vicinity of the prospect consists of silicic and andesitic volcanic flow rocks and associated pyroclastics which reach a thickness of several hundred meters. They overlay Cretaceous intermediate intrusive rocks.

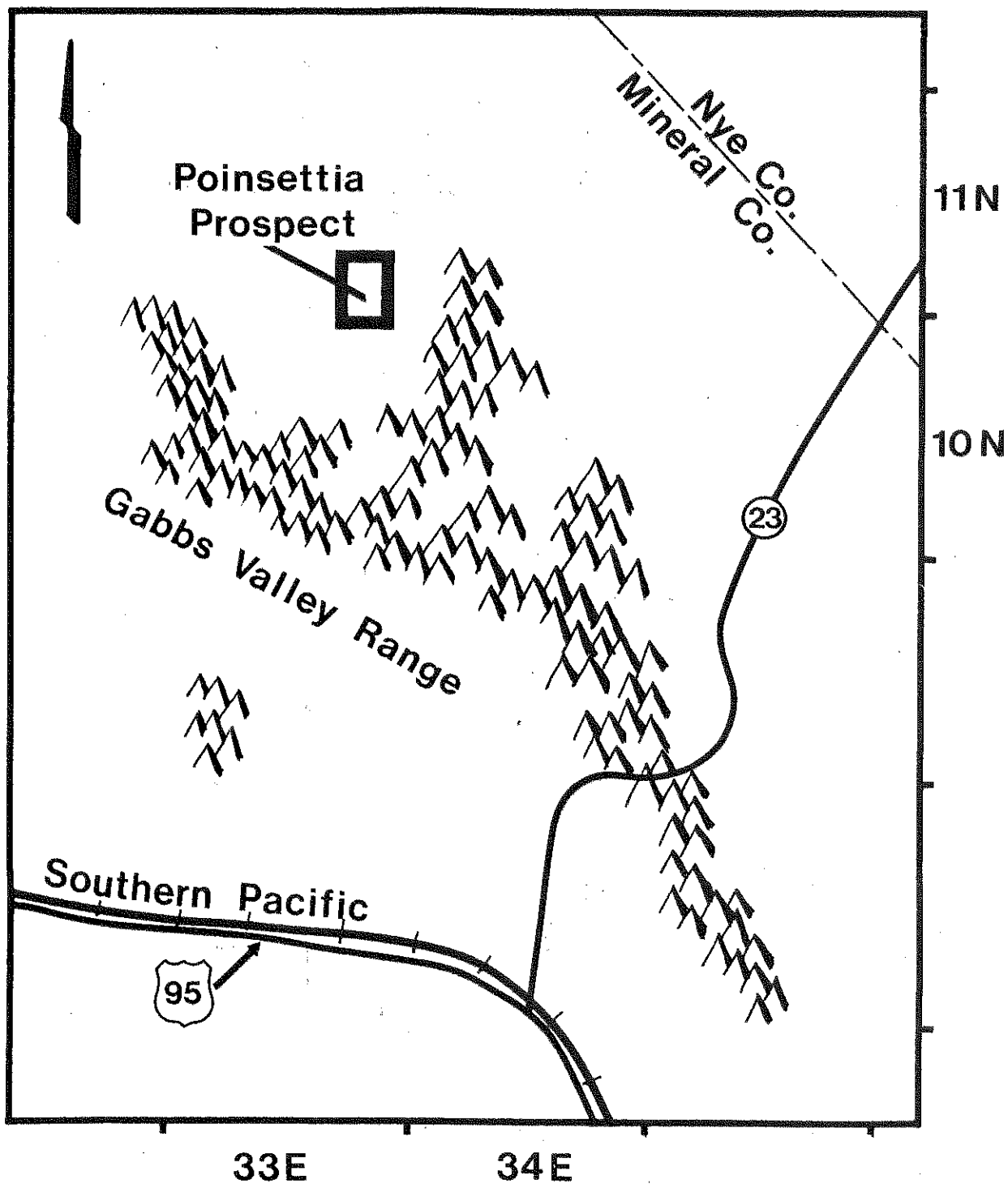
Alteration and mineralization at the prospect site consists of intense and pervasive argillization of medium grained rhyo-dacitic rock accompanied by patchy opalization and cinnabar deposition in and near fractures. The alteration zone covers an area of approximately one-quarter square kilometer.

No heat flow data is available in the vicinity of the prospect. The nearest thermal feature is Alkali Flat Hot Spring which is located 17 kilometers to the northeast.

The prospect is located on unpatented and unleased BLM land.

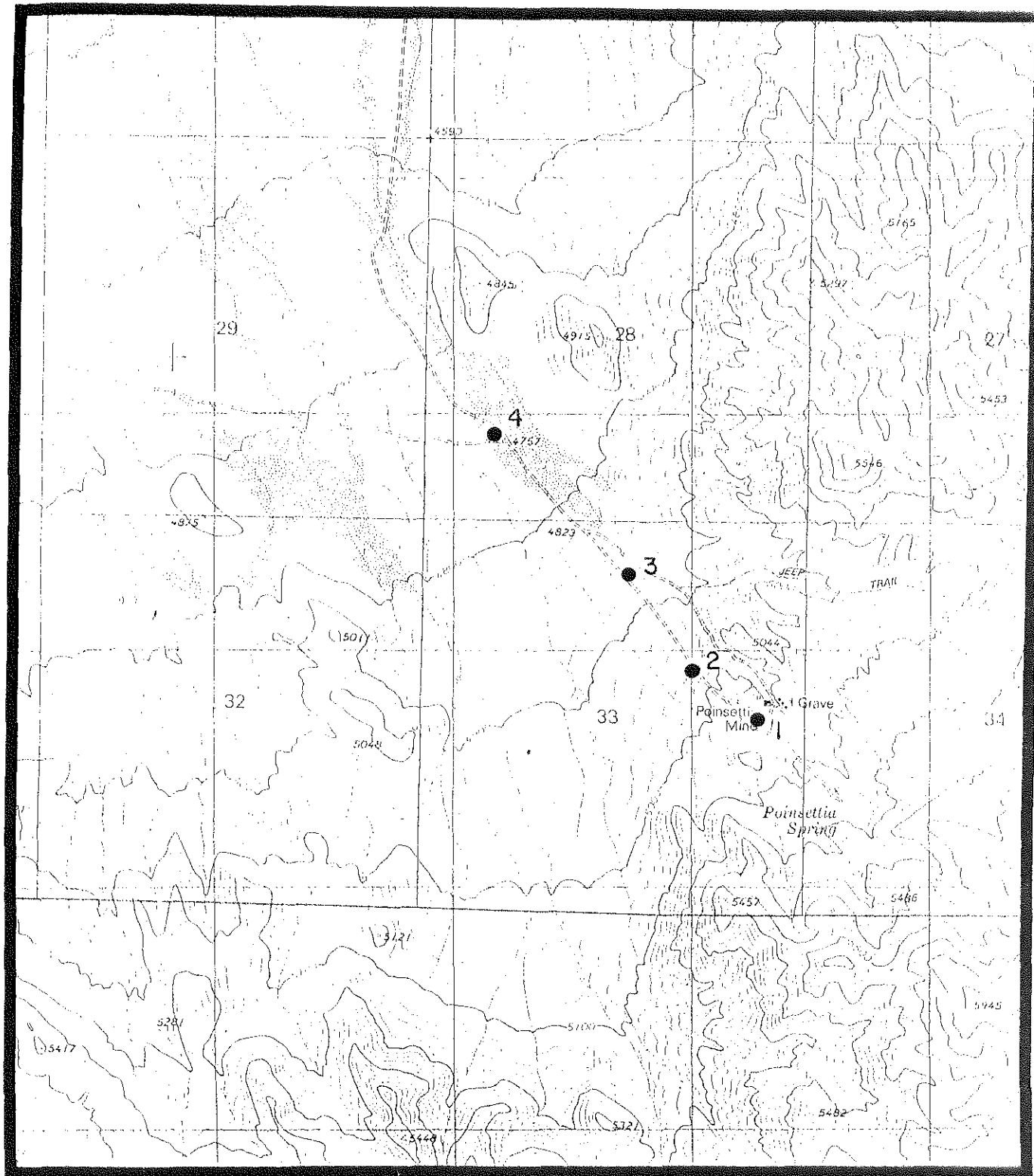


Figure 10. Location Map - Poinsettia, NV



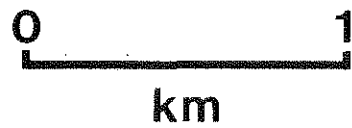
1:250,000

Figure 11. Drill Hole Location Map - Poinsettia, NV



T  
11  
N

R 33 E



Cina Mine, UT-8

The Cina mercury mine is in Iron County, Utah in Section 5 of Township 31 South, Range 15 West (Figure 12). It is located 48 km southwest of Milford, Utah. The prospect lies at an elevation of 2043 meters in a region of moderate relief at the southern end of the Wah Wah Mountains.

The Wah Wah Mountains are a typical Basin and Range block consisting of Lower Paleozoic carbonate and clastic units overlain by Middle Tertiary silicic pyroclastic and flow rocks. The Cina Mine straddles a high-angle fault contact between a Paleozoic dolomite and Tertiary water-lain tuffs.

Alteration and mineralization are pervasive and intense over the one-quarter square kilometer occupied by the mine. The tuff unit is bleached and argillized. Massive replacement lenses of opalite and chalcedony roughly follow remnant bedding in the tuff. Massive, irregularly shaped bodies of native sulfur and alunite with dimensions up to several meters are dispersed throughout the alteration zone. Cinnabar is found as knots and stringers in the alunite, as fillings in faults and fractures and disseminated in the opalite. Faulting in the mine is both pre- and post-mineralization.

The only heat flow data available for the prospect is a 12°C tunnel temperature taken at 127 meters from the tunnel entrance. The tunnel enters the open-pitted ridge at its base and has a maximum of 30 meters rock thickness overhead. The low tunnel temperature is thus thought to be caused by topographic and microclimatic effects. A cold well with a water temperature of 10°C at 12 meters is located one-half kilometer west of the mine. The prospect is located within a 72 kilometer radius of the Newcastle, Beryl, Frisco and Roosevelt Hot Springs geothermal anomalies.

