UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Analytical results and sample locality map of stream-sediment, panned-concentrate, rock, and water samples from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona

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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 resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona.

INTRODUCTION

In March 1981-82, we conducted a reconnaissance geochemical survey of the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona.

The Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, comprise about 95 mi^2 (246 km^2) in the northwest corner of Mohave County, Arizona, and lie about 13 mi (21 km) south of St. George, Utah. Access to the vicinity of the study area is provided on the north by Interstate Highway 15. Access to the study areas is provided by graded and dirt roads from Mesquite, Nevada and St. George, Utah.

The three study areas are in the transition zone between the Colorado Plateau and Basin and Range Physiographic provinces. The exposed and underlying rocks are primarily sediments ranging in age from Mississippian to Quaternary. Quaternary basalt flows locally interbedded with tuff and agglomerate cap upland surfaces. Quaternary and Tertiary surficial deposits are present in thin unconsolidated layers flooring major drainages as alluvial fans and dune sands. Major structures are related to the Overthrust Belt and the Virgin Mountain anticline. The individual formations have been described in detail by Bohannon (unpubl. data, 1983).

The study area extends from the southern Beaverdam Mountains on the northwest along the east flank of the Virgin Mountains to the Shivwits Plateau on the southeast. The topographic relief in the study areas is about 5400 ft (1646 m). In places, the ground surface is a gently sloping plateau cut by intermittent streams. Parts of the area are precipitous. The climate is arid to semiarid.

METHODS OF STUDY

Sample Collection

We collected 157 samples at 132 sites (fig. 1, plate 1). These consisted of 83 stream-sediment samples, 25 panned-concentrate samples, 30 rock samples, and 19 water samples, for a sampling density of about 1 sample per 1 mi^2 for the stream sediment samples, and about 1 sample per 3 mi^2 for the rock. The drainage basins ranged from 1/2-10 mi^2.

Stream-sediment samples

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.

The stream-sediment samples consisted of alluvium collected primarily from first-order (unbranched) and second-order (below the junction of two first-order) streams as shown on USGS topographic maps (scale = 1:12,500 and 1:24,000). Each sample was composited from several localities within an area that may extend as much as 150 ft from the site plotted on the map.

Heavy-mineral-concentrate samples

We panned heavy-mineral-concentrate samples from the same alluvium as the stream-sediment samples, but the material selected for panning was intentionally biased by collection from points of natural concentration of heavy minerals by stream processes. The material was panned until most of the quartz, feldspar, organic material, and clay-sized material was removed. The sample was air dried.

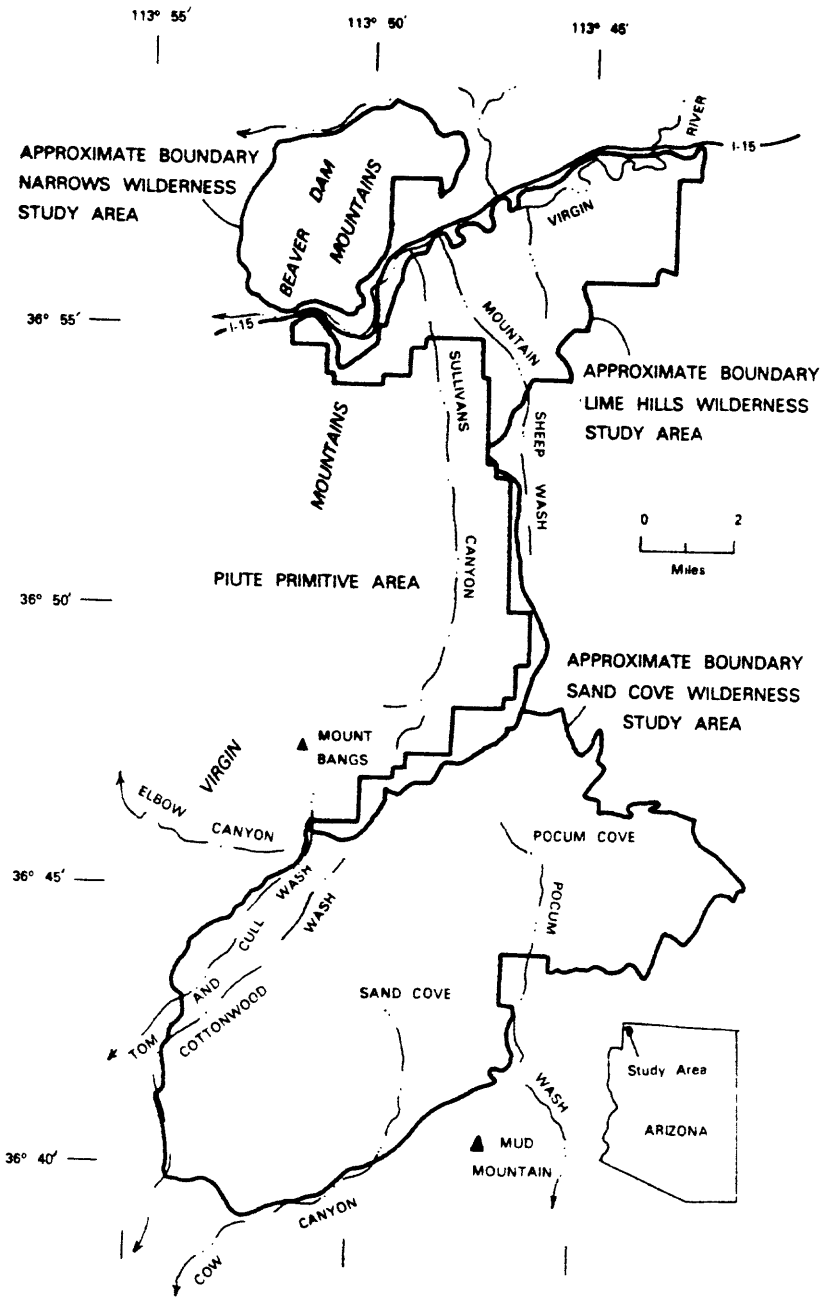

Figure 1. Location map of the Narrows, Lime Hills, and Sand Cove Wilderness Areas, Mohave County, Arizona.

Rock samples

We collected rock samples from outcrops or exposures in the vicinity of the plotted site location. Most samples were collected from unaltered rock. Rock samples provide background information on elements in rocks that have not been affected by alteration or mineralization. Table 7 contains values for background rocks from a measured geologic section near the study area. In addition, some altered and(or) mineralized rocks were collected.

Water samples

We collected water samples from springs. A 500-mL sample was taken at each site and stored in a new untreated plastic bottle. In addition, a 500-mL sample was filtered through a 0.45-micrometer filter, was acidified with reagent-grade concentrated nitric acid to pH 2, and was stored in an acid-rinsed polyethylene bottle. The water temperature was measured at each site. The pH of the water was determined at the sample site, using a Markson model 88 digital pH meter.

Sample Preparation

Only the stream-sediment samples required extensive preparation. Rock samples were crushed and then pulverized with ceramic plates to minus 0.15 mm. Water samples required no preparation beyond that done in the process of collecting them.

