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GEOLOGICAL SURVEY

Analytical results and sample locality map of rock samples from the Roberts Mountains, Eureka County, Nevada

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INTRODUCTION

Between July 1974 and August 1977, the U.S. Geological Survey conducted a reconnaissance geochemical survey of selected silicified rocks (jasperiods) along the Roberts Mountains thrust in the Roberts Creek Mountains quadrangle, Eureka County, Nevada.

The Roberts Creek Mountains quadrangle comprises about 240 mi^2 in the central part of Eureka County, Nevada, and lies about 30 miles NW of Eureka, Nevada, and 50 mi south of Carlin, Nevada (see fig. 1). Access to the study area is provided by maintained and unmaintained dirt roads that branch west from Nevada State Route 51 or north from U.S. 50.

The rocks in the Roberts Mountains range in age from Cambrian to Holocene; most of the area is comprised of lower Paleozoic strata and some Tertiary volcanic rocks, primarily basalt dikes and lava flows.

The Paleozoic rocks are of two contrasting assemblages deposited in different marine environments. One assemblage, consisting mostly of carbonate rocks, was deposited on a broad continental shelf. Variations in these carbonate strata are related to the distribution of reefs, shallow-subtidal, regions, and deeper basins on the shelf. A complex, intertonguing relationship between coarse-grained algal and coral rich limestone-dolomite (ancient reef), and thin-bedded, finely laminated, lime mudstone with interbeds rich in reefs debris (shelf basin deposits) clearly define the continental shelf with its great variety of subenvironments. The other assemblage consists of dark graptolite-bearing shale, bedded chert, thin clean sandstone beds, thin dark fine-grained limestones, a small amount of bedded barite, and some massive, lenticular volcanic breccias. These rocks were deposited in deep water, probably many miles beyond the edge of the continental shelf and beyond the continental slope. The two rock assemblages, representing two different environments that must have once been many miles apart, have been brought together in the Roberts Mountains on the Roberts Mountains thrust, which was active in central Nevada in Late Devonian Mississippian time. A geologic map of the quadrangle was published by Murphy and others (1978) and a summary of the geology is in McKee (1986).

The terrain is rugged and the relief is as much as 3,700 ft. Elevation ranges from 10,133 ft above sea level at Roberts Creek Mountain to about 6,400 ft above sea level along the north edge of the mountains at the mouth of Birch Creek. The climate is semiarid and the vegetation is typical of the transition climatic life zone, which supports pinon pine, juniper, and mountain mahogany.

METHODS OF STUDY

Sample Media

Analysis of unaltered or unmineralized rock samples provide background geochemical data for individual rock units. Analyses of altered or mineralized rocks, where present, may provide useful geochemical information about the major- and trace-element assemblages associated with a mineralizing system.

Sample Collection

Eighty-seven samples were collected from 80 sites (plate 1). In a few cases, additional samples were taken at the same site and are designated with a letter A or B suffix. The samples were collected from unaltered and altered