The prospect is located on unleased federal land. Mineral rights are held by Exxon Mineral Company, P.O. Box 120, Denver, CO 80201. The mine is currently inactive. Proposed drill site locations are shown in figure 13.

Figure 12. Location Map - Cina, UT

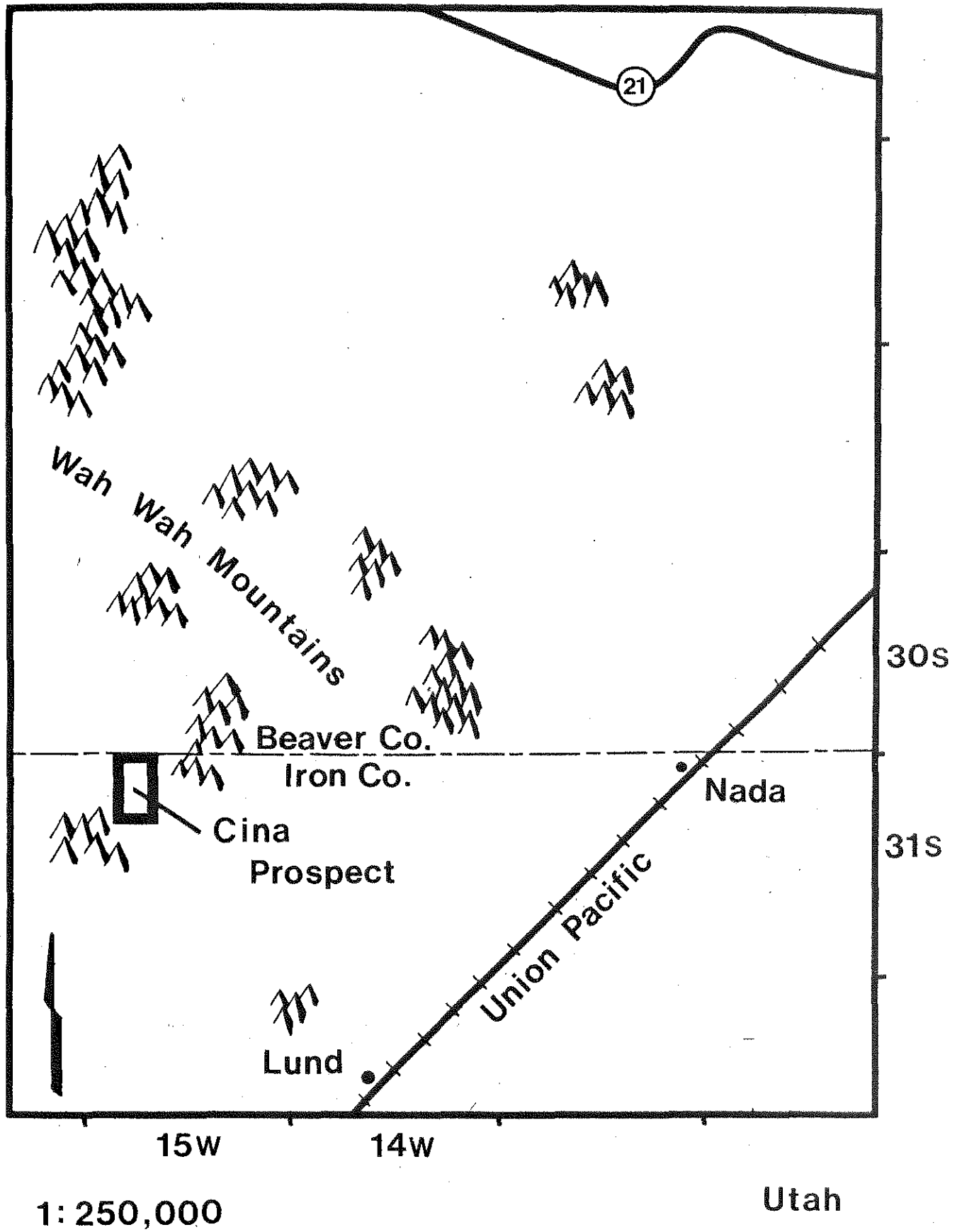




Table 2  
Summary of Evaluated Prospects

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
<u>Arizona</u>						
AZ-17	Cochise	Superior and Boston	23S	24E	30015, 41	2
AZ-18	"	Ricketts Mine	18S	19E	30019	2
AZ-19	"	Toughnut	20S	22E	30016, 17, 42, 43	3
AZ-20	"	Silver Bill, Gleeson	19-20S	24-25E	30018	2
AZ-16	Coconino	Chinle Fm.	40N	8E	-	2
AZ-2	Gila & Maricopa	Ord, Pine Mt., Sunflower, Rattle- snake, Flotation to Tables Mill, National, Apex, Cendia, Native, Oneida, Red Top, Cornucopia, Blue Bird, Gold Creek Gp., Irl Gp., Mercuria Gp.	7N	8-9E	30007, 08, 36, 37	2
AZ-5	Gila	Old Dominican, Cowboy	3S	15E	30012, 40	2
AZ-12	"	Deadman's Wash	9N	8E	-	2
AZ-24	Graham	Lone Star District	6S	26-27E	-	3
AZ-4	Greenlee	Stevens, Paradise, Ryerson	4S	29E	-	1
AZ-9	Maricopa	Rico, Mercury and Eureka claims, San Hughes claim, Boulder Gp., Cram, Sealrock, Victoria, Brown	2-3N	3E	30010, 38	2
AZ-11	"	Wolf, several unnamed mines	5-6N	4W	30004, 05, 34, 35	4
AZ-22	"	Cave Creek district	6N	4E	30009	2
AZ-15	Mojave	Fey, Senator	28N	19W	30030, 54	2
AZ-21	"	Several unnamed mines	17N	19W	-	5
AZ-25	"	Idaho, Cerbat, Tripple R, Sixty- Three, Jordan	22-24N	17-18W	-	2

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
AZ-30	Mojave	Alamo	12N	13W	-	2
AZ-6	Pima	Roadside	16S	8E	30024, 48	3
AZ-7	"	Cerro Colorado (Heitzelman)	20S	10E	30023, 47	2
AZ-8	Pinal	Jack Rabbit, Turning Point, Desert Queen	9S	4-5E	30025, 49	2
AZ-10	"	Mt. View Cinnabar (Dacite Cliffs)	1N	10E	30011, 39	6
AZ-23	"	Reward	9-10N	2-3E	30026, 50	3
AZ-26	"	San Manuel	8S	16E	-	2
AZ-27	"	Ray, Kennecott	3S	13E	-	2
AZ-3	Santa Cruz	Pat, 3R, Worlds Fair	22S	15E	30021, 22, 45, 46	3
AZ-29	"	Duranium, Wandering Jew, Alto, Royal Blue	20S	14E	30020, 44	2
AZ-13	Yavapai	Mercury, Cinnabar, Queen, Zero	13N	3W	30003, 33	3
AZ-14	"	Shylock, Yaeger	14-15N	2E	30002, 32	2