The samples were air dried and sieved through minus-80-mesh stainless steel sieves. The portion of the sediment passing through the sieve was split and a representative fraction was saved for analysis.

Panned concentrates were air dried and examined to determine mineral composition. A small split of each sample was separated and hand ground for spectrographic analyses. The entire remainder of each concentrate was saved for analysis.

Sample Analysis

Spectrographic method

We analyzed the stream-sediment, heavy-mineral-concentrate, and rock samples for 31 elements using a semiquantitative, direct-current arc emission spectrographic method (Grimes and Marranzino, 1968). 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 unit at the 83 percent confidence level and plus or minus two reporting units 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) (table 1). Analytical results are given in tables 3-6.

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

[The spectrographic limits of determination for heavy-mineral-concentrate samples are two reporting units higher than the limits given for rocks and stream sediments]

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	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)	5	2,000
Chromium (Cr)	10	5,000
Copper (Cu)	5	20,000
Lanthanum (La)	20	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	2,000

Chemical methods

Other methods of analysis used on samples from the Narrows, Lime Hills, and Sand Cove Wilderness Areas are summarized in table 2.

Table 2.--Chemical methods used

Sample type	Constituent determined	Analytical method	Determination limit[1] micrograms/ gram or ppm	Analyst	Reference
Rocks	U, Th	Delayed neutron activation	variable	USGS Branch of Analytical Laboratories	Millard and Keaten, 1982.
Sediments	U, Th,	Delayed neutron activation	variable	USGS Branch of Analytical Laboratories	Millard and others, 1982.
	Cu, Pb Zn	Atomic Absorption	5	W. L. Campbell	Modification of Viets, 1978.
Concentrates	Au	Atomic Absorption	0.05	W. L. Campbell	Thompson and others, 1968.
Water[2]	Cu, Pb, Zn	Atomic Absorption	1 (µg/L)	J. B. McHugh	Miller and others, 1982.
	$SO_4^=$	Ion chromatography	.1 mg/L	J. B. McHugh	Miller and others, 1982.
	Cl^-,F^-	Ion chromatography	.01 mg/L	J. B. McHugh	Miller and others, 1982.
	U	Flourometry	.10 µg/L	J. B. McHugh	Scintrex Corp,
	HCO_3^-	Gran's plot potentimetric titration	1 mg/L	J. B. McHugh	Miller and others, 1982.
	Specific Conductance	Conductivity bridge	NA	J. B. McHugh	Miller and others, 1982.

[1]The determination limit is dependent upon sample weight. Given limits imply use of sample weight required by method. Higher limits of determination result from using less than required sample weight.

[2]Untreated water samples were analyzed for anions, alkalinity, pH, and specific conductance. Filtered and acidified water samples were analyzed for metals.

ROCK ANALYSIS STORAGE SYSTEM

Upon completion of all analytical work, the analytical results were entered into a computer-based file called RASS (Rock Analysis Storage System). This RASS file contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and converted to a standard form (STATPAC) for computerized statistical analysis or publication (VanTrump and Miesch, 1976).

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Table 3.-- Analytical data for stream sediments from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona

[The following qualifiers are used in reporting spectographic data: --, no determination made; N, concentration less than the detection limit; <, detected--but present at a concentration less than the value reported; and >, element present at a concentration greater than the upper detection limit.]

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
GW001S	36 55 25	113 45 25	.7	.50	1.5	.15	150	N	N	N	50	200	N
GW002S	36 55 40	113 45 55	.7	.30	1.0	.20	100	N	N	N	70	200	<1.0
GW003S	36 56 20	113 45 55	.7	.30	.7	.15	150	N	N	N	70	300	<1.0
GW004S	36 56 55	113 46 15	.7	.30	1.0	.15	100	N	N	N	70	300	N
GW005S	36 57 15	113 46 10	2.0	2.00	5.0	.30	500	N	N	N	70	500	<1.0
GW006S	36 50 20	113 46 30	5.0	2.00	1.0	1.00	700	N	N	N	100	700	<1.0
GW007S	36 51 40	113 46 40	5.0	1.50	1.0	1.00	700	N	N	N	70	500	1.0
GW008S	36 52 25	113 46 25	5.0	2.00	2.0	.70	700	N	N	N	70	500	1.0
GW009S	36 52 50	113 46 40	3.0	5.00	7.0	.50	700	N	N	N	100	500	1.5
GW010S	36 53 10	113 46 35	5.0	5.00	10.0	.30	700	N	N	N	100	300	1.5
GW011S	36 54 4	113 46 25	1.5	.70	2.0	.15	200	N	N	N	70	300	<1.0
GW012S	36 54 0	113 46 30	3.0	2.00	7.0	.30	500	N	N	N	70	500	1.0
GW013S	36 55 15	113 47 45	3.0	2.00	10.0	.30	500	N	N	N	70	300	<1.0
GW014S	36 57 15	113 49 40	2.0	5.00	7.0	.20	500	N	N	N	70	500	<1.0
GW015S	36 57 50	113 49 55	1.0	1.50	5.0	.10	200	N	N	N	70	300	<1.0
GW016S	36 58 10	113 50 10	1.5	3.00	5.0	.15	300	N	N	N	70	300	N
GW017S	36 58 15	113 50 0	1.0	1.50	2.0	.15	150	N	N	N	50	300	N
GW018S	36 58 20	113 50 45	1.0	1.50	5.0	.15	150	N	N	N	70	300	<1.0
GW019S	36 58 30	113 50 45	.7	.70	2.0	.10	100	N	N	N	70	300	<1.0
GW020S	36 58 15	113 51 40	1.5	.70	1.5	.15	150	N	N	N	70	300	<1.0
GW021S	36 45 45	113 50 0	2.0	2.00	3.0	.30	500	N	N	N	100	500	1.0
GW022S	36 45 50	113 50 25	1.5	5.00	5.0	.30	300	N	N	N	70	300	<1.0
GW023S	36 45 10	113 50 55	5.0	.70	1.0	1.00	1,500	N	N	N	30	200	<1.0
GW024S	36 45 0	113 50 37	7.0	1.00	1.0	.70	2,000	N	N	N	30	200	<1.0
GW025S	36 43 30	113 49 50	1.5	.70	.7	.50	300	N	N	N	70	300	<1.0
GW026S	36 43 5	113 49 35	2.0	.70	.5	.50	500	N	N	N	50	500	1.0
GW027S	36 43 5	113 49 25	1.0	.70	.5	.15	200	N	N	N	50	700	<1.0
GW028S	36 42 55	113 48 50	3.0	1.50	2.0	.50	700	N	N	N	70	700	1.0
GW029S	36 42 40	113 47 35	2.0	1.00	.7	.30	500	N	N	N	70	700	<1.0
GW030S	36 41 40	113 46 55	2.0	1.50	2.0	.30	700	N	N	N	100	1,000	1.0
GW031S	36 41 52	113 46 15	3.0	3.00	3.0	.50	1,000	N	N	N	100	700	1.5
GW032S	36 56 50	113 48 45	1.0	.70	3.0	.10	200	N	N	N	30	300	<1.0
GW033S	36 57 53	113 48 5	.5	.50	1.5	.07	100	N	N	N	30	500	N
GW034S	36 58 50	113 49 5	.5	.30	1.5	.20	70	N	N	N	30	300	<1.0
GW035S	36 56 45	113 51 35	1.5	3.00	1.0	.30	300	N	N	N	50	300	<1.0
GW036S	36 56 55	113 51 45	2.0	5.00	10.0	.15	500	N	N	N	50	300	1.0
GW037S	36 56 25	113 52 15	1.5	5.00	7.0	.20	500	N	N	N	50	500	1.0
GW038S	36 55 50	113 52 45	3.0	2.00	5.0	.30	500	N	N	N	70	500	1.0
GW039S	36 55 25	113 52 10	1.5	3.00	7.0	.20	500	N	N	N	70	300	1.0
GW040S	36 55 0	113 50 15	1.5	3.00	7.0	.15	500	N	N	N	100	500	1.0
GW041S	36 39 20	113 52 40	1.0	.30	1.5	.20	150	<.5	N	N	50	200	<1.0
GW042S	36 40 20	113 49 15	1.5	.20	.3	.30	200	N	N	N	70	200	<1.0
GW043S	36 39 15	113 51 48	.7	.15	.5	.10	150	N	N	N	50	300	<1.0
GW044S	36 40 9	113 54 0	1.0	.15	.1	.20	300	N	N	N	100	150	<1.0
GW045S	36 48 30	113 46 23	3.0	.70	.7	1.00	700	N	N	N	70	500	1.0

Table 3.-- Analytical data for stream sediments from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---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
GW001S	N	N	5	30	<5	<20	N	N	7	<10	N	<5	N
GW002S	N	N	<5	30	<5	<20	N	N	7	10	N	<5	N
GW003S	N	N	<5	50	<5	<20	N	N	7	10	N	<5	N
GW004S	N	N	N	50	<5	<20	N	N	7	10	N	N	N
GW005S	N	N	5	70	15	20	N	N	5	20	N	5	N
GW006S	N	N	15	200	30	30	N	20	150	30	N	7	N
GW007S	N	N	10	150	30	50	N	N	100	30	N	7	N
GW008S	N	N	15	150	30	30	N	N	100	20	N	7	N
GW009S	N	N	10	100	30	20	N	N	30	30	N	7	N
GW010S	N	N	10	70	30	20	N	N	30	30	N	7	N
GW011S	N	N	5	70	<5	<20	N	N	15	<10	N	<5	N
GW012S	N	N	7	100	30	30	N	N	30	30	N	5	N
GW013S	N	N	10	150	20	20	N	N	50	20	N	5	N
GW014S	N	N	7	70	20	20	<5	N	20	30	N	5	N
GW015S	N	N	N	50	7	20	N	N	10	20	N	<5	N
GW016S	N	N	5	70	10	20	N	N	15	30	N	<5	N
GW017S	N	N	N	50	<5	20	N	N	7	15	N	<5	N
GW018S	N	N	N	30	<5	20	N	N	10	15	N	<5	N
GW019S	N	N	N	15	<5	<20	N	N	7	10	N	<5	N
GW020S	N	N	N	50	7	<20	N	N	10	20	N	<5	N
GW021S	N	N	7	70	20	30	N	N	20	30	N	5	N
GW022S	N	N	7	100	15	20	N	N	20	20	N	5	N
GW023S	N	N	7	70	15	150	N	N	15	30	N	10	N
GW024S	N	N	7	70	20	100	N	N	20	20	N	10	N
GW025S	N	N	7	150	15	<20	N	<20	50	20	N	5	N
GW026S	N	N	7	70	20	20	N	N	20	20	N	5	N
GW027S	N	N	<5	70	5	<20	N	N	7	20	N	<5	N
GW028S	N	N	7	70	20	20	N	N	15	20	N	5	N
GW029S	N	N	7	100	20	20	N	N	10	20	N	5	N
GW030S	N	N	7	70	20	20	N	N	15	20	N	5	N
GW031S	N	N	10	100	30	30	N	N	50	30	N	7	N
GW032S	N	N	<5	30	<5	<20	N	N	7	15	N	<5	N
GW033S	N	N	N	50	<5	<20	N	N	5	<10	N	<5	N
GW034S	N	N	N	30	<5	<20	N	N	5	<10	N	N	N
GW035S	N	N	5	50	7	20	N	N	7	20	N	<5	N
GW036S	N	N	5	70	15	20	N	N	10	30	N	5	N
GW037S	N	N	5	70	15	20	N	N	7	30	N	<5	N
GW038S	N	N	7	70	20	20	N	N	15	30	N	5	N
GW039S	N	N	5	50	15	20	N	N	10	30	N	5	N
GW040S	N	N	<5	50	15	20	N	N	7	30	N	5	N
GW041S	N	N	<5	50	5	<20	N	N	5	20	N	<5	N
GW042S	N	N	5	20	7	<20	N	N	7	20	N	<5	N
GW043S	N	N	N	30	<5	20	N	N	5	15	N	<5	N
GW044S	N	N	N	50	<5	30	N	N	5	15	N	<5	N
GW045S	N	N	15	200	30	20	N	<20	100	30	N	5	N

Table 3.-- Analytical data for stream sediments from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---continued

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Cu-ppm aa	Pb-ppm aa	Zn-ppm aa	U(N-act)	Th(N-act
GW001S	N	20	N	10	N	500	N	--	--	--	1.110	3.10
GW002S	N	20	N	10	N	300	N	--	--	--	.980	3.60
GW003S	<100	20	N	10	N	300	N	--	--	--	1.050	2.90
GW004S	N	15	N	<10	N	150	N	--	--	--	.992	3.30
GW005S	200	50	N	20	N	300	N	--	--	--	2.790	7.36
GW006S	150	100	N	30	N	1,000	N	--	--	--	2.840	1.26
GW007S	150	100	N	30	N	300	N	--	--	--	2.590	10.20
GW008S	150	100	N	20	N	500	N	--	--	--	2.100	9.72
GW009S	300	100	N	20	N	200	N	--	--	--	2.810	9.59
GW010S	1,000	100	N	20	N	150	N	--	--	--	3.100	7.39
GW011S	N	30	N	10	N	300	N	--	--	--	1.680	2.70
GW012S	300	70	N	20	N	300	N	--	--	--	2.560	9.24
GW013S	200	100	N	20	N	150	N	--	--	--	3.440	<2.50
GW014S	200	70	N	15	N	200	N	--	--	--	2.920	6.88
GW015S	100	20	N	10	N	200	N	--	--	--	2.160	3.30
GW016S	100	50	N	15	N	200	N	--	--	--	2.500	4.80
GW017S	N	20	N	10	N	500	N	--	--	--	1.610	3.80
GW018S	N	30	N	15	N	300	N	--	--	--	2.120	3.90
GW019S	N	15	N	10	N	500	N	--	--	--	1.550	2.60
GW020S	N	20	N	10	N	300	N	--	--	--	1.610	3.80
GW021S	<100	70	N	20	N	500	N	--	--	--	3.240	10.30
GW022S	N	50	N	20	N	300	N	--	--	--	2.590	7.50
GW023S	N	100	N	70	N	1,000	N	--	--	--	7.850	47.20
GW024S	N	150	N	70	N	>1,000	N	--	--	--	7.000	39.60
GW025S	N	70	N	10	N	700	N	--	--	--	1.660	4.10
GW026S	100	70	N	10	N	300	N	--	--	--	1.320	5.20
GW027S	N	30	N	10	N	300	N	--	--	--	1.020	2.80
GW028S	<100	70	N	20	N	500	N	--	--	--	5.680	11.90
GW029S	<100	70	N	15	N	500	N	--	--	--	2.930	8.25
GW030S	100	70	N	15	N	300	N	--	--	--	3.230	6.42
GW031S	200	100	N	20	N	200	N	--	--	--	2.960	12.40
GW032S	N	20	N	<10	N	500	N	--	--	--	1.200	2.30
GW033S	<100	15	N	<10	N	150	N	--	--	--	1.100	<1.90
GW034S	N	15	N	<10	N	200	N	--	--	--	.940	2.20
GW035S	<100	70	N	15	N	500	N	--	--	--	3.260	4.50
GW036S	150	70	N	15	N	70	N	--	--	--	3.560	7.42
GW037S	150	50	N	15	N	300	N	--	--	--	3.090	8.39
GW038S	100	70	N	20	N	500	N	--	--	--	2.870	11.40
GW039S	100	50	N	15	N	200	N	--	--	--	2.570	8.60
GW040S	200	50	N	20	N	1,000	N	--	--	--	2.930	7.61
GW041S	N	30	N	10	N	300	N	2	8	7	--	--
GW042S	N	50	N	N	N	300	N	2	5	7	--	--
GW043S	N	30	N	<10	N	150	N	2	8	4	--	--
GW044S	N	50	N	10	N	200	N	2	9	3	--	--
GW045S	<100	100	N	20	N	500	N	15	15	30	--	--