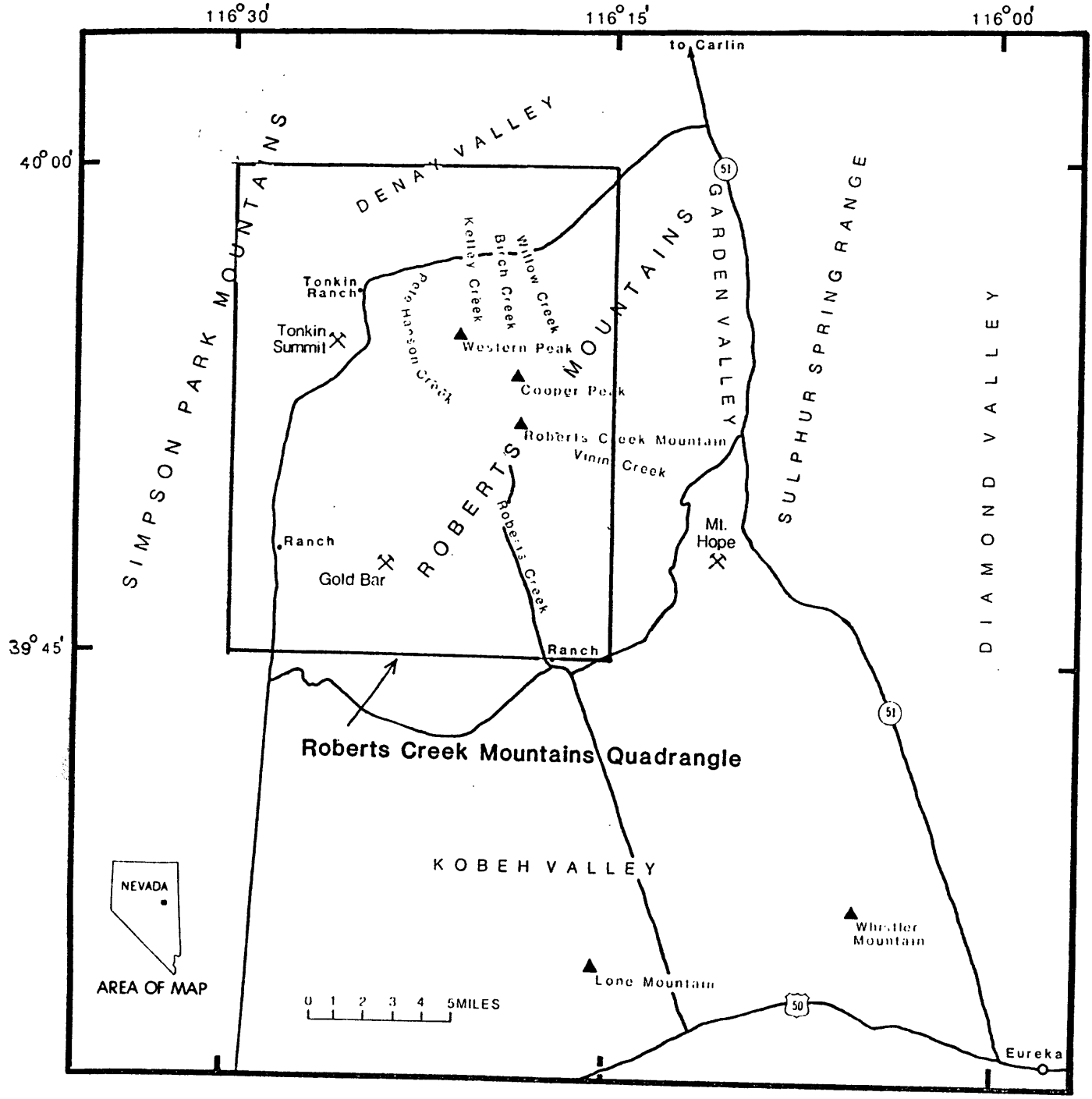

Figure 1. Location map of Roberts Mountains, Eureka County, Nevada.

(mineralized) rocks in the vicinity of the plotted site location. Sample sites are generally grouped into clusters of from two to a dozen sites with a between site spacing as small as 150 yards.

Sample Preparation

The 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 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. 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). Values determined for the major elements (iron, magnesium, calcium, and titanium) are given in weight percent; all others are given in parts per million (micrograms/gram). Analytical data for rock samples from the Roberts Mountains are listed in table 3.

Other methods of analysis used on rocks samples from the Roberts Mountains are summarized in table 2. Analytical results from the analysis by chemical methods are included in table 3.

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

Table 3 lists the results of the analyses of rock samples. The data are arranged so that column 1 contains the USGS-assigned sample numbers. These numbers correspond to the numbers shown on the site location map (plate 1). Columns in which the element headings show the letter "s" below the element symbol are emission spectrographic analyses; "inst" indicates an instrumental method; and "cm" indicates a colorimetric method. 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 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 but was above the highest reporting value, a "greater than" symbol (>) was entered in the tables in front of the upper limit of determination. Because of the formatting used in the computer program that produced the table, some of the elements listed in the table (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.

REFERENCES CITED

Grimes, D. J., and Marranzino, A. P., 1968, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.

McKee, E. H., 1986, Geologic map of the Robert Wilderness Study Area, Eureka County, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1844, scale 1:48,000.

Motooka, J. M., and Grimes, D. J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analyses: U.S. Geological Survey Circular 738, 25 p.

Murphy, M. A., McKee, E. H., Winterer, E. L., Matti, J. C., and Dunham, J. B., 1978, Preliminary geologic map of the Roberts Creek Mountain quadrangle, Nevada: U.S. Geological Survey Open-File Map 78-316, scale 1:31,250.

Thompson, C. E., Nakagawa, H. M., and VanSickle, G. H., 1968, Rapid analysis for gold in geologic materials: U.S. Geological Suvey Professional Paper 600-B, p. B130-132.

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.

Vaughn, W. W., and McCarthy, J. H., Jr., 1964, An instrumental technique for the determinationof submicrogram concentrations of mercury in soils, rocks, and gas: U.S. Geological Survey Professional Paper 501-D, p. D123-D127.

Viets, J. G., 1978, Determination of silver, bismuth, cadmium, copper, lead, and zinc in geologic materials by atomic absorption spectrometry with tricaprylyl methyl ammonium chloride: Analytical Chemistry, v. 50, no. 8, p. 1097-1101.

