

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

**Analytical results for rock samples collected from
the Mercur and Ophir mining districts, Utah,
the Lookout Pass prospect area, Utah,
and the Ferber mining district, Nevada**

by

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Open-File Report 91-349

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards or with the North American Stratigraphic Code. Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

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1991

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STUDIES RELATED TO CUSMAP

This report supplements results of a geochemical survey of the Delta 1⁰ x 2⁰ quadrangle, Utah. Geochemical samples from within and close to the Delta quadrangle were collected as one of several multidisciplinary studies associated with the Conterminous United States Mineral Assessment Program (CUSMAP).

INTRODUCTION

Beginning in 1986 and continuing through 1989, the U.S. Geological Survey conducted a geochemical survey of the Delta 1⁰ x 2⁰ quadrangle and nearby areas, Utah and Nevada. The geology of the Delta 1⁰ x 2⁰ quadrangle and surrounding areas has been succinctly described by Hintze (1988). Rocks range in age from Late Precambrian to Recent and were subjected to compressive stresses during the late Mesozoic and extensional stresses during the late Cretaceous.

METHODS OF STUDY

Sample Media

Analyses of altered or mineralized rocks may provide useful geochemical information about the major- and trace-element assemblages associated with a mineralizing system.

Sample Collection

Rock samples were collected from outcrops or mine dumps in the vicinity of the plotted site locations (fig 1). Thirty samples were collected from the Mercur mine, Utah; four samples were collected from the Ophir mining district, Utah; 12 samples were collected from the Lookout Pass prospect area, Utah; and 11 samples were collected from the Ferber mining district, Nevada.

Sample Preparation

Rock samples were crushed and then pulverized to minus 0.15 mm with ceramic plates.

Sample Analysis

Spectrographic method

The rock samples were analyzed for 31 (samples collected in 1987) or 35 (samples collected in 1988) elements using a semiquantitative, direct-current arc emission spectrographic method (Grimes and Marranzino, 1968). The elements analyzed and their lower limits of determination are listed in table 1.

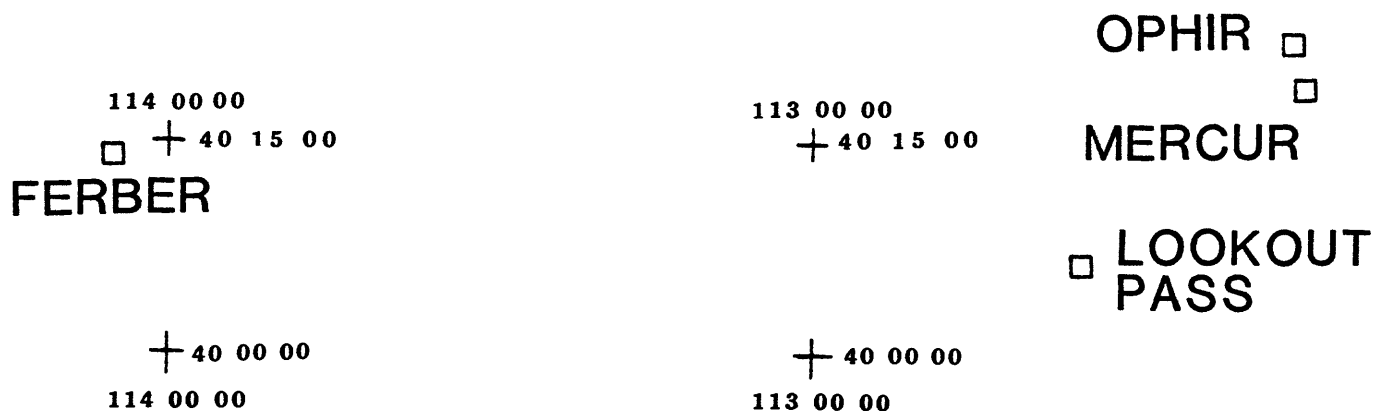


Figure 1--Approximate location map for rock samples from the Mercur and Ophir mining districts, Utah, the Lookout Pass prospect area, Utah, and the Ferber mining district, Nevada.

Spectrographic results were obtained by visual comparison of spectra derived from the sample against spectra obtained from standards made from pure oxides and carbonates. Standard concentrations are geometrically spaced over any given order of magnitude of concentration as follows: 100, 50, 20, 10, and so forth. Samples whose concentrations are estimated to fall between those values are assigned values of 70, 30, 15, and so forth. The precision of the analytical method is approximately plus or minus one reporting interval at the 83 percent confidence level and plus or minus two reporting intervals at the 96 percent confidence level (Motooka and Grimes, 1976). Analytical data from the spectrographic analyses are listed in tables 3-6.

Other analytical methods

Other methods of analysis used on samples from the study area are summarized in table 2. Elements analyzed for include Au, As, Sb, Bi, Cd, Zn, Hg, and F. Gold analyses were done using an atomic absorption spectroscopy method described by Thompson and others (1968). Arsenic, Sb, Bi, Cd, and Zn were analyzed by an inductively coupled plasma-atomic emission spectrometric method described by Crock and others (1987). Mercury was analyzed by a modification of the atomic absorption method described by Crock and others (1987). Fluorine was analyzed by an ion selective electrode method described by Hopkins (1977). Results of analyses are listed in tables 3-6.

