UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CHEMICAL ANALYSES AND STATISTICAL SUMMARIES FOR SAMPLES OF ROCK, MINUS-60-MESH (0.25-MM) STREAM SEDIMENT, AND NONMAGNETIC HEAVY-MINERAL CONCENTRATE, RAYMOND PEAK ROADLESS AREA, TOIYABE NATIONAL FOREST, ALPINE COUNTY, CALIFORNIA

by

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STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands 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 geochemical survey of the Raymond Peak Roadless Area in the Toiyabe National Forest, Alpine County, California. The Raymond Peak Roadless Area (4985) was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

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INTRODUCTION

Geochemical sampling was conducted in the Raymond Peak Roadless Area, Alpine County, California, during the summers of 1978 and 1979. This report includes a map showing the locations of all sites sampled in this program (plate 1), a tabulation of the lower limits of determination used in the various analytical methods (table 1), a tabulation of chemical analyses for samples of rock, minus-60-mesh (0.25-mm) stream sediment, and nonmagnetic heavy-mineral concentrate from stream sediment collected at each sample site (tables 2, 3, and 4, respectively), and summary statistics for the elements listed in tables 2-4 (tables 5-7). Tables 2-4 and 5-7 are based on data provided by computer programs in the U.S. Geological Survey RASS-STATPAC system (VanTrump and Miesch, 1977).

SAMPLE COLLECTION AND PREPARATION

A set of samples was collected at most sites shown on plate 1; a complete set consisted of a rock sample, a stream-sediment sample, and a bulk stream-sediment sample used for panning. At all sites, a stream-sediment sample and a bulk stream-sediment sample were collected, and where suitable outcrop was available, a rock sample was also collected. Analyses for a total of 38 rock samples, 41 stream-sediment samples, and 41 nonmagnetic heavy-mineral-concentrate samples are listed in this report (tables 2-4). The number of samples analyzed for each medium yields an approximate sample density of 1 sample/1.6 mi^2 (1 sample/4.1 km^2) for the rock samples and 1 sample/1.5 mi^2 (1 sample/3.8 km^2) for the other two.

Most of the rock samples are of unaltered material. These samples provide information on chemical abundances in rocks that have not been affected by hydrothermal alteration or mineralization. In addition, some altered and(or) mineralized rocks were collected to characterize anomalous areas and to test for ore-related elements that might not be identified by a visual examination. Although each sample was selected to be representative of the rocks exposed in the vicinity of its plotted site point, the actual areal extent of influence of the chemical information provided by a specific sample is not known; the sampling program was designed only to provide some general information of the geochemical nature of the rock units present.

The sediment samples provide information about the chemical elements present in rock material eroded from the drainage basin upstream from each sample site. Such information is useful in identifying those basins that contain unusually high concentrations of elements that may be related to mineral deposits.

Concentrate samples were processed from the same active alluvium used to make minus-60-mesh (0.25-mm) stream-sediment samples. The concentrate samples provide information about the chemistry of a limited number of minerals present in rock material eroded from the drainage basin upstream from each sample site. Removing most of the quartz, feldspars, clay minerals, and highly magnetic minerals concentrates a number of other minerals that are commonly associated with mineral deposits. The selective concentration of ore-related minerