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GEOLOGICAL SURVEY

**Analytical results and sample locality maps of stream sediments,
heavy-mineral concentrates, and plant samples from
Black Rock, Fishhooks, and Needles Eye Wilderness Study Areas,
Graham and Gila Counties, Arizona**

By

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CONTENTS

	Page
Studies related to Wilderness.....	1
Introduction.....	1
Methods of study.....	3
Sample collection.....	3
Stream-sediment samples.....	3
Heavy-mineral-concentrate samples.....	4
Plant samples.....	4
Sample preparation.....	5
Stream-sediment samples.....	5
Heavy-mineral-concentrate samples.....	5
Plant samples.....	5
Sample analyses.....	5
Stream-sediment and heavy-mineral-concentrate samples.....	5
Plant samples.....	6
Description of data tables.....	6
RASS.....	7
References.....	9

Tables

Table 1. Limits of determination for spectrographic analyses of stream sediments.....	8
Table 2. Analytical data for stream sediments from the Black Rock Wilderness Study Area, Graham County, Arizona.....	10
Table 3. Analytical data for stream sediments from the Fishhooks Wilderness Study Area, Graham County, Arizona.....	13
Table 4. Analytical data for stream sediments from the Needles Eye Wilderness Study Area, Gila County, Arizona.....	16
Table 5. Analytical data for heavy-mineral concentrates from the Black Rock Wilderness Study Area, Graham County, Arizona.....	19
Table 6. Analytical data for heavy-mineral concentrates from the Fishhooks Wilderness Study Area, Graham County, Arizona.....	23
Table 7. Analytical data for heavy-mineral concentrates from the Needles Eye Wilderness Study Area, Gila County, Arizona.....	27
Table 8. Analytical data for ashed samples of mesquite leaves from the Black Rock Wilderness Study Area, Graham County, Arizona.....	31
Table 9. Analytical data for ashed samples of mesquite leaves from the Fishhooks Wilderness Study Area, Graham County, Arizona.....	33
Table 10. Analytical data for ashed samples of juniper from the Fishhooks Wilderness Study Area, Graham County Arizona.....	35

Table 11. Analytical data for ashed samples of mesquite leaves from the Needles Eye Wilderness Study Area, Gila County, Arizona.....	38
Table 12. Number of data with qualifying codes in stream sediments from the Black Rock Wilderness Study Area, Graham County, Arizona.....	40
Table 13. Number of data with qualifying codes in stream sediments from the Fishhooks Wilderness Study Area, Graham County, Arizona.....	41
Table 14. Number of data with qualifying codes in stream sediments from the Needles Eye Wilderness Study Area, Gila County, Arizona.....	42
Table 15. Number of data with qualifying codes in heavy-mineral concentrates for the Black Rock Wilderness Study Area, Graham County, Arizona.....	43
Table 16. Number of data with qualifying codes in heavy-mineral concentrates for the Fishhooks Wilderness Study Area, Graham County, Arizona	44
Table 17. Number of data with qualifying codes in heavy-mineral concentrates for the Needles Eye Wilderness Study Area, Gila County, Arizona.....	45
Table 18. Number of data with qualifying codes in ash of mesquite leaves from the Black Rock Wilderness Study Area, Graham County, Arizona.....	46
Table 19. Number of data with qualifying codes in ash of mesquite leaves from the Fishhooks Wilderness Study Area, Graham County, Arizona.....	47
Table 20. Number of data with qualifying codes in ash of juniper from the Fishhooks Wilderness Study Area, Graham County, Arizona.....	48
Table 21. Number of data with qualifying codes in ash of mesquite leaves from the Needles Eye Wilderness Study Area, Gila County, Arizona.....	49

Illustrations

Figure 1. Location map of the Black Rock, Fishhooks, and Needles Eye Wilderness Study Areas, Arizona.....	2
Plate 1. Geochemical sample locality map, Black Rock Wilderness Study Area, Graham County, Arizona.....	In pocket
Plate 2. Geochemical sample locality map, Fishhooks Wilderness Study Area, Graham County Arizona.....	In pocket
Plate 3. Geochemical sample locality map, Needles Eye Wilderness Study Area, Gila County, Arizona.....	In pocket

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 mineral surveys of the Black Rock, Fishhooks, and Needles Eye Wilderness Study Areas (WSA), Graham and Gila Counties, Arizona.

Introduction

In April 1984, we conducted reconnaissance geochemical surveys of three wilderness study areas--Black Rock, Fishhooks, and Needles Eye in Graham and Gila Counties, Arizona. These areas are in eastern Arizona and each is adjacent to the San Carlos Apache Indian Reservation (fig. 1).

The Black Rock Wilderness Study Area (AZ-040-008) comprises 6,590 acres (approximately 10 square miles) in the eastern foothills of the Santa Teresa Mountains in the western part of Graham County, Arizona. The area is located about 25 miles northwest of Safford and 45 miles southeast of Globe; access to the study area is by a graded gravel road up Black Rock Wash from Fort Thomas.

The predominant rocks of the Black Rock WSA are granite gneiss of Precambrian age in the eastern half, Santa Teresa granite of Tertiary age which intrudes the metamorphic rocks of Precambrian age in the western part, and volcanic rocks of Tertiary age which form Black Rock itself. The volcanic rocks in the study area are in fault contact with the granite and metamorphic rocks. The topographic relief in the study area is 2300 feet, with a maximum elevation of 5890 feet on Jackson Mountain. The dominant physiographic feature of the area is Black Rock, an oval shaped rhyolite plug that rises nearly a thousand feet above its base and is approximately a mile long.

The Fishhooks Study Area (AZ-040-014) comprises 10,681 acres (about 16 square miles) along the crest and southern slopes of the Gila Mountains in northern Graham County, Arizona, approximately nine miles north of Fort Thomas. Access to the southern part of the study area is by a gravel road from Fort Thomas to the Diamond Bar Ranch; access to the northeastern part of the study area is by a few unimproved roads that branch off Indian Highway 8 on the San Carlos Apache Indian Reservation.

The Fishhooks Study Area is underlain by volcanic rocks of probable Tertiary age ranging in composition from basalt to rhyolite and in character from lava flows to rhyolitic plugs. The topographic relief is 2600 feet, ranging from about 4000 feet in Steer Springs Canyon to 6629 feet on Gila Peak. The area is generally quite rugged with deep canyons cutting the volcanic rocks. The higher areas of the Gila Mountains support stands of pine and juniper. In the Fishhooks WSA as well as the other two areas discussed in this report, the climate is arid to semi-arid and streams flow only intermittently.

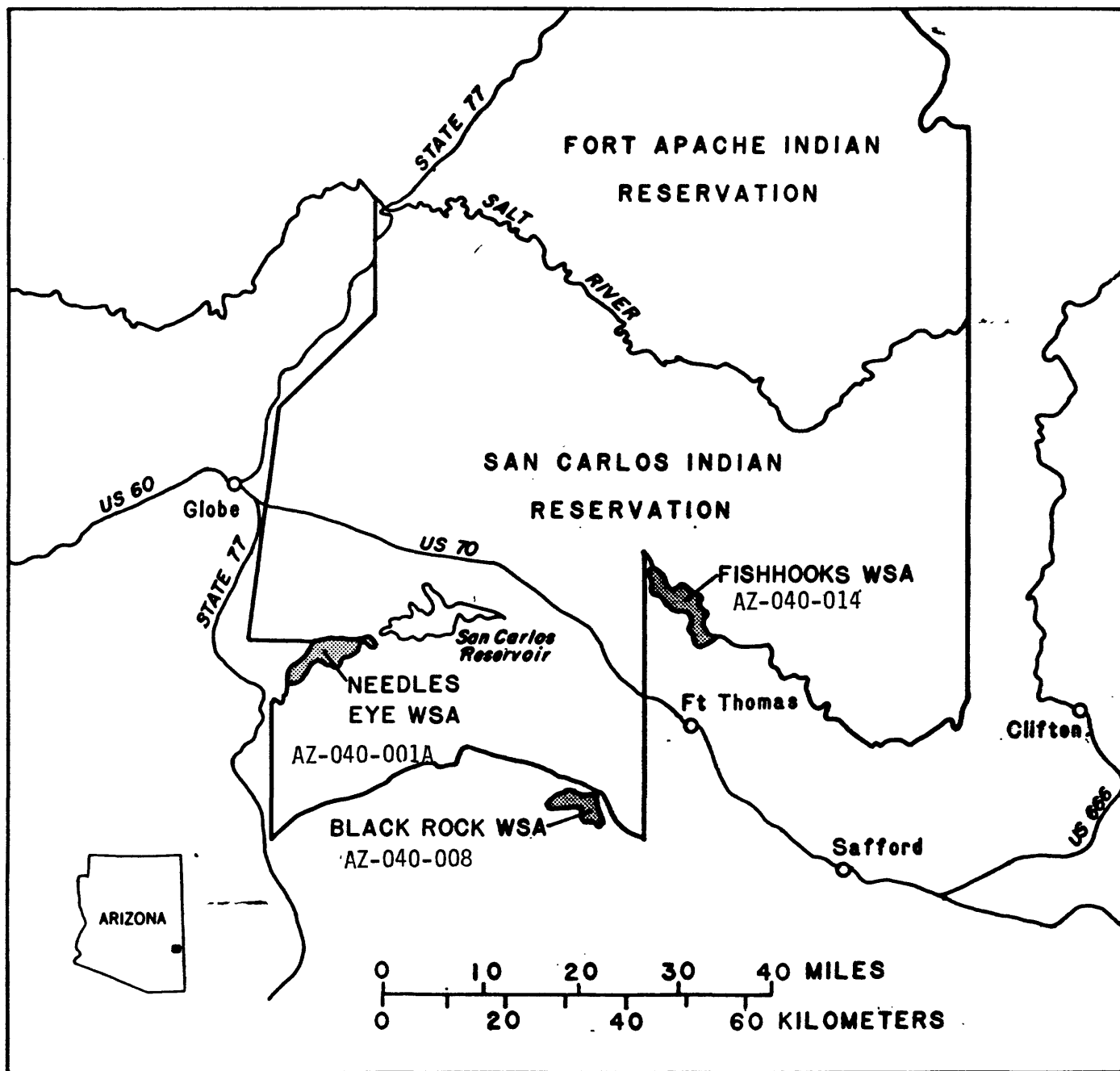


Figure 1. Location map of the Black Rock, Fishhooks, and Needles Eye Wilderness Study Areas, Arizona.

The Needles Eye Study Area (AZ-040-001A) comprises 8,970 acres (approximately 14 square miles) in the southwestern corner of Gila County, Arizona, 18 miles south southeast of Globe. Access to the study area on the east side is by an unimproved road along the Gila River below Coolidge Dam; access to the north-central area is by an unimproved road from Cutter through the San Carlos Apache Indian Reservation. In the southwest corner an unimproved road that branches off Arizona Highway 77 about 2 miles north of Christmas provides access.

The Needles Eye Study Area was mapped geologically by Willden (1964) as part of the Christmas 1:62,500 quadrangle. Rocks in the area include granite of Precambrian age, sedimentary rocks of Precambrian and Paleozoic age, and volcanic rocks of Cretaceous, Tertiary, and Quaternary ages. The sedimentary rocks form three high ridges in which the rock units have been repeated and which are separated by northwest-trending faults. The Gila River, which forms the southeastern boundary of the study area, has cut narrow steep gorges through the resistant quartzite of the ridges. The topographic relief in the study area is 2400 feet, ranging from 2100 feet along the Gila River to 4500 feet along the crest of the Mescal Mountains.

Methods of Study

Sample Collection

We collected samples at 30 sites in the Black Rock WSA (plate 1), at 24 sites in the Fishhooks WSA (plate 2), and at 27 sites in the Needles Eye WSA (plate 3). At each of these sites, we collected both a stream-sediment sample and a heavy-mineral-concentrate sample. At most sites, we also collected a plant sample of either mesquite leaves or juniper leaves and twigs. This gives a sampling density of one sample site per 0.34 square miles for the Black Rock WSA, one site per 0.65 square miles for the Fishhooks WSA, and one site per 0.51 square miles for the Needles Eye WSA. Drainage basins range in size from 0.15-2 square miles for Black Rock, from 0.2-1.7 square miles for Fishhooks, and from 0.25-1.5 square miles for Needles Eye.

Stream-sediment samples

Stream sediments reflect the composition of rocks and other materials that have eroded from the drainage basin upstream of the sample site. Analyses of these sediments give information that can be used to identify those drainage basins which contain concentrations of elements that may be related to mineral deposits and information that can be used to characterize the regional geochemistry.

The stream-sediment samples consisted of alluvium collected from the active stream channels of first order (unbranched) or second order (below the junction of two first order) streams as shown on USGS topographic maps (1:24,000 and 1:62,500). To obtain a representative, unbiased sample of the alluvium, each sample was composited from within a small area near the location plotted on the maps. At the site, each sample was sieved with a 2 mm (10 mesh) stainless steel screen to remove coarse material.

Heavy-mineral-concentrate samples

The heavy-mineral-concentrate samples were collected in the same area as the stream-sediment samples. However, these samples were intentionally biased towards the collection of heavy minerals by collection of material from places within the stream channel where these minerals are naturally concentrated by stream dynamics. Each sample was sieved through a 2-mm (10 mesh) stainless steel screen to remove coarse material. Approximately 8-10 pounds of less than 2-mm material was collected; this was panned until most of the quartz, feldspar, organic material, and clay-sized material had been removed.

The heavy-mineral-concentrate samples provide information about a limited number of minerals; however, many ore-related minerals are relatively heavy and are enriched in the heavy-mineral-concentrate samples compared to ordinary stream sediments. This concentration permits determination of some elements that are not detected in stream-sediment samples.

Plant samples

The use of plant samples in mineral exploration adds another dimension to the task of locating geochemical anomalies. Plants, through their extensive root system, have the potential to accumulate elements from varying depths beneath the surface and therefore to penetrate through overburden to give evidence of mineralization at depth. Plants also may reflect the chemistry of ground water which may contain metals forming a dispersion halo around a buried deposit.

Two kinds of plants were collected for this study. Mesquite (Prosopis juliflora) was the only plant collected in the Black Rock and Needles Eye areas. Mesquite is common in the Basin and Range province, and its roots typically tap the ground water table. Roots may reach depths of 150 feet and extend laterally for 40-50 feet (Simpson, 1977). Mesquite has been used experimentally in exploration for porphyry copper deposits in Arizona (Huff, 1970; Chaffee, 1975, 1976, 1977) and shows potential for exploring areas covered by post-ore pediment gravels.

In the Fishhooks WSA, mesquite was collected only at lower elevations. The higher elevations of the Gila Mountains are beyond the normal range of mesquite. In these areas, juniper was collected. Two species, Utah juniper (Juniperus osteosperma) and one-seeded juniper (J. monosperma) are difficult to distinguish in the field and both occur in similar habitats. We considered these two species as one and made no attempt to distinguish between them.

A plant sample consisted of several handfuls of leaves from a mesquite tree, or the terminal 3-4 inches of the branch tips of a juniper. Each sample was composited from several branches around the canopy of the tree, and was sufficient to fill a 4 x 6-inch cloth bag. Only a single tree was sampled at each site. Occasionally neither mesquite nor juniper occurred at a sampling site; in these cases, no plant was collected. We collected 29 samples in Black Rock, 25 samples in Needles Eye, and 28 samples in Fishhooks (12 mesquite and 16 juniper). At four sites in the Fishhooks WSA, we collected juniper samples in addition to the mesquite leaves because the mesquite trees were just beginning to produce leaves and only marginal quantities of leaves could be collected.

Sample Preparation

Stream-sediment samples

The stream-sediment samples were air dried and then sieved using 30-mesh (0.60-mm) stainless steel sieves. The portion of the sediment passing through the sieve was split, and a representative fraction was pulverized for analyses with ceramic plates to minus 0.12 mm.

Heavy-mineral-concentrate samples

After air drying, any remaining quartz and feldspar left after panning was removed with bromoform. The resultant heavy-mineral sample (specific gravity 2.8 or greater) 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 analysis/archival storage. The third fraction (the least magnetic material including 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.

Plant samples

All the plant samples were oven dried at 40-50°C until sufficiently brittle to grind in a Wiley Mill to pass a 1.3 mm sieve. A portion of this homogenized sample was ashed at 500°C in a muffle furnace. In the final preparation for analyses, 0.5 g of plant ash was digested in nitric acid, and the resulting solution was slowly evaporated to dryness. The dry, solubilized salts were redissolved in 20.0 ml of 2.5 N HCl. The solution was filtered through retentive filter paper to remove any undissolved solids and placed in a test tube for analyses.

Sample Analyses

Stream-sediment and heavy-mineral-concentrate samples

Stream-sediment samples were analyzed for 31 elements by a semiquantitative, direct-current arc emission spectrographic method modified from the procedure by Myers, Havens, and Dunton (1961) for the analyses of geologic materials; the heavy-mineral concentrates were analyzed by a similar procedure of Grimes and Marranzino (1968). The elements analyzed and their limits of determination are listed in table 1.

Each sample spectrum was visually compared with spectra obtained from powdered standards arced under identical conditions. The concentrations of the standards are geometrically spaced over any given order of magnitude 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 a reported value is plus or minus one reporting

interval at the 68% confidence level, or two reporting intervals at the 95% confidence level. 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 per gram).

Analytical results for stream-sediment samples from the Black Rock, Fishhooks, and Needles Eye WSA's are listed in tables 2-4. Seven elements were not detected in any of the stream-sediment samples and are not listed in the tables. These elements are gold, silver, arsenic, bismuth, cadmium, antimony, and tungsten. Analytical results for the heavy-mineral-concentrate samples are given in tables 5-7. Two elements, gold and antimony, were not detected in any samples and are not listed in the tables.

Plant samples

The plant samples were analyzed for 30 elements by an induction coupled plasma (ICP) instrument (Applied Research Laboratories model 13700) by a procedure similar to that reported by Motooka and Sutley (1982) but with standards adjusted for high calcium matrices. All operating parameters are identical to and analytical results are calculated according to procedures described by Church (1981).

Analytical results for the samples of mesquite leaves and juniper are listed in table 8-11. All data are reported in parts per million except for calcium, magnesium, and phosphorus, which are reported in percent. The lower limits of determination may vary due to weight or dilution factors. Eight elements were not detected in any of the mesquite or juniper samples and are not listed in the tables. These elements and their lower limits of determination are silver (1.2), arsenic (8.0), bismuth (32), cerium (3.6), cobalt (8.0), antimony (10), tin (8.0), and tungsten (12). In addition, beryllium (0.04), chromium (4.0), lanthanum (4.0), and lead (8.0) have been omitted from the mesquite tables and molybdenum (8.0) from the juniper table for the same reason.

Description of Data Tables

Tables 2-11 list the analytical data for the samples of stream sediments, heavy-mineral concentrates, mesquite leaves, and juniper from the Black Rock, Fishhooks, and Needles Eye WSA's. The data tables are arranged so that the column labeled "Row ID" contains the sample numbers; these numbers correspond to the numbers shown on the sample location maps (plates 1-3). Latitude and longitude are given in degrees, minutes, and seconds. Most of the elements listed in these tables carry one or more nonsignificant zeros to the right of the significant digits because of the formatting used in the computer program that produced the tables. We did not determine these elements to the accuracy suggested by the extra zeros.

For the heavy-mineral-concentrate samples (tables 5-7) and the plant samples (tables 8-11), the letter "N" following the lower limit of determination indicates that an element was looked for, but was not detected. If an element was observed, but was below the lowest reporting value, the letter "L" (less than) follows the lower limit of determination. If an element was observed but was above the highest reporting value, the letter "G" (greater than) follows the upper limit of determination.

In the data for the stream sediments (tables 2-4), no distinction is made between an "L" and an "N"--all values below the lowest reporting value are given as the lower limit of determination followed by the letter "L". In a few samples, the composition of the major elements in the sample caused interferences in the zinc and tin lines, preventing these elements from being read. In these cases the lower limit of determination is followed by the letter "H".

The data summary tables (tables 12-21) provide a summary of the data from each set of samples. The tables list the elements determined for each set of samples, the number of samples with an "H", "L", "G", or unqualified value, and the minimum unqualified value for each element.

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, 1976).

TABLE 1.--Limits of determination for the spectrographic analysis of 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 stream sediments with five exceptions. These elements and their lower limits are As (500), Au (20), Cd (50), La (50), and Th (200)]

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)	700	10,000
Gold (Au)	15	500
Boron (B)	10	2,000
Barium (Ba)	20	5,000
Beryllium (Be)	1	1,000
Bismuth (Bi)	10	1,000
Cadmium (Cd)	30	500
Cobalt (Co)	5	2,000
Chromium (Cr)	10	5,000
Copper (Cu)	5	20,000
Lanthanum (La)	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)	200	2,000

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Table 2.--Analytical data for stream sediments from the Black Rock
Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	B ppm	Ba ppm	Be ppm	Ca %	Co ppm	Cr ppm	Cu ppm	Fe %
1 BR0001	325702	1101033	10.00L	500.00	3.00	.50	15.00	70.00	15.00	7.00
2 BR0002	325653	1101012	30.00	700.00	3.00	.70	15.00	30.00	70.00	3.00
3 BR0003	325706	1100935	15.00	300.00	3.00	.70	15.00	30.00	15.00	7.00
4 BR0004	325357	1100749	10.00L	700.00	2.00	1.50	7.00	15.00	15.00	3.00
5 BR0005	325413	1100744	10.00L	500.00	2.00	1.50	5.00L	15.00	10.00	3.00
6 BR0006	325548	1101143	15.00	700.00	1.50	1.50	15.00	50.00	30.00	3.00
7 BR0007	325608	1101137	10.00L	500.00	3.00	1.00	7.00	15.00	7.00	3.00
8 BR0008	325604	1101126	15.00	500.00	1.00	.30	7.00	30.00	15.00	1.50
9 BR0009	325610	1101111	10.00	700.00	3.00	.15	5.00L	10.00L	7.00	1.00
10 BR0010	325419	1100842	10.00L	700.00	1.00	1.50	15.00	30.00	15.00	3.00
11 BR0011	325420	1100838	10.00L	300.00	1.50	1.50	7.00	15.00	10.00	3.00
12 BR0012	325419	1100829	10.00L	300.00	1.50	1.50	7.00	20.00	15.00	3.00
13 BR0013	325402	1100758	10.00L	700.00	1.50	1.50	7.00	30.00	15.00	3.00
14 BR0014	325559	1101102	10.00L	700.00	2.00	.50	15.00	30.00	20.00	3.00
15 BR0015	325603	1101055	30.00	700.00	2.00	.50	15.00	30.00	15.00	3.00
16 BR0016	325559	1101202	10.00L	300.00	3.00	1.50	7.00	15.00	7.00	5.00
17 BR0017	325617	1101228	10.00L	500.00	3.00	1.50	15.00	30.00	10.00	10.00
18 BR0018	325537	1101251	10.00L	300.00	3.00	.70	10.00	30.00	7.00	10.00
19 BR0019	325547	1101242	10.00L	300.00	3.00	1.50	7.00	15.00	7.00	7.00
20 BR0020	325550	1101240	10.00L	300.00	3.00	.70	7.00	10.00L	7.00	2.00
21 BR0021	325620	1101034	20.00	700.00	3.00	.30	5.00	10.00L	15.00	1.50
22 BR0022	325634	1101033	10.00L	300.00	3.00	.15	15.00	15.00	10.00	7.00
23 BR0023	325633	1101023	15.00	700.00	3.00	.50	10.00	20.00	30.00	3.00
24 BR0024	325654	1100912	15.00	500.00	3.00	.70	5.00	15.00	10.00	2.00
25 BR0025	325613	1100858	10.00L	500.00	3.00	.70	5.00L	15.00	7.00	3.00
26 BR0026	325557	1100839	10.00L	300.00	1.50	.30	5.00L	10.00L	7.00	.70
27 BR0027	325559	1100832	10.00L	300.00	1.50	.30	5.00L	10.00L	15.00	1.00
28 BR0028	325556	1100933	10.00L	700.00	1.50	.30	5.00	15.00	10.00	2.00
29 BR0029	325558	1100929	10.00L	500.00	1.50	1.50	10.00	30.00	10.00	7.00
30 BR0030	325611	1100928	10.00	700.00	1.50	.70	15.00	70.00	30.00	5.00

Table 2.--continued

ROW ID	La ppm	Mg %	Mn ppm	Mo ppm	Nb ppm	Ni ppm	Pb ppm	Sc ppm	Sn ppm	Sr ppm
1 BR0001	100.00	.70	1000.00	5.00L	50.00	20.00	30.00	15.00	15.00	200.00
2 BR0002	70.00	.70	700.00	5.00L	30.00	30.00	150.00	7.00	10.00L	300.00
3 BR0003	150.00	.30	1500.00	5.00L	70.00	15.00	30.00	7.00	15.00	150.00
4 BR0004	70.00	1.00	700.00	5.00L	30.00	15.00	30.00	7.00	10.00L	300.00
5 BR0005	150.00	.30	300.00	5.00L	30.00	7.00	30.00	7.00	10.00L	300.00
6 BR0006	70.00	1.50	700.00	5.00L	20.00L	30.00	50.00	10.00	10.00L	300.00
7 BR0007	150.00	.70	700.00	5.00L	70.00	7.00	15.00	7.00	15.00	300.00
8 BR0008	30.00L	.50	300.00	5.00L	20.00L	15.00	30.00	7.00	10.00L	150.00
9 BR0009	70.00	.30	1500.00	5.00L	30.00	5.00L	30.00	7.00	10.00L	150.00
10 BR0010	150.00	.70	300.00	5.00L	30.00	20.00	20.00	7.00	10.00L	300.00
11 BR0011	150.00	.50	300.00	5.00L	30.00	10.00	20.00	7.00	10.00L	300.00
12 BR0012	150.00	.70	300.00	5.00L	30.00	15.00	20.00	7.00	10.00L	300.00
13 BR0013	70.00	1.50	300.00	5.00L	20.00L	20.00	15.00	7.00	10.00L	300.00
14 BR0014	70.00	1.50	700.00	5.00L	30.00	30.00	50.00	10.00	10.00L	300.00
15 BR0015	70.00	.70	700.00	5.00L	30.00	20.00	30.00	15.00	10.00L	200.00
16 BR0016	150.00	.70	700.00	5.00L	70.00	7.00	15.00	7.00	10.00L	300.00
17 BR0017	300.00	.70	700.00	5.00L	70.00	10.00	15.00	7.00	10.00L	300.00
18 BR0018	150.00	.30	700.00	5.00L	70.00	10.00	20.00	7.00	10.00L	300.00
19 BR0019	150.00	.50	700.00	5.00L	30.00	7.00	15.00	7.00	10.00L	200.00
20 BR0020	300.00	.70	300.00	5.00L	50.00	5.00L	15.00	5.00	10.00L	300.00
21 BR0021	70.00	.30	700.00	5.00L	30.00	7.00	30.00	7.00	10.00L	200.00
22 BR0022	100.00	.20	2000.00	5.00L	100.00	7.00	100.00	10.00	20.00	100.00
23 BR0023	70.00	1.50	700.00	5.00	30.00	30.00	30.00	7.00	10.00L	300.00
24 BR0024	30.00L	.70	500.00	5.00L	30.00	7.00	20.00	7.00	10.00L	150.00
25 BR0025	70.00	.20	300.00	5.00L	20.00	7.00	15.00	5.00	10.00L	150.00
26 BR0026	70.00	.15	150.00	5.00L	20.00L	7.00	15.00	5.00L	10.00L	100.00L
27 BR0027	50.00	.30	150.00	5.00L	20.00L	7.00	15.00	5.00L	10.00L	150.00
28 BR0028	50.00	.30	300.00	5.00L	20.00L	7.00	15.00	7.00	10.00L	150.00
29 BR0029	300.00	.30	700.00	5.00L	70.00	15.00	20.00	7.00	10.00L	200.00
30 BR0030	70.00	1.50	1000.00	5.00L	20.00L	70.00	100.00	10.00	10.00L	300.00

Table 2.--continued

ROW ID	Th ppm	Ti %	V ppm	Y ppm	Zn ppm	Zr ppm
1 BR0001	200.00L	.70	150.00	30.00	200.00L	300.00
2 BR0002	200.00L	.30	150.00	30.00	200.00L	200.00
3 BR0003	300.00	.30	150.00	50.00	200.00L	300.00
4 BR0004	200.00L	.30	70.00	70.00	200.00L	150.00
5 BR0005	200.00L	.30	70.00	70.00	200.00L	300.00
6 BR0006	200.00L	.30	70.00	20.00	200.00L	150.00
7 BR0007	200.00L	.30	70.00	70.00	200.00L	300.00
8 BR0008	200.00L	.15	30.00	15.00	200.00L	300.00
9 BR0009	200.00L	.15	15.00	30.00	200.00L	300.00
10 BR0010	200.00L	.30	150.00	70.00	200.00L	150.00
11 BR0011	200.00L	.50	70.00	70.00	200.00L	200.00
12 BR0012	200.00L	.30	70.00	70.00	200.00L	200.00
13 BR0013	200.00L	.30	70.00	50.00	200.00L	300.00
14 BR0014	200.00L	.30	70.00	20.00	200.00L	200.00
15 BR0015	200.00L	.30	150.00	30.00	200.00L	300.00
16 BR0016	200.00L	.50	150.00	100.00	200.00L	300.00
17 BR0017	200.00L	.30	150.00	150.00	200.00L	1000.00
18 BR0018	200.00	.30	150.00	70.00	200.00L	1500.00
19 BR0019	200.00L	.30	150.00	70.00	200.00L	300.00
20 BR0020	200.00L	.50	50.00	70.00	200.00L	150.00
21 BR0021	200.00L	.30	30.00	30.00	200.00L	300.00
22 BR0022	200.00L	.70	150.00	70.00	200.00L	700.00
23 BR0023	200.00L	.30	70.00	30.00	200.00L	300.00
24 BR0024	200.00L	.30	70.00	30.00	200.00L	150.00
25 BR0025	200.00L	.15	20.00	30.00	200.00L	200.00
26 BR0026	200.00L	.07	15.00	30.00	200.00L	70.00
27 BR0027	200.00L	.15	15.00	30.00	200.00L	150.00
28 BR0028	200.00L	.15	20.00	30.00	200.00L	300.00
29 BR0029	200.00L	.70	150.00	150.00	200.00L	300.00
30 BR0030	200.00L	.50	150.00	20.00	300.00	200.00

Table 3.--Analytical data for stream sediments from the Fishhooks
Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	B ppm	Ba ppm	Be ppm	Ca %	Co ppm	Cr ppm	Cu ppm	Fe %
1 FH0001	331159	1095938	10.00	700.00	3.00	1.00	7.00	15.00	20.00	1.50
2 FH0002	331047	1095836	10.00L	1000.00	1.50	1.50	10.00	30.00	15.00	3.00
3 FH0003	331052	1095840	10.00L	1500.00	1.50	1.50	20.00	150.00	30.00	7.00
4 FH0004	331029	1095744	10.00L	500.00	1.50	.30	20.00	70.00	15.00	10.00
5 FH0005	331036	1095747	10.00L	1500.00	1.50	1.50	15.00	30.00	7.00	3.00
6 FH0006	331226	1095805	10.00L	700.00	2.00	1.50	15.00	300.00	15.00	7.00
7 FH0007	331233	1095801	10.00L	1000.00	1.50	1.50	15.00	70.00	10.00	5.00
8 FH0008	331347	1100056	10.00L	1500.00	2.00	3.00	20.00	150.00	50.00	7.00
9 FH0009	331357	1100057	10.00L	300.00	2.00	1.50	15.00	70.00	30.00	3.00
10 FH0010	331358	1095848	10.00L	1000.00	1.50	3.00	30.00	500.00	70.00	7.00
11 FH0011	331352	1095846	10.00L	700.00	1.00L	3.00	20.00	300.00	70.00	3.00
12 FH0012	331356	1095903	10.00L	700.00	1.50	3.00	30.00	150.00	70.00	7.00
13 FH0013	331253	1100034	10.00L	1500.00	1.50	1.50	20.00	300.00	50.00	7.00
14 FH0014	331302	1100029	10.00L	700.00	1.50	2.00	30.00	70.00	50.00	3.00
15 FH0015	331301	1100042	10.00L	700.00	1.50	2.00	30.00	70.00	50.00	5.00
16 FH0016	331544	1100139	10.00L	150.00	3.00	.50	5.00	15.00	7.00	1.50
17 FH0017	331550	1100140	15.00	150.00	3.00	.50	5.00L	10.00	15.00	1.00
18 FH0018	331546	1100201	10.00L	300.00	1.50	1.50	15.00	15.00	15.00	3.00
19 FH0019	331357	1100140	10.00L	700.00	1.50	2.00	30.00	150.00	70.00	10.00
20 FH0020	331402	1100144	10.00L	700.00	3.00	3.00	15.00	30.00	30.00	3.00
21 FH0021	331429	1100225	10.00L	700.00	1.50	2.00	30.00	70.00	70.00	7.00
22 FH0022	331526	1100214	10.00L	700.00	1.50	1.50	20.00	30.00	30.00	7.00
23 FH0023	331525	1100220	10.00L	700.00	1.50	1.50	30.00	70.00	70.00	7.00
24 FH0024	331526	1100229	10.00L	700.00	1.50	1.50	30.00	30.00	30.00	7.00

Table 3.--continued

ROW ID	La ppm	Hg %	Mn ppm	Mo ppm	Nb ppm	Ni ppm	Pb ppm	Sc ppm	Sn ppm	Sr ppm
1 FH0001	70.00	.70	700.00	5.00L	30.00	7.00	20.00	7.00	10.00L	300.00
2 FH0002	70.00	.70	700.00	5.00L	20.00	20.00	30.00	7.00	10.00L	500.00
3 FH0003	150.00	1.50	1000.00	5.00L	30.00	30.00	30.00	15.00	10.00L	700.00
4 FH0004	70.00	.50	1000.00	5.00L	30.00	20.00	30.00	7.00	10.00L	300.00
5 FH0005	70.00	.70	700.00	5.00L	30.00	10.00	30.00	7.00	10.00L	700.00
6 FH0006	70.00	.70	1500.00	5.00L	50.00	30.00	30.00	10.00	10.00L	700.00
7 FH0007	70.00	.70	700.00	5.00L	20.00	20.00	30.00	7.00	10.00L	700.00
8 FH0008	100.00	1.50	1500.00	5.00L	30.00	30.00	70.00	15.00	10.00L	700.00
9 FH0009	70.00	1.50	700.00	5.00L	20.00	30.00	15.00	7.00	10.00L	500.00
10 FH0010	70.00	5.00	1000.00	5.00L	20.00L	100.00	15.00	30.00	10.00L	1000.00
11 FH0011	50.00	3.00	1500.00	5.00L	20.00	50.00	15.00	15.00	10.00L	700.00
12 FH0012	70.00	3.00	700.00	5.00L	20.00L	30.00	20.00	15.00	10.00L	700.00
13 FH0013	70.00	1.50	1500.00	5.00L	30.00	30.00	30.00	15.00	10.00L	700.00
14 FH0014	70.00	1.50	700.00	5.00L	30.00	30.00	20.00	15.00	10.00L	700.00
15 FH0015	70.00	1.50	700.00	5.00L	30.00	50.00	20.00	10.00	10.00L	700.00
16 FH0016	70.00	.30	300.00	5.00L	30.00	7.00	30.00	5.00L	10.00L	150.00
17 FH0017	30.00	.30	300.00	5.00L	30.00	7.00	30.00	5.00L	10.00L	150.00
18 FH0018	50.00	.70	500.00	5.00L	20.00	20.00	15.00	7.00	10.00L	300.00
19 FH0019	150.00	1.50	700.00	5.00L	20.00	30.00	30.00	15.00	10.00L	1500.00
20 FH0020	70.00	1.50	1000.00	5.00L	20.00	30.00	20.00	7.00	10.00L	700.00
21 FH0021	70.00	1.50	1000.00	5.00L	20.00L	50.00	15.00	15.00	10.00L	700.00
22 FH0022	30.00	1.50	1000.00	5.00L	30.00	20.00	15.00	7.00	10.00L	700.00
23 FH0023	70.00	1.50	1500.00	5.00L	30.00	30.00	20.00	15.00	10.00L	700.00
24 FH0024	70.00	1.50	700.00	5.00L	20.00	30.00	20.00	10.00	10.00L	700.00

Table 3.--continued

ROW ID	Th ppm	Ti %	V ppm	W ppm	Y ppm	Zn ppm
1 FH0001	200.00L	.30	50.00	50.00L	30.00	200.00L
2 FH0002	200.00L	.30	70.00	50.00L	30.00	200.00L
3 FH0003	200.00L	.50	150.00	50.00L	30.00	200.00L
4 FH0004	200.00L	1.00	300.00	50.00L	30.00	200.00L
5 FH0005	200.00L	.30	70.00	50.00L	30.00	200.00L
6 FH0006	200.00L	.70	150.00	50.00L	30.00	200.00L
7 FH0007	200.00L	1.00	150.00	50.00L	20.00	200.00L
8 FH0008	200.00L	.70	200.00	50.00L	30.00	200.00L
9 FH0009	200.00L	.50	150.00	50.00L	30.00	200.00L
10 FH0010	200.00L	1.00	200.00	50.00L	30.00	200.00L
11 FH0011	200.00L	.70	150.00	50.00L	20.00	200.00L
12 FH0012	200.00L	1.00	150.00	50.00L	30.00	200.00L
13 FH0013	200.00L	.70	200.00	50.00L	30.00	200.00L
14 FH0014	200.00L	.70	150.00	50.00L	30.00	200.00L
15 FH0015	200.00L	.70	150.00	50.00L	30.00	200.00L
16 FH0016	200.00L	.15	30.00	50.00L	30.00	200.00L
17 FH0017	200.00L	.15	20.00	50.00L	30.00	200.00L
18 FH0018	200.00L	.30	70.00	50.00L	15.00	200.00L
19 FH0019	200.00L	1.00	300.00	50.00L	30.00	200.00L
20 FH0020	200.00L	.30	100.00	50.00L	30.00	200.00L
21 FH0021	200.00L	.70	150.00	50.00L	30.00	200.00L
22 FH0022	200.00L	1.006	200.00	50.00L	30.00	200.00L
23 FH0023	200.00L	1.006	300.00	50.00L	30.00	200.00L
24 FH0024	200.00L	1.00	300.00	50.00L	30.00	200.00L

Table 4.--Analytical data for stream sediments from the Needles Eye
Wilderness Study Area, Gila County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	B ppm	Ba ppm	Be ppm	Ca %	Co ppm	Cr ppm	Cu ppm	Fe %
1 NE0001	330716	1103940	10.00L	150.00	1.00L	10.00	5.00L	30.00	50.00	.70
2 NE0002	330705	1103934	20.00	300.00	1.50	3.00	10.00	70.00	50.00	3.00
3 NE0003	330941	1103848	10.00L	150.00	1.00L	15.00	5.00L	30.00	15.00	.70
4 NE0004	330910	1103828	10.00L	150.00	1.00L	1.50	70.00	300.00	30.00	15.00
5 NE0005	330913	1103822	10.00L	500.00	1.50	1.50	15.00	30.00	30.00	15.00
6 NE0006	330903	1103812	10.00L	500.00	2.00	3.00	10.00	15.00	30.00	2.00
7 NE0007	330831	1103806	10.00L	200.00	1.50	1.50	20.00	50.00	20.00	5.00
8 NE0008	330849	1103629	10.00L	300.00	1.50	5.00	30.00	150.00	30.00	5.00
9 NE0009	330841	1103720	15.00	300.00	1.00L	10.00	15.00	70.00	20.00	2.00
10 NE0010	330855	1103457	10.00L	700.00	1.00	3.00	30.00	150.00	100.00	7.00
11 NE0011	330910	1103512	10.00L	150.00	1.00L	3.00	20.00	100.00	70.00	3.00
12 NE0012	330932	1103521	10.00L	300.00	1.50	5.00	30.00	150.00	50.00	3.00
13 NE0013	330951	1103534	10.00L	500.00	2.00	2.00	15.00	50.00	20.00	3.00
14 NE0014	330858	1103402	10.00L	300.00	1.00L	3.00	15.00	150.00	30.00	3.00
15 NE0015	330857	1103412	10.00L	300.00	1.50	3.00	20.00	150.00	50.00	5.00
16 NE0016	330928	1103437	10.00L	300.00	1.50	3.00	30.00	100.00	70.00	5.00
17 NE0017	330927	1103433	10.00	300.00	2.00	1.50	20.00	150.00	30.00	5.00
18 NE0018	330922	1103331	10.00L	300.00	1.00L	7.00	15.00	30.00	30.00	3.00
19 NE0019	330947	1103333	10.00	300.00	1.00L	3.00	15.00	30.00	30.00	3.00
20 NE0020	331006	1103417	10.00L	200.00	1.50	2.00	30.00	70.00	50.00	5.00
21 NE0021	330939	1103640	10.00L	300.00	1.00L	7.00	30.00	150.00	70.00	7.00
22 NE0022	331004	1103724	10.00L	150.00	1.00L	15.00	20.00	100.00	30.00	3.00
23 NE0023	330755	1103958	10.00L	30.00	1.00L	15.00	5.00L	30.00	7.00	1.00
24 NE0024	330752	1103956	10.00	150.00	1.00L	15.00	7.00	20.00	15.00	.70
25 NE0025	330717	1104017	10.00	300.00	1.00L	15.00	7.00	50.00	30.00	1.50
26 NE0026	330651	1104033	10.00L	700.00	1.00L	7.00	15.00	70.00	50.00	3.00
27 NE0027	330819	1103548	10.00L	500.00	1.00L	3.00	15.00	70.00	70.00	3.00

Table 4.--continued

ROW ID	La ppm	Mg %	Mn ppm	Mo ppm	Nb ppm	Ni ppm	Pb ppm	Sc ppm	Sn ppm	Sr ppm
1 NE0001	30.00L	3.00	300.00	5.00L	20.00L	15.00	70.00	7.00	30.00	150.00
2 NE0002	70.00	2.00	500.00	5.00L	20.00L	30.00	20.00	7.00	10.00L	300.00
3 NE0003	30.00L	.70	300.00	5.00L	20.00L	15.00	10.00	7.00	10.00L	300.00
4 NE0004	30.00L	2.00	1500.00	5.00L	20.00	70.00	10.00	30.00	10.00H	150.00
5 NE0005	150.00	.70	300.00	5.00L	20.00L	20.00	30.00	15.00	10.00H	150.00
6 NE0006	150.00	1.50	300.00	5.00L	20.00L	10.00	30.00	15.00	10.00L	300.00
7 NE0007	30.00	2.00	1000.00	5.00L	20.00L	30.00	15.00	15.00	10.00L	150.00
8 NE0008	30.00	7.00	700.00	5.00L	20.00L	150.00	15.00	15.00	10.00L	300.00
9 NE0009	30.00	3.00	700.00	5.00L	20.00L	30.00	10.00	7.00	10.00L	300.00
10 NE0010	30.00L	.70	1500.00	5.00L	20.00	70.00	10.00L	30.00	10.00L	500.00
11 NE0011	30.00L	2.00	700.00	5.00L	20.00L	50.00	10.00L	15.00	10.00L	300.00
12 NE0012	30.00	1.50	700.00	5.00L	20.00L	70.00	15.00	15.00	10.00L	150.00
13 NE0013	30.00L	1.50	700.00	5.00L	20.00L	30.00	10.00	15.00	10.00L	300.00
14 NE0014	30.00L	1.50	700.00	5.00L	20.00L	70.00	15.00	15.00	10.00L	300.00
15 NE0015	70.00	1.50	1000.00	5.00L	30.00	30.00	30.00	20.00	10.00L	300.00
16 NE0016	50.00	2.00	700.00	5.00L	20.00L	30.00	30.00	30.00	10.00L	150.00
17 NE0017	100.00	1.50	700.00	5.00L	20.00	70.00	15.00	15.00	10.00L	300.00
18 NE0018	30.00L	2.00	700.00	5.00L	20.00L	20.00	15.00	7.00	10.00L	300.00
19 NE0019	30.00	1.00	500.00	5.00L	20.00L	20.00	15.00	7.00	10.00L	500.00
20 NE0020	30.00	3.00	700.00	5.00L	20.00L	30.00	15.00	30.00	10.00L	150.00
21 NE0021	30.00L	5.00	1500.00	5.00L	20.00L	70.00	10.00L	15.00	10.00H	300.00
22 NE0022	30.00L	3.00	300.00	5.00L	20.00L	70.00	10.00	15.00	10.00L	300.00
23 NE0023	30.00L	1.50	150.00	5.00L	20.00L	10.00	50.00	5.00L	10.00L	150.00
24 NE0024	30.00L	3.00	300.00	5.00L	20.00L	15.00	30.00	5.00	10.00L	200.00
25 NE0025	30.00	1.50	300.00	5.00L	20.00L	30.00	30.00	7.00	10.00L	700.00
26 NE0026	70.00	1.50	300.00	5.00L	20.00L	30.00	20.00	15.00	10.00L	1000.00
27 NE0027	50.00	3.00	700.00	5.00L	20.00L	50.00	15.00	15.00	10.00L	300.00