ROCK ANALYSIS STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into a computer-based file called Rock Analysis Storage System (RASS). This data base contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and converted to a binary form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1977).

DESCRIPTION OF DATA TABLES

Tables 3-6 list the results of analyses for the rock samples. The data are arranged so that column 1 contains the USGS-assigned sample numbers.

Columns in which the element headings show the letter "s" below the element symbol are emission spectrographic analyses; "aa" represents atomic absorption analyses; "icp" represents inductively coupled plasma-atomic emission spectrometric analyses; and "ise" represents ion selective electrode analyses. A letter "N" in the tables indicates that a given element was looked for but not detected at the lower limit of determination shown for that element in table 1. If an element was observed in the spectrographic analysis, but was below the lowest reporting value, a "less than" symbol (<) was entered in the tables in

front of the lower limit of determination. If an element was observed in the spectrographic analysis, but was above the highest reporting value, a "greater than" symbol (>) was entered in the tables in front of the upper limit of determination. If an element was not looked for in a sample two dashes (--) are entered in the tables in place of an analytical value. Because of the formatting used in the computer program that produced the tables some of the elements (Fe, Mg, Ca, Ti, Ag, and Be) carry one or more nonsignificant digits to the right of the significant digits. The analysts did not determine these elements to the accuracy suggested by the extra zeros.

Values determined for the major elements (Fe, Mg, Ca, Ti, Na, P, and F) are given in weight percent; all others are given in parts per million (micrograms/gram).

SAMPLE DESCRIPTIONS

Succinct descriptions of the rock samples, consisting of information gathered during field examinations, are provided in appendices A-D.

REFERENCES CITED

- Crock, J.G., Briggs, P.H., Jackson, L.L., and Lichte, F.E., 1987, Analytical methods for the analysis of stream sediments and rocks from Wilderness Study Areas: U.S. Geol. Surv. Open-File Report 87-84, 35 p.
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- Hintze, L.F., 1988, Geologic history of Utah: Brigham Young University Geology Studies Special Publication 7, 202 p.
- Hopkins, D.M., 1977, An improved ion-selective electrode method for the rapid determination of fluorine in rocks and soils: U.S. Geol. Surv. Journal of Research, v. 5, p. 589-593.
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- Thompson, C.E., Nakagawa, H.M., and Van Sickle, G.H., 1968, Rapid analysis for gold in geologic materials, in Geological Survey research 1968: U.S. Geol. Surv. Prof. Paper 600-B, p. B130-B132.
- VanTrump, George, Jr., and Miesch, A.T., 1977, The U.S. Geological Survey RASS-STATPAC system for management and statistical reduction of geochemical data: Computers and Geosciences, v. 3, p. 475-488.

TABLE 1.--Limits of determination for the spectrographic analysis of rock samples, based on a 10-mg sample.

Elements	Lower determination limit	Upper determination limit
Percent		
Calcium (Ca)	.05	20
Iron (Fe)	.05	20
Magnesium (Mg)	.02	10
Sodium (Na)	.2	5
Phosphorus (P)	.2	10
Titanium (Ti)	.002	1
Parts per million		
Silver (Ag)	0.5	5,000
Arsenic (As)	200	10,000
Gold (Au)	10	500
Boron (B)	10	2,000
Barium (Ba)	20	5,000
Beryllium (Be)	1	1,000
Bismuth (Bi)	10	1,000
Cadmium (Cd)	20	500
Cobalt (Co)	10	2,000
Chromium (Cr)	10	5,000
Copper (Cu)	5	20,000
Gallium (Ga)	5	500
Germanium (Ge)	10	100
Lanthanum (La)	50	1,000
Manganese (Mn)	10	5,000
Molybdenum (Mo)	5	2,000
Niobium (Nb)	20	2,000
Nickel (Ni)	5	5,000
Lead (Pb)	10	20,000
Antimony (Sb)	100	10,000
Scandium (Sc)	5	100
Tin (Sn)	10	1,000
Strontium (Sr)	100	5,000
Thorium (Th)	100	2,000
Vanadium (V)	10	10,000
Tungsten (W)	20	10,000
Yttrium (Y)	10	2,000
Zinc (Zn)	200	10,000
Zirconium (Zr)	10	1,000

TABLE 2.--Chemical methods and lower limits of determination

[AA, atomic absorption; AACV, atomic absorption cold vapor; ICP, inductively coupled argon plasma-atomic emission spectrographic; ISE, ion selective electrode; all values in parts per million]

Element	Method	Limit of Determination	Reference
Gold (Au)	AA	0.05	Thompson and others, 1968
Arsenic (As)	ICP	5	Crock and others, 1987
Antimony (Sb)	ICP	2	and <u>modification of</u>
Zinc (Zn)	ICP	2	O'Leary and Viets, 1986
Bismuth (Bi)	ICP	2	
Cadmium (Cd)	ICP	.1	
Mercury (Hg)	AACV	0.02	Crock and others, 1987
Fluorine (F)	ISE	100	Hopkins, 1977 and others, 1956

TABLE 3--RESULTS OF ANALYSES, MERCUR MINING DISTRICT, UTAH

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
7WW5390A	40 18 30	112 14 0	.20	3.00	>20.00	.02	200	3.0	N	N
7WW5390B	40 18 30	112 14 0	1.00	1.00	>20.00	.07	2,000	2.0	N	N
7WW5390C	40 18 30	112 14 0	.20	2.00	>20.00	.03	300	2.0	N	N
7WW5447A	40 18 30	112 14 0	.50	.02	<.05	.05	20	3.0	500	N
7WW5447B	40 18 30	112 14 0	.50	.03	.10	.02	50	1.0	<200	N
7WW5447C	40 18 30	112 14 0	1.00	.05	.10	.03	70	5.0	N	N
7WW5447D	40 18 30	112 14 0	.50	.03	.20	.02	70	2.0	<200	N
7WW5447E	40 18 30	112 14 0	2.00	.20	.30	.20	20	N	5,000	N
7WW5447F	40 18 30	112 14 0	5.00	.50	20.00	.15	500	N	500	N
7WW5447G	40 18 30	112 14 0	5.00	.50	.20	.50	500	<.5	2,000	N
7WW5447H	40 18 30	112 14 0	2.00	.50	.05	.20	20	<.5	300	N
7WW5447I	40 18 30	112 14 0	.20	.10	<.05	.05	30	10.0	N	N
7WW5447K	40 18 30	112 14 0	1.00	.20	.10	.50	20	N	N	30
7WW5447L	40 18 30	112 14 0	3.00	.50	20.00	.20	1,000	N	1,500	N
7WW5447M	40 18 30	112 14 0	5.00	.50	15.00	.20	20	N	N	N
7WW5447N	40 18 30	112 14 0	.50	.50	.05	.30	20	N	N	N
7WW5447O	40 18 30	112 14 0	10.00	2.00	2.00	.10	5,000	N	<200	N
7WW5447P	40 18 30	112 14 0	5.00	.70	.30	.50	1,000	N	N	N
7WW5447Q	40 18 30	112 14 0	.15	.02	<.05	.05	30	N	N	N
7WW5447R	40 18 30	112 14 0	.50	.02	<.05	.02	50	N	N	N
7WW5447S	40 18 30	112 14 0	7.00	.05	.10	.10	<10	1.0	700	N
7WW5447T	40 18 30	112 14 0	7.00	.20	.10	.20	20	1.0	500	N
7WW5447U	40 18 30	112 14 0	5.00	.10	.05	.20	10	N	1,000	N
8WW5754A	40 18 30	112 14 0	.15	.20	.05	.02	100	N	N	N
8WW5754B	40 18 30	112 14 0	.15	.20	<.05	.50	<10	N	N	N
8WW5754C	40 18 30	112 14 0	.20	.10	.10	.05	200	N	N	N
8WW5754D	40 18 30	112 14 0	5.00	1.50	1.00	.20	1,000	N	N	N
8WW5754E	40 18 30	112 14 0	.15	.10	.05	.03	<10	2.0	3,000	N
8WW5754F	40 18 30	112 14 0	.05	.02	<.05	.07	10	2.0	300	N
8WW5754G	40 18 30	112 14 0	.07	<.02	<.05	.07	30	3.0	<200	N

TABLE 3--RESULTS OF ANALYSES, MERCUR MINING DISTRICT, UTAH--Continued

Sample	B-ppm s	Ba-ppm s	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s
7WW5390A	10	200	<1	N	N	N	70	20	150	N	N
7WW5390B	50	500	<1	N	N	N	20	10	N	10	N
7WW5390C	<10	100	<1	N	N	N	15	20	N	7	N
7WW5447A	10	70	<1	N	N	<5	20	5	N	<5	N
7WW5447B	10	70	1	N	N	N	30	5	N	N	N
7WW5447C	20	5,000	1	N	N	<5	30	15	20	N	N
7WW5447D	15	>5,000	<1	N	N	5	30	15	30	N	N
7WW5447E	70	200	N	N	N	5	200	20	<20	<5	N
7WW5447F	50	100	N	N	N	5	200	10	N	<5	N
7WW5447G	70	300	<1	N	N	10	100	15	<20	<5	N
7WW5447H	50	500	<1	N	N	N	150	<5	<20	N	N
7WW5447I	10	500	N	N	N	N	20	<5	N	N	N
7WW5447K	50	2,000	N	N	N	<5	100	5	20	N	N
7WW5447L	50	300	N	N	N	<5	150	15	20	<5	N
7WW5447M	50	5,000	N	N	N	5	150	10	<20	5	N
7WW5447N	50	200	N	N	N	N	150	<5	<20	5	N
7WW5447O	30	20	N	N	N	50	10	10	N	7	N
7WW5447P	200	200	N	N	N	15	200	20	50	N	<20
7WW5447Q	10	50	3	N	N	N	100	<5	20	N	20
7WW5447R	10	<20	5	N	N	N	<10	<5	<20	N	20
7WW5447S	50	700	N	N	N	20	200	30	N	20	N
7WW5447T	200	1,000	N	N	N	30	150	30	<20	10	N
7WW5447U	100	>5,000	<1	N	N	10	200	20	20	5	N
8WW5754A	10	200	2	N	N	N	N	<5	N	N	N
8WW5754B	1,000	70	<1	N	N	N	100	5	50	N	N
8WW5754C	<10	100	2	N	N	N	N	<5	N	N	<20
8WW5754D	<10	1,500	<1	N	N	<10	10	10	50	N	N
8WW5754E	20	200	1	N	N	N	20	10	N	5	N
8WW5754F	15	5,000	1	N	N	N	50	7	N	<5	N
8WW5754G	15	5,000	1	N	N	N	20	5	N	N	N