Table 3.-- Analytical data for stream sediments from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---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	Be-ppm s
GW046S	36 47 40	113 47 45	2.0	.50	.7	.70	500	N	N	N	70	500	1.5
GW047S	36 46 10	113 51 5	5.0	.50	.7	.70	1,500	N	N	N	70	200	<1.0
GW048S	36 43 15	113 53 25	1.0	.30	.5	.20	200	N	N	N	70	300	1.0
GW049S	36 43 5	113 52 45	3.0	1.50	2.0	.70	700	N	N	N	70	500	1.5
GW050S	36 42 45	113 53 30	2.0	1.50	1.5	.50	300	N	N	N	100	500	1.0
GW051S	36 42 35	113 54 5	2.0	1.50	2.0	.50	300	N	N	N	100	500	1.5
GW052S	36 46 50	113 46 55	2.0	2.00	5.0	.50	500	N	N	N	70	500	1.5
GW053S	36 45 55	113 46 10	2.0	5.00	10.0	.30	700	N	N	N	100	300	1.0
GW054S	36 45 35	113 46 0	2.0	3.00	7.0	.30	700	N	N	N	70	700	1.0
GW055S	36 45 40	113 45 55	3.0	2.00	5.0	.50	700	N	N	N	100	500	1.5
GW056S	36 53 55	113 50 50	1.5	10.00	20.0	.20	300	N	N	N	70	150	N
GW057S	36 54 55	113 48 35	3.0	3.00	7.0	.50	1,000	N	N	N	70	500	<1.0
GW058S	36 56 15	113 49 0	3.0	3.00	7.0	.30	1,000	N	N	N	70	500	1.0
GW059S	36 54 55	113 49 50	1.5	5.00	10.0	.15	300	N	N	N	70	300	<1.0
GW060S	36 56 25	113 48 20	1.5	1.50	7.0	.30	300	N	N	N	100	300	N
GW061S	36 46 32	113 43 33	2.0	2.00	2.0	.15	300	N	N	N	50	150	N
GW062S	36 43 43	113 44 0	1.5	2.00	10.0	.15	500	N	N	N	100	200	1.5
GW063S	36 43 45	113 42 28	2.0	3.00	7.0	.50	700	N	N	N	100	500	1.0
GW064S	36 46 4	113 42 22	2.0	3.00	10.0	.50	1,000	N	N	N	100	500	1.0
GW065S	36 58 18	113 42 34	.7	.50	1.5	.20	150	N	N	N	100	300	<1.0
GW265S	36 44 1	113 53 40	.7	1.00	3.0	.30	300	N	N	N	70	500	1.0
GW266S	36 42 37	113 54 16	1.0	.70	2.0	.50	500	N	N	N	100	500	1.0
GW267S	36 42 52	113 53 50	1.0	.70	2.0	.50	300	N	N	N	100	500	1.5
GW268S	36 42 13	113 54 11	2.0	1.50	3.0	.50	700	N	N	N	100	700	1.5
GW269S	36 40 47	113 53 57	.5	.15	.2	.10	150	N	N	N	15	300	<1.0
GW270S	36 39 44	113 51 45	.7	.10	.3	.15	150	N	N	N	70	500	<1.0
GW271S	36 45 2	113 41 59	3.0	5.00	10.0	.50	1,000	N	N	N	150	500	2.0
GW272S	36 44 22	113 42 9	3.0	5.00	15.0	.30	1,000	N	N	N	100	700	1.5
GW273S	36 43 28	113 42 52	3.0	3.00	15.0	.50	1,000	N	N	N	150	700	1.5
GW274S	36 43 30	113 43 10	5.0	5.00	10.0	.50	1,500	N	N	N	150	700	2.0
GW275S	36 43 43	113 44 0	3.0	5.00	10.0	.50	1,000	N	N	N	200	1,000	2.0
GW276S	36 43 39	113 44 3	5.0	5.00	15.0	.50	1,000	N	N	N	200	700	2.0
GW277S	36 43 52	113 44 2	3.0	3.00	15.0	.20	700	N	N	N	150	500	2.0
GW278S	36 43 55	113 44 14	3.0	5.00	15.0	.30	1,000	N	N	N	150	500	2.0
GW279S	36 43 58	113 44 17	5.0	5.00	10.0	.50	1,000	N	N	N	200	700	2.0
GW280S	36 43 28	113 45 2	3.0	5.00	15.0	.30	1,500	N	N	N	150	500	2.0
GW281S	36 43 31	113 45 1	3.0	5.00	10.0	.30	1,500	N	N	N	200	700	2.0
GW282S	36 43 38	113 44 50	3.0	7.00	15.0	.50	1,500	<.5	N	N	200	700	2.0

Table 3.-- Analytical data for stream sediments from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---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
GW046S	N	N	7	100	30	30	N	N	30	30	N	5	N
GW047S	N	N	7	100	15	150	N	N	15	20	N	7	N
GW048S	N	N	N	30	<5	<20	N	N	10	15	N	<5	N
GW049S	N	N	7	70	30	30	N	N	30	30	N	10	N
GW050S	N	N	5	15	15	<20	N	N	5	30	N	5	N
GW051S	N	N	7	100	15	20	N	N	10	20	N	5	N
GW052S	N	N	7	100	50	20	N	N	20	20	N	5	N
GW053S	N	N	7	70	30	20	N	N	20	30	N	7	N
GW054S	N	N	7	100	30	20	N	N	20	30	N	7	N
GW055S	N	N	10	100	30	20	N	N	30	30	N	10	N
GW056S	N	N	5	50	10	20	N	N	15	30	N	5	N
GW057S	N	N	7	100	20	30	N	N	20	30	N	7	N
GW058S	N	N	7	100	20	20	N	N	20	30	N	10	N
GW059S	N	N	5	50	10	20	N	N	10	30	N	5	N
GW060S	N	N	5	70	10	<20	N	N	20	20	N	5	N
GW061S	N	N	7	150	50	N	N	N	30	30	N	7	N
GW062S	N	N	<5	50	20	20	N	N	10	20	N	5	N
GW063S	N	N	7	100	30	20	N	N	20	30	N	7	N
GW064S	N	N	10	150	30	20	N	N	50	30	N	7	N
GW065S	N	N	5	50	<5	<20	N	N	10	15	N	<5	N
GW265S	N	N	7	50	10	20	N	N	10	20	N	5	N
GW266S	N	N	7	70	15	20	N	<20	20	30	N	5	N
GW267S	N	N	7	70	15	20	N	<20	15	30	N	5	N
GW268S	N	N	10	70	20	20	N	<20	20	50	N	10	N
GW269S	N	N	5	30	5	<20	N	N	10	20	N	<5	N
GW270S	N	N	<5	30	<5	<20	N	N	5	20	N	<5	N
GW271S	N	N	10	100	30	30	N	<20	50	50	N	10	N
GW272S	N	N	10	100	20	20	N	<20	30	50	N	7	N
GW273S	N	N	10	100	30	30	N	<20	70	50	N	10	N
GW274S	N	N	15	100	50	30	N	<20	30	50	N	15	N
GW275S	N	N	20	100	500	30	20	<20	50	150	N	15	N
GW276S	N	N	10	100	50	30	N	<20	30	30	N	15	N
GW277S	N	N	7	70	20	20	N	N	20	30	N	7	N
GW278S	N	N	10	70	30	30	N	<20	20	30	N	10	N
GW279S	N	N	10	70	70	30	N	<20	30	70	N	10	N
GW280S	N	N	10	70	50	20	N	N	20	50	N	10	N
GW281S	N	N	10	70	50	30	N	<20	20	50	N	10	N
GW282S	N	N	10	70	700	30	15	<20	20	50	N	10	N

Table 3.-- Analytical data for stream sediments from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---continued

Sample	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Cu-ppm aa	Pb-ppm aa	Zn-ppm aa	U(N-act)	Th(N-act
GW046S	100	70	N	30	N	500	N	10	25	30	--	--
GW047S	N	100	N	100	N	500	N	4	10	7	--	--
GW048S	N	30	N	10	N	300	N	2	5	5	--	--
GW049S	150	100	N	20	N	200	N	10	20	25	--	--
GW050S	N	70	N	20	N	700	N	2	20	8	--	--
GW051S	<100	100	N	20	N	500	N	1	5	3	--	--
GW052S	300	100	N	20	N	300	N	25	6	6	--	--
GW053S	200	70	N	20	N	200	N	10	20	15	--	--
GW054S	300	70	N	20	N	200	N	3	10	8	--	--
GW055S	300	100	N	20	N	150	N	10	15	7	--	--
GW056S	100	50	N	20	N	200	N	4	15	20	--	--
GW057S	<100	100	N	30	N	300	N	3	6	10	--	--
GW058S	<100	100	N	30	N	700	N	4	6	10	--	--
GW059S	<100	50	N	15	N	200	N	3	15	15	--	--
GW060S	150	50	N	15	N	300	N	3	7	15	--	--
GW061S	150	100	N	20	N	100	N	15	15	30	--	--
GW062S	3,000	50	N	15	N	50	N	7	10	25	--	--
GW063S	200	100	N	20	N	300	N	8	15	10	--	--
GW064S	500	100	N	20	N	300	N	5	15	10	--	--
GW065S	N	20	N	15	N	500	N	2	6	9	--	--
GW265S	100	50	N	20	N	500	N	--	--	--	--	--
GW266S	150	50	N	20	N	300	N	--	--	--	--	--
GW267S	<100	70	N	30	N	700	N	--	--	--	--	--
GW268S	100	70	N	20	N	200	N	--	--	--	--	--
GW269S	N	20	N	10	N	30	N	--	--	--	--	--
GW270S	N	20	N	10	N	150	N	--	--	--	--	--
GW271S	200	100	N	30	N	200	N	--	--	--	--	--
GW272S	500	70	N	30	N	200	N	--	--	--	--	--
GW273S	300	100	N	30	N	300	N	--	--	--	--	--
GW274S	200	150	N	30	N	300	N	--	--	--	--	--
GW275S	5,000	150	N	30	700	300	N	--	--	--	--	--
GW276S	1,500	150	N	30	N	150	N	--	--	--	--	--
GW277S	2,000	100	N	20	N	50	N	--	--	--	--	--
GW278S	1,500	100	N	20	N	100	N	--	--	--	--	--
GW279S	200	100	N	30	N	150	N	--	--	--	--	--
GW280S	700	100	N	20	N	100	N	--	--	--	--	--
GW281S	2,000	150	N	20	N	70	N	--	--	--	--	--
GW282S	300	100	N	30	N	150	N	--	--	--	--	--

Table 4.-- Analytical data for panned concentrates from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona

[The following qualifiers are used in reporting spectographic data: --, no determination made; N, concentration less than the detection limit; <, detected--but present at a concentration less than the value reported; and >, element present at a concentration greater than the upper detection limit.]

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
GW001P	36 56 55	113 46 15	5.0	5.00	5.0	.30	700	N	<500	N	100	5,000
GW002P	36 57 15	113 46 10	20.0	.70	2.0	2.00	1,500	N	N	N	30	5,000
GW003P	36 45 0	113 50 37	30.0	1.00	.7	1.50	10,000	N	N	N	20	100
GW004P	36 42 32	113 47 13	7.0	5.00	.7	1.00	1,000	N	N	N	30	200
GW005P	36 41 40	113 46 55	5.0	2.00	.7	.70	700	N	N	N	30	7,000
GW006P	36 41 52	113 46 15	10.0	2.00	1.0	1.50	1,500	N	N	N	100	10,000
GW007P	36 58 11	113 52 4	1.0	3.00	15.0	.10	150	N	N	N	30	300
GW008P	36 56 45	113 51 35	2.0	5.00	20.0	.30	700	N	N	N	150	200
GW009P	36 40 20	113 49 15	7.0	.30	.3	1.50	1,500	N	N	N	150	300
GW010P	36 40 5	113 54 0	20.0	2.00	1.0	1.50	>10,000	N	N	N	N	300
GW011P	36 56 15	113 49 0	15.0	3.00	5.0	1.00	7,000	N	N	N	20	500
GW048P	36 44 1	113 53 40	1.5	.15	1.5	2.00	150	N	N	N	100	10,000
GW049P	36 42 37	113 54 16	2.0	.30	.7	>2.00	500	N	N	N	200	>10,000
GW050P	36 42 13	113 54 11	1.5	.30	3.0	>2.00	700	N	N	N	150	10,000
GW051P	36 40 47	113 53 57	3.0	.15	.5	>2.00	1,000	N	N	N	300	7,000
GW052P	36 39 44	113 51 45	1.5	.10	.2	>2.00	300	N	N	N	200	3,000
GW053P	36 43 45	113 42 28	3.0	5.00	7.0	1.00	500	N	N	N	200	10,000
GW054P	36 43 30	113 43 10	1.5	2.00	2.0	.70	300	N	N	N	<20	>10,000
GW055P	36 43 39	113 44 3	.7	.70	2.0	.10	200	N	N	N	20	>10,000
GW056P	36 43 31	113 45 1	1.0	.50	2.0	.07	300	N	N	N	20	>10,000