Ward, F. N., Lakin, H. W., Canney, F. C., and others, 1963, Analytical methods used in geochemical exploration by the U.S. Geological Survey: U.S. Geological Survey Bulltein 1152, 100 p.

Weslch, E. P., 1983, A rapid geochemical spectrophotometric determination of tungsten with dithiol: Talanta, v. 30, p. 876-878.

TABLE 1.--Limits of determination for the spectrographic analysis of rocks based on a 5-mg sample

Elements	Lower determination limit	Upper determination limit
	Percent	
Iron (Fe)	0.1	50
Magnesium (Mg)	.05	20
Calcium (Ca)	.1	50
Titanium (Ti)	.005	2
	Parts per million	
Manganese (Mn)	20	10,000
Silver (Ag)	1	10,000
Arsenic (As)	500	20,000
Gold (Au)	20	1,000
Boron (B)	20	5,000
Barium (Ba)	50	10,000
Beryllium (Be)	2	2,000
Bismuth (Bi)	20	2,000
Cadmium (Cd)	50	1,000
Cobalt (Co)	10	5,000
Chromium (Cr)	20	10,000
Copper (Cu)	10	50,000
Lanthanum (La)	50	2,000
Molybdenum (Mo)	10	5,000
Niobium (Nb)	50	5,000
Nickel (Ni)	10	10,000
Lead (Pb)	20	50,000
Antimony (Sb)	200	20,000
Scandium (Sc)	10	200
Tin (Sn)	20	2,000
Strontium (Sr)	200	10,000
Vanadium (V)	20	20,000
Tungsten (W)	100	20,000
Yttrium (Y)	20	5,000
Zinc (Zn)	500	20,000
Zirconium (Zr)	20	2,000
Thorium (Th)	200	5,000

TABLE 2.--Chemical methods used

[AA = atomic absorption; I = instrumental; S = spectrophotometry; and CM = colorimetric]

Element or constituent determined	Method	Determination limit (micrograms/ gram or ppm)	Reference
Gold (Au)	AA	0.05	Thompson and others, 1968.
Mercury (Hg)	I	0.02	Modification of McNerney and others, 1972, and Vaughn, and McCarthy, 1964.
Arsenic (As)	AA	10	Modification of Viets, 1978
	CM	10	Ward and others, 1963.
Antimony (Sb)	AA	2	Modification of Viets 1978.
Tungsten (W)	S	0.2	Welsch, 1983.

Table 3.--Analysis of rock samples from the Roberts Mountains, Eureka County, Nevada