TABLE 3--RESULTS OF ANALYSES, MERCUR MINING DISTRICT, UTAH--Continued

Sample	Ni-ppm s	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
7WW5390A	30	1,000	N	N	N	5,000	150	N	200	300	50	N
7WW5390B	20	500	N	5	N	500	100	N	20	N	200	N
7WW5390C	30	300	N	N	N	2,000	100	N	50	300	50	N
7WW5447A	5	<10	500	N	N	N	10	N	N	N	20	N
7WW5447B	5	<10	200	N	N	N	15	N	N	N	10	N
7WW5447C	20	<10	7,000	N	N	<100	15	N	N	200	10	N
7WW5447D	10	<10	5,000	N	N	<100	10	N	N	200	N	N
7WW5447E	15	15	N	5	N	<100	100	N	<10	N	150	N
7WW5447F	50	20	N	5	N	200	50	N	15	<200	50	N
7WW5447G	70	15	N	7	N	100	70	N	10	<200	200	N
7WW5447H	<5	10	200	N	N	N	50	N	N	<200	200	N
7WW5447I	5	<10	500	N	N	N	15	N	N	N	20	N
7WW5447K	5	10	<100	<5	N	1,000	70	N	<10	<200	150	N
7WW5447L	10	20	N	10	N	100	100	N	20	<200	100	N
7WW5447M	50	10	N	<5	N	<100	50	N	<10	N	100	N
7WW5447N	30	10	N	N	N	N	50	N	N	<200	200	N
7WW5447O	70	20	N	10	N	500	100	N	20	200	50	N
7WW5447P	30	<10	N	15	N	<100	150	N	30	<200	150	N
7WW5447Q	5	15	N	N	N	N	10	N	20	<200	100	N
7WW5447R	10	20	N	N	N	N	10	N	10	<200	50	N
7WW5447S	50	20	N	N	N	1,500	100	N	10	<200	50	N
7WW5447T	50	20	N	15	N	500	150	N	30	<200	150	N
7WW5447U	20	20	N	<5	N	1,500	100	N	15	<200	100	N
8WW5754A	<5	20	N	N	N	N	<10	N	N	N	15	N
8WW5754B	<5	<10	N	10	N	N	150	N	15	N	200	N
8WW5754C	<5	30	N	N	N	N	<10	N	N	N	20	N
8WW5754D	5	30	N	<5	N	500	70	N	10	N	100	N
8WW5754E	10	<10	1,000	N	N	200	15	N	N	N	<10	N
8WW5754F	5	<10	700	N	N	N	20	N	N	N	20	N
8WW5754G	5	<10	500	N	N	N	15	N	N	N	30	N

TABLE 3--RESULTS OF ANALYSES, MERCUR MINING DISTRICT, UTAH--Continued

Sample	Au-ppm aa	AS-PPM ICP	BI-PPM ICP	CD-PPM ICP	SB-PPM ICP	ZN-PPM ICP	Na-pct. s	P-pct. s	Ga-ppm s	Ge-ppm s	HG-PPM AACV	F% ISE
7WW5390A	N	10	N	8.3	N	400	--	--	--	--	--	--
7WW5390B	<.05	140	N	.8	30	80	--	--	--	--	--	--
7WW5390C	.15	<10	N	9.1	N	400	--	--	--	--	--	--
7WW5447A	.60	500	N	N	480	N	--	--	--	--	--	--
7WW5447B	.50	110	N	N	240	N	--	--	--	--	--	--
7WW5447C	.30	100	N	4.6	>1,000	110	--	--	--	--	--	--
7WW5447D	.40	30	N	11.0	>1,000	110	--	--	--	--	--	--
7WW5447E	<.05	>2,000	N	.3	44	40	--	--	--	--	--	--
7WW5447F	3.50	1,700	N	.9	8	170	--	--	--	--	--	--
7WW5447G	1.40	>2,000	N	.5	12	140	--	--	--	--	--	--
7WW5447H	<.05	400	N	N	84	15	--	--	--	--	--	--
7WW5447I	<.05	30	N	N	360	N	--	--	--	--	--	--
7WW5447K	16.50	160	N	N	30	10	--	--	--	--	--	--
7WW5447L	.15	>2,000	N	1.0	14	70	--	--	--	--	--	--
7WW5447M	.60	500	N	.3	18	90	--	--	--	--	--	--
7WW5447N	<.05	90	N	N	16	5	--	--	--	--	--	--
7WW5447O	N	600	N	.4	N	130	--	--	--	--	--	--
7WW5447P	N	40	N	N	N	55	--	--	--	--	--	--
7WW5447Q	.10	N	N	N	<2	15	--	--	--	--	--	--
7WW5447R	N	120	N	.1	10	70	--	--	--	--	--	--
7WW5447S	1.65	>2,000	N	3.0	34	75	--	--	--	--	--	--
7WW5447T	.10	1,100	N	1.8	10	50	--	--	--	--	--	--
7WW5447U	4.65	>2,000	N	.6	62	10	--	--	--	--	--	--
8WW5754A	<.05	<5	<2	<.1	<2	10	1.5	<.2	20	N	N	.02
8WW5754B	<.05	28	<2	<.1	<2	10	.3	<.2	20	N	N	.03
8WW5754C	<.05	19	<2	<.1	<2	48	1.0	<.2	20	N	.08	.02
8WW5754D	<.05	<5	<2	.2	<2	52	3.0	.2	30	N	N	.03
8WW5754E	.55	2,600	<2	<.1	620	32	N	<.2	N	N	10.00	.62
8WW5754F	.05	450	<2	.2	220	7	N	<.2	N	N	6.00	.17
8WW5754G	.10	260	<2	.2	190	<2	N	<.2	N	N	5.00	.02