AZ-28	"	Westerdahl	7-7 $\frac{1}{2}$ N	2-3W	30006	2
AZ-1	Yuma	Mammoth, Dome Basin, Darling, Colria, Bear, Copper Bottom, Copper Chief, Sugarloaf Peak, Sugarloaf Peak Alunite, numerous unnamed mines	2-5N	20W	30027, 28, 29, 51, 52, 53	2
<u>California</u>						
CA-1	Alpine	Cherokee, Alpine and unnamed mines, Leviathan, Zaca	10N	21E	CA-1	4-5
CA-58	Del Norte	Prospect	18N	2E	-	1

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
CA-59	Del Norte	Holiday Mine	18N	3E	30603	1
CA-60	"	Big Boy	19N	2E	30604,5	1
CA-96	Fresno	Anita	18S	13E	-	2
CA-97	"	Del Mexico	18S	13E	-	2
CA-98	"	Archer	19S	13E	-	2
CA-25	Imperial	Coyote Mountain district	16S	10E	30516	1
CA-32	"	Clay prospects	11S	20E	-	1
CA-55	"	American Girl Mine	15S	21E	-	3
CA-38	Inyo	Black Sulfur Group, Crater	8S	39E	30509	3
CA-39	"	El Capitan	8S	39E	30512	2
CA-51	"	Mercury Mine	8S	39E	30504	2
CA-15	Kern	Middle Butte	10N	13W	30577	3
CA-22	"	Cuddeback, Walibu	31S	32E	30569,70,71,72, 73,74,75,76	4
CA-70	"	Tehachapi district	30S	37E	30578,9	3
CA-2	Kings	Atlas, Dawson	23S	16E	CA-2	2
CA-90	"	Kings Mine, Atlas	23S	16E	30192	2
CA-91	"	Avenal Canyon	23S	16E	-	2
CA-92	"	Dawson, Atlas	23S	16E	30188,89,90,91	2
CA-93	"	Little Kings	23S	16E	-	2
CA-62	Mendocino	Hopland	12N	11W	30606,7	4



NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
CA-40	Modoc	Brown Prospect	39N	14E	30591	3
CA-41	"	Willow Ranch district	46N	14E	30589,90	3
CA-43	"	Klondike Mines	47N	15E	30585,6,7,8	3
CA-44	"	Canby district	41N	9E	30584	2
CA-71	"	Obsidian quarry	46N	14E	-	4
CA-23	Mono	Hg prospect	4N	26E	30524,5,6,7,8	2
CA-29	"	Cornucopia, Comanche	2S	32E	30518,19,20,21,22,23	3
CA-54	"	Hg Prospect	5N	24E	30542,3	2
CA-56	"	Paramount	5N	26E	30534,5,6,7	2
CA-57	"	Rough Creek	5N	27E	-	2
CA-117	Monterey	Patriquin	23N	14E	30193,94,95	3
CA-118	"	White Mine, Rattlesnake Prospect	23N	16E	-	2
CA-3	San Benito	Central San Benito district	16S	10E	CA-3	4
CA-4	"	Clear Creek Mine	17-18N	11-12E	CA-4	3
CA-110	"	Lea-Grant	16S	10E	30657	3
CA-111	"	Wonder	17S	12E	30200	1
CA-112	"	Spanish	17N	12E	-	*
CA-113	"	New Idria	17S	12E	30201	2
CA-114	"	Flint Group, Clear Creek	18S	11E	30199	2
CA-115	"	Alpine	18S	11E	30197,98	2