[N, not dectected; <, detected but below the limit of determination shown; >, determined to be greater than the values 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	B-ppm s	Ba-ppm s	Be-ppm s
RCM1	39 53 52	116 17 37	1.00	.05	.20	.050	50	.7	N	N	30	5,000	N
RCM1A	39 53 52	116 17 37	2.00	.20	.20	.200	50	1.0	N	N	70	>5,000	N
RCM1B	39 53 52	116 17 37	2.00	.10	.20	.100	30	2.0	300	N	50	>5,000	N
RCM2	39 53 55	116 17 39	1.00	.20	.30	.100	70	1.0	N	N	50	1,500	N
RCM3	39 53 57	116 17 41	.70	3.00	10.00	.100	200	.5	N	N	20	2,000	<1
RCM4	39 53 59	116 17 42	1.00	.10	.30	.020	70	.5	200	N	20	>5,000	<1
RCM5	39 53 56	116 17 46	.70	.10	.10	.070	50	1.0	500	N	30	>5,000	N
RCM6	39 53 53	116 17 42	1.00	.10	.20	.100	100	N	N	N	30	>5,000	<1
RCM7	39 53 48	116 17 29	.50	.05	.10	.050	10	1.0	N	N	50	700	N
RCM8	39 53 44	116 17 32	1.00	.05	.20	.070	20	2.0	1,500	N	50	1,000	N
RCM9	39 53 42	116 17 34	.70	.05	.20	.050	50	1.0	N	N	10	>5,000	<1
RCM10	39 53 40	116 17 36	.70	.05	.10	.020	100	1.0	N	N	30	700	N
RCM11	39 53 40	116 17 41	1.00	.20	.10	.200	30	1.0	200	N	70	>5,000	<1
RCM12	39 53 39	116 17 43	2.00	1.00	.20	.500	200	.5	200	N	100	>5,000	1
RCM13	39 53 38	116 17 47	2.00	.05	.20	.070	200	.7	1,000	N	10	>5,000	<1
RCM14	39 55 38	116 16 41	1.00	.02	.10	.010	20	10.0	300	N	<10	1,000	<1
RCM14A	39 55 38	116 16 41	1.00	.20	.50	.020	70	10.0	300	N	<10	1,500	<1
RCM15	39 55 31	116 16 44	1.00	.05	.10	.100	30	N	200	N	20	500	<1
RCM16	39 55 32	116 16 40	2.00	.07	.10	.100	70	N	N	N	15	1,500	<1
RCM17	39 55 39	116 16 44	10.00	.05	.10	.100	20	N	1,500	N	50	200	N
RCM18	39 55 46	116 16 39	3.00	.05	.07	.100	30	N	<200	N	20	2,000	N
RCM19	39 57 21	116 16 28	.70	.05	.10	.020	70	N	<200	N	15	5,000	<1
RCM20	39 57 19	116 16 24	3.00	.20	1.00	.150	150	.5	200	N	30	1,500	1
RCM21	39 57 17	116 16 21	.70	.05	.30	.050	100	N	N	N	10	>5,000	<1
RCM22	39 57 14	116 16 19	.20	3.00	5.00	.010	200	N	N	N	<10	70	<1
RCM23	39 57 11	116 16 18	2.00	.05	.50	.050	500	7.0	500	N	15	1,000	1
RCM24	39 56 52	116 16 22	1.00	3.00	20.00	.050	500	.5	N	N	<10	1,000	1
RCM25	39 56 50	116 16 26	7.00	.05	1.00	.020	70	N	1,000	N	30	70	1
RCM26	39 56 46	116 16 27	3.00	.50	1.00	.050	70	N	1,000	N	20	300	1
RCM27	39 56 43	116 16 30	5.00	.05	1.00	.050	70	N	1,500	N	20	700	<1
RCM28	39 56 51	116 16 32	1.00	.07	1.00	.070	500	.5	200	N	20	1,000	<1
RCM29	39 57 2	116 16 25	5.00	.10	.10	.100	50	N	<200	N	70	200	7
RCM30	39 57 7	116 16 28	.70	.03	.10	.020	100	N	<200	N	15	100	3
RCM31	39 56 41	116 17 9	.70	.07	.30	.050	100	N	N	N	10	5,000	1
RCM32	39 56 39	116 17 14	1.00	.02	.05	.050	20	N	<200	N	10	200	<1
RCM33	39 56 38	116 17 16	2.00	1.00	5.00	.100	500	N	N	N	20	70	<1
RCM34	39 56 13	116 16 57	5.00	.02	.05	.010	20	N	1,500	N	10	300	<1
RCM35	39 55 32	116 17 31	2.00	.20	.05	.100	20	N	N	N	30	1,500	1
RCM35A	39 55 32	116 17 31	5.00	.05	.05	.100	10	N	<200	N	<10	>5,000	<1
RCM36	39 55 39	116 17 32	.70	.10	.10	.150	30	1.0	N	N	30	2,000	3
RCM37	39 55 58	116 17 31	1.00	.05	.20	.100	70	.5	N	N	10	700	1
RCM38	39 55 45	116 17 28	2.00	2.00	2.00	.020	200	2.0	N	N	<10	300	N
RCM38A	39 55 45	116 17 28	.10	.70	20.00	.010	100	N	N	N	N	70	N
RCM39	39 55 38	116 17 29	3.00	.05	.50	.100	500	N	200	N	30	1,000	1
RCM40	39 55 34	116 17 29	5.00	.07	.10	.100	50	N	300	N	20	700	1

Table 3.--Analysis of rock samples from the Roberts Mountains, Eureka County, Nevada

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

Sample	Pi-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	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
RCM1	N	N	5	N	15	N	10	N	15	150	N	N	N	N
RCM1A	N	N	5	70	50	N	20	N	50	70	<100	5	N	100
RCM1B	N	N	5	70	30	70	50	N	30	70	100	5	N	100
RCM2	N	N	5	100	15	N	30	N	30	70	<100	7	N	100
RCM3	N	N	5	50	10	N	N	N	15	70	N	5	N	N
RCM4	N	N	5	10	15	N	10	N	20	70	N	N	N	200
RCM5	N	N	5	10	7	50	50	N	10	200	<100	N	N	N
RCM6	N	N	5	20	10	30	5	N	10	30	N	N	N	200
RCM7	N	N	5	10	20	20	15	N	30	10	N	N	N	N
RCM8	N	N	5	20	20	20	50	N	30	10	N	N	N	N
RCM9	N	N	5	N	5	30	10	N	10	10	N	N	N	N
RCM10	N	N	5	10	15	20	15	N	15	500	N	N	N	N
RCM11	N	N	5	50	20	30	15	N	20	50	N	5	N	300
RCM12	N	N	10	200	50	70	N	20	30	50	<100	20	N	150
RCM13	N	N	5	20	15	20	15	N	50	20	<100	5	N	300
RCM14	N	>500	5	N	300	N	7	N	15	1,000	200	N	N	N
RCM14A	N	>500	5	N	500	50	N	N	20	150	150	N	N	N
RCM15	N	N	5	10	7	70	7	N	10	100	<100	N	N	100
RCM16	N	N	5	10	10	20	5	N	10	30	<100	N	N	N
RCM17	N	N	5	10	10	50	N	N	50	70	<100	N	N	N
RCM18	N	N	5	10	15	30	30	N	15	70	<100	N	N	300
RCM19	N	N	5	N	15	20	N	N	10	200	<100	N	N	100
RCM20	N	N	5	50	20	20	10	N	15	700	100	5	N	200
RCM21	N	N	5	N	15	N	5	N	30	300	100	5	N	200
RCM22	N	N	5	N	5	N	N	N	20	70	<100	N	N	N
RCM23	N	N	10	10	20	70	30	N	70	1,000	300	N	N	100
RCM24	N	N	5	50	5	N	5	N	30	70	<100	7	N	100
RCM25	N	N	5	10	10	20	5	N	10	10	<100	N	N	N
RCM26	N	N	5	10	15	70	15	N	70	30	300	5	N	N
RCM27	N	N	5	30	15	50	70	N	10	70	1,500	N	N	200
RCM28	N	N	20	10	20	50	5	N	70	300	100	N	N	N
RCM29	N	N	N	30	20	70	N	N	10	100	3,000	7	N	N
RCM30	N	N	5	30	5	20	N	N	10	50	150	N	N	N
RCM31	N	N	5	N	7	20	N	N	10	50	<100	5	N	N
RCM32	N	N	N	N	7	20	5	N	10	70	100	N	N	N
RCM33	N	N	10	20	15	20	10	N	70	70	100	7	N	N
RCM34	N	30	N	N	15	20	7	N	20	70	<100	N	N	N
RCM35	N	N	N	50	15	20	10	N	20	50	<100	5	N	N
RCM35A	N	N	N	20	50	50	15	N	10	70	<100	5	N	1,500
RCM36	N	N	5	100	500	20	5	N	70	15	<100	7	N	N
RCM37	N	N	5	10	10	20	5	N	5	15	<100	5	N	N
RCM38	N	N	5	N	7	20	20	N	50	1,000	<100	<5	N	N
RCM38A	N	N	N	N	<5	20	N	N	<5	30	N	N	N	100
RCM39	N	N	10	20	15	20	15	N	70	50	<100	7	N	N
RCM40	N	N	N	30	30	50	10	N	15	30	N	7	N	300

Table 3.--Analysis of rock samples from the Roberts Mountains, Eureka County, Nevada

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

Sample	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Au-ppm aa	Hg-ppm inst	As-ppm aa	Sb-ppm aa	As-ppm cm	W-ppm cm
RCM1	200	N	N	300	50	N	5.00	--	20	60	--
RCM1A	1,000	N	15	N	100	N	1.50	--	20	20	--
RCM1B	2,000	N	30	N	150	.10	>10.00	--	70	120	--
RCM2	2,000	N	10	N	70	N	>10.00	--	25	20	--
RCM3	30	N	10	N	70	N	.28	--	5	10	--
RCM4	30	N	10	300	50	N	2.50	--	20	60	--
RCM5	30	N	20	N	100	.20	>10.00	--	90	160	--
RCM6	20	N	10	N	100	N	2.50	--	10	30	--
RCM7	1,000	N	10	N	70	N	>10.00	--	15	40	--
RCM8	1,500	N	20	N	70	<.05	5.00	--	45	800	--
RCM9	50	N	10	N	200	N	2.50	--	30	40	--
RCM10	300	N	10	N	30	N	>10.00	--	20	30	--
RCM11	300	N	30	N	200	.10	>10.00	--	20	80	--
RCM12	300	N	30	N	150	N	.90	--	20	120	--
RCM13	200	N	10	300	150	.15	1.50	--	150	400	--
RCM14	50	N	N	>10,000	N	N	>10.00	--	50	200	--
RCM14A	50	N	N	>10,000	N	N	>10.00	--	45	100	--
RCM15	50	N	N	1,000	70	N	6.00	--	20	40	--
RCM16	150	N	<10	200	70	N	5.00	--	30	40	--
RCM17	150	N	<10	500	70	N	8.00	--	80	800	--
RCM18	500	N	<10	200	100	N	5.00	--	50	80	--
RCM19	70	N	N	200	70	N	7.00	--	20	120	--
RCM20	300	N	10	300	150	N	3.00	--	35	120	--
RCM21	150	N	10	200	150	N	3.00	--	20	40	--
RCM22	20	N	N	200	20	N	2.00	--	5	<10	--
RCM23	200	N	10	700	70	.20	>10.00	--	180	300	--
RCM24	70	N	20	N	50	N	3.00	--	20	20	--
RCM25	70	N	10	N	N	N	3.00	--	10	400	--
RCM26	100	N	20	1,000	150	N	3.00	--	210	400	--
RCM27	200	N	10	N	30	.05	8.00	--	1,900	800	--
RCM28	70	N	20	1,000	70	N	6.00	--	110	160	--
RCM29	150	150	20	N	70	N	.35	--	5,000	60	--
RCM30	100	70	10	N	50	N	1.10	--	120	20	--
RCM31	70	N	10	N	50	N	1.50	--	20	20	--
RCM32	70	N	N	N	50	N	6.00	--	80	80	--
RCM33	100	N	10	500	70	.10	4.00	--	70	60	--
RCM34	100	N	<10	1,500	20	N	3.00	--	110	1,000	--
RCM35	150	N	10	N	70	N	5.00	--	45	80	--
RCM35A	500	N	10	N	70	N	6.00	--	60	140	--
RCM36	200	N	30	N	70	N	3.00	--	30	80	--
RCM37	70	N	<10	N	70	N	1.50	--	20	100	--
RCM38	200	N	<10	300	N	N	2.50	--	35	30	--
RCM38A	15	N	15	N	30	N	1.50	--	2	10	--
RCM39	70	N	15	700	100	N	.55	--	25	150	--
RCM40	500	N	10	200	70	N	.45	--	15	1,000	--