Table 4.--continued

ROW ID	Th ppm	Ti %	V ppm	W ppm	Y ppm	Zn ppm
1 NE0001	200.00L	.10	30.00	50.00L	20.00	200.00L
2 NE0002	200.00L	.30	100.00	50.00L	30.00	200.00L
3 NE0003	200.00L	.15	30.00	50.00L	15.00	200.00L
4 NE0004	200.00L	1.006	700.00	50.00L	20.00	200.00H
5 NE0005	200.00L	.30	200.00	50.00L	50.00	200.00L
6 NE0006	200.00L	.15	50.00	50.00L	30.00	200.00L
7 NE0007	200.00L	1.00	200.00	50.00L	30.00	200.00L
8 NE0008	200.00L	.70	150.00	50.00L	15.00	200.00L
9 NE0009	200.00L	.30	70.00	50.00L	30.00	200.00L
10 NE0010	200.00L	1.006	200.00	50.00L	20.00	200.00L
11 NE0011	200.00L	.30	70.00	50.00L	20.00	200.00L
12 NE0012	200.00L	.50	150.00	50.00L	15.00	200.00L
13 NE0013	200.00L	.70	150.00	50.00L	30.00	200.00L
14 NE0014	200.00L	.30	150.00	50.00L	20.00	200.00L
15 NE0015	200.00L	.70	150.00	50.00L	30.00	200.00L
16 NE0016	200.00L	.70	150.00	50.00L	30.00	200.00L
17 NE0017	200.00L	.70	150.00	50.00L	70.00	200.00L
18 NE0018	200.00L	.30	70.00	50.00L	15.00	200.00L
19 NE0019	200.00L	.50	150.00	50.00L	15.00	200.00L
20 NE0020	200.00L	.70	300.00	50.00L	30.00	200.00L
21 NE0021	200.00L	.50	150.00	50.00L	15.00	200.00L
22 NE0022	200.00L	.30	70.00	50.00L	15.00	200.00L
23 NE0023	200.00L	.05	30.00	50.00L	15.00	200.00L
24 NE0024	200.00L	.07	30.00	50.00L	15.00	200.00L
25 NE0025	200.00L	.30	70.00	50.00L	20.00	200.00L
26 NE0026	200.00L	.30	150.00	50.00L	15.00	200.00L
27 NE0027	200.00L	.30	70.00	50.00L	15.00	200.00L

Table 5.--Analytical data for heavy-mineral concentrates from the
Black Rock Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	Ag ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm
1 BR0001	325702	1101033	1.00N	500.00N	30.00	700.00	5.00	100.00	1.50	50.00N
2 BR0002	325653	1101012	1.00	500.00N	50.00	10000.00G	7.00	150.00	1.00	50.00N
3 BR0003	325706	1100936	1.00N	500.00N	50.00	500.00	15.00	500.00	2.00	50.00N
4 BR0004	325357	1100749	1.00N	500.00N	20.00	500.00	2.00N	50.00	7.00	50.00N
5 BR0005	325413	1100744	1.00N	500.00N	20.00	700.00	2.00N	100.00	2.00	50.00N
6 BR0006	325548	1101143	1.00N	500.00N	100.00	300.00	2.00N	20.00N	2.00	50.00N
7 BR0007	325608	1101137	1.00N	500.00N	20.00	1000.00	3.00	20.00N	7.00	50.00N
8 BR0008	325604	1101126	1.00N	500.00N	100.00	300.00	2.00N	20.00L	.50	50.00N
9 BR0009	325610	1101111	1.00N	1000.00	100.00	2000.00	10.00	50.00	7.00	50.00N
10 BR0010	325419	1100842	150.00	500.00N	20.00	10000.00G	2.00N	500.00	7.00	50.00N
11 BR0011	325420	1100838	1.00N	500.00N	20.00N	500.00	2.00N	20.00	7.00	50.00N
12 BR0012	325419	1100829	1.00N	500.00N	50.00	700.00	2.00N	30.00	3.00	50.00N
13 BR0013	325402	1100758	1.00N	500.00N	20.00	500.00	2.00N	20.00	5.00	50.00N
14 BR0014	325559	1101102	1.00N	500.00N	150.00	500.00	2.00	20.00N	1.50	50.00N
15 BR0015	325603	1101055	1.00N	500.00N	150.00	10000.00G	5.00	20.00N	1.50	50.00N
16 BR0016	325559	1101202	1.00N	500.00N	20.00	700.00	2.00N	50.00	3.00	50.00N
17 BR0017	325617	1101228	1.00N	500.00N	70.00	500.00	2.00N	200.00	2.00	50.00N
18 BR0018	325537	1101251	1.00N	500.00N	1500.00	700.00	2.00	1500.00	2.00	50.00N
19 BR0019	325547	1101241	1.00N	500.00N	20.00N	500.00	5.00	700.00	2.00	50.00N
20 BR0020	325550	1101240	1.00N	500.00N	20.00	500.00	2.00N	700.00	1.50	50.00N
21 BR0021	325620	1101034	1.00N	500.00N	70.00	10000.00G	7.00	20.00N	2.00	50.00N
22 BR0022	325634	1101033	1.00N	500.00N	50.00	1000.00	10.00	150.00	1.00	50.00N
23 BR0023	325633	1101023	1.00	500.00L	100.00	10000.00G	10.00	70.00	1.00	50.00N
24 BR0024	325654	1100912	1.00N	500.00N	100.00	3000.00	7.00	70.00	1.50	50.00N
25 BR0025	325613	1100858	1.00N	500.00N	20.00	2000.00	5.00	2000.00G	5.00	50.00N
26 BR0026	325557	1100839	1.00N	500.00N	50.00	1000.00	2.00	20.00N	3.00	50.00N
27 BR0027	325559	1100832	1.00N	500.00N	20.00	500.00	2.00N	70.00	10.00	50.00N
28 BR0028	325556	1100933	1.00N	500.00N	70.00	700.00	5.00	500.00	10.00	50.00N
29 BR0029	325558	1100929	1.00	500.00N	20.00	10000.00G	2.00N	2000.00G	10.00	50.00N
30 BR0030	325611	1100928	2.00	500.00N	70.00	700.00	5.00	20.00N	5.00	50.00N

Table 5.--continued

ROW ID	Co ppm	Cr ppm	Cu ppm	Fe %	La ppm	Hg %	Mn ppm	Mo ppm	Nb ppm	Ni ppm
1 BR0001	70.00	50.00	100.00	.30	300.00	.05	200.00	10.00	150.00	10.00N
2 BR0002	50.00	30.00	200.00	.50	200.00	.05	200.00	5000.00	50.00N	10.00N
3 BR0003	20.00	30.00	50.00	.50	1000.00	.05	200.00	10.00N	50.00	10.00N
4 BR0004	10.00	20.00	150.00	.70	300.00	.15	700.00	300.00	150.00	10.00N
5 BR0005	10.00	20.00L	10.00	.30	150.00	.07	1000.00	200.00	70.00	10.00N
6 BR0006	10.00L	100.00	10.00L	2.00	70.00	.20	300.00	10.00N	50.00L	10.00L
7 BR0007	10.00	20.00N	10.00	.30	1500.00	.10	700.00	10.00N	70.00	10.00N
8 BR0008	10.00N	100.00	10.00L	2.00	70.00	.07	150.00	10.00N	50.00L	10.00L
9 BR0009	10.00	30.00	10.00	1.00	1000.00	.20	500.00	10.00N	50.00N	10.00L
10 BR0010	10.00N	20.00	30.00	.30	150.00	.07	300.00	300.00	50.00	10.00N
11 BR0011	10.00	20.00N	50.00	.20	70.00	.07	700.00	500.00	50.00L	10.00L
12 BR0012	10.00N	20.00L	10.00	.70	100.00	.20	500.00	70.00	50.00	10.00L
13 BR0013	10.00	20.00	100.00	.70	200.00	.10	1000.00	70.00	70.00	10.00N
14 BR0014	10.00L	50.00	10.00L	1.50	150.00	.50	500.00	10.00L	50.00L	10.00L
15 BR0015	10.00L	30.00	10.00L	2.00	150.00	.30	150.00	10.00N	50.00N	10.00
16 BR0016	15.00	20.00L	10.00	.50	1500.00	.05	2000.00	10.00N	50.00	10.00N
17 BR0017	15.00	20.00L	20.00	.30	1500.00	.05	700.00	10.00	50.00	10.00N
18 BR0018	50.00	30.00	70.00	.30	500.00	.05L	300.00	10.00N	50.00	10.00N
19 BR0019	15.00	20.00L	15.00	.30	500.00	.07	500.00	10.00N	50.00	10.00N
20 BR0020	20.00	20.00L	20.00	.30	1500.00	.05	1500.00	10.00N	50.00L	10.00N
21 BR0021	10.00	30.00	10.00L	1.00	150.00	.10	300.00	10.00L	50.00L	10.00L
22 BR0022	15.00	20.00L	20.00	.30	300.00	.07	1500.00	10.00	50.00N	10.00N
23 BR0023	15.00	20.00	1000.00	1.00	300.00	.10	200.00	10.00L	50.00N	10.00N
24 BR0024	15.00	50.00	15.00	.70	150.00	.05	200.00	10.00	70.00	10.00N
25 BR0025	10.00	20.00	10.00	1.00	70.00	.05	300.00	700.00	150.00	10.00L
26 BR0026	10.00N	20.00N	10.00L	1.50	100.00	.07	500.00	30.00	70.00	10.00N
27 BR0027	10.00	20.00L	70.00	.50	150.00	.30	700.00	100.00	100.00	10.00L
28 BR0028	10.00L	20.00	10.00L	1.50	50.00	.10	200.00	10.00L	50.00L	10.00L
29 BR0029	10.00N	20.00N	20.00	.30	100.00	.07	500.00	700.00	150.00	10.00N
30 BR0030	15.00	70.00	200.00	1.50	300.00	.50	300.00	200.00	100.00	10.00L

Table 5.--continued

ROW ID	Pb ppm	Sc ppm	Sn ppm	Sr ppm	Th ppm	Ti %	V ppm	W ppm	Y ppm	Zn ppm
1 BR0001	200.00	50.00	70.00	200.00	5000.006	1.00	700.00	100.00L	3000.00	500.00N
2 BR0002	15000.00	30.00	1000.00	200.00	5000.006	1.50	3000.00	100.00N	2000.00	500.00N
3 BR0003	200.00	70.00	500.00	200.00	5000.006	2.00	500.00	100.00N	3000.00	500.00N
4 BR0004	300.00	10.00L	30.00	200.00N	1000.00	2.006	300.00	2000.00	1000.00	500.00N
5 BR0005	100.00	20.00	20.00	200.00N	3000.00	2.006	100.00	1500.00	500.00	500.00N
6 BR0006	20.00	10.00L	20.00N	200.00N	300.00	1.50	100.00	100.00N	300.00	500.00N
7 BR0007	30.00	30.00	30.00	200.00N	5000.006	2.006	150.00	100.00N	1000.00	500.00N
8 BR0008	20.00L	10.00N	20.00N	200.00N	500.00	.70	70.00	100.00	100.00	500.00N
9 BR0009	30.00	30.00	20.00N	300.00	5000.00	.70	100.00	100.00N	1000.00	500.00N
10 BR0010	300.00	20.00	70.00	500.00	300.00	2.006	200.00	700.00	1000.00	500.00N
11 BR0011	100.00	30.00	20.00N	200.00N	700.00	2.00	70.00	700.00	500.00	500.00N
12 BR0012	70.00	15.00	20.00	200.00N	700.00	2.006	100.00	300.00	700.00	500.00N
13 BR0013	70.00	20.00	30.00	200.00N	300.00	2.006	200.00	200.00	500.00	500.00N
14 BR0014	10000.00	15.00	20.00	200.00N	5000.00	1.50	70.00	100.00N	200.00	500.00N
15 BR0015	150.00	10.00	20.00N	500.00	500.00	1.00	70.00	100.00N	200.00	500.00N
16 BR0016	50.00	20.00	30.00	200.00	5000.006	2.006	150.00	100.00N	1000.00	500.00N
17 BR0017	30.00	50.00	20.00	200.00N	5000.008	2.008	150.00	100.00N	1500.00	500.00N
18 BR0018	150.00	30.00	20.00	200.00	5000.006	2.006	150.00	100.00N	2000.00	500.00N
19 BR0019	70.00	30.00	20.00N	200.00	5000.006	2.00	100.00	100.00N	1500.00	500.00N
20 BR0020	70.00	50.00	20.00	200.00	5000.006	2.006	150.00	100.00N	500.00	500.00N
21 BR0021	50.00	10.00	20.00N	2000.00	3000.00	1.50	50.00	100.00N	300.00	500.00N
22 BR0022	200.00	50.00	2000.006	200.00	5000.008	.70	150.00	100.00N	700.00	500.00N
23 BR0023	30.00	50.00	20.00N	200.00	5000.006	1.00	100.00	100.00N	1000.00	500.00N
24 BR0024	150.00	30.00	700.00	200.00	5000.006	2.00	200.00	100.00N	2000.00	500.00N
25 BR0025	700.00	15.00	1000.00	200.00N	5000.008	1.00	70.00	15000.00	700.00	500.00N
26 BR0026	70.00	15.00	20.00	500.00	200.00N	2.00	50.00	1000.00	500.00	500.00N
27 BR0027	30.00	10.00	20.00	200.00N	200.00N	2.006	150.00	1000.00	500.00	500.00N
28 BR0028	30.00	10.00L	20.00N	200.00N	1500.00	1.50	100.00	700.00	1000.00	500.00N
29 BR0029	500.00	20.00	100.00	500.00	700.00	2.006	150.00	7000.00	1000.00	500.00N
30 BR0030	20000.00	30.00	30.00	200.00N	5000.008	1.50	700.00	100.00N	1500.00	5000.00

Table 5.--continued

ROW ID	Zr ppm
1 BR0001	2000.006
2 BR0002	2000.006
3 BR0003	2000.006
4 BR0004	2000.006
5 BR0005	2000.006
6 BR0006	2000.006
7 BR0007	2000.006
8 BR0008	2000.006
9 BR0009	2000.006
10 BR0010	2000.006
11 BR0011	2000.006
12 BR0012	2000.006
13 BR0013	2000.006
14 BR0014	2000.006
15 BR0015	2000.006
16 BR0016	2000.006
17 BR0017	2000.006
18 BR0018	2000.006
19 BR0019	2000.006
20 BR0020	2000.006
21 BR0021	2000.006
22 BR0022	2000.006
23 BR0023	2000.006
24 BR0024	2000.006
25 BR0025	2000.006
26 BR0026	2000.006
27 BR0027	2000.006
28 BR0028	2000.006
29 BR0029	2000.006
30 BR0030	2000.006

Table 6.--Analytical data for heavy-mineral concentrates from the Fishhooks Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	Ag ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm
1 FH0001	331159	1095938	1.00N	500.00N	700.00	10000.00	2.00	20.00L	5.00	50.00N
2 FH0002	331047	1095836	1.00N	500.00N	100.00	5000.00	5.00	20.00N	10.00	50.00N
3 FH0003	331052	1095840	1.00N	500.00N	30.00	3000.00	2.00	20.00N	5.00	50.00N
4 FH0004	331029	1095744	1.00N	500.00N	30.00	2000.00	2.00	20.00N	3.00	50.00N
5 FH0005	331036	1095747	1.00N	500.00N	50.00	2000.00	3.00	20.00N	3.00	50.00N
6 FH0006	331226	1095805	1.00N	500.00N	50.00	1000.00	5.00	70.00	1.00	50.00N
7 FH0007	331233	1095801	1.00N	500.00N	30.00	1500.00	5.00	20.00L	3.00	50.00N
8 FH0008	331347	1100056	1.00N	500.00N	20.00N	10000.00G	5.00	20.00N	15.00	50.00N
9 FH0009	331357	1100057	1.00	500.00N	100.00	10000.00	2.00	20.00N	10.00	50.00N
10 FH0010	331358	1095848	1.00N	500.00N	20.00N	1000.00	2.00N	20.00L	15.00	50.00N
11 FH0011	331352	1095846	1.00N	500.00N	30.00	2000.00	2.00	20.00N	10.00	50.00N
12 FH0012	331356	1095903	1.00N	500.00N	20.00	2000.00	2.00	20.00N	20.00	50.00N
13 FH0013	331253	1100033	1.00N	500.00N	20.00N	2000.00	2.00	20.00N	5.00	50.00N
14 FH0014	331302	1100029	1.00N	500.00N	50.00	2000.00	2.00	20.00N	7.00	50.00N
15 FH0015	331301	1100042	1.00N	500.00N	50.00	5000.00	2.00	20.00L	10.00	50.00N
16 FH0016	331544	1100139	1.00N	500.00N	50.00	500.00	2.00	20.00N	1.00	50.00N
17 FH0017 *	331550	1100140	2.00N	1000.00N	200.00	1500.00	10.00	20.00L	5.00	50.00N
18 FH0018	331546	1100201	1.00N	500.00N	20.00	1000.00	2.00	70.00	20.00	50.00N
19 FH0019	331357	1100140	1.00N	500.00N	20.00	2000.00	2.00	30.00	7.00	50.00N
20 FH0020	331402	1100144	1.00N	500.00N	30.00	10000.00	2.00	20.00L	5.00	50.00N
21 FH0021	331429	1100225	1.00N	500.00N	20.00	2000.00	2.00	20.00L	15.00	50.00N
22 FH0022	331526	1100214	1.00N	500.00N	50.00	1000.00	2.00N	20.00N	10.00	50.00N
23 FH0023	331525	1100220	1.00N	500.00N	50.00	1000.00	2.00	20.00N	7.00	50.00N
24 FH0024	331526	1100229	1.00N	500.00N	15.00	3000.00	2.00N	20.00N	15.00	50.00N

*Elements have more than one lower and upper limit of determination because of varying sample weights.

Table 6.--continued

ROW ID	Co ppm	Cr ppm	Cu ppm	Fe %	La ppm	Mg %	Mn ppm	Mo ppm	Nb ppm	Ni ppm
1 FH0001	10.00	20.00N	1500.00	1.00	150.00	1.00	500.00	10.00N	50.00N	10.00
2 FH0002	10.00N	20.00L	10.00	1.00	50.00	.50	500.00	10.00N	50.00N	10.00L
3 FH0003	10.00N	20.00L	10.00	.70	100.00	.20	500.00	10.00L	50.00N	10.00L
4 FH0004	10.00N	20.00N	10.00L	1.00	50.00	.20	300.00	10.00N	50.00N	10.00N
5 FH0005	10.00L	20.00L	10.00L	.70	50.00	.20	500.00	10.00N	50.00N	10.00L
6 FH0006	10.00N	20.00L	10.00L	.30	50.00	.10	300.00	10.00N	50.00N	10.00L
7 FH0007	10.00L	20.00N	10.00L	1.50	70.00	.10	300.00	10.00N	50.00N	10.00N
8 FH0008	10.00	20.00L	10.00L	1.00	100.00	1.50	1500.00	10.00N	50.00N	10.00L
9 FH0009	10.00L	20.00N	10.00L	1.00	70.00	1.00	700.00	10.00N	50.00N	10.00L
10 FH0010	10.00N	20.00L	10.00L	.70	70.00	.50	200.00	10.00N	50.00N	10.00L
11 FH0011	10.00L	20.00L	150.00	.70	150.00	.70	500.00	10.00N	50.00N	50.00
12 FH0012	10.00L	20.00	10.00L	.70	500.00	.50	500.00	10.00L	50.00N	10.00L
13 FH0013	10.00N	20.00L	10.00L	.50	50.00	.50	500.00	10.00N	50.00N	10.00N
14 FH0014	10.00N	20.00N	10.00L	1.00	100.00	.70	300.00	10.00N	50.00N	10.00N
15 FH0015	10.00	20.00	15.00	3.00	100.00	1.50	1500.00	10.00N	50.00L	10.00
16 FH0016	10.00N	20.00N	10.00L	.30	50.00L	.50	100.00	10.00N	50.00N	10.00N
17 FH0017	10.00L	20.00L	50.00	7.00	200.00	1.50	3000.00	10.00N	100.00	50.00
18 FH0018	10.00L	20.00N	10.00L	.50	700.00	.30	700.00	10.00N	50.00L	10.00N
19 FH0019	10.00N	20.00N	10.00L	.70	100.00	.30	300.00	10.00N	50.00N	10.00L
20 FH0020	10.00N	20.00N	10.00L	1.00	150.00	.50	1000.00	10.00N	50.00N	10.00L
21 FH0021	10.00	20.00	10.00	1.50	300.00	2.00	1000.00	10.00N	50.00L	10.00
22 FH0022	10.00L	20.00N	10.00L	1.50	200.00	.50	500.00	10.00N	50.00N	10.00L
23 FH0023	10.00N	20.00L	10.00L	.50	100.00	.20	300.00	10.00N	50.00N	10.00N
24 FH0024	10.00N	20.00L	10.00L	1.50	300.00	.30	500.00	10.00N	50.00N	10.00L

Table 6.--continued

ROW ID	Pb ppm	Sc ppm	Sn ppm	Sr ppm	Th ppm	Ti %	V ppm	W ppm	Y ppm	Zn ppm
1 FH0001	30.00	20.00	100.00	500.00	200.00N	1.00	70.00	100.00N	300.00	500.00
2 FH0002	20.00	10.00	20.00N	200.00	200.00N	1.00	70.00	100.00N	500.00	500.00N
3 FH0003	20.00	10.00L	20.00N	500.00	200.00N	.50	50.00	100.00N	300.00	500.00N
4 FH0004	20.00L	10.00N	300.00	1000.00	200.00N	.20	20.00	100.00N	150.00	500.00N
5 FH0005	20.00	10.00L	20.00N	700.00	200.00N	.15	30.00	100.00N	200.00	500.00N
6 FH0006	30.00	20.00	150.00	500.00	200.00N	.50	50.00	100.00N	700.00	500.00N
7 FH0007	20.00	10.00N	20.00N	1000.00	500.00	.20	50.00	100.00N	300.00	500.00N
8 FH0008	30.00	10.00N	20.00N	1000.00	200.00N	.20	30.00	100.00N	150.00	500.00N
9 FH0009	2000.00	10.00N	500.00	700.00	200.00N	.30	30.00	100.00N	150.00	500.00N
10 FH0010	20.00	10.00	20.00N	1500.00	200.00N	.50	50.00	100.00N	70.00	500.00N
11 FH0011	50.00	10.00N	20.00N	1000.00	200.00N	.30	30.00	100.00N	150.00	500.00N
12 FH0012	20.00	10.00L	20.00N	1500.00	200.00	.70	50.00	100.00N	300.00	500.00N
13 FH0013	100.00	10.00N	50.00	700.00	200.00N	.15	20.00	100.00N	50.00	500.00N
14 FH0014	2000.00	10.00N	2000.00	700.00	200.00N	.15	20.00	100.00N	70.00	500.00N
15 FH0015	20.00	10.00N	20.00N	1000.00	200.00	.50	70.00	100.00N	150.00	500.00N
16 FH0016	30.00	10.00N	2000.00B	200.00N	200.00N	.15	20.00	100.00N	50.00	500.00N
17 FH0017	50.00	30.00	5000.00	200.00N	2000.00	5.00B	150.00	100.00N	700.00	500.00N
18 FH0018	20.00	10.00N	2000.00B	700.00	700.00	.50	30.00	100.00N	500.00	500.00N
19 FH0019	100.00	10.00N	500.00	1000.00	200.00N	.30	30.00	100.00N	150.00	500.00N
20 FH0020	500.00	10.00L	20.00N	1000.00	200.00N	.70	50.00	100.00N	200.00	500.00N
21 FH0021	20.00	10.00N	20.00N	1000.00	200.00	.70	50.00	100.00N	500.00	500.00N
22 FH0022	20.00	10.00N	20.00N	700.00	200.00N	.20	30.00	100.00N	200.00	500.00N
23 FH0023	70.00	10.00N	200.00	700.00	200.00N	.30	30.00	100.00N	200.00	500.00N
24 FH0024	20.00L	10.00N	20.00N	1000.00	200.00N	.70	30.00	100.00N	300.00	500.00N

Table 6.--continued

ROW ID	Zr ppm
1 FH0001	2000.006
2 FH0002	2000.006
3 FH0003	2000.006
4 FH0004	2000.006
5 FH0005	2000.006
6 FH0006	2000.006
7 FH0007	2000.006
8 FH0008	2000.006
9 FH0009	2000.006
10 FH0010	2000.006
11 FH0011	2000.006
12 FH0012	2000.006
13 FH0013	2000.006
14 FH0014	2000.006
15 FH0015	2000.006
16 FH0016	2000.006
17 FH0017	5000.006
18 FH0018	2000.006
19 FH0019	2000.006
20 FH0020	2000.006
21 FH0021	2000.006
22 FH0022	2000.006
23 FH0023	2000.006
24 FH0024	2000.006

Table 7.--Analytical data for heavy-mineral concentrates from the
Needles Eye Wilderness Study Area, Gila County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	Ag ppm	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm
1 NE0001	330716	1103940	1.00	500.00N	50.00	10000.00G	2.00N	20.00N	15.00	200.00
2 NE0002	330705	1103934	1.00N	500.00N	70.00	700.00	2.00N	20.00N	15.00	50.00N
3 NE0003	330941	1103848	1.00N	500.00N	50.00	10000.00G	2.00N	20.00N	30.00	50.00N
4 NE0004	330910	1103828	1.00N	500.00N	70.00	5000.00	2.00N	20.00N	50.00	50.00N
5 NE0005	330913	1103822	1.00N	500.00N	100.00	10000.00G	50.00	150.00	3.00	50.00N
6 NE0006	330903	1103812	1.00N	500.00N	70.00	10000.00G	50.00	20.00N	7.00	50.00N
7 NE0007	330831	1103806	1.00N	500.00N	150.00	10000.00G	2.00N	20.00N	15.00	50.00N
8 NE0008	330849	1103629	1.00N	500.00N	30.00	7000.00	5.00	20.00N	15.00	50.00N
9 NE0009	330841	1103720	1.00N	500.00N	70.00	3000.00	7.00	20.00N	20.00	50.00N
10 NE0010	330855	1103457	1.00N	500.00N	20.00	10000.00G	2.00N	20.00N	3.00	50.00N
11 NE0011	330910	1103512	1.00N	500.00N	20.00N	10000.00G	2.00N	20.00N	50.00	50.00N
12 NE0012	330932	1103521	1.00	500.00N	50.00	7000.00	5.00	20.00N	20.00	50.00N
13 NE0013	330951	1103534	1.00N	500.00N	70.00	1000.00	15.00	20.00L	5.00	50.00N
14 NE0014	330858	1103402	1.00N	500.00N	30.00	3000.00	7.00	20.00N	15.00	50.00N
15 NE0015	330857	1103412	1.00N	500.00N	70.00	10000.00	15.00	20.00N	7.00	50.00N
16 NE0016	330926	1103436	1.00N	500.00N	100.00	10000.00	10.00	20.00L	5.00	50.00N
17 NE0017	330927	1103433	1.00N	500.00N	100.00	5000.00	10.00	20.00N	3.00	50.00N
18 NE0018	330922	1103331	1.00N	500.00N	70.00	10000.00G	2.00N	20.00N	5.00	50.00N
19 NE0019	330947	1103333	1.00N	500.00N	70.00	10000.00G	7.00	20.00N	5.00	50.00N
20 NE0020	331006	1103417	1.00N	500.00N	70.00	700.00	15.00	20.00N	3.00	50.00N
21 NE0021	330939	1103640	1.00N	500.00N	30.00	300.00	2.00N	20.00N	20.00	50.00N
22 NE0022	331004	1103724	1.00N	500.00N	20.00N	500.00	2.00N	20.00N	20.00	50.00N
23 NE0023	330755	1103958	1.00N	500.00L	30.00	2000.00	2.00N	20.00N	30.00	50.00N
24 NE0024	330752	1103957	500.00	500.00N	70.00	2000.00	2.00	20.00N	20.00	50.00N
25 NE0025	330717	1104017	1.00	500.00N	30.00	10000.00G	2.00	20.00N	20.00	50.00N
26 NE0026	330651	1104033	1.00N	500.00N	1000.00	7000.00	2.00N	20.00N	20.00	50.00N
27 NE0027	330819	1103547	1.00N	500.00N	50.00	10000.00G	2.00N	20.00N	20.00	50.00N

Table 7.--continued

ROW ID	Co ppm	Cr ppm	Cu ppm	Fe Z	La ppm	Mg Z	Mn ppm	Mo ppm	Nb ppm	Ni ppm
1 NE0001	10.00	20.00	150.00	.70	100.00	5.00	500.00	10.00N	50.00L	10.00
2 NE0002	30.00	50.00	10.00	2.00	100.00	7.00	700.00	10.00N	50.00L	20.00
3 NE0003	10.00L	20.00	10.00L	1.00	200.00	1.00	1000.00	10.00N	50.00L	10.00
4 NE0004	10.00	20.00L	10.00L	1.50	500.00	.70	1000.00	10.00N	50.00L	10.00
5 NE0005	10.00	20.00N	15.00	1.00	70.00	.30	1000.00	10.00N	50.00L	10.00L
6 NE0006	10.00	20.00N	10.00L	.50	200.00	.50	1500.00	10.00N	50.00L	10.00N
7 NE0007	10.00	20.00	10.00	2.00	150.00	1.00	500.00	10.00N	50.00	10.00L
8 NE0008	10.00	30.00	10.00	1.00	200.00	3.00	500.00	10.00N	50.00L	10.00
9 NE0009	10.00L	20.00L	10.00L	1.00	300.00	7.00	1500.00	10.00N	50.00L	10.00
10 NE0010	10.00N	20.00L	10.00L	.50	50.00L	.20	300.00	10.00N	50.00N	10.00N
11 NE0011	10.00	20.00L	10.00L	.70	100.00	1.00	500.00	10.00N	50.00N	10.00
12 NE0012	10.00	20.00	15.00	1.00	150.00	5.00	1000.00	10.00N	150.00	30.00
13 NE0013	10.00N	20.00L	10.00	1.00	200.00	.50	500.00	15.00	50.00	10.00L
14 NE0014	10.00N	20.00L	10.00L	.70	150.00	1.00	700.00	10.00N	50.00L	10.00
15 NE0015	10.00N	20.00N	10.00	1.00	70.00	.20	700.00	150.00	50.00L	10.00L
16 NE0016	10.00N	20.00L	10.00	1.50	100.00	1.00	300.00	10.00N	70.00	10.00
17 NE0017	10.00	20.00L	20.00	1.50	500.00	1.00	700.00	10.00N	300.00	10.00L
18 NE0018	10.00L	20.00L	10.00L	.20	100.00	.20	300.00	10.00N	50.00	10.00N
19 NE0019	10.00	20.00L	10.00L	.30	150.00	1.50	700.00	10.00N	50.00L	10.00N
20 NE0020	10.00N	20.00N	10.00	1.00	100.00	.30	300.00	10.00N	50.00	10.00L
21 NE0021	10.00	20.00	10.00	1.50	200.00	4.00	500.00	10.00N	50.00L	15.00
22 NE0022	10.00L	20.00	10.00	.50	150.00	1.00	300.00	10.00N	50.00L	10.00
23 NE0023	10.00N	30.00	10.00L	.50	100.00	10.00	300.00	10.00N	50.00L	10.00L
24 NE0024	15.00	20.00	15.00	2.00	300.00	5.00	1000.00	10.00N	50.00L	30.00
25 NE0025	10.00L	20.00L	70.00	.70	700.00	1.00	1500.00	10.00N	50.00L	10.00
26 NE0026	10.00N	30.00	30.00	1.00	300.00	1.50	500.00	10.00N	50.00L	10.00
27 NE0027	10.00	20.00	10.00	1.00	300.00	1.50	1500.00	10.00N	50.00L	10.00

Table 7.--continued

ROW ID	Pb ppm	Sc ppm	Sn ppm	Sr ppm	Th ppm	Ti %	V ppm	W ppm	Y ppm	Zn ppm
1 NE0001	700.00	10.00	20.00N	3000.00	200.00N	1.00	150.00	100.00N	150.00	10000.00
2 NE0002	30.00	10.00	20.00N	200.00N	200.00N	1.50	70.00	100.00N	200.00	500.00N
3 NE0003	500.00	10.00N	20.00N	7000.00	200.00N	.50	50.00	100.00N	200.00	500.00N
4 NE0004	20.00	10.00N	20.00N	700.00	200.00N	.50	70.00	100.00N	700.00	500.00N
5 NE0005	50.00	70.00	20.00N	200.00	200.00N	1.50	70.00	100.00	700.00	500.00N
6 NE0006	50.00	70.00	20.00L	200.00	200.00N	2.00	70.00	100.00N	500.00	500.00N
7 NE0007	30.00	10.00	20.00	500.00	200.00N	2.00	70.00	100.00N	300.00	500.00N
8 NE0008	20.00	20.00	20.00N	300.00	200.00N	1.50	70.00	100.00N	700.00	500.00N
9 NE0009	50.00	30.00	20.00N	200.00	200.00N	2.00	70.00	100.00N	500.00	500.00N
10 NE0010	20.00L	10.00N	20.00N	2000.00	200.00N	.70	50.00	100.00N	30.00	500.00N
11 NE0011	20.00N	10.00N	20.00N	10000.00	200.00N	.50	50.00	100.00N	150.00	500.00N
12 NE0012	20.00	20.00	20.00N	1500.00	200.00N	2.00	50.00	100.00N	300.00	500.00N
13 NE0013	300.00	50.00	20.00N	200.00N	200.00	2.00	100.00	100.00L	700.00	500.00N
14 NE0014	30.00	30.00	20.00N	1500.00	200.00N	1.50	70.00	100.00N	1000.00	500.00N
15 NE0015	30.00	70.00	20.00N	200.00	200.00N	1.00	50.00	300.00	2000.00	500.00N
16 NE0016	20.00	30.00	20.00N	200.00	200.00N	2.00	70.00	100.00N	700.00	500.00N
17 NE0017	70.00	30.00	50.00	200.00	200.00N	2.006	100.00	100.00N	1000.00	500.00N
18 NE0018	20.00L	10.00L	20.00N	2000.00	200.00N	1.50	50.00	100.00N	200.00	500.00N
19 NE0019	20.00	20.00	20.00N	3000.00	200.00N	2.00	50.00	100.00N	500.00	500.00N
20 NE0020	30.00	50.00	20.00N	200.00N	200.00N	2.00	50.00	100.00N	1000.00	500.00N
21 NE0021	20.00	10.00L	20.00N	700.00	200.00N	2.00	150.00	100.00N	500.00	500.00N
22 NE0022	70.00	10.00N	20.00N	500.00	200.00N	1.00	70.00	100.00N	200.00	500.00N
23 NE0023	2000.00	10.00N	20.00N	200.00	200.00N	.30	300.00	100.00N	100.00	2000.00
24 NE0024	100.00	15.00	20.00N	1500.00	200.00N	2.00	70.00	100.00N	1000.00	500.00
25 NE0025	5000.00	10.00	20.00L	2000.00	200.00N	1.00	500.00	100.00N	300.00	500.00N
26 NE0026	300.00	10.00	20.00	300.00	200.00N	2.006	300.00	100.00N	200.00	500.00N
27 NE0027	20.00	10.00	20.00N	1000.00	200.00N	2.00	150.00	100.00N	500.00	500.00N

Table 7.--continued

ROW ID	Zr ppm
1 NE0001	2000.006
2 NE0002	2000.006
3 NE0003	2000.006
4 NE0004	2000.006
5 NE0005	2000.006
6 NE0006	2000.006
7 NE0007	2000.006
8 NE0008	2000.006
9 NE0009	2000.006
10 NE0010	2000.006
11 NE0011	2000.006
12 NE0012	2000.006
13 NE0013	2000.006
14 NE0014	2000.006
15 NE0015	2000.006
16 NE0016	2000.006
17 NE0017	2000.006
18 NE0018	2000.006
19 NE0019	2000.006
20 NE0020	2000.006
21 NE0021	2000.006
22 NE0022	2000.006
23 NE0023	2000.006
24 NE0024	2000.006
25 NE0025	2000.006
26 NE0026	2000.006
27 NE0027	2000.006

Table 8.--Analytical data for ashed samples of mesquite leaves from the
Black Rock Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	Al ppm	B ppm	Ba ppm	Ca %	Cd ppm	Cu ppm	Fe ppm	Mg %
1 BR0001	325702	1101033	410.00	520.00	90.00	10.00	.80N	110.00	1200.00	3.20
2 BR0002	325653	1101012	430.00	490.00	74.00	7.70	.80N	270.00	1100.00	3.80
3 BR0003	325706	1100936	440.00	430.00	55.00	11.00	.80N	160.00	1100.00	3.40
4 BR0004	325357	1100749	1600.00	830.00	94.00	11.00	.80N	150.00	2200.00	4.50
5 BR0005	325413	1100744	1100.00	390.00	67.00	11.00	.80N	150.00	1600.00	3.40
6 BR0006	325548	1101143	1100.00	530.00	120.00	11.00	.80N	210.00	1600.00	3.10
7 BR0007	325608	1101137	1100.00	560.00	80.00	10.00	.80N	100.00	1700.00	3.00
8 BR0009	325610	1101111	1300.00	420.00	79.00	7.40	.80N	190.00	2000.00	3.10
9 BR0010	325419	1100842	660.00	430.00	47.00	8.10	.80N	190.00	940.00	4.00
10 BR0011	325420	1100838	310.00	420.00	85.00	6.60	.80N	210.00	1100.00	3.80
11 BR0012	325419	1100829	360.00	490.00	88.00	10.00	.80N	180.00	1100.00	3.10
12 BR0013	325402	1100758	360.00	500.00	95.00	7.40	.80N	210.00	900.00	5.60
13 BR0014	325559	1101102	980.00	470.00	52.00	10.00	.80N	140.00	1700.00	5.20
14 BR0015	325603	1101055	1100.00	450.00	55.00	10.00	.80N	200.00	1900.00	3.10
15 BR0016	325559	1101202	1600.00	470.00	110.00	10.00	.80N	82.00	2300.00	2.60
16 BR0017	325617	1101228	1400.00	460.00	72.00	8.20	.80N	88.00	2200.00	3.00
17 BR0018	325537	1101251	1500.00	490.00	77.00	11.00	.80N	130.00	2400.00	4.40
18 BR0019	325547	1101241	730.00	790.00	110.00	12.00	.80N	230.00	1800.00	3.70
19 BR0020	325550	1101240	1700.00	450.00	64.00	3.30	.80N	140.00	2800.00	2.50
20 BR0021	325620	1101034	1900.00	730.00	100.00	9.20	.89N	190.00	2800.00	4.90
21 BR0022	325634	1101033	1200.00	460.00	110.00	12.00	.80N	140.00	1600.00	3.00
22 BR0023	325633	1101023	940.00	420.00	81.00	13.00	.80N	230.00	1700.00	4.20
23 BR0024	325654	1100912	610.00	410.00	100.00	15.00	.80N	150.00	1200.00	3.50
24 BR0025	325613	1100858	820.00	520.00	85.00	10.00	.80N	210.00	1900.00	3.10
25 BR0026	325557	1100839	700.00	490.00	48.00	11.00	.80N	170.00	1600.00	3.90
26 BR0027	325559	1100832	920.00	570.00	60.00	12.00	.80N	160.00	1400.00	2.80
27 BR0028	325556	1100933	990.00	340.00	76.00	10.00	.80N	140.00	1600.00	3.70
28 BR0029	325558	1100929	1100.00	490.00	86.00	11.00	.80N	170.00	1900.00	3.70
29 BR0030	325611	1100928	840.00	520.00	50.00	9.70	.80N	140.00	1400.00	4.00

Table 8.--continued

ROW ID	Mn ppm	Mo ppm	Nb ppm	Ni ppm	P %	Sr ppm	Ti ppm	V ppm	Y ppm	Zn ppm
1 BR0001	530.00	1.60N	4.00N	23.00	16.00	260.00	40.00	.60N	.16N	580.00
2 BR0002	460.00	12.00	4.00N	9.90	18.00	260.00	39.00	.60N	.16N	740.00
3 BR0003	430.00	1.60N	4.00N	31.00	16.00	330.00	42.00	.60N	.60	650.00
4 BR0004	450.00	12.00	4.00N	17.00	17.00	480.00	170.00	.60N	.16N	640.00
5 BR0005	1000.00	1.60N	4.00N	24.00	10.00	400.00	110.00	.60N	.28	360.00
6 BR0006	580.00	7.60	4.00N	18.00	23.00	340.00	120.00	.60N	.16N	670.00
7 BR0007	1100.00	3.80	4.00N	6.80	15.00	310.00	140.00	.60N	.16N	570.00
8 BR0009	410.00	2.40	4.00N	39.00	18.00	170.00	140.00	.60N	.16N	660.00
9 BR0010	390.00	6.30	4.00N	21.00	9.70	560.00	80.00	.60N	.16N	680.00
10 BR0011	820.00	12.00	4.00N	12.00	22.00	250.00	32.00	.60N	.16N	700.00
11 BR0012	450.00	5.60	4.00N	4.00N	14.00	400.00	39.00	.60N	.16N	770.00
12 BR0013	530.00	9.20	6.80	29.00	21.00	290.00	37.00	.60N	.16N	750.00
13 BR0014	720.00	1.60N	5.00	4.70	21.00	430.00	130.00	.60N	.16N	770.00
14 BR0015	680.00	1.60N	4.00N	17.00	16.00	310.00	130.00	.60N	.22	680.00
15 BR0016	540.00	1.60N	4.00N	4.00N	15.00	300.00	170.00	.60N	.16N	440.00
16 BR0017	580.00	2.90	4.00N	18.00	22.00	320.00	160.00	.60N	.16N	530.00
17 BR0018	630.00	20.00	4.00N	8.20	22.00	330.00	170.00	.83	.16N	690.00
18 BR0019	770.00	1.60N	4.00N	74.00	22.00	250.00	86.00	.60N	.16N	750.00
19 BR0020	670.00	29.00	4.00N	7.60	23.00	110.00	210.00	.60N	.16N	710.00
20 BR0021	900.00	2.00	4.40N	6.00	18.00	490.00	240.00	.70	.18N	1100.00
21 BR0022	620.00	1.60N	4.00N	4.00N	10.00	330.00	120.00	.60N	.16N	610.00
22 BR0023	990.00	1.60N	4.40	18.00	15.00	330.00	120.00	.60N	.16N	840.00
23 BR0024	440.00	2.80	4.00N	6.40	6.60	730.00	69.00	.60N	.16N	760.00
24 BR0025	470.00	1.60N	4.00N	63.00	15.00	250.00	90.00	.60N	2.80	960.00
25 BR0026	790.00	1.60N	4.00N	18.00	21.00	270.00	90.00	.60N	3.10	700.00
26 BR0027	730.00	5.00	4.00N	14.00	17.00	390.00	100.00	.60N	.16N	650.00
27 BR0028	780.00	32.00	4.00N	7.80	16.00	300.00	110.00	.60N	.87	610.00
28 BR0029	830.00	3.80	4.00N	8.70	22.00	280.00	120.00	.60N	.16N	590.00
29 BR0030	780.00	2.70	4.30	17.00	13.00	210.00	92.00	.60N	.16N	700.00