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
CA-116	San Benito	Breen, Picacho, St. Thomas	18S	11E	30196	2
CA-19	San Bernardino	Hart	14N	17E	-	2
CA-24	"	Mercury Prospect	6N	18E	-	1
CA-46	"	Rhumba	11N	1W	30582	3
CA-47	"	Turtle Dove Quicksilver Mine	9N	18E	-	2
CA-52	"	Redlead	7N	22E	30508	1
CA-53	"	Red Bird claim	9N	3W	30580,1	2
	San Luis Obispo					
CA-6	"	Rinconada, Mercury Belle	30S	14E	CA-6	3-4
CA-7	"	Cambria, Hamilton, Warner	26S	8-10E	-	4-5
CA-69	"	Polar Star	25S	6E	30633,34	1
CA-82	"	Hamilton-Warren	26N	9E	30631,32	1
CA-83	"	Klan	26S	10E	30621,22	2
CA-84	"	Buena Vista - Mahoney	26S	10E	30619,20	2
CA-85	"	Oceanic	27S	9E	30627,28	2
CA-86	"	Bonanza	27S	10E	30623,24	2
CA-87	"	La Libertad	27S	10E	30625,26	1
CA-88	"	Rinconada	30S	14E	30615,16	2
CA-89	"	Deer Trail	32S	16E	30617,18	1
CA-8	Santa Barbara	Redrock, several unnamed mines	7N	29W	CA-8	3

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
CA-9	Santa Barbara	Graciosa Ridge district	9N	33-34W	CA-9	2
CA-64	"	Happy Canyon	7N	29W	30610, 30611	1
CA-65	"	Gibraltar	5N	27W	30608, 09	1
CA-66	"	Lion Den	8N	29W	30612	1
CA-67	"	Red Rock	7-8N	29W	30613, 4	1
CA-68	"	Sulfur Dome	7N	29W	30614	1
CA-121	Santa Clara	North American	7N	2E	30659	2
CA-124	"	Rianda	10S	4E	30658	2
CA-11	"	Guadalupe Mines, Day tunnel, Randol tunnel, English twon mine, New Almadin mine	8-9S	1W	-	6
CA-33	Siskiyou	Cinnabar	46N	10W	30592, 3	2
CA-80	"	Cinnabar	47N	7W	30594, 5	1
CA-12	Stanislaus	Phoenix,	6S	5E	-	2
CA-99	"	Phoenix	6S	5E	30656	3
CA-28	Trinity	Altoona	38N	6W	30596, 7	2
CA-72	"	Soda Pop Spring	38N	5W		2
CA-73	"	Integral	38N	6W	30598, 9	2
CA-13	Ventura	Sulfur district	9N	23W	-	1-2

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
<u>Idaho</u> ID-14	Bear Lake	Rattlesnake Canyon Sulfur	10S	43E	-	*
ID-1	Blaine	Deer Creek, Bonnie	3N	16E	30156,57,58	2
ID-16	Camas	Perseverance, Sunday Group	2N	14E	30154, 30155	2
ID-15	"	Jennie R. Prospect	2N	16E	30159,60,61	2
ID-17	Caribou	Dewey, Idaho, Sulfur, Sulfur springs, unnamed mines	9S	42E	-	*
ID-2	Cassia	Miller Cinnabar, Valentine, Ackerill Cinnabar, Hazel Pine Tolman	15-16S	29E	30183, 84,85,86,87	1
ID-18	Clearwater	Driessel	39N	2E	-	*
ID-19	"	Moose Mountain	40N	10E	-	*
ID-3	Custer	Massacre Hg, Stanley Creek, Willis Placer, Bell Cross	11N	13E	30165	2
ID-20	"	New Hope Lode	14N	18E	30162,63,64,66	2
ID-33	Elmore	Boise-Rochester	5N	11E	-	3
ID-4	Idaho	Rube placers	22N	4E	30172	2
ID-5	"	Bostic	22N	4E	30171	2
ID-21	"	Red River Stibnite Deposit	29N	8E	30173	2
ID-22	Lemhi	Blackbird	21N	18E	30180,30181	2
ID-23	"	Hughes Creek	3S	20W	30177,78,79	1
ID-6	Owyhee	Mac D Mining Corp.	2N	5-6W	30149	2
ID-7	"	Fletcher & Brunzell	2-3S	2W	-	*

