UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analytical results and sample locality map of heavy-mineral-concentrate and rock samples from the Mount Stirling Wilderness Study Area (NV-050-401), Nye and Clark Counties, Nevada

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STUDIES RELATED TO WILDERNESS

Bureau of Land Management Wilderness Study Areas

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral values, if any. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a geochemical survey of the Mount Stirling Wilderness Study Area (NV-050-401), Nye and Clark Counties, Nevada.

INTRODUCTION

In May 1984, the U.S. Geological Survey conducted a reconnaissance geochemical survey of the Mount Stirling Wilderness Study Area (NV-050-401), Nye and Clark Counties, Nevada.

The part of the Mt. Stirling Wilderness Study Area on which mineral surveys were requested comprises 40,275 acres, about 47 mi^2 (122 km^2) on the border of Nye and Clark Counties, Nevada and lies about 44 mi (70 km) west-northwest of Las Vegas, Nevada (see fig. 1). Access to the study area is provided on U.S. Highway 95 for 29 miles north of Las Vegas and on State Highway 52 for 15 miles to the southwest. Jeep roads give access to the periphery of the study area.

The Mt. Stirling Wilderness Study Area occupies the north part of the Spring Mountains, from Wheeler Pass north. The study area consists of marine miogeosynclinal rocks which are Mesozoic, Paleozoic, and Precambrian in age. Easterly directed thrust faults occurred during the Cretaceous period. The thrusting was accompanied by some folding. Basin and Range normal faulting occurred during the late Miocene. The major rock units consist of limestones, dolomites, quartzite, sandstone, shale, siltstone, micaceous shale, and minor amounts of marble in the older rocks. Gold is being mined in the Johnnie district which is located a few miles northwest of the study area. The location of the mineralization is structurally controlled by the Basin and Range normal faults on the southwest flank of the Spring Mountains.

The topographic relief in the study area is about 3,200 ft (975 m), with a maximum elevation of 8,217 ft (2,505 m). The ground surface rises steeply from flat valleys on the east and west sides of the Spring Mountains. The streams draining from the mountains are intermittent. Above 6,400 ft, evergreen trees cover the mountains. The climate is arid.

METHODS OF STUDY

Sample Media

Analyses of the stream-sediment samples represent the chemistry of the rock material eroded from the drainage basin upstream from each sample site. Such information is useful in identifying those basins which contain concentrations of elements that may be related to mineral deposits. Heavy-mineral-concentrate samples provide information about the chemistry of a limited number of minerals in rock material eroded from the drainage basin upstream from each sample site. The selective concentration of minerals, many of which are ore-related, permits determination of some elements that are not easily detected in stream-sediment samples.