TABLE 4--RESULTS OF ANALYSES, OPHIR MINING DISTRICT, UTAH

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude		Longitude		Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
7WW5389A	40	22 0	112	15 0	20	5	3	.2	1,000	300	N	N
7WW5389B	40	22 0	112	15 0	10	7	>20	.2	>5,000	100	2,000	N
7WW5389C	40	22 0	112	15 0	2	7	>20	.1	2,000	2	N	N
7WW5389D	40	22 0	112	15 0	20	3	5	.2	3,000	150	N	N

Sample	B-ppm s	Ba-ppm s	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s
7WW5389A	100	5,000	5	N	>500	50	50	5,000	N	N	N	30
7WW5389B	100	1,000	100	1,000	200	50	20	10,000	N	N	N	30
7WW5389C	100	300	<1	N	N	N	10	15,000	N	N	N	5
7WW5389D	500	5,000	2	N	>500	20	<10	2,000	N	N	N	20

Sample	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
7WW5389A	>20,000	300	10	1,000	200	50	200	30	>10,000	50	N
7WW5389B	15,000	1,000	20	1,000	500	100	2,000	50	5,000	150	N
7WW5389C	500	N	10	N	2,000	30	N	20	<200	70	N
7WW5389D	>20,000	300	15	700	200	100	1,500	50	>10,000	150	N

Sample	Au-ppm aa	AS-PPM ICP	BI-PPM ICP	CD-PPM ICP	SB-PPM ICP	ZN-PPM ICP	Na-pct. s	P-pct. s	Ga-ppm s	Ge-ppm s	HG-PPM AACV	F% ISE
7WW5389A	N	N	6	>100.0	230	>2,000	--	--	--	--	--	--
7WW5389B	N	690	850	>100.0	340	>2,000	--	--	--	--	--	--
7WW5389C	.05	<10	N	1.4	N	60	--	--	--	--	--	--
7WW5389D	N	N	N	>100.0	240	>2,000	--	--	--	--	--	--

TABLE 5--RESULTS OF ANALYSES, LOOKOUT PASS PROSPECT AREA, UTAH

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
8VV5715A	40 6 0	112 35 0	.50	.05	.50	.050	50	5.0	500	N
8VV5715B	40 6 0	112 35 0	.50	2.00	3.00	.015	50	2.0	200	N
8VV5715C	40 6 0	112 35 0	.10	5.00	3.00	.010	20	5.0	N	N
8VV5715D	40 6 0	112 35 0	.50	.20	.20	.100	30	<.5	300	N
8VV5715E	40 6 0	112 35 0	.15	>10.00	20.00	.002	100	N	N	N
8VV5715F	40 6 0	112 35 0	.15	>10.00	20.00	.002	150	N	N	N
8VV5715G	40 6 0	112 35 0	.07	.10	.07	.015	15	N	N	N
8VV5716A	40 6 0	112 35 0	2.00	.05	.07	.010	10	N	5,000	N
8VV5716B	40 6 0	112 35 0	.15	10.00	>20.00	.002	100	N	N	N
8VV5717A	40 6 0	112 35 0	.20	.05	.10	.015	70	N	N	N
8VV5718A	40 6 0	112 35 0	.10	10.00	20.00	.005	200	2.0	N	N
8VV5718B	40 6 0	112 35 0	.15	>10.00	>20.00	.003	150	N	N	N

Sample	B-ppm s	Ba-ppm s	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s
8VV5715A	20	200	10.0	N	N	N	<10	7	70	50	N	7
8VV5715B	20	100	7.0	N	N	N	<10	7	<50	20	N	5
8VV5715C	10	70	5.0	N	N	N	<10	5	70	50	N	5
8VV5715D	20	200	15.0	N	N	N	<10	7	70	50	N	10
8VV5715E	<10	<20	N	N	N	N	N	5	N	N	N	N
8VV5715F	<10	<20	N	N	N	N	N	<5	N	N	N	N
8VV5715G	30	70	20.0	N	N	N	N	<5	N	N	N	7
8VV5716A	10	50	10.0	N	N	N	<10	10	N	70	N	7
8VV5716B	<10	20	N	N	N	N	N	<5	N	N	N	<5
8VV5717A	<10	150	5.0	N	N	N	N	5	N	N	N	10
8VV5718A	<10	50	1.5	N	N	N	N	<5	N	N	N	5
8VV5718B	N	<20	N	N	N	N	N	<5	N	N	N	N

TABLE 5--RESULTS OF ANALYSES, LOOKOUT PASS PROSPECT AREA, UTAH--Continued

Sample	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Au-ppm aa
8VV5715A	<10	>10,000	N	N	N	15	N	N	N	20	N	.80
8VV5715B	<10	7,000	N	N	N	15	N	N	N	<10	N	.10
8VV5715C	<10	>10,000	N	N	N	10	N	N	N	<10	N	.05
8VV5715D	<10	10,000	N	N	N	20	N	N	N	30	N	1.70
8VV5715E	<10	100	N	N	N	<10	N	N	N	N	N	<.05
8VV5715F	<10	100	N	N	N	<10	N	N	N	N	N	<.05
8VV5715G	<10	300	N	N	N	15	N	N	N	<10	N	<.05
8VV5716A	<10	5,000	N	N	N	30	N	N	N	<10	N	.30
8VV5716B	<10	N	N	N	N	10	N	N	N	N	N	<.05
8VV5717A	<10	100	N	N	N	15	N	N	N	<10	N	<.05
8VV5718A	<10	<100	N	N	N	15	N	N	N	<10	N	<.05
8VV5718B	<10	N	N	N	N	10	N	N	N	N	N	<.05

Sample	AS-PPM ICP	BI-PPM ICP	CD-PPM ICP	SB-PPM ICP	ZN-PPM ICP	Na-pct. s	P-pct. s	Ga-ppm s	Ge-ppm s	HG-PPM AACV	FX ISE
8VV5715A	81	<2	<.1	15,000	<2	N	<.2	5	N	2.00	.01
8VV5715B	240	<2	<.1	3,000	<2	N	<.2	5	N	1.20	<.01
8VV5715C	30	<2	<.1	14,000	<2	N	<.2	<5	N	1.80	.01
8VV5715D	180	<2	<.1	14,000	2	N	<.2	5	N	3.00	.01
8VV5715E	6	<2	<.1	69	<2	N	N	N	N	.02	.01
8VV5715F	8	<2	<.1	36	<2	N	N	N	N	.04	.01
8VV5715G	41	<2	<.1	31	<2	N	<.2	10	N	.14	<.01
8VV5716A	1,500	<2	<.1	1,200	<2	N	N	<5	N	.0	.01
8VV5716B	21	<2	<.1	17	<2	N	N	N	N	.04	.01
8VV5717A	41	<2	<.1	17	4	N	.2	<5	N	.04	<.01
8VV5718A	8	<2	<.1	15	<2	N	N	<5	N	.08	.01
8VV5718B	<5	<2	<.1	12	<2	N	N	N	N	N	<.01

TABLE 6--RESULTS OF ANALYSES, FERBER MINING DISTRICT, NEVADA

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
8YY5481A	40 14 0	114 5 0	>20.0	5.00	1.50	.100	1,000	3.0	N	N
8YY5481B	40 14 0	114 5 0	1.5	10.00	3.00	.100	1,000	7.0	N	N
8YY5481C	40 14 0	114 5 0	>20.0	.05	<.05	.002	50	7.0	N	N
8YY5482A	40 14 0	114 5 0	10.0	.50	5.00	.020	700	150.0	N	N
8YY5482B	40 14 0	114 5 0	7.0	2.00	10.00	.010	1,000	150.0	N	N
8YY5483A	40 14 0	114 5 0	10.0	1.50	7.00	.010	1,000	100.0	N	N
8YY5484A	40 14 0	114 5 0	5.0	1.50	1.00	.200	300	.5	N	N
8YY5484B	40 14 0	114 5 0	.5	7.00	>20.00	.100	200	<.5	N	N
8YY5484C	40 14 0	114 5 0	2.0	.20	.05	.050	100	50.0	N	N
8YY5484D	40 14 0	114 5 0	20.0	.30	.50	.015	2,000	100.0	500	N
8YY5485A	40 14 0	114 5 0	3.0	1.50	.30	.200	300	N	N	N