Table 3.--Analysis of rock samples from the Roberts Mountains, Eureka County, Nevada

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

Sample	Latitude	Longitude	Fe-pct.	Mg-pct.	Ca-pct.	Ti-pct.	Mn-ppm	Ag-ppm	As-ppm	Au-ppm	B-ppm	Ba-ppm	Be-ppm
			s	s	s	s	s	s	s	s	s	s	s
RCM41	39 55 9	116 16 50	1.00	.20	.20	.200	70	N	200	N	30	>5,000	<1
RCM41A	39 55 9	116 16 50	15.00	.10	.30	.050	70	N	1,500	N	100	1,000	1
RCM42	39 54 42	116 17 10	2.00	.10	.20	.150	50	1.0	300	N	30	>5,000	N
RCM43	39 54 47	116 17 8	.50	.10	.30	.100	50	1.0	N	N	<10	>5,000	N
RCM44	39 51 50	116 17 43	1.00	.20	.07	.200	70	.5	N	N	100	>5,000	1
RCM45	39 51 51	116 17 40	1.00	.05	.10	.100	70	N	N	N	30	>5,000	<1
RCM46	39 51 54	116 17 38	2.00	.10	.50	.100	70	1.0	1,000	N	30	>5,000	<1
RCM47	39 51 56	116 17 34	3.00	.10	.30	.100	50	7.0	1,000	N	30	>5,000	1
RCM47A	39 51 56	116 17 34	.05	3.00	20.00	.010	70	N	N	N	N	500	N
RCM48	39 51 50	116 17 28	1.00	.10	.20	.100	20	1.5	1,000	N	30	>5,000	1
RCM49	39 51 46	116 17 34	1.00	.05	.10	.100	100	N	N	N	30	5,000	1
RCM50	39 51 45	116 17 37	.70	.50	.20	.300	70	1.0	N	N	150	5,000	1
RCM51	39 51 9	116 16 52	2.00	.10	.10	.100	50	N	N	N	30	1,500	N
RCM52	39 51 33	116 16 42	.50	.10	2.00	.050	70	7.0	N	N	20	1,000	N
RCM53	39 52 43	116 16 56	3.00	1.00	.50	.300	100	.5	N	N	150	1,500	1
RCM54	39 56 19	116 16 55	10.00	.20	.50	.200	30	N	<200	N	200	1,000	N
RCM55	39 57 9	116 17 9	.20	.20	20.00	.050	500	N	N	N	<10	>5,000	N
RCM56	39 57 10	116 17 5	1.00	.15	1.00	.100	100	1.0	200	N	30	500	<1
RCM57	39 52 2	116 23 24	.15	.05	.10	.020	20	N	N	N	15	100	<1
RCM58	39 52 5	116 23 19	2.00	.10	.10	.100	50	.5	<200	N	50	5,000	1
RCM59	39 52 18	116 23 12	.70	.03	.50	.050	50	.5	N	N	<10	>5,000	<1
RCM60	39 52 16	116 23 23	1.00	.10	.70	.100	70	N	N	N	15	2,000	1
RCM61	39 52 18	116 23 26	.20	.10	.20	.070	100	.5	N	N	30	300	1
RCM62	39 52 23	116 23 40	2.00	.07	5.00	.030	70	N	200	N	15	300	1
565	39 51 55	116 21 14	.15	.05	.10	.050	70	1.0	N	N	70	1,500	<1
661	39 51 56	116 21 26	.70	.07	3.00	.070	200	N	500	N	70	5,000	5
662	39 51 52	116 21 26	.70	.05	1.00	.050	150	N	500	N	50	3,000	5
663	39 51 37	116 21 9	.70	.05	3.00	.050	150	N	N	N	50	>5,000	5
664	39 51 39	116 21 17	.30	.20	.15	.150	70	1.0	N	N	150	700	3
665	39 50 54	116 21 8	.70	.15	.10	.150	70	.7	N	N	200	1,000	3
666	39 50 57	116 21 13	5.00	.15	.10	.150	100	N	<200	N	300	3,000	10
771	39 49 48	116 21 30	.20	.10	.70	.030	200	N	N	N	15	>5,000	3
772	39 49 45	116 21 32	.70	2.00	10.00	.030	500	N	N	N	30	>5,000	2
781	39 49 38	116 23 19	.70	.07	.05	.150	50	.5	1,000	N	50	1,000	3
881	39 49 13	116 23 10	.70	.10	.20	.150	150	N	200	N	150	300	5
882	39 49 16	116 23 10	.70	.20	.50	.050	70	N	200	N	100	500	3
883	39 48 57	116 23 5	.70	.07	.10	.050	150	1.5	200	N	<10	1,000	3
961	39 46 57	116 21 35	1.50	.10	.30	.100	150	1.5	1,000	N	200	500	20
962	39 46 53	116 21 33	1.00	.10	.05	.150	70	1.0	200	N	150	700	10
963	39 46 24	116 21 8	.70	.10	.70	.100	70	2.0	N	N	50	500	2
CC1	39 49 34	116 23 17	.20	.07	.20	.030	150	5.0	N	N	N	>5,000	<1
CC2	39 49 31	116 23 15	.15	5.00	10.00	.007	70	3.0	N	N	N	700	N