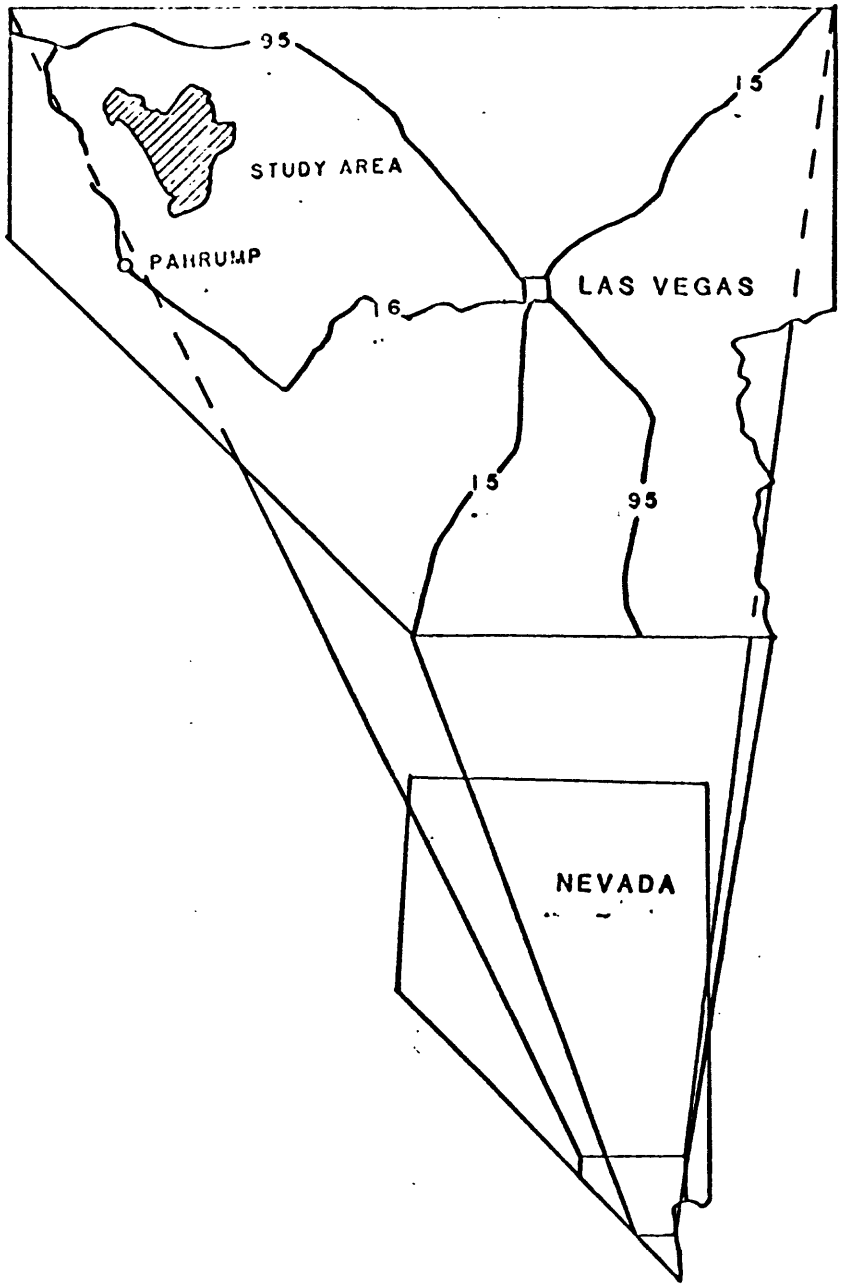

Figure 1. Location of Mount Stirling Wilderness Study Area (NV-050-401), Nye and Clark Counties, Nevada.

Analyses of unaltered or unmineralized rock samples provide background geochemical data for individual rock units. On the other hand, 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

Heavy-mineral concentrates were collected at 62 sites and rocks were collected at 18 sites (plate 1). The average sampling density was about one sample site per 0.7 mi^2 for the heavy-mineral concentrates, and about one sample site per 2.6 mi^2 for the rocks. The area of the drainage basins sampled ranged from 1.5 mi^2 to 0.5 mi^2.

Heavy-mineral-concentrate samples

Heavy-mineral-concentrate samples were collected from active alluvium primarily from first-order (unbranched) and second-order (below the junction of two first-order) streams as shown on USGS topographic maps (scale = 1:62,500 and 1:24,800). Each sample was composited from several localities within an area that may extend as much as 50 ft from the site plotted on the map. Each bulk sample was sieved with a 2.0-mm (10-mesh) screen to remove the coarse material. The less than 2.0-mm fraction was panned until most of the quartz, feldspar, organic material, and clay-sized material were removed.

Rock samples

We collected rock samples from outcrops or exposures in the vicinity of the plotted site location. Samples were collected from unaltered, altered, and mineralized rocks (table 5).

Sample Preparation

After air drying, bromoform (specific gravity 2.8) was used to remove the remaining quartz and feldspar from the heavy-mineral-concentrate samples that had been panned in the field. The resultant heavy-mineral sample was separated into three fractions using a large electromagnet (in this case a modified Frantz Isodynamic Separator). The most magnetic material, primarily magnetite, was not analyzed. The second fraction, largely ferromagnesian silicates and iron oxides, was saved for archival storage. The third fraction (the least magnetic material which may include the nonmagnetic ore minerals, zircon, sphene, etc.) was split using a Jones splitter. One split was hand ground for spectrographic analysis; the other split was saved for mineralogical analysis. These magnetic separates are the same separates that would be produced by using a Frantz Isodynamic Separator set at a slope of 15° and a tilt of 10° with a current of 0.1 ampere to remove the magnetite and ilmenite, and a current of 1.0 ampere to split the remainder of the sample into paramagnetic and nonmagnetic fractions.

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

Sample Analysis

Spectrographic method

The heavy-mineral-concentrate and rock samples were analyzed for 31 elements using a semiquantitative, direct-current arc emission spectrographic method. The analyses for heavy-mineral-concentrate samples were performed by analysts in the Branch of Exploration Geochemistry using the method of Grimes and Marranzino (1968); analyses for rock samples were performed by analysts in the Branch of Analytical Chemistry using the method of Myers and others (1961). The elements analyzed and their lower limits of determination are listed in table 1. For arsenic (As), gold (Au), cadmium (Cd), and thorium (Th), the lower limit of determination of the two analytical methods varies. The values in the parentheses are the limits of determination for Myers and others (1961). 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 heavy-mineral concentrate and rock samples from this study in the Mount Stirling Wilderness Study Area are listed in tables 3 and 4, respectively.

Chemical methods

Other methods of analysis used on samples from the Mount Stirling Wilderness Study Area are summarized in table 2. The analytical method used for determining As, Bi, Cd, Sb, and Zn is a modification of the method of O'Leary and Viets (1986) adapted to the inductively coupled plasma-atomic emission spectroscopy (ICP-AES) method of Crock and others (1983).

Analytical results for heavy-mineral-concentrate and rock samples are listed in tables 3 and 4, respectively.

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 and 4 list the analyses for the heavy-mineral concentrate and rock samples, respectively. For the two tables, 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; "icp" indicates inductively coupled plasma. A letter "N" in table 3 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 table 3 in front of the lower limit of determination. For table 4, the letter N is not used and a "less than" symbol (<) indicates that an element, observed or not observed, is below the detection limit in table 1. A letter H indicates that the value of an element could not be determined because of interference from another element. 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 tables 3 and 4, some of the elements listed in these tables (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.

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

[The values shown are the lower limits of determination assigned by the Grimes and Marranzino method, except for those values in parentheses, which are the lower values assigned by the Myers and others method. The spectrographic limits of determination for heavy-mineral-concentrate samples (Grimes and Marranzino are based on a 5-mg sample, and are therefore two reporting intervals higher than the limits given for rocks and stream sediment. Analyst: Nancy M. Conklin (rocks); Gordon W. Day (heavy-mineral concentrates)]

Elements	Lower determination limit		Upper determination limit
	Percent		
Iron (Fe)	0.05		20
Magnesium (Mg)	.02		10
Calcium (Ca)	.05		20
Titanium (Ti)	.002		1
	Parts per million		
Manganese (Mn)	10		5,000
Silver (Ag)	0.5		5,000
Arsenic (As)	200	(700)	10,000
Gold (Au)	10	(15)	500
Boron (B)	10		2,000
Barium (Ba)	20		5,000
Beryllium (Be)	1		1,000
Bismuth (Bi)	10		1,000
Cadmium (Cd)	20	(30)	500
Cobalt (Co)	5		2,000
Chromium (Cr)	10		5,000
Copper (Cu)	5		20,000
Lanthanum (La)	20	(30)	1,000
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
Vanadium (V)	10		10,000
Tungsten (W)	50		10,000
Yttrium (Y)	10		2,000
Zinc (Zn)	200		10,000
Zirconium (Zr)	10		1,000
Thorium (Th)	100	(200)	2,000

TABLE 2.--Commonly used chemical methods

[ICP = Inductively coupled plasma]

Element or constituent determined	Sample Type	Method	Determination limit (micrograms/ gram or ppm)	Analyst	Reference
Arsenic (As)	Rock	ICP	5	Briggs, Paul H.	Crock and others, 1983.
Bismuth (Bi)	Rock	ICP	2		Modification of O'Leary and Viets, 1986.
Cadmium (Cd)	Rock	ICP	0.1		
Antimony (Sb)	Rock	ICP	2		
Zinc (Zn)	Rock	ICP	2		