Sample	B-ppm s	Ba-ppm s	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s
8YY5481A	20	20	<1	N	N	30	50	15,000	N	<5	N	20
8YY5481B	50	200	N	N	N	30	20	>20,000	N	N	N	10
8YY5481C	<10	50	N	N	N	<10	<10	2,000	N	10	N	<5
8YY5482A	<10	30	N	700	N	20	10	10,000	N	N	N	10
8YY5482B	15	30	N	>1,000	N	15	10	10,000	N	N	N	15
8YY5483A	10	30	N	700	300	200	<10	7,000	N	200	N	30
8YY5484A	10	1,000	2	N	N	10	30	30	50	N	N	20
8YY5484B	<10	200	N	N	N	N	30	100	N	N	N	10
8YY5484C	10	50	<1	200	N	N	20	100	N	15	N	<5
8YY5484D	10	50	1	150	500	<10	10	1,500	<50	300	N	5
8YY5485A	15	1,000	3	N	N	<10	30	20	50	N	N	10

TABLE 6--RESULTS OF ANALYSES, FERBER MINING DISTRICT, NEVADA--Continued

Sample	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s
8YY5481A	N	N	N	N	N	70	N	15	2,000	150	N
8YY5481B	<10	N	N	N	N	20	N	N	N	150	N
8YY5481C	N	N	N	N	N	20	N	N	300	N	N
8YY5482A	150	N	N	N	N	30	50	<10	1,500	50	N
8YY5482B	200	N	N	N	N	30	<20	N	300	30	N
8YY5483A	500	N	N	15	N	20	700	N	>10,000	<10	N
8YY5484A	30	N	5	N	150	50	N	20	700	150	N
8YY5484B	2,000	N	N	N	300	300	N	10	500	100	N
8YY5484C	5,000	N	N	N	N	15	N	N	300	100	N
8YY5484D	10,000	N	N	N	N	50	N	10	>10,000	10	N
8YY5485A	200	N	<5	N	N	50	N	15	<200	70	N

Sample	Au-ppm aa	AS-PPM ICP	BI-PPM ICP	CD-PPM ICP	SB-PPM ICP	ZN-PPM ICP	Na-pct. s	P-pct. s	Ga-ppm s	Ge-ppm s	HG-PPM AACV	F% ISE
8YY5481A	<.05	22	<2	12.0	<2	2,100	<.2	N	10	N	.06	.04
8YY5481B	<.05	<5	4	1.4	<2	240	<.2	N	5	N	.04	.03
8YY5481C	<.05	<5	<2	2.9	<2	92	N	N	15	N	.04	.03
8YY5482A	.10	98	630	18.0	<2	2,000	N	N	15	N	.0	.02
8YY5482B	.20	71	1,300	8.3	<2	270	N	N	10	N	.0	.01
8YY5483A	.05	58	710	380.0	<2	24,000	N	N	15	N	.0	<.01
8YY5484A	<.05	6	<2	2.8	<2	770	3.0	<.2	20	N	N	.05
8YY5484B	.05	10	<2	11.0	<2	490	.5	N	<5	N	N	.03
8YY5484C	<.05	59	210	2.1	17	170	N	.3	<5	N	N	.01
8YY5484D	<.05	790	260	610.0	27	23,000	N	N	15	N	.0	.01
8YY5485A	<.05	7	<2	3.0	<2	150	3.0	<.2	20	N	N	.03

Appendix A--Succinct description of rock samples collected from the Mercur mining district, Utah. Descriptions generally formatted as follows: color of fresh rock; texture; mineralogy; alteration; other comments. NOTE: all information is based on information estimated during examinations in the field.

Abbreviations: **approx**-approximately, **ba**-barite, **bt**-biotite, **bx**-breccia, **cc**-calcite, **cg**-coarse grained, **cm**-centimeters, **do**-dolomite, **fd**-feldspar (undifferentiated), **fg**-fine grained, **ix**-iron oxide minerals, **m**-meters, **mg**-medium grained, **microxln**-microcrystalline, **mm**-millimeters, **mv**-muscovite, **py**-pyrite, **qz**-quartz, **vfg**-very coarse grained, **vfg**-very fine grained, **2nd**-secondary.

SAMPLE No.	DESCRIPTION
5390A	Limestone --black; vfg; cc; no visible alteration.
5390B	Breccia --red and white; bx; cc; cc veinlets.
5390C	Limestone --black; vfg; cc; no visible alteration.
5447A	Jasperoid --gray; microxln, vuggy; qz, ix; "Silver Chert" from the Marion pit area.
5447B	Jasperoid --gray; microxln, vuggy; qz, ix; "Silver Chert" from the Marion pit area.
5447C	Jasperoid --gray; microxln, vuggy; qz, ix, 2nd Sb-minerals, barite; "Silver Chert" from the Marion pit area.
5447D	Jasperoid --gray; microxln, vuggy; qz, ix, 2nd Sb-minerals, barite; "Silver Chert" from the Marion pit area.
5447E	Siltstone --white, browns; silty; clays, chert, 2nd As minerals; Marion pit area.
5447F	Breccia --yellowish-brown; clayey, bx; clays, jasperoid, limestone; heavily altered matrix; from an old glory hole.
5447G	Breccia --yellowish-brown; clayey, bx; clays, jasperoid, limestone; heavily altered matrix; from an old glory hole.
5447H	Sandstone --light brown; vfg, sandy; qz, clays; no visible alteration.
5447I	Sandstone --light brown; vfg, sandy; qz, clays; no visible alteration.
5447K	Gouge --light brown and white; clayey; clays; highly altered, oxidized; from the South pit area.
5447L	Gouge --light brown and white; clayey; clays; highly altered, oxidized; from the South pit area.
5447M	Gouge --light brown and white; clayey; clays; highly altered, oxidized; from the South pit area.
5447N	Gouge --light brown and white; clayey; clays; highly altered, oxidized; from the South pit area.
5447O	Shale --black; vfg, shaley; shale minerals with disseminated pyrite.
5447P	Shale --black; vfg, shaley; shale minerals with

disseminated pyrite.