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
ID-8	Owyhee	Castle Creek Mercury	5S	1W	-	*
ID-24	"	Imperial	15S	6E	30152,53	5
ID-25	"	Mac D Mining	10S	3E	-	*
ID-26	"	Eagle Rock Placers	6S	4W	30150,51	2
ID-9	Power	Juniper Hill, Barite	8S	31E	30182	2
ID-27	Shoshone	Sunset minerals	48N	2E	30174,75,76	1
ID-28	Teton	Sulfur Springs	4N	45E	-	1
ID-10	Valley	Hermes, Fern, North Monday	18N	9E	30168,69,70	2
ID-29	"	Greenrock prospect	16N	10E	-	*
ID-30	"	B & B	19-21N	8-9E	-	*
ID-31	"	Boiling Springs	12N	5E	30167	5
ID-11	Washington	Idaho Almaden	10-11N	3W	-	*
ID-12	"	Consolidated	11-12N	4W	-	*
ID-13	"	John Coats Prospect	12N	5E	-	*
ID-32	"	Virginia L.	15N	6W	-	*
<u>Nevada</u>						
NV-1	Churchill	Cinnabar Hill	15N	30E	NV-1	2
NV-2	"	Fairview district	16N	34E	-	2
NV-3	"	Mountain wells district	17-18N	32E	NV-3-VB	2
NV-4	Elko	Butte Quicksilver, Coleman, Govener, Jackson Surprise, Rim- rock, Homestake, Silver Cloud, Rock Creek, Teapot	37-38N	47-48E	NV-4	7

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
NV-5	Esmeralda	B and B, Red Rock	1S	34E	-	3
NV-6	"	Fish Lake Valley district	1S	35E	-	7
NV-7	"	Castle Rocks	3N	38E	NV-7	4
NV-8	"	Gilbert Junction	3N	39E	NV-8	6
NV-9	"	Alum	1S	39E	NV-9	7
NV-10	Humboldt	Winnemucca district	36N	37E	NV-10	2
NV-11	"	Cahill, Hapgood, Holt, Prentiss	40N	40E	-	2-3
NV-12	"	Dutch Flat, Last Chance	38N	40E	NV-12	3-4
NV-13	"	Baldwin, Birthday, Blue Canyon, McAdoo, Nieburh, Red Ore, White Peaks, White Peak Mines	40N	33E	NV-13	4
NV-14	"	Cordero, Disaster Peak	47N	37E	-	5
NV-15	"	Buckskin Peak Mine, Canyon Creek Prospect	45N	39E	-	2
NV-16	"	Gayer-Moo Plymouth	35N	38E	NV-16	2
NV-17	"	Getchell	39N	42E	NV-17	2
NV-18	"	Rattlesnake Canyon	35N	30E	-	2
NV-19	"	Nevada Sulphur	35N	29E	-	5
NV-20	Lander	Rast property district	21N	45E	-	9
NV-21	"	Rast property	21N	45E	-	9
NV-22	"	Warm Springs Prospect	27N	43E	-	4

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
NV-23	Lyon	DeLongchamps Prospect district	18N	24E	-	4
NV-24	Mineral	Lou Prospect	8N	36E	NV-23	2
NV-25	"	Red Top (Red Wing)	6N	36E	-	2
NV-26	"	Poinsettia	11N	33E	NV-25	4
NV-52	"	Noquez	3N	32E	-	7
NV-27	Nye	Houston Oil and Mineral Big Four Mine	8N	44E	-	5
NV-28	"	Mariposa Canyon district	9N	44E	-	3
NV-29	"	War Cloud property	12N	39E	NV-28	2
NV-30	"	Nevada Cinnabar	12N	39E	-	3
NV-31	"	Mercury Mining Co.	12N	39E	-	3
NV-32	"	San Pedro	12N	40E	-	3
NV-33	"	unnamed	1S	43E	-	1
NV-34	"	Telluridge Hg mine	12S	38E	-	2
NV-35	"	Thompson mine	11S	48E	NV-34	3
NV-36	"	Relston	4S	43E	-	4-5
NV-37	"	Montezuma	3S	41E	-	3
NV-38	"	Finger Rock Prospect	11N	36E	NV-37	3
NV-39	Ormsby	Valley View property	15N	20E	NV-38	2
NV-40	Pershing	American Canyon, Cinnabar, Cinnabar City	28N	34-35E	-	2
NV-41	"	Crawford, Juniper, Pershing, Bunker Hill Group, Montgomery, S & J Mine	27N	34E	-	6

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
NV-42	Pershing	Lovelock Sulfur district	27N	32E	NV-41	3
NV-43	"	Goldbanks, Oldtimer, Pronto Plata	30N	38E	NV-42	2
NV-44	"	Rosebud district	34N	29-30E	NV-43	3
NV-45	"	Last Chance, Mt. Tobin, North Fork	28-29N	39-40E	NV-44	6
NV-46	Storey	Castle Peak, Washington Hill	18N	21E	NV-45	3
NV-47	"	Taylor-Branch	20N	22E	30001	2
NV-48	Washoe	Antelope Prospect	45N	21E	NV-47	2
NV-49	"	Golden Fleece, several unnamed mines	20N	18-19E	-	3
NV-50	"	Unnamed	20N	23E	-	3
NV-51	"	White Horse district	21N	23E	NV-50	4
<u>Oregon</u>						
OR-22	Baker	White Wonder, Paramount, IXL, Red Boy, 8-10S Columbia Gold, Sumpter Placer, Golconda		35-37E	30107,08,09	2
OR-23	"	Cave Creek Cinnabar	12S	42E	30102	2
OR-24	"	Clear Creek Reservoir Prospect	6S	45E	-	1
OR-25	"	Connor Creek Pros., Rose Lee	11S	45E	-	2
OR-30	"	Int. Gold Corp.	11S	39E	30104	2
OR-31	"	Paddy Creek Pros.	6S	44E	-	2
OR-32	"	Quicksilver & Easy Money, Morton Clark Creek, Iron Door, Mormon Basin group.	13S	41E	30103	2



NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
OR-33	Baker	Pioneer Pros.	12S	38E	-	2
OR-62	"	Hiller Chrome - Cinnabar, Orion	14S	36E	30145, 46, 47, 48	2
OR-34	Clackamas	Aimes Bancroft Gp., Kiggins, Nisbet	6S	7-8E	30122	2
OR-35	"	North Fork Claims	4S	5E	-	2
OR-63	Coos	Fuller Quicksilver	32S	10W	-	2
OR-36	Crook	Amundson, Botz, Hudson, Israel, Pinkey, Platner, Salt Creek	18S	17E	30127, 28, 29, 30, 31	2
OR-37	"	Eickeneyer, Maury Mt.	17S	19E	30132, 33, 34	2
OR-38	"	Amity, Ochoco, Byram-Oscar, Gray Prairie, Independent, Johnson, Mother Lode, Ontko, Round Mt., Little Hay Creek, Orion, Jimmie Anns	13-15S	19-20E	30135-36	2
OR-39	"	Allison, Barnes, Butte, Watson	12-13S	17-20E	30137, 38, 39, 40	2
OR-1	Douglas	Poor Boy Prospect	29S	1W	-	2
OR-2	"	Umpqua	29S	2W	-	2
OR-3	"	Nonpareil	25S	4W	-	2
OR-4	"	Bonanza	25S	4W	-	2
OR-5	"	Elkhead	23S	4W	-	2
OR-12	Douglas, Jackson	Roxana, War Eagle, Mountain King, Rayone	33-34S	3-2W, 1E	OR-12	2
OR-64	"	Baldwin, Victory Placer	29S	8W	-	2
OR-68	"	Last Chance Sulfur	29S	3E	-	2

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
OR-40	Grant	Broadway, Roba-Westfall	16S	29E	30143,44	1
OR-41	"	Canyon Creek Mercury	15S	32E	-	3
OR-42	"	Mill, Wild Cat Basin	14,15S	33E	-	1
OR-43	"	Cinnabar Mt., Dead Horse, Gray	14S	30E	30141,42	2
OR-44	"	Long Walk, Wray, Silver Streak	10S	33E	30105,06	2
OR-6	Harney	Farnham and Pueblo Groups	40S	35E	OR-6	3
OR-7	"	Rabbit Hole Prospect, South, O'Keefe, Spring Creek, AZ, Pueblo Mining Co., Apache, Farnham and Pueblo, Mile High	39S	34E	OR-7	2
OR-8	"	Fisher, Regal, Shepherder, Blue Bull, Mogul, Lucky Star, Blair Group, O'Keefe claims, Nellie B Group, Lucky Strike, Red Hill prospect, Eldorado, Fields lode, Red Dome, Lucky Boy.	39S	34E	OR-8	2
OR-9	"	Alexander, Jackpot, Last Chance prospects	34S	34E	OR-9	9
OR-10	"	Horsehead	27S	25E	-	5
OR-26	"	Duncan Pros.	23S	29E	-	2
OR-27	"	Red Rock #1	22-23S	36E	30116	2
OR-28	"	Valley View Prosp.	23S	33E	30113,14,15	2
OR-29	"	Woodson Long Prospect	21S	36E	30117,18	3
OR-65	"	Idol City Placers	21S	32E	-	2

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
OR-11	Jackson	Hopeless, Lucky 13, Mammoth, Bobbit, Palmer Creek, Steamboat, Phillips, ALR prospect	38-41S	4W-1E	OR-11	2
OR-47	Jefferson	Axehandle Butte, Roark, Good Chance, Good Earth, Horse Creek, Horse Haven, Red Jacket, Redskin	9-11S	17-19E	30123, 24, 25, 26	3
OR-48	"	Gray Butte	13S	13E	-	2
OR-13	Josephine	Murray, Empire, Barr, Lightning Ridge Prospect	35-37S	9-7W	-	2
OR-45	"	Eggers & Hance, Frog Pond	40S	9W	-	*
OR-46	"	Young	33S	5W	-	*
OR-49	Klamath	Klamath Hills	40S	12E	-	2
OR-50	"	Givan Ranch	36S	12E	30110, 11, 12	3-4
OR-51	"	Oregon Tech. Inst.	38S	9E	-	*
OR-54	"	Chewaucan, Kingwell, School Creek	34S	18E	30119, 20	2
OR-14	Lake	Manzanita	37S	16E	-	2
OR-15	"	Currier Prospect	32S	16E	-	4
OR-16	"	Pinto	41S	18E	-	2
OR-17	"	Gray Prospect	35S	23E	OR-17	2
OR-18	"	Rosalite	38S	17E	-	2
OR-52	"	Adel	39S	24E	-	1
OR-53	"	Cascade, Glass Buttes	23-24S	23E	-	*