Table 3.--Analysis of rock samples from the Roberts Mountains, Eureka County, Nevada
[N, not dectected; <, detected but below the limit of determination shown; >, determined to be greater than the values shown.]

Sample	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	Pb-ppm s	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s
RCM41	N	N	5	30	15	70	20	N	50	50	100	7	N	300
RCM41A	N	N	20	50	50	20	10	N	200	10	N	5	N	N
RCM42	N	N	N	70	20	70	30	N	20	30	100	5	N	500
RCM43	N	N	N	10	20	20	20	N	7	<10	<100	N	N	500
RCM44	N	N	N	70	15	50	N	N	5	10	<100	10	N	100
RCM45	N	N	N	20	20	N	N	N	10	<10	<100	5	N	N
RCM46	N	N	N	70	20	50	20	N	10	200	<100	7	N	700
RCM47	N	N	N	50	15	50	15	N	10	70	100	10	N	700
RCM47A	N	N	N	20	N	20	N	N	5	10	N	N	N	N
RCM48	N	N	N	20	15	20	15	N	10	70	100	5	N	300
RCM49	N	N	N	20	15	20	5	N	10	<10	<100	5	N	300
RCM50	N	N	N	150	20	70	10	N	10	10	<100	15	N	300
RCM51	N	N	N	70	50	50	N	N	5	<10	N	10	N	100
RCM52	N	N	N	150	50	50	20	N	20	15	<100	5	N	300
RCM53	N	N	20	200	100	100	5	N	50	30	<100	20	N	N
RCM54	N	N	N	150	100	N	10	N	10	50	<100	10	N	N
RCM55	N	N	N	30	5	20	N	N	5	150	N	5	N	100
RCM56	N	N	N	30	15	20	30	N	50	150	200	5	N	N
RCM57	N	N	N	10	5	N	N	N	10	10	200	N	N	N
RCM58	N	N	N	50	20	20	5	N	15	15	<100	5	N	100
RCM59	N	N	N	20	15	20	5	N	5	15	<100	N	N	200
RCM60	N	N	N	30	7	20	N	N	20	15	100	10	N	100
RCM61	N	N	N	10	7	20	N	N	7	N	<100	N	N	100
RCM62	N	N	5	10	15	20	7	N	50	N	300	N	N	N
565	N	N	N	20	10	N	10	N	10	10	N	N	N	N
661	N	N	5	15	15	20	100	N	20	30	500	7	N	<100
662	N	N	5	10	15	20	70	N	20	50	500	5	N	<100
663	N	N	N	10	15	20	7	N	50	30	100	5	N	700
664	N	N	N	50	30	<20	20	N	10	15	N	7	N	<100
665	N	N	N	30	15	20	7	N	7	15	<100	7	N	<100
666	N	N	N	50	50	20	30	N	50	20	200	7	N	<100
771	N	N	N	<10	10	N	20	N	20	20	N	N	N	300
772	N	N	N	<10	10	20	20	N	20	15	200	N	N	700
781	N	N	N	15	20	20	15	N	7	<10	700	7	N	<100
881	N	N	15	50	20	30	30	N	30	20	700	7	N	<100
882	N	N	N	10	7	<20	7	N	20	10	700	5	N	N
883	N	N	N	10	20	30	7	N	20	15	700	5	N	<100
961	N	N	10	20	50	20	10	N	500	20	300	7	N	<100
962	N	N	N	30	20	20	<5	N	30	20	200	10	N	300
963	N	N	N	20	15	N	7	N	50	10	100	5	N	N
CC1	N	N	N	<10	10	<20	10	N	15	15	<100	N	N	N
CC2	N	N	N	N	5	<20	5	N	15	20	500	N	N	N