TABLE 3.--Results of the analyses of heavy-mineral-concentrate samples from the Mount Stirling Wilderness Study Area, Nye and Clark Counties, 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	B-ppm s	Ba-ppm s
MS003H	36 28 34	115 56 23	.50	2.00	5.0	1.00	10Q	30	N	N	<20	500
MS005H	36 27 42	115 53 43	.30	2.00	7.0	1.50	100	N	N	N	20	N
MS006H	36 27 52	115 50 26	.50	10.00	7.0	1.50	150	N	N	N	20	N
MS007H	36 27 55	115 50 59	.50	2.00	5.0	1.50	70	N	N	N	50	N
MS008H	36 27 55	115 51 8	.30	2.00	5.0	1.50	100	N	N	N	20	N
MS009H	36 28 5	115 47 35	.30	5.00	7.0	.70	100	N	N	N	50	1,000
MS010H	36 27 57	115 47 24	1.00	2.00	5.0	1.50	150	N	N	N	150	1,500
MS011H	36 27 58	115 47 14	.30	5.00	7.0	1.50	100	N	N	N	150	500
MS012H	36 25 13	115 47 6	.50	.05	.5	1.50	50	N	N	N	<20	5,000
MS013H	36 22 22	115 56 33	.50	2.00	7.0	1.50	100	N	N	N	50	200
MS014H	36 22 6	115 56 22	.30	.10	.7	2.00	70	N	N	N	50	2,000
MS015H	36 21 39	115 56 3	.20	.10	.2	1.50	20	N	N	N	<20	2,000
MS016H	36 20 34	115 53 44	.50	.20	7.0	1.50	150	N	N	N	20	2,000
MS017H	36 20 32	115 53 40	.50	3.00	10.0	1.00	100	N	N	N	<20	1,000
MS018H	36 25 2	115 56 44	.50	.05	.5	2.00	50	N	N	N	20	200
MS019H	36 23 50	115 58 15	.20	1.00	1.5	2.00	50	N	N	N	50	1,500
MS022H	36 19 38	115 49 24	.20	2.00	10.0	.70	100	N	N	N	20	1,000
MS023H	36 19 23	115 49 27	.20	5.00	10.0	.70	100	N	N	N	20	10,000
MS026H	36 17 52	115 49 29	.50	2.00	10.0	1.50	100	N	N	N	20	700
MS028H	36 16 9	115 52 33	.20	5.00	10.0	1.50	100	N	N	N	20	500
MS029H	36 18 9	115 50 40	.30	2.00	5.0	1.50	100	N	N	N	30	10,000
MS030H	36 29 6	116 2 24	.20	.20	1.0	1.50	50	N	N	N	70	2,000
MS031H	36 25 30	116 3 2	.20	.05	.2	1.50	20	N	N	N	70	200
MS032H	36 25 21	115 57 59	.30	.50	2.0	2.00	100	N	N	N	100	>10,000
MS033H	36 23 59	115 54 56	.30	5.00	10.0	.30	100	N	N	N	50	3,000
MS034H	36 23 59	115 55 43	.30	.10	.5	2.00	50	N	N	N	100	5,000
MS041H	36 25 14	115 51 36	.30	10.00	20.0	.20	70	N	N	N	20	500
MS042H	36 24 6	115 51 26	.50	2.00	7.0	.70	150	N	N	N	20	N
MS043H	36 23 33	115 50 45	.20	10.00	10.0	.20	100	N	N	N	20	N
MS044H	36 22 27	115 49 39	.30	10.00	10.0	1.00	100	N	N	N	20	N
MS045H	36 21 9	115 50 17	.20	5.00	7.0	.20	70	N	N	N	20	N
MS046H	36 20 57	115 50 18	.30	10.00	10.0	.20	100	N	N	N	50	N
MS047H	36 17 10	115 49 52	1.00	1.00	5.0	2.00	300	N	N	N	<20	N
MS048H	36 18 6	115 50 48	.20	10.00	10.0	.50	100	N	N	N	50	2,000
MS049H	36 17 31	115 51 9	1.00	2.00	5.0	1.50	200	N	N	N	50	N
MS050H	36 28 55	116 2 15	.20	.50	.5	2.00	50	N	N	N	70	1,500
MS051H	36 27 12	116 1 36	.50	.05	.5	2.00	100	N	N	N	70	700
MS052H	36 26 9	115 59 42	.50	.20	1.0	2.00	100	N	N	N	70	3,000
MS053H	36 25 50	115 58 10	2.00	.20	2.0	2.00	150	N	N	N	20	>10,000
MS054H	36 24 58	115 56 41	.20	1.00	5.0	1.00	100	N	N	N	50	3,000
MS055H	36 23 54	115 58 20	.50	2.00	2.0	1.50	150	N	N	N	<20	5,000
MS063H	36 28 27	115 48 58	.30	10.00	10.0	.10	150	N	N	N	50	N
MS064H	36 27 14	115 45 53	.50	2.00	5.0	1.50	150	N	N	N	20	500
MS065H	36 23 37	115 47 54	.30	.05	.1	2.00	70	15	N	N	20	N
MS066H	36 25 45	115 46 0	.20	<.05	.5	1.50	50	N	N	N	20	2,000