Table 9.--Analytical data for ashed samples of mesquite leaves from the Fishhooks Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	Al ppm	B ppm	Ba ppm	Ca %	Cd ppm	Cu ppm	Fe ppm	Mg %
1 FH0001	331159	1095938	860.00	540.00	100.00	7.50	.80N	160.00	1800.00	2.80
2 FH0002	331047	1095836	890.00	480.00	76.00	11.00	.80N	80.00	1300.00	2.80
3 FH0003	331052	1095840	990.00	570.00	110.00	14.00	.80N	160.00	1600.00	3.00
4 FH0004	331029	1095744	690.00	470.00	100.00	11.00	.80N	120.00	1100.00	2.40
5 FH0005	331036	1095747	960.00	590.00	68.00	9.10	.80N	100.00	1700.00	2.90
6 FH0007	331233	1095801	790.00	580.00	45.00	12.00	.80N	160.00	1300.00	3.50
7 FH0008	331347	1100056	600.00	510.00	53.00	5.20	1.80N	180.00	1200.00	3.00
8 FH0009	331357	1100057	690.00	500.00	66.00	7.20	.80N	140.00	1300.00	3.60
9 FH0013	331253	1100033	710.00	380.00	60.00	11.00	.80N	170.00	1200.00	2.60
10 FH0015	331301	1100042	720.00	520.00	72.00	9.60	.80N	170.00	1300.00	4.70
11 FH0018	331546	1100201	1200.00	470.00	110.00	13.00	.80N	220.00	1600.00	3.20
12 FH0021	331429	1100225	710.00	520.00	75.00	12.00	.92N	160.00	1100.00	2.80

Table 9.--continued

ROW ID	Mn ppm	Mo ppm	Nb ppm	Ni ppm	P %	Sr ppm	Ti ppm	V ppm	Y ppm	Zn ppm
1 FH0001	760.00	1.60N	4.00N	27.00	22.00	170.00	99.00	.60N	.16N	820.00
2 FH0002	430.00	1.60N	4.00N	20.00	14.00	390.00	87.00	.60N	.16N	410.00
3 FH0003	750.00	8.40	4.00N	51.00	21.00	500.00	110.00	.60N	.16N	610.00
4 FH0004	540.00	16.00	4.00N	26.00	19.00	460.00	77.00	.60N	.16N	570.00
5 FH0005	740.00	4.80	4.00N	14.00	22.00	260.00	110.00	.60N	.16N	720.00
6 FH0007	1300.00	1.60N	4.00N	22.00	23.00	220.00	85.00	.60N	.42	600.00
7 FH0008	570.00	3.60N	9.10N	20.00	22.00	370.00	57.00	1.40N	.36N	650.00
8 FH0009	870.00	3.80	4.00N	29.00	22.00	240.00	76.00	.60N	.16N	670.00
9 FH0013	630.00	1.60N	4.00N	59.00	16.00	450.00	70.00	.60N	.16N	500.00
10 FH0015	840.00	1.60N	4.00N	92.00	21.00	320.00	85.00	.60N	.16N	640.00
11 FH0018	690.00	1.60N	4.00N	21.00	21.00	440.00	130.00	.60N	.16N	610.00
12 FH0021	580.00	1.80N	4.60N	19.00	21.00	520.00	69.00	.69N	.18N	620.00

Table 10.--Analytical data for ashed samples of juniper from the
Fishhooks Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	Al ppm	B ppm	Ba ppm	Be ppm	Ca %	Cd ppm	Cr ppm	Cu ppm
1 FH0006C	331226	1095805	1000.00	260.00	49.00	.28	28.00	2.60	4.00N	90.00
2 FH0008C	331347	1100056	1700.00	260.00	190.00	.07	29.00	1.90	4.00N	140.00
3 FH0010C	331358	1095848	1300.00	320.00	120.00	.05	29.00	1.90	5.80	140.00
4 FH0011C	331352	1095846	1200.00	270.00	110.00	.04N	27.00	1.40	4.00N	110.00
5 FH0012C	331356	1095903	1100.00	220.00	110.00	.04N	22.00	1.20	4.00N	89.00
6 FH0013C	331253	1100033	1700.00	320.00	350.00	.07	27.00	1.70	4.00N	150.00
7 FH0014C	331302	1100029	1400.00	250.00	68.00	.05	26.00	1.40	4.00N	120.00
8 FH0016C	331544	1100139	2200.00	310.00	29.00	.27	28.00	2.40	4.00N	150.00
9 FH0017C	331550	1100140	1700.00	320.00	86.00	.17	27.00	2.60	4.00N	150.00
10 FH0018C	331546	1100201	1900.00	220.00	240.00	.12	28.00	1.70	4.00N	110.00
11 FH0019C	331357	1100140	960.00	250.00	150.00	.04N	27.00	1.00	4.00N	91.00
12 FH0020C	331402	1100144	1600.00	250.00	180.00	.09	28.00	1.90	4.00N	140.00
13 FH0021C	331429	1100225	1900.00	270.00	260.00	.08	29.00	2.40	4.00N	170.00
14 FH0022C	331526	1100214	1300.00	220.00	210.00	.06	30.00	2.10	13.00	99.00
15 FH0023C	331525	1100220	1300.00	350.00	70.00	.05	26.00	1.70	4.00N	120.00
16 FH0024C	331526	1100229	1200.00	240.00	230.00	.09	29.00	1.40	4.00N	100.00

Table 10.--continued

ROW ID	Fe ppm	La ppm	Hg Z	Mn ppm	Nb ppm	Ni ppm	P %	Pb ppm	Sr ppm	Ti ppm
1 FH0006C	980.00	6.80	3.70	820.00	5.70	15.00	1.30	8.00N	870.00	82.00
2 FH0008C	1500.00	16.00	3.50	390.00	4.30	4.00N	2.10	8.00N	860.00	110.00
3 FH0010C	1400.00	9.60	3.30	190.00	4.00N	6.60	3.40	8.00N	900.00	110.00
4 FH0011C	1200.00	7.80	3.20	230.00	4.00N	6.10	2.10	8.00N	900.00	92.00
5 FH0012C	1100.00	9.90	2.80	260.00	4.00N	4.00N	1.60	8.00N	860.00	82.00
6 FH0013C	1600.00	13.00	2.30	200.00	4.00N	4.00N	2.40	8.00N	900.00	120.00
7 FH0014C	1300.00	5.50	2.70	280.00	4.00N	4.00N	2.70	8.00N	850.00	91.00
8 FH0016C	1900.00	7.50	2.30	320.00	4.00N	4.00N	2.10	15.00	400.00	140.00
9 FH0017C	1700.00	7.80	2.80	570.00	4.00N	6.00	2.80	8.00N	900.00	130.00
10 FH0018C	1700.00	16.00	3.40	460.00	4.00N	4.00N	2.30	8.00N	900.00	130.00
11 FH0019C	880.00	5.90	1.60	230.00	4.00N	4.00N	1.70	8.00N	860.00	71.00
12 FH0020C	1600.00	8.20	2.70	220.00	4.00N	4.00N	2.40	8.00N	900.00	120.00
13 FH0021C	1800.00	15.00	2.70	300.00	4.00N	4.00N	1.90	11.00	900.00	150.00
14 FH0022C	1200.00	13.00	2.10	250.00	4.00N	5.40	1.00	8.00N	900.00	100.00
15 FH0023C	1200.00	11.00	3.10	500.00	4.00N	4.00N	2.20	8.00N	900.00	99.00
16 FH0024C	1100.00	11.00	2.60	290.00	4.00N	4.00N	3.10	8.00N	900.00	100.00

Table 10.--continued

ROW ID	V ppm	Y ppm	Zn ppm
1 FH0006C	.60N	1.20	180.00
2 FH0008C	.68	1.00	180.00
3 FH0010C	.60N	.56	200.00
4 FH0011C	.60N	.31	180.00
5 FH0012C	.60N	.16N	170.00
6 FH0013C	.60N	.74	160.00
7 FH0014C	.60N	.57	150.00
8 FH0016C	2.00	1.50	130.00
9 FH0017C	.60N	1.20	250.00
10 FH0018C	.71	1.50	160.00
11 FH0019C	.60N	.19	130.00
12 FH0020C	.60N	.71	270.00
13 FH0021C	.73	.99	250.00
14 FH0022C	.60N	.79	120.00
15 FH0023C	.60N	.64	200.00
16 FH0024C	.60N	.53	190.00

Table 11.--Analytical data for ashed samples of mesquite leaves from the
Needles Eye Wilderness Study Area, Gila County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

ROW ID	LATITUDE	LONGITUDE	Al ppm	B ppm	Ba ppm	Ca %	Cd ppm	Cu ppm	Fe ppm	Mg %
1 NE0001	330716	1103940	1400.00	330.00	120.00	16.00	.80	170.00	1800.00	5.30
2 NE0002	330705	1103934	1200.00	450.00	91.00	12.00	.80N	230.00	1700.00	2.40
3 NE0003	330941	1103848	1100.00	800.00	110.00	15.00	1.50	230.00	1600.00	5.40
4 NE0004	330910	1103828	1100.00	630.00	79.00	10.00	.80N	160.00	1700.00	4.10
5 NE0005	330913	1103822	900.00	540.00	120.00	18.00	.80N	250.00	1600.00	4.90
6 NE0006	330903	1103812	930.00	810.00	110.00	18.00	.80N	150.00	1400.00	3.00
7 NE0007	330831	1103806	890.00	690.00	95.00	19.00	.80N	180.00	1400.00	5.10
8 NE0008	330849	1103629	1000.00	610.00	54.00	14.00	.86N	230.00	1600.00	5.80
9 NE0009	330841	1103720	950.00	530.00	120.00	11.00	.80N	170.00	1300.00	6.10
10 NE0010	330855	1103457	1200.00	470.00	74.00	9.60	.80N	240.00	2000.00	3.30
11 NE0011	330910	1103512	960.00	460.00	66.00	10.00	.80N	200.00	1700.00	5.40
12 NE0012	330932	1103521	940.00	520.00	57.00	9.60	.80N	130.00	1500.00	3.50
13 NE0013	330951	1103534	1100.00	640.00	120.00	10.00	.84N	120.00	1900.00	3.30
14 NE0014	330858	1103402	1000.00	650.00	97.00	11.00	.80N	210.00	1600.00	4.20
15 NE0015	330857	1103412	1000.00	700.00	140.00	14.00	.80N	250.00	1400.00	4.20
16 NE0016	330926	1103436	1000.00	320.00	45.00	7.70	.80N	230.00	1700.00	3.80
17 NE0017	330927	1103433	990.00	730.00	82.00	17.00	.80N	200.00	1400.00	3.90
18 NE0018	330922	1103331	1300.00	810.00	100.00	12.00	.88N	310.00	1700.00	5.20
19 NE0019	330947	1103333	890.00	510.00	86.00	10.00	.80N	270.00	1600.00	3.50
20 NE0020	331006	1103417	840.00	430.00	57.00	6.10	1.00N	250.00	1400.00	3.50
21 NE0021	330939	1103640	790.00	450.00	38.00	15.00	.80N	120.00	1200.00	3.50
22 NE0022	331004	1103724	740.00	600.00	30.00	13.00	.80N	150.00	1100.00	3.00
23 NE0023	330755	1103958	530.00	510.00	120.00	18.00	.80N	210.00	960.00	3.30
24 NE0026	330651	1104033	830.00	400.00	99.00	13.00	1.00N	220.00	1200.00	3.60
25 NE0027	330819	1103547	980.00	590.00	87.00	18.00	.80N	130.00	1400.00	5.10

Table 11.--continued

ROW ID	Mn ppm	Mo ppm	Nb ppm	Ni ppm	P %	Sr ppm	Ti ppm	V ppm	Y ppm	Zn ppm
1 NE0001	530.00	1.60N	5.40	5.50	4.60	160.00	110.00	.60N	.16N	1100.00
2 NE0002	250.00	1.60N	4.00N	4.80	5.60	840.00	110.00	.60N	.16N	770.00
3 NE0003	310.00	2.90	5.00	5.60	3.40	800.00	110.00	.60N	.16N	680.00
4 NE0004	510.00	1.60N	4.00N	4.00N	15.00	240.00	120.00	.60N	.16N	810.00
5 NE0005	530.00	1.80	4.70	4.00N	13.00	400.00	100.00	.60N	1.20	700.00
6 NE0006	390.00	1.60N	4.00N	4.00N	5.30	520.00	92.00	.60N	.16N	810.00
7 NE0007	700.00	22.00	4.70	7.40	13.00	340.00	94.00	.60N	.16N	990.00
8 NE0008	490.00	3.70	5.40	8.80	13.00	470.00	130.00	.65N	.17N	730.00
9 NE0009	470.00	5.90	4.90	12.00	8.90	220.00	110.00	.60N	.16N	1000.00
10 NE0010	450.00	13.00	4.00N	23.00	19.00	480.00	130.00	.60N	.16N	670.00
11 NE0011	420.00	5.50	4.60	20.00	8.30	600.00	110.00	.60N	.16N	780.00
12 NE0012	480.00	1.60N	4.00N	11.00	14.00	390.00	110.00	.60N	.16N	650.00
13 NE0013	430.00	1.70N	4.20N	18.00	9.60	240.00	130.00	.63N	.17N	550.00
14 NE0014	620.00	2.90	4.40	10.00	21.00	270.00	130.00	.60N	.16N	1100.00
15 NE0015	690.00	1.60N	4.00N	13.00	9.00	380.00	110.00	.60N	.16N	980.00
16 NE0016	610.00	16.00	4.00N	8.20	22.00	570.00	110.00	.60N	.16N	660.00
17 NE0017	480.00	5.80	4.00N	5.00	14.00	670.00	120.00	.60N	.16N	880.00
18 NE0018	450.00	1.80N	4.40N	4.80	7.40	950.00	110.00	.66N	.18N	760.00
19 NE0019	480.00	3.70	4.00	17.00	18.00	610.00	120.00	.60N	.16N	900.00
20 NE0020	670.00	21.00	5.00N	12.00	13.00	240.00	96.00	.75N	.20N	870.00
21 NE0021	350.00	1.80	4.00N	6.50	8.80	490.00	87.00	.60N	.16N	400.00
22 NE0022	460.00	1.60N	4.00N	17.00	19.00	390.00	92.00	.60N	.16N	490.00
23 NE0023	510.00	7.00	4.00N	4.00	7.80	230.00	60.00	.60N	.16N	1300.00
24 NE0026	340.00	2.50	5.00N	5.00N	5.20	590.00	89.00	.75N	.20N	850.00
25 NE0027	360.00	37.00	4.50	4.00N	6.00	830.00	100.00	.60N	.16N	620.00

Table 12. Number of data with qualifying codes in stream sediments from the Black Rock Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