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
OR-55	Lake	Hart Mt. Hg	36S	25E	-	2
OR-19	Lane	Black Butte	23S	3W	-	2
OR-21	"	Hobart Butte, Sullivan	22S	3W	30121	2
OR-20	Malheur	Bretz, Opalite	40-41S	40-41 E	-	9
OR-56	"	Jordan, Reed	17S	43E	-	*
OR-57	"	Lackey, Clay, Cinnabar	15S	45E	-	2
OR-58	"	Ontario & Pearl	18S	45E	-	*
OR-66	"	Brandon	25S	43E	30100, 101	2
OR-59	Marion	Breitenbusch Mineral Springs	9S	7E	-	*
OR-60	Multnomah	Portland Tunnel	1N	1E	-	1
OR-61	Tillamook	Watrous	2N	10W	-	1
OR-67	Wheeler	Lucky Lost	13S	25E	-	*
<u>Texas</u>						
Tx-1	Brewster	Fresno, Mariposa, Waldron, Little 38, Rainbow, Chisos, 248, Study Butte	29°19'N	103°40'W	30013, 14	3
<u>Utah</u>						
UT-8	Beaver-Iron	Earth Sciences, Mercury, The Tar Claims, The Cina Mine	30S	15W	30641, 42	6
UT-13	Beaver	Sheep Rock	28S	6W	30647, 8	1
UT-14	"	Earth Sciences	29S	15W	-	2
UT-9	Garfield	Veater	31S	5W	30649	2

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
UT-15	Iron	Earth Sciences, PV Property	32S	16W	30639,40	2
UT-1	Piute	Lucky Boy, Mineral Products, Close-In, Crystal Fraction	28S	4W	-	1
UT-12	Piute, Sevier	Big Chief, Winkelman Gap, April Fool	26S	4W	-	1
UT-4	Tooele	Probert	10S	18W	30635,6	1
UT-6	"	Sacramento	6S	3W	-	1
<u>Washington</u>						
WA-2	Chelan	Tom Burke, King Creek	22N	17E	30057,58	2
WA-3	"	Black Jack, La Rica	22N		30059,60	2
WA-4	"	Shoshone	22N	17E	-	2
WA-5	"	Northpole	22N	17E	-	2
WA-6	"	Squaw Saddle	22N	20E	30061,62	4
WA-7	"	Bartlett, Velma	23N	17E	-	2
WA-8	"	Orondo	25N	21E	-	2
WA-9	Clallam	Hobo district	31N	14W	30551,2	1
WA-10	Clark	Unnamed	2N	4E	-	1
WA-31	"	Golden Wonder	6N	4E	-	1
WA-11	Cowlitz	Unnamed	10N	2E	-	*
WA-32	"	Red Star, Prospect	8N	2E	-	1
WA-12	King	Unnamed	21N	7E	-	1

NUMBER	COUNTY	MINE	TOWNSHIP	RANGE	SAMPLE NUMBER	RATING
WA-13	Kittitas	Home, Silver Tip	19N	15E	30055,56	2
WA-14	"	Washington Quicksilver, Skookum, Ben Nevis, Keystone, Elsener, Tenaway River, Denny	22N	15E	30063,64	2
WA-15	"	Cle Elum district	22N	16E	-	2
WA-33	"	Teanaway	20N	16E	-	2
WA-16	Lewis	Unnamed	13N	4E	-	*
WA-17	"	Unnamed	12N	4E	-	1
WA-18	"	Unnamed	13N	3E	-	1
WA-19	Okanagon	Sullivan Pond district	35N	21E	30559	2
WA-35	"	Minnie Mine	32N	22E	30560,1,2,3,4	2
WA-36	"	Loomis district	38N	26E	30565,6,7,8	2
WA-1	Pierce	Enumclaw district	19N	7-8E	30066,67	4
WA-23	Snohomish	Unnamed	27N	10E	30558	2
WA-25	"	Silverton district	30N	10E	30556,7	2
WA-26	"	Darrington district	32N	10E	30554,5	2
WA-28	Yakima	Clear Lake	13N	12E	-	2
WA-29	"	Quicksilver, Cinnabar, Quartz load	13N	13E	30065	3
WA-30	"	Wild Cat Creek, Indian Creek	14N	12-13E	-	3

<u>NUMBER</u>	<u>COUNTY</u>	<u>MINE</u>	<u>TOWNSHIP</u>	<u>RANGE</u>	<u>SAMPLE NUMBER</u>	<u>RATING</u>
<u>Wyoming</u> WY-1	Fresno	Golden Dome	39N	93W	-	1
WY-2	Hot Springs	Brutch Sulfur Deposits	43N	95W	-	*
WY-3	Lincoln	Auburn Area	33N	119W	-	7
WY-4	Park	Cody deposits	52N	102W	-	6
WY-13	"	Sunlight Basin Sulfur	54N	106W	-	6
WY-11	Sweetwater	Aspen Mt.	29N	104W	30655	2

\*Not rated