TABLE 3.--Continued

Sample	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	Pb-ppm s
MS003H	N	N	N	N	20	15	<50	N	<50	N	50,000
MS005H	N	N	N	N	50	10	100	N	N	N	700
MS006H	N	N	N	N	50	10	50	N	N	N	500
MS007H	N	N	N	N	50	10	100	N	N	N	150
MS008H	N	N	N	N	50	10	70	N	N	N	100
MS009H	N	50	N	N	20	15	50	N	N	N	150
MS010H	N	N	N	N	70	100	100	N	N	N	100
MS011H	N	N	N	N	20	10	<50	N	N	N	70
MS012H	N	N	N	N	20	10	50	N	N	N	20
MS013H	N	N	N	N	70	10	100	N	N	N	150
MS014H	N	N	N	N	70	10	50	N	N	N	30
MS015H	N	N	N	N	N	<10	<50	N	N	N	150
MS016H	N	N	N	N	70	100	100	N	N	N	200
MS017H	N	N	N	N	20	10	50	N	N	N	100
MS018H	2	N	N	N	100	20	100	N	N	N	50
MS019H	2	N	N	N	70	10	100	N	N	N	20
MS022H	N	N	N	N	50	15	50	N	N	N	<20
MS023H	N	N	N	N	N	10	50	N	N	N	200
MS026H	N	N	N	N	50	10	100	N	N	N	50
MS028H	N	N	N	N	50	<10	50	N	N	N	20
MS029H	N	N	N	N	70	10	50	N	N	N	1,000
MS030H	15	N	N	N	70	10	150	N	N	N	70
MS031H	2	N	N	N	50	10	150	N	N	N	20
MS032H	2	N	N	N	50	15	200	N	N	N	100
MS033H	N	N	N	N	20	10	70	N	N	N	200
MS034H	2	N	N	N	50	15	150	N	N	N	100
MS041H	N	N	N	N	20	15	50	N	N	N	20
MS042H	N	N	N	N	30	10	150	N	N	N	20
MS043H	N	N	N	N	N	<10	50	N	N	N	50
MS044H	N	N	N	N	N	<10	50	N	N	N	20
MS045H	N	N	N	N	N	20	<50	N	N	N	150
MS046H	N	N	N	N	N	<10	50	N	N	N	<20
MS047H	N	N	N	N	70	15	100	N	<50	N	20
MS048H	N	N	N	N	N	15	<50	N	N	N	<20
MS049H	N	N	N	N	70	<10	100	N	N	N	150
MS050H	2	N	N	N	70	10	100	N	N	N	30
MS051H	5	N	N	N	50	15	150	N	N	N	30
MS052H	2	N	N	N	70	15	100	N	N	N	150
MS053H	2	N	N	20	70	15	100	N	N	N	150
MS054H	2	N	N	N	20	<10	50	N	N	N	150
MS055H	2	N	N	N	50	10	200	N	N	N	70
MS063H	N	N	N	N	N	<10	<50	N	N	N	20
MS064H	2	N	N	N	20	<10	150	N	N	N	20
MS065H	N	N	N	N	100	150	50	N	N	N	2,000
MS066H	5	N	N	N	N	<10	50	N	N	N	50

TABLE 3.--Continued

Sample	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
MS003H	N	20	70	500	50	N	500	N	>2,000	N
MS005H	N	50	N	N	50	N	500	N	>2,000	N
MS006H	N	20	N	N	20	N	200	N	>2,000	200
MS007H	N	50	30	N	20	N	700	N	>2,000	N
MS008H	N	50	N	N	20	N	700	N	>2,000	N
MS009H	N	50	N	N	<20	N	200	700	>2,000	N
MS010H	N	70	N	N	70	N	500	N	>2,000	N
MS011H	N	20	N	N	50	N	200	N	>2,000	N
MS012H	N	70	N	N	50	N	2,000	N	>2,000	N
MS013H	N	50	N	N	20	N	500	N	>2,000	N
MS014H	N	70	N	N	20	N	700	N	>2,000	N
MS015H	N	70	N	N	20	N	700	N	>2,000	N
MS016H	N	50	N	N	20	N	500	500	>2,000	N
MS017H	N	30	70	N	<20	N	200	500	>2,000	N
MS018H	N	70	N	N	20	N	700	N	>2,000	N
MS019H	N	50	N	N	20	N	500	N	>2,000	N
MS022H	N	10	N	N	20	N	150	N	>2,000	N
MS023H	N	10	N	300	50	N	150	N	>2,000	N
MS026H	N	30	N	N	20	N	300	N	>2,000	N
MS028H	N	10	N	N	20	N	200	N	>2,000	N
MS029H	N	30	N	N	50	N	500	N	>2,000	N
MS030H	N	100	N	N	20	N	700	N	>2,000	N
MS031H	N	100	N	N	20	N	1,500	N	>2,000	N
MS032H	N	70	N	N	20	N	700	N	>2,000	N
MS033H	N	10	N	N	<20	N	200	N	>2,000	N
MS034H	N	70	<20	N	20	N	1,000	N	>2,000	N
MS041H	N	10	N	N	<20	N	100	N	>2,000	N
MS042H	N	30	20	N	20	N	300	N	>2,000	N
MS043H	N	10	N	N	<20	N	150	N	>2,000	N
MS044H	N	20	N	N	<20	N	200	N	>2,000	N
MS045H	N	30	N	N	<20	N	150	N	>2,000	N
MS046H	N	20	N	200	<20	N	70	N	>2,000	N
MS047H	N	50	N	N	70	N	500	N	>2,000	N
MS048H	N	10	N	N	<20	N	100	N	>2,000	N
MS049H	N	50	N	N	50	N	500	N	>2,000	N
MS050H	N	100	N	N	50	N	700	N	>2,000	N
MS051H	N	100	N	N	50	N	1,000	N	>2,000	N
MS052H	N	100	N	N	50	N	700	N	>2,000	N
MS053H	N	50	150	N	50	N	500	N	>2,000	N
MS054H	N	70	N	700	20	N	500	N	>2,000	N
MS055H	N	50	N	N	50	N	500	N	>2,000	N
MS063H	N	10	N	N	<20	N	30	N	>2,000	N
MS064H	N	50	70	N	30	N	700	N	>2,000	N
MS065H	200	50	N	N	30	N	200	N	>2,000	N
MS066H	N	50	N	N	20	N	1,000	N	>2,000	N

TABLE 3.--Continued

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
MS067H	36 21 45	115 54 8	.20	2.00	5.0	1.00	70	N	N	N	20	2,000
MS068H	36 21 20	115 55 41	.15	10.00	10.0	.20	100	N	N	N	<20	N
MS069H	36 18 55	115 54 7	.10	.50	.5	.70	50	N	N	N	<20	5,000
MS070H	36 19 43	115 54 38	.20	1.00	.7	1.50	50	N	N	N	30	7,000
MS071H	36 24 18	115 54 56	.20	5.00	5.0	.50	100	N	N	N	<20	7,000
MS072H	36 23 26	115 56 25	.20	.05	.2	1.50	50	N	N	N	20	5,000
MS061H	36 29 40	115 58 30	.20	.20	.5	1.00	50	N	N	N	<20	N
MS081H	36 25 10	115 51 12	.15	5.00	7.0	.50	50	N	N	N	<20	1,000
MS082H	36 25 10	115 51 21	.20	5.00	10.0	.10	100	N	N	N	20	N
MS083H	36 23 59	115 51 19	.30	.70	2.0	.50	70	N	N	N	20	N
MS084H	36 22 44	115 49 54	.15	5.00	5.0	.20	70	N	N	N	<20	N
MS085H	36 21 59	115 49 44	.20	7.00	10.0	.10	100	N	N	N	20	N
MS086H	36 28 3	115 55 58	.20	10.00	10.0	.05	150	N	N	N	<20	N
MS087H	36 27 47	115 53 24	.20	5.00	10.0	.50	100	N	N	N	20	1,000
MS088H	36 26 30	115 51 4	.30	7.00	10.0	.10	70	N	N	N	<20	1,500
MS089H	36 28 37	115 49 0	.20	7.00	10.0	.10	50	N	N	N	<20	N
MS090H	36 24 15	115 47 16	.50	.20	.5	2.00	50	N	N	N	20	1,500

TABLE 3.-- Continued

Sample	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	Pb-ppm s
MS057H	2	N	N	N	N	<10	<50	N	N	N	50
MS068H	N	N	N	N	N	<10	<50	N	N	N	20
MS069H	2	N	N	N	N	<10	<50	N	N	N	20
MS070H	2	N	N	N	50	<10	<50	N	N	N	50
MS071H	2	N	N	N	N	<10	<50	N	N	N	500
MS072H	2	N	N	N	20	<10	<50	N	N	N	50
MS061H	30	N	N	N	20	<10	<50	N	N	N	20
MS081H	2	N	N	N	20	<10	<50	N	N	N	<20
MS082H	N	N	N	N	N	<10	<50	N	N	N	N
MS083H	N	N	N	N	N	<10	70	N	N	N	N
MS084H	N	N	N	N	N	<10	<50	N	N	N	<20
MS085H	N	N	N	N	N	<10	<50	N	N	N	150
MS086H	N	N	N	N	N	<10	<50	N	N	N	<20
MS087H	N	N	N	N	N	<10	<50	N	N	N	N
MS088H	N	N	N	N	N	<10	<50	N	N	N	N
MS089H	N	N	N	N	N	<10	<50	N	N	N	20
MS090H	N	N	N	N	70	<10	<50	N	N	N	700

TABLE 3.--Continued

Sample	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
MS067H	N	30	N	N	<20	N	700	N	>2,000	N
MS068H	N	20	N	N	<20	N	100	N	>2,000	N
MS069H	N	70	N	N	<20	N	1,000	N	>2,000	N
MS070H	N	70	N	200	<20	N	500	N	>2,000	N
MS071H	N	20	N	200	<20	N	300	700	>2,000	N
MS072H	N	70	N	N	20	N	1,000	N	>2,000	N
MS061H	N	50	N	N	<20	N	500	N	>2,000	N
MS081H	N	30	N	N	<20	N	500	N	>2,000	N
MS082H	N	10	N	N	<20	N	200	N	>2,000	N
MS083H	N	30	N	N	<20	N	300	N	>2,000	N
MS084H	N	30	N	N	<20	N	200	N	>2,000	N
MS085H	N	20	N	N	20	N	70	N	>2,000	N
MS086H	N	10	N	N	<20	N	50	N	>2,000	N
MS087H	N	10	N	N	<20	N	200	N	>2,000	N
MS088H	N	20	N	N	<20	N	70	N	>2,000	N
MS089H	N	20	N	N	<20	N	100	N	>2,000	N
MS090H	N	70	N	N	20	N	500	N	>2,000	N

TABLE 4.--Results of the analyses of rock samples from the Mount Stirling Wilderness Study Area, Nye and Clark Counties, 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	B-ppm s	Ba-ppm s	Be-ppm s
MS001R	36 29 13	115 58 27	.07	<.02	.10	.010	<10	<.5	<700	<15	20	30	<1
MS003R	36 28 35	115 56 22	15.00	.07	.15	.003	15	2.0	<700	<15	<10	500	<1
MS004R	36 26 45	115 55 43	.30	.15	15.00	.007	300	<.5	<700	<15	<10	70	<1
MS014R	36 22 7	115 56 22	.20	.03	<.05	.030	15	<.5	<700	<15	10	100	<1
MS023R	36 19 22	115 49 29	.70	.70	15.00	.070	1,000	<.5	<700	<15	<10	70	<1
MS024R	36 18 32	115 49 31	3.00	.50	15.00	.030	50	<.5	<700	<15	<10	30	<1
MS025R	36 18 19	115 49 30	.30	.30	>20.00	.070	70	<.5	<700	<15	<10	20	<1
MS026R	36 17 52	115 49 31	.30	.70	15.00	.070	70	<.5	<700	<15	30	30	<1
MS027R	36 17 37	115 49 33	.30	1.50	15.00	.030	70	.5	<700	<15	30	30	<1
MS030R	36 29 6	116 2 24	.15	.03	.07	.003	70	<.5	<700	<15	<10	70	<1
MS031R1	36 25 31	116 3 3	<.05	<.02	<.05	<.002	<10	<.5	<700	<15	<10	30	<1
MS031R2	36 25 31	116 3 3	15.00	.07	<.05	.200	30	<.5	<700	<15	N	70	<1
MS032R	36 25 21	115 58 1	.30	.15	7.00	.003	1,500	<.5	<700	<15	<10	70	<1
MS047R	36 17 11	115 49 52	.15	.70	20.00	.030	30	<.5	<700	<15	<10	30	<1
MS050R	36 28 55	116 2 23	.10	<.02	.10	.015	20	<.5	<700	<15	<10	30	<1
MS051R	36 27 12	116 1 37	<.05	<.02	<.05	.007	<10	<.5	<700	<15	<10	70	<1
MS052R	36 26 8	115 59 42	.07	<.02	<.05	.005	15	<.5	<700	<15	<10	7,000	<1
MS088R	36 26 32	115 51 4	.30	7.00	15.00	.003	50	<.5	<700	<15	<10	<20	<1