5447Q **Rhyolite**--white; vfg; clays, fd, qz, py; pervasive argillic alteration; from near Eagle Hill.

5447R **Rhyolite**--white; vfg; clays, fd, qz, py; pervasive argillic alteration; from near Eagle Hill.

5447S **Gouge**--red, green, white; bx; clays, ix, 2nd As minerals; from Eagle Hill area.

5447T **Carbon Seam**--black; bx, clayey; clays, carbon; from Eagle Hill area.

5447U **Carbon Seam**--black; bx, clayey; clays, carbon; from Eagle Hill area.

5754A **Rhyolite**--white; vfg; mineralogy not visible in the field; from Eagle Hill area.

5754B **Rhyolite**--white; vfg; mineralogy not visible in the field; from Eagle Hill area.

5754C **Rhyolite**--white; vfg; mineralogy not visible in the field; from Eagle Hill area.

5754D **Porphyry**--green and white; porphyritic, phenocrysts to 3 mm, aphanitic groundmass; fd, chlorite; propylitically altered; from Porphyry Knob area.

5754E **Jasperoid**--gray; microxln; qz, clays; "Silver Chert" from Marion Hill area.

5754F **Jasperoid**--gray; microxln; qz, clays; "Silver Chert" from Marion Hill area.

5754G **Jasperoid**--gray; fg, vuggy; qz, ix.

Appendix B--Succinct descriptions of rock samples collected from the Ophir mining district, Utah. Format for descriptions and explanation of abbreviations given in appendix A.

SAMPLE No.	DESCRIPTION
5389A	Replacement --gray, brown; microxln to vfg, cg sulfide minerals; carbonate minerals, chalcopyrite, galena, py, sphalerite.
5389B	Replacement --gray, brown; microxln to vfg, cg sulfide minerals; carbonate minerals, py, arsenopyrite.
5389C	Replacement --gray, brown; microxln to vfg, fg sulfide minerals; carbonate minerals, disseminated py.
5389D	Replacement --gray, brown; mg to cg, massive; various sulfide minerals.

Appendix C--Succinct descriptions of rock samples collected from the Lookout Pass prospect area, Utah. Format for descriptions and explanation of abbreviations given in appendix A.

SAMPLE No.	DESCRIPTION
5715A	Jasperoid --gray, brown; microxln to vcg; qz, stibnite, 2nd Sb-minerals.
5715B	Jasperoid --gray, brown; microxln to vcg; qz, stibnite, 2nd Sb-minerals.
5715C	Jasperoid --gray, brown; microxln to vcg; qz, stibnite, 2nd Sb-minerals.
5715D	Jasperoid --gray, brown; microxln to vcg; qz, stibnite, 2nd Sb-minerals.
5715E	Dolomite --gray; fg, massive; do, qz.
5715F	Dolomite --gray; fg, massive; do, qz.
5715G	Opal --white, bluish-white; opaline, banded; opal.
5716A	Jasperoid --brown, grey; vfg; qz, ix, stibnite.
5716B	Dolomite --gray; vfg; do, qz veinlets.
5717A	Jasperoid --gray; mg, massive to vuggy; qz.
5718A	Jasperoid --white; vcg, vuggy; qz.
5718B	Jasperoid --white; vcg, vuggy; qz.

Appendix D--Succinct descriptions of rock samples collected from the Ferber mining district, Nevada. Format for descriptions and explanation of abbreviations given in appendix A.

SAMPLE No.	DESCRIPTION
5481A	Jasperoid --yellowish-brown; vfg; qz, chrysocolla, ix.
5481B	Jasperoid --bluish-white; vfg; qz, chrysocolla.
5481C	Gossan --brown; vfg, bx; ix.
5482A	Skarn --green and white; mg to vcg; cc, garnet, pyroxene, chrysocolla.
5482B	Skarn --green and white; mg to vcg; cc, garnet, pyroxene, chrysocolla.
5483A	Jasperoid --brown; vfg to vcg, massive; ix, chrysocolla, qz, garnet, cc, sphalerite.
5484A	Granodiorite --gray; mg, equigranular; qz, fd, bt; poorly-exposed.
5484B	Marble --white; mg to vcg, recrystallized; cc.
5484C	Jasperoid --brown; vfg, massive; qz, ix, galena, sphalerite.
5484D	Jasperoid --brown; vfg, massive; qz, ix, galena, sphalerite, molybdenite.
5485A	Granodiorite --gray; mg, equigranular; qz, fd, bt; no visible alteration.