Table 3.--Analysis of rock samples from the Roberts Mountains, Eureka County, Nevada

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

Sample	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Au-ppm aa	Hg-ppm inst	As-ppm aa	Sb-ppm aa	As-ppm cm	W-ppm cm
RCM41	500	N	20	200	150	N	2.00	--	80	140	--
RCM41A	1,000	N	30	2,000	70	N	2.50	--	20	160	--
RCM42	200	N	10	N	70	.70	5.00	--	80	160	--
RCM43	200	N	<10	N	30	N	8.00	--	35	60	--
RCM44	200	N	10	N	200	N	.65	--	25	40	--
RCM45	150	50	10	N	100	N	.65	--	40	100	--
RCM46	150	N	50	N	100	.20	2.00	--	45	600	--
RCM47	200	N	20	N	70	.15	2.50	--	80	800	--
RCM47A	10	N	20	N	20	N	.35	--	1	10	--
RCM48	200	N	10	200	70	<.05	>10.00	--	40	400	--
RCM49	150	50	10	N	70	N	.80	--	25	20	--
RCM50	300	N	50	N	200	N	.75	--	15	10	--
RCM51	100	N	10	N	70	N	.75	--	2	<10	--
RCM52	2,000	N	50	N	70	N	.55	--	10	30	--
RCM53	200	N	30	N	200	N	.65	--	3	<10	--
RCM54	200	N	20	200	70	N	.30	--	4	80	--
RCM55	50	N	20	N	50	N	1.50	--	10	80	--
RCM56	300	N	<10	300	70	N	>10.00	--	150	160	--
RCM57	70	N	N	N	30	N	4.00	--	10	10	--
RCM58	200	N	10	N	100	N	1.50	--	15	120	--
RCM59	150	N	<10	N	70	N	1.50	--	15	40	--
RCM60	150	N	30	N	70	N	3.00	--	25	40	--
RCM61	70	N	10	N	70	N	.35	--	5	10	--
RCM62	200	N	10	200	30	N	10.00	--	90	160	--
565	1,000	N	<10	N	50	<.05	.90	10	25	--	.5
661	150	N	30	700	50	<.05	5.00	160	300	--	2.0
662	150	N	20	500	70	<.05	5.00	160	275	--	N
663	150	N	70	200	30	<.05	.70	40	55	--	3.0
664	1,000	N	30	N	100	<.05	.50	20	15	--	3.0
665	150	N	10	N	70	<.05	.30	20	40	--	7.0
666	700	N	20	1,500	100	<.05	.30	80	150	--	1.0
771	150	N	<10	1,000	30	<.05	.60	N	40	--	.7
772	150	N	<10	500	50	<.05	.75	80	125	--	<.5
781	100	N	<10	N	70	<.05	6.00	140	1,000	--	<.5
881	200	N	30	300	100	<.05	4.00	160	600	--	.7
882	30	N	N	<200	30	<.05	.40	160	500	--	<.5
883	100	N	<10	200	30	<.05	5.00	160	500	--	1.5
961	150	N	70	5,000	70	<.05	7.00	160	275	--	N
962	150	50	15	500	100	N	.12	80	200	--	<.5
963	150	N	<10	<200	50	<.05	.50	20	80	--	7.0
CC1	30	N	N	N	50	2.50	4.00	40	42	--	15.0
CC2	20	N	N	N	10	.30	6.00	20	250	--	.7