TABLE 4.--Continued

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
MS001R	<10	<30	<5	<10	5	<30	<5	<20	<5	<10	<100	<5	<10
MS003R	<10	<30	<5	<10	30	<30	7	<20	7	7,000	<100	<5	<10
MS004R	<10	<30	<5	<10	<5	<30	<5	<20	<5	30	<100	<5	<10
MS014R	<10	<30	<5	<10	<5	<30	<5	<20	<5	15	<100	<5	<10
MS023R	<10	<30	<5	<10	50	<30	<5	<20	7	<10	<100	5	<10
MS024R	<10	<30	<5	30	7	<30	15	<20	30	<10	<100	<5	<10
MS025R	<10	<30	<5	50	<5	<30	<5	<20	10	<10	<100	<5	<10
MS026R	<10	<30	<5	70	7	<30	<5	<20	7	<10	<100	<5	<10
MS027R	<10	<30	<5	30	15	<30	<5	<20	7	<10	<100	<5	<10
MS030R	<10	<30	<5	<10	5	<30	<5	<20	<5	<10	<100	<5	<10
MS031R1	<10	<30	<5	<10	<5	<30	<5	<20	<5	<10	<100	<5	<10
MS031R2	<10	<30	7	10	<5	<30	<5	<20	15	<10	<100	<5	<10
MS032R	<10	<30	<5	<10	<5	<30	<5	<20	<5	<10	<100	<5	<10
MS047R	<10	<30	<5	30	<5	<30	<5	<20	7	<10	<100	<5	<10
MS050R	<10	<30	<5	<10	<5	<30	<5	<20	<5	<10	<100	<5	<10
MS051R	<10	<30	<5	<10	<5	<30	<5	<20	<5	<10	<100	<5	<10
MS052R	<10	<30	<5	<10	<5	<30	<5	<20	<5	<10	<100	<5	<10
MS088R	<10	<30	<5	<10	<5	<30	<5	<20	7	<10	<100	<5	<10

TABLE 4.--Continued.

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	As-ppm icp	Zn-ppm icp	Cd-ppm icp	Li-ppm icp	Sb-ppm icp
MS001R	<100	<10	<50	<10	<200	30	<200	11	<2	<.1	<2	<2
MS003R	<100	30	<50	<10	1,500	<10	<200	143	750	3.2	2	20
MS004R	300	<10	<50	30	<200	<10	<200	<5	5	.2	<2	4
MS014R	<100	<10	<50	<10	<200	30	<200	<5	2	.1	<2	2
MS023R	300	15	<50	15	<200	30	<200	<5	14	.1	<2	4
MS024R	1,500	30	<50	10	500	20	<200	85	384	2.2	<2	7
MS025R	5,000	15	<50	10	<200	30	<200	<5	43	.4	<2	3
MS026R	700	20	<50	10	<200	30	<200	<5	23	.2	<2	2
MS027R	500	15	<50	10	<200	30	<200	<5	33	.3	<2	2
MS030R	<100	<10	<50	<10	<200	<10	<200	<5	4	.1	<2	<2
MS031R1	<100	<10	<50	<10	<200	<10	<200	<5	<2	.1	<2	<2
MS031R2	<100	30	<50	15	<200	300	<200	<5	<2	.6	3	3
MS032R	300	<10	<50	20	<200	<10	<200	<5	3	.1	<2	<2
MS047R	700	15	<50	<10	<200	30	<200	<5	20	.4	<2	3
MS050R	<100	<10	<50	<10	<200	20	<200	<5	3	<.1	<2	<2
MS051R	<100	<10	<50	<10	<200	30	<200	<5	<2	<.1	<2	<2
MS052R	<100	<10	<50	<10	<200	<10	<200	<5	<2	<.1	<2	<2
MS088R	<100	10	<50	<10	<200	<10	<200	<5	7	.2	<2	9

TABLE 5.--Description of rocks from Mount Stirling Wilderness Study Area, Nye and Clark Counties, Nevada

Sample number	Description
MS001R	quartzite
003R	limestone
004R	quartz vein
014R	sandstone
023R	limestone
024R	limestone
025R	limestone
026R	limestone
027R	limestone
030R	quartz vein
031R1	quartz vein
031R2	skarn
032R	quartz vein
047R	limestone
050R	quartz vein
051R	quartz vein
052R	quartz vein
088R	calcite vein