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	Sb-ppm s
GW001P	N	N	N	20	200	30	<50	20	N	500	50	N
GW002P	N	N	N	20	300	100	50	N	50	100	50	N
GW003P	N	N	N	50	200	50	1,500	N	N	50	100	N
GW004P	N	N	N	50	500	50	<50	N	N	300	20	N
GW005P	N	N	N	20	500	30	<50	N	N	150	30	N
GW006P	<2	N	N	20	700	100	50	N	<50	300	100	N
GW007P	<2	N	N	N	50	<10	<50	N	N	10	<20	N
GW008P	<2	N	N	10	100	10	<50	20	N	20	30	N
GW009P	<2	N	N	10	70	50	50	N	<50	20	70	N
GW010P	N	N	N	20	300	30	700	N	N	30	70	N
GW011P	N	N	N	20	300	30	700	N	N	50	70	N
GW048P	<2	N	N	N	200	20	150	N	N	20	1,500	N
GW049P	<2	N	N	N	200	70	300	N	N	70	200	N
GW050P	<2	N	N	N	100	2,000	700	N	N	10	100	N
GW051P	N	N	N	<10	150	N	1,500	N	N	50	100	N
GW052P	N	N	N	N	150	<10	300	N	N	20	70	N
GW053P	N	N	N	<10	300	70	70	N	N	100	100	N
GW054P	N	N	N	N	100	20	70	20	N	50	3,000	N
GW055P	N	N	N	N	50	150	50	20	N	10	7,000	N
GW056P	N	N	N	N	20	30	50	20	N	10	7,000	N

Table 4.-- Analytical data for panned concentrates from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---continued

Sample	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
GW001P	<10	N	200	100	N	20	N	2,000	N	N
GW002P	10	N	<200	700	N	50	N	700	N	N
GW003P	70	N	N	500	N	500	N	1,500	300	N
GW004P	10	N	N	200	N	20	N	500	N	N
GW005P	<10	N	N	200	N	<20	N	500	N	N
GW006P	<10	N	700	300	N	50	N	>2,000	N	N
GW007P	<10	N	N	50	N	<20	N	500	N	N
GW008P	<10	N	<200	100	N	30	N	500	N	.08
GW009P	<10	N	N	500	N	50	N	>2,000	N	N
GW010P	70	N	N	300	N	500	N	1,000	<200	N
GW011P	70	N	N	200	N	500	N	>2,000	<200	N
GW048P	100	N	N	100	N	1,000	N	>2,000	N	--
GW049P	100	N	>10,000	200	N	100	N	>2,000	N	--
GW050P	70	150	N	200	<100	700	N	>2,000	N	--
GW051P	150	N	N	300	N	1,000	N	>2,000	N	--
GW052P	150	70	N	150	N	700	N	>2,000	N	--
GW053P	30	N	>10,000	100	N	200	N	>2,000	N	--
GW054P	20	N	>10,000	70	N	200	N	>2,000	N	--
GW055P	10	N	>10,000	70	N	20	N	2,000	N	--
GW056P	10	N	>10,000	200	N	20	N	500	N	--

Table 5.-- Analytical data for rocks from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona

[The following qualifiers are used in reporting spectographic data: --, no determination made; N, concentration less than the detection limit; <, detected--but present at a concentration less than the value reported; and >, element present at a concentration greater than the upper detection limit.]

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
GW001R	36 50 50	113 46 40	10.00	5.00	5.00	1.000	1,500	N	N	N	10	500
GW002R	36 53 10	113 46 45	<.05	.20	20.00	.010	15	N	N	N	N	20
GW003R	36 53 50	113 46 20	1.00	.50	20.00	.070	1,000	N	N	N	20	150
GW004R	36 56 25	113 50 5	1.00	5.00	7.00	.200	150	N	N	N	70	150
GW005R	36 57 25	113 50 10	.15	5.00	20.00	.050	300	N	N	N	<10	70
GW006R	36 57 35	113 49 50	1.00	7.00	20.00	.100	200	N	N	N	20	70
GW007R	36 43 55	113 49 50	.20	.10	.20	.020	50	N	N	N	10	150
GW008R	36 42 55	113 48 32	.20	.07	.20	.007	150	N	N	N	20	200
GW009R	36 42 50	113 48 17	5.00	5.00	5.00	.700	1,500	N	N	N	N	300
GW010R	36 58 0	113 47 55	<.05	.30	20.00	.010	15	N	N	N	N	20
GW011R	36 47 40	113 47 50	.20	.07	3.00	.020	100	N	N	N	70	100
GW012R	36 46 0	113 50 50	1.00	.10	.30	.010	700	N	N	N	N	150
GW013R	36 42 45	113 52 40	10.00	5.00	5.00	1.000	1,000	N	N	N	N	700
GW014R	36 42 30	113 53 5	.30	.10	.07	.030	70	N	N	N	15	150
GW015R	36 43 25	113 52 30	2.00	1.00	2.00	.500	500	N	N	N	50	500
GW016R	36 43 32	113 52 30	.70	.05	.07	.050	150	N	N	N	15	70
rW017R	36 42 55	113 52 55	1.50	.07	.30	.070	70	N	N	N	150	1,000
GW019R	36 46 55	113 46 55	2.00	3.00	10.00	.070	200	N	N	N	30	1,000
GW020R	36 47 5	113 47 0	1.50	5.00	10.00	.150	500	N	N	N	100	150
GW021R	36 46 45	113 46 45	2.00	2.00	10.00	.020	3,000	N	N	N	15	200
GW022R	36 46 50	113 49 45	>20.00	.20	15.00	.007	70	N	N	N	N	30
GW023R	36 46 8	113 42 21	1.00	10.00	20.00	.030	500	N	N	N	<10	70
GW024R	36 45 37	113 41 42	3.00	5.00	5.00	.500	500	N	N	N	100	500
GW148R	36 41 46	113 54 29	5.00	.50	1.50	.300	1,000	N	N	N	10	1,000
GW159R	36 43 45	113 43 53	3.00	2.00	10.00	.500	500	N	N	N	200	1,000
GW160R	36 43 48	113 44 14	.05	.20	>20.00	.030	10	N	N	N	N	<20
GW161R	36 43 52	113 44 13	10.00	7.00	10.00	1.000	1,000	N	N	N	N	2,000
GW162R	36 43 58	113 44 14	10.00	5.00	10.00	1.000	1,500	N	N	N	<10	1,500
GW0120	36 37 37	113 58 38	1.50	.20	1.00	.002	>5,000	N	200	N	N	>5,000
GW0130	36 43 53	113 52 55	2.00	.10	.30	.050	3,000	<.5	N	N	N	700

Table 5.-- Analytical data for rocks from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---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	Sb-ppm s
GW001R	N	N	N	50	500	70	30	N	<20	100	15	N
GW002R	N	N	N	N	<10	<5	20	N	N	N	<10	N
GW003R	N	N	N	20	70	7	<20	10	N	20	30	N
GW004R	<1.0	N	N	<5	100	5	20	<5	N	15	20	N
GW005R	N	N	N	N	50	<5	<20	<5	N	<5	<10	N
GW006R	N	N	N	N	70	5	<20	N	N	10	20	N
GW007R	<1.0	N	N	N	20	<5	<20	N	N	<5	<10	N
GW008R	<1.0	N	N	N	N	20	N	N	N	<5	<10	N
GW009R	N	N	N	30	500	50	20	N	<20	150	20	N
GW010R	N	N	N	N	20	<5	20	N	N	N	N	N
GW011R	N	N	N	N	30	<5	20	N	N	5	<10	N
GW012R	N	N	N	N	10	<5	<20	N	N	5	50	N
GW013R	N	N	N	50	700	70	20	N	<20	150	15	N
GW014R	<1.0	N	N	N	10	<5	<20	N	N	5	20	N
GW015R	1.0	N	N	15	30	20	20	N	N	10	30	N
GW016R	N	N	N	<5	30	<5	20	N	N	5	15	N
FW017R	1.0	N	N	N	100	30	70	N	N	7	50	N
GW019R	1.0	N	N	N	50	10	20	N	N	<5	<10	N
GW020R	1.5	N	N	5	70	15	20	N	N	10	15	N
GW021R	1.0	N	N	N	10	30	20	N	N	<5	15	N
GW022R	N	N	N	N	30	30	N	100	N	70	200	N
GW023R	N	N	N	N	20	7	<20	N	N	<5	30	N
GW024R	1.0	N	N	10	100	20	30	N	N	30	15	N
GW148R	1.5	N	N	7	15	70	30	N	20	<5	70	N
GW159R	2.0	N	N	20	70	300	30	15	<20	30	100	N
GW160R	<1.0	N	N	N	10	70	20	N	N	<5	10	N
GW161R	N	N	N	30	1,000	70	30	N	30	150	20	N
GW162R	<1.0	N	N	30	500	70	30	N	30	150	30	N
GW0120	7.0	N	N	>2,000	150	10,000	20	1,500	N	500	>20,000	N
GW0130	3.0	N	N	20	20	700	20	30	N	10	200	N

Table 5.-- Analytical data for rocks from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---continued

Sample	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	U(N-act)	Th(N-act
GW001R	20	N	700	200	N	20	N	150	N	1.420	4.92
GW002R	N	N	1,500	10	N	N	N	N	N	<.120	2.10
GW003R	<5	N	500	20	N	15	N	100	N	2.280	<6.80
GW004R	5	N	<100	70	N	20	N	200	N	3.190	4.10
GW005R	N	N	N	20	N	10	N	200	N	6.390	<3.00
GW006R	<5	N	N	50	N	15	N	100	N	3.000	3.80
GW007R	N	N	N	10	N	N	N	50	N	.228	1.20
GW008R	N	N	N	20	N	N	N	10	N	1.260	<4.40
GW009R	20	N	500	150	N	20	N	100	N	.944	4.03
GW010R	N	N	1,000	10	N	N	N	<10	N	<.140	<.15
GW011R	N	N	N	20	N	20	N	150	N	1.460	2.10
GW012R	<5	N	N	10	N	10	N	10	N	.670	2.20
GW013R	30	N	300	200	N	30	N	150	N	.560	2.70
GW014R	N	N	N	15	N	N	N	30	N	.216	1.70
GW015R	10	N	300	100	N	20	N	70	N	2.270	6.47
GW016R	N	N	N	30	N	10	N	50	N	.612	3.65
FW017R	<5	N	1,000	100	N	30	N	100	N	1.980	3.50
GW019R	<5	N	1,500	30	N	10	N	30	N	.968	3.50
GW020R	5	N	700	70	N	20	N	100	N	1.930	7.18
GW021R	N	N	N	50	N	15	N	20	N	2.140	<2.30
GW022R	N	N	N	70	N	<10	<200	N	N	2.690	<2.30
GW023R	N	N	150	20	N	<10	N	20	N	1.690	<2.30
GW024R	10	N	150	150	N	20	N	150	N	4.500	11.00
GW148R	20	N	150	20	N	100	N	500	N	--	--
GW159R	15	N	5,000	200	N	30	1,000	200	N	--	--
GW160R	<5	N	2,000	20	N	<10	N	15	N	--	--
GW161R	30	N	700	200	N	30	N	200	N	--	--
GW162R	30	N	1,000	200	N	30	N	200	N	--	--
GW0120	N	N	3,000	700	N	30	200	50	N	16.100	<4.60
GW0130	N	N	N	20	N	15	N	100	N	.982	2.90

TABLE 6.--Analytical data for waters from the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona
[The following qualifier is used in reporting data: --, no determination made]

Sample Number	Latitude	Longitude	Cu (µg/L)	U (µg/L)	Pb (µg/L)	Zn (µg/L)	$SO_4^=$ (mg/L)	F^- (mg/L)	Cl^- (mg/L)	HCO_3^- (mg/L)	Specific Conductance (µmhos/cm)	pH	Temp (°C)
GW001W	36 55 51	113 46 01	--	1.0	--	--	100	.14	4.2	76	380	8.56	12
GW002W	36 56 20	113 45 55	--	.32	--	--	10	.08	1.7	102	205	8.58	16
GW003W	36 52 37	113 46 32	--	1.4	--	--	937	.15	22	158	1700	8.14	11
GW004W	36 57 11	113 49 34	--	.76	--	--	9.5	.10	1.6	168	290	8.99	14
GW005W	36 45 53	113 50 01	--	.20	--	--	1.8	.12	.90	92	165	9.00	5
GW006W	36 47 38	113 50 27	--	.42	--	--	1.0	.13	23	253	500	8.34	10
GW007W	36 42 32	113 47 13	--	5.0	--	--	262	.29	34	354	1160	7.34	14
GW008W	36 41 46	113 46 47	--	5.4	--	--	557	.35	29	301	1500	8.13	12
GW009W	36 39 43	113 54 07	--	.34	--	--	9.4	.17	12.6	224	460	9.17	15
GW011W	36 46 11	113 51 08	--	2.0	--	--	37	.50	22	329	600	7.68	6
GW012W	36 44 21	113 52 34	--	.24	--	--	6.7	.10	2.8	80	170	9.85	13
GW013W	36 43 15	113 52 33	--	1.2	--	--	41	.22	17	319	650	7.68	11
GW014W	36 42 48	113 53 46	--	1.5	--	--	31	.91	14	314	600	7.76	10
GW015W	36 46 30	113 43 28	--	1.5	--	--	884	1.4	21	286	1800	8.16	10
GW016W	36 43 43	113 44 00	--	15	--	--	4280	1.5	167	252	5200	8.06	8
GW017W	36 44 12	113 42 14	--	3.0	--	--	2652	.81	200	329	4300	7.36	12
GW018W	36 46 08	113 42 21	--	.82	--	--	2338	1.4	86	314	3500	7.90	14
GW040W	36 43 37	113 44 58	5.8	32	4.2	4.1	2200	1.4	80	--	3700	--	--

Table 7.-- Analytical data for backround rocks from measured geologic section near the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona.

Sample	Latitude	Longitude	GEOLNAME	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s
GW120R	36 43 0	114 56 30	Bullion	36.7167	114.9417	<.05	.50	20.00	.002	20	N	N
GW121R	36 43 0	114 56 30	Arrowhead	36.7167	114.9417	.20	.70	>20.00	.030	70	N	N
GW122R	36 43 0	114 56 30	Yellowpine	36.7167	114.9417	<.05	.50	>20.00	.005	30	N	N
GW123R	36 43 0	114 56 30	Dawn	36.7167	114.9417	<.05	10.00	15.00	<.002	500	N	N
GW124R	36 43 0	114 55 30	Anchor	36.7167	114.9250	.07	1.00	20.00	.010	70	N	N
GW125R	36 43 0	114 55 30	Callville	36.7167	114.9250	.30	.70	>20.00	.050	50	N	N
GW126R	36 43 0	114 55 30	Callville	36.7167	114.9250	.07	.30	10.00	.070	50	N	N
GW127R	36 43 0	114 55 30	Pakoon	36.7167	114.9250	.15	10.00	15.00	.050	70	N	N
GW128R	36 43 0	114 55 30	Pakoon	36.7167	114.9250	.20	10.00	20.00	.007	70	7.0	N
GW129R	36 43 0	114 55 30	Esplanade	36.7167	114.9250	.20	.15	.50	.070	50	N	N
GW130R	36 43 0	114 55 30	Esplanade	36.7167	114.9250	.20	.30	1.00	.070	70	N	N
GW131R	36 43 0	114 55 30	Toroweap	36.7167	114.9250	.07	.70	>20.00	.010	20	N	N
GW132R	36 41 30	114 55 30	Shinarump	36.6917	114.9250	2.00	.07	.30	.100	50	.5	N
GW133RA	36 41 30	114 55 30	Chinle	36.6917	114.9250	1.50	.07	.20	.070	150	N	N
GW133RB	36 41 30	114 55 30	Chinle	36.6917	114.9250	3.00	.70	1.50	.200	1,000	N	N
GW134R	36 42 0	114 55 30	Moenave	36.7000	114.9250	3.00	3.00	15.00	.300	700	N	N
GW135R	36 41 0	114 55 30	Moenkopi	36.6833	114.9250	2.00	2.00	5.00	.300	1,000	N	N
GW136R	36 41 0	114 55 30	Moenkopi	36.6833	114.9250	.15	7.00	10.00	.015	700	N	N
GW137R	36 41 0	114 55 30	Moenkopi	36.6833	114.9250	3.00	3.00	7.00	.300	1,500	N	N
GW138R	36 41 0	114 55 30	Moenkopi	36.6833	114.9250	.30	.70	>20.00	.020	1,000	<.5	N
GW139R	36 40 30	114 55 30	Kaibab	36.6750	114.9250	.05	.50	>20.00	.010	30	N	N
GW140R	36 42 0	114 55 30	Navajo	36.7000	114.9250	.30	.05	.15	.020	30	N	N

Sample	Au-ppm s	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
GW120R	N	N	N	N	N	N	N	50	5	20	N	N	N
GW121R	N	20	20	N	N	N	N	50	<5	20	N	N	5
GW122R	N	10	N	N	N	N	N	50	<5	20	N	N	5
GW123R	N	N	N	N	N	N	N	<10	<5	20	N	N	<5
GW124R	N	10	30	N	N	N	N	20	10	20	N	N	5
GW125R	N	15	20	N	N	N	N	70	<5	20	N	N	5
GW126R	N	20	150	<1.0	N	N	<5	30	<5	20	N	N	<5
GW127R	N	10	20	<1.0	N	N	N	50	<5	20	N	N	<5
GW128R	N	N	<20	<1.0	N	N	N	50	5	20	N	N	5
GW129R	N	30	200	<1.0	N	N	<5	30	<5	20	N	N	7
GW130R	N	50	300	<1.0	N	N	<5	30	<5	20	N	N	15
GW131R	N	15	50	N	N	N	N	50	<5	<20	N	N	7
GW132R	N	150	1,000	1.5	N	N	N	100	150	150	5	N	10
GW133RA	N	30	1,000	N	N	N	N	20	10	<20	N	N	5
GW133RB	N	70	1,000	1.5	N	N	5	20	10	30	N	N	7
GW134R	N	100	700	<1.0	N	N	15	100	30	30	N	N	30
GW135R	N	70	500	1.5	N	N	7	70	20	30	N	N	20
GW136R	N	20	150	N	N	N	N	10	70	20	N	N	5
GW137R	N	70	1,000	<1.0	N	N	10	70	50	30	N	N	30
GW138R	N	<10	<20	N	N	N	<5	20	7	20	N	N	<5

Table 7.-- Analytical data for backround rocks from measured geologic section near the Narrows, Lime Hills, and Sand Cove Wilderness Study Areas, Mohave County, Arizona---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
GW120R	10	N	N	N	150	20	N	N	N	N	N
GW121R	30	N	<5	N	300	20	N	<10	N	15	N
GW122R	20	N	N	N	200	30	N	N	N	N	N
GW123R	<10	N	N	N	N	15	N	<10	N	N	N
GW124R	10	N	N	N	300	10	N	15	N	<10	N
GW125R	<10	N	N	N	300	30	N	10	N	50	N
GW126R	<10	N	<5	N	150	15	N	<10	N	200	N
GW127R	<10	N	N	N	N	15	N	<10	N	50	N
GW128R	15	N	N	N	N	20	N	N	N	<10	N
GW129R	<10	N	N	N	N	15	N	<10	N	200	N
GW130R	<10	N	N	N	N	15	N	<10	N	150	N
GW131R	<10	N	N	N	300	20	N	<10	N	15	N
GW132R	50	N	<5	N	1,000	100	N	70	N	150	N
GW133RA	<10	N	N	N	N	50	N	<10	N	150	N
GW133RB	20	N	5	N	200	70	N	15	N	100	N
GW134R	20	N	10	N	300	150	N	20	N	150	N
GW135R	20	N	7	N	100	70	N	30	N	200	N
GW136R	<10	N	N	N	1,500	15	N	N	N	10	N
GW137R	30	N	10	N	150	200	N	20	N	100	N
GW138R	30	N	N	N	300	20	N	N	N	10	N
GW139R	<10	N	N	N	300	15	N	<10	N	<10	N
GW140R	<10	N	N	N	N	10	N	N	N	70	N