Number of samples = 30

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	0	30	0	0	No data
As	0	0	30	0	0	No data
Au	0	0	30	0	0	No data
B	0	0	20	0	10	10 ppm
Ba	0	0	0	0	30	300 ppm
Be	0	0	0	0	30	1 ppm
Bi	0	0	30	0	0	No data
Ca	0	0	0	0	30	0.15%
Cd	0	0	30	0	0	No data
Co	0	0	5	0	25	5 ppm
Cr	0	0	5	0	25	15 ppm
Cu	0	0	0	0	30	7 ppm
Fe	0	0	0	0	30	0.7%
La	0	0	2	0	28	50 ppm
Mg	0	0	0	0	30	0.15%
Mn	0	0	0	0	30	150 ppm
Mo	0	0	29	0	1	5 ppm
Nb	0	0	7	0	23	20 ppm
Ni	0	0	2	0	28	7 ppm
Pb	0	0	0	0	30	15 ppm
Sb	0	0	30	0	0	No data
Sc	0	0	2	0	28	5 ppm
Sn	0	0	26	0	4	15 ppm
Sr	0	0	1	0	29	100 ppm
Th	0	0	28	0	2	200 ppm
Ti	0	0	0	0	30	0.07%
V	0	0	0	0	30	15 ppm
W	0	0	30	0	0	No data
Y	0	0	0	0	30	15 ppm
Zn	0	0	29	0	1	300 ppm
Zr	0	0	0	0	30	70 ppm

Table 13. Number of data with qualifying codes in stream sediments
from the Fishhooks Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

No of samples = 24

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	0	24	0	0	No data
As	0	0	24	0	0	No data
Au	0	0	24	0	0	No data
B	0	0	22	0	2	10 ppm
Ba	0	0	0	0	24	150 ppm
Be	0	0	1	0	23	1.5 ppm
Bi	0	0	24	0	0	No data
Ca	0	0	0	0	24	0.3%
Cd	0	0	24	0	0	No data
Co	0	0	1	0	23	5 ppm
Cr	0	0	0	0	24	10 ppm
Cu	0	0	0	0	24	7 ppm
Fe	0	0	0	0	24	1.0%
La	0	0	0	0	24	30 ppm
Mg	0	0	0	0	24	0.3%
Mn	0	0	0	0	24	300 ppm
Mo	0	0	24	0	0	No data
Nb	0	0	3	0	21	20 ppm
Ni	0	0	0	0	24	7 ppm
Pb	0	0	0	0	24	15 ppm
Sb	0	0	24	0	0	No data
Sc	0	0	2	0	22	7 ppm
Sn	0	0	24	0	0	No data
Sr	0	0	0	0	24	150 ppm
Th	0	0	24	0	0	No data
Ti	0	0	0	2	22	0.15%
V	0	0	0	0	24	20 ppm
W	0	0	24	0	0	No data
Y	0	0	0	0	24	15 ppm
Zn	0	0	24	0	0	No data
Zr	0	0	0	0	24	70 ppm

Table 14. Number of data with qualifying codes in stream sediments
from the Needles Eye Wilderness Study Area, Gila County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

Number of samples = 27

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	0	27	0	0	No data
As	0	0	27	0	0	No data
Au	0	0	27	0	0	No data
B	0	0	21	0	6	10 ppm
Ba	0	0	0	0	27	30 ppm
Be	0	0	15	0	12	1 ppm
Bi	0	0	27	0	0	No data
Ca	0	0	0	0	27	1.5%
Cd	0	0	27	0	0	No data
Co	0	0	3	0	24	7 ppm
Cr	0	0	0	0	27	15 ppm
Cu	0	0	0	0	27	7 ppm
Fe	0	0	0	0	27	0.7%
La	0	0	12	0	15	30 ppm
Mg	0	0	0	0	27	0.7%
Mn	0	0	0	0	27	150 ppm
Mo	0	0	27	0	0	No data
Nb	0	0	23	0	4	20 ppm
Ni	0	0	0	0	27	10 ppm
Pb	0	0	3	0	24	10 ppm
Sb	0	0	27	0	0	No data
Sc	0	0	1	0	26	5 ppm
Sn	3	0	23	0	1	30 ppm
Sr	0	0	0	0	27	150 ppm
Th	0	0	27	0	0	No data
Ti	0	0	0	2	25	0.05%
V	0	0	0	0	27	30 ppm
W	0	0	27	0	0	No data
Y	0	0	0	0	27	15 ppm
Zn	0	0	26	0	0	No data
Zr	1	0	0	0	26	30 ppm

Table 15. Number of data with qualifying codes in heavy-mineral concentrates for the Black Rock Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

Number of samples = 30

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	25	0	0	5	1 ppm
As	0	28	1	0	1	1000 ppm
Au	0	30	0	0	0	No data
B	0	2	0	0	28	20 ppm
Ba	0	0	0	6	24	300 ppm
Be	0	13	0	0	17	2 ppm
Bi	0	7	1	2	20	20 ppm
Ca	0	0	0	0	30	0.5%
Cd	0	30	0	0	0	No data
Co	0	5	4	0	21	10 ppm
Cr	0	4	8	0	18	20 ppm
Cu	0	0	7	0	23	10 ppm
Fe	0	0	0	0	30	0.2%
La	0	0	0	0	30	50 ppm
Mg	0	0	1	0	29	0.05%
Mn	0	0	0	0	30	150 ppm
Mo	0	10	4	0	16	10 ppm
Nb	0	5	7	0	18	50 ppm
Ni	0	18	11	0	1	10 ppm
Pb	0	0	1	0	29	20 ppm
Sb	0	30	0	0	0	No data
Sc	0	1	3	0	26	10 ppm
Sn	0	9	0	1	20	20 ppm
Sr	0	14	0	0	16	200 ppm
Th	0	2	0	14	14	300 ppm
Ti	0	0	0	12	18	0.7%
V	0	0	0	0	30	50 ppm
W	0	17	1	0	12	100 ppm
Y	0	0	0	0	30	100 ppm
Zn	0	29	0	0	1	5000 ppm
Zr	0	0	0	30	0	No data

Table 16. Number of data with qualifying codes in heavy-mineral concentrates for the Fishhooks Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

Number of samples = 24

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag*	0	23	0	0	1	1 ppm
As*	0	24	0	0	0	No data
Au*	0	24	0	0	0	No data
B	0	3	0	0	21	15 ppm
Ba	0	0	0	1	23	500 ppm
Be	0	3	0	0	21	2 ppm
Bi	0	14	7	0	3	30 ppm
Ca	0	0	0	0	24	1%
Cd	0	24	0	0	0	No data
Co	0	12	8	0	4	10 ppm
Cr	0	10	11	0	3	20 ppm
Cu	0	0	17	0	7	10 ppm
Fe	0	0	0	0	24	0.3%
La	0	0	1	0	23	50 ppm
Mg	0	0	0	0	24	0.1%
Mn	0	0	0	0	24	100 ppm
Mo	0	22	2	0	0	No data
Nb	0	20	3	0	1	100 ppm
Ni	0	7	12	0	5	10 ppm
Pb*	0	0	2	0	22	20 ppm
Sb*	0	24	0	0	0	No data
Sc*	0	15	4	0	5	10 ppm
Sn*	0	13	0	2	9	50 ppm
Sr	0	2	0	0	22	200 ppm
Th*	0	18	0	0	6	200 ppm
Ti*	0	0	0	1	23	0.15%
V	0	0	0	0	24	20 ppm
W	0	24	0	0	0	No data
Y	0	0	0	0	24	50 ppm
Zn*	0	23	0	0	1	500 ppm
Zr	0	0	0	24	0	No data

*Elements have more than one lower and upper limits of determination because of varying sample weights.

Table 17. Number of data with qualifying codes in heavy-mineral concentrates from the Needles Eye Wilderness Study Area, Gila County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

Number of samples = 27

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	23	0	0	4	1 ppm
As	0	26	1	0	0	No data
Au	0	27	0	0	0	No data
B	0	2	0	0	25	20 ppm
Ba	0	0	0	11	16	300 ppm
Be	0	13	0	0	14	2 ppm
Bi	0	24	2	0	1	150 ppm
Ca	0	0	0	0	27	3%
Cd	0	26	0	0	1	200 ppm
Co	0	8	5	0	14	10 ppm
Cr	0	4	11	0	12	20 ppm
Cu	0	0	10	0	17	10 ppm
Fe	0	0	0	0	27	0.2%
La	0	0	1	0	26	70 ppm
Mg	0	0	0	0	27	0.2%
Mn	0	0	0	0	27	300 ppm
Mo	0	25	0	0	2	15 ppm
Nb	0	2	18	0	7	50 ppm
Ni	0	4	7	0	16	10 ppm
Pb	0	1	2	0	24	20 ppm
Sb	0	27	0	0	0	No data
Sc	0	6	2	0	19	10 ppm
Sn	0	22	2	0	3	20 ppm
Sr	0	3	0	0	24	200 ppm
Th	0	26	0	0	1	200 ppm
Ti	0	0	0	2	25	0.3%
V	0	0	0	0	27	50 ppm
W	0	24	1	0	2	100 ppm
Y	0	0	0	0	27	30 ppm
Zn	0	24	0	0	3	500 ppm
Zr	0	0	0	27	0	No data

Table 18. Number of data with qualifying codes in ash of mesquite leaves from the Black Rock Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

Number of samples = 29

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	29	0	0	0	No data
Al	0	0	0	0	29	310 ppm
As	0	29	0	0	0	No data
B	0	0	0	0	29	340 ppm
Ba	0	0	0	0	29	47 ppm
Be	0	29	0	0	0	No data
Bi	0	29	0	0	0	No data
Ca*	0	0	0	0	29	3.3%
Cd	0	29	0	0	0	No data
Ce	0	29	0	0	0	No data
Co	0	29	0	0	0	No data
Cr	0	29	0	0	0	No data
Cu	0	0	0	0	29	82 ppm
Fe	0	0	0	0	29	900 ppm
La	0	29	0	0	0	No data
Mg	0	0	0	0	29	2.5%
Mn	0	0	0	0	29	390 ppm
Mo*	0	11	0	0	18	2 ppm
Nb*	0	25	0	0	4	4.3 ppm
Ni	0	3	0	0	26	4.7 ppm
P	0	0	0	0	29	6.6%
Pb	0	29	0	0	0	No data
Sb	0	29	0	0	0	No data
Sn	0	29	0	0	0	No data
Sr	0	0	0	0	29	110 ppm
Ti	0	0	0	0	29	32 ppm
V	0	27	0	0	2	0.7 ppm
W*	0	29	0	0	0	No data
Y*	0	23	0	0	6	0.2 ppm
Zn	0	0	0	0	29	360 ppm

*Elements have more than one lower limit of determination because of varying sample weight.

Table 19. Number of data with qualifying codes in ash of mesquite leaves from the Fishhooks Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

Number of samples = 12

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	12	0	0	0	No data
Al	0	0	0	0	12	600 ppm
As	0	12	0	0	0	No data
B	0	0	0	0	12	380 ppm
Ba	0	0	0	0	12	45 ppm
Be	0	12	0	0	0	No data
Bi	0	12	0	0	0	No data
Ca*	0	0	0	0	12	5.2%
Cd	0	12	0	0	0	No data
Ce	0	12	0	0	0	No data
Co	0	12	0	0	0	No data
Cr	0	12	0	0	0	No data
Cu	0	0	0	0	12	80 ppm
Fe	0	0	0	0	12	1100 ppm
La	0	12	0	0	0	No data
Mg	0	0	0	0	12	2.4%
Mn*	0	0	0	0	12	430 ppm
Mo*	0	8	0	0	4	3.8 ppm
Nb*	0	12	0	0	0	No data
Ni	0	0	0	0	12	14 ppm
P	0	0	0	0	12	14%
Pb	0	12	0	0	0	No data
Sb	0	12	0	0	0	No data
Sn	0	12	0	0	0	No data
Sr	0	0	0	0	12	170 ppm
Ti*	0	0	0	0	12	57 ppm
V*	0	12	0	0	0	No data
W*	0	12	0	0	0	No data
Y*	0	12	0	0	0	No data
Zn	0	0	0	0	12	410 ppm

*Elements have more than one lower limit of determination because of varying sample weight.

Table 20. Number of data with qualifying codes in ash of juniper
from the Fishhooks Wilderness Study Area, Graham County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown;
G, greater than limit shown]

Number of samples = 16

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	16	0	0	0	No data
Al	0	0	0	0	16	960 ppm
As	0	16	0	0	0	No data
B	0	0	0	0	16	220 ppm
Ba	0	0	0	0	16	29 ppm
Be	0	3	0	0	13	0.045 ppm
Bi	0	16	0	0	0	No data
Ca	0	0	0	0	16	22%
Cd	0	0	0	0	16	1.0 ppm
Ce	0	16	0	0	0	No data
Co	0	16	0	0	0	No data
Cr	0	14	0	0	2	5.8 ppm
Cu	0	0	0	0	16	89 ppm
Fe	0	0	0	0	16	880 ppm
La	0	0	0	0	16	5.5 ppm
Mg	0	0	0	0	16	1.6%
Mn	0	0	0	0	16	190 ppm
Mo	0	16	0	0	0	No data
Nb	0	14	0	0	2	4.3 ppm
Ni	0	11	0	0	5	5.4 ppm
P	0	0	0	0	16	1.0%
Pb	0	14	0	0	2	11 ppm
Sb	0	16	0	0	0	No data
Sn	0	16	0	0	0	No data
Sr	0	0	0	0	16	400 ppm
Ti	0	0	0	0	16	71 ppm
V	0	12	0	0	4	0.68 ppm
W	0	16	0	0	0	No data
Y	0	1	0	0	15	0.19 ppm
Zn	0	0	0	0	16	120 ppm

Table 21. Number of data with qualifying codes in ash of mesquite leaves from the Needles Eye Wilderness Study Area, Gila County, Arizona

[N, not detected; H, interference from matrix; L, less than limit shown; G, greater than limit shown]

Number of samples = 25

Element	H	N	L	G	Unqualified values	Minimum unqualified value
Ag	0	25	0	0	0	No data
Al	0	0	0	0	25	530 ppm
As	0	25	0	0	0	No data
B	0	0	0	0	25	320 ppm
Ba	0	0	0	0	25	30 ppm
Be	0	25	0	0	0	No data
Bi	0	25	0	0	0	No data
Ca*	0	0	0	0	25	6.1%
Cd*	0	23	0	0	2	0.8 ppm
Ce	0	25	0	0	0	No data
Co	0	25	0	0	0	No data
Cr	0	25	0	0	0	No data
Cu	0	0	0	0	25	120 ppm
Fe	0	0	0	0	25	960 ppm
La	0	25	0	0	0	No data
Mg	0	0	0	0	25	2.4%
Mn*	0	0	0	0	25	250 ppm
Mo*	0	9	0	0	16	1.8 ppm
Nb*	0	15	0	0	10	4 ppm
Ni*	0	5	0	0	20	4 ppm
P	0	0	0	0	25	3.4%
Pb	0	25	0	0	0	No data
Sb	0	25	0	0	0	No data
Sn	0	25	0	0	0	No data
Sr	0	0	0	0	25	160 ppm
Ti*	0	0	0	0	25	60 ppm
V*	0	25	0	0	0	No data
W*	0	25	0	0	0	No data
Y*	0	24	0	0	1	1.2 ppm
Zn	0	0	0	0	25	400 ppm

* Elements have more than one lower limit of determination because of varying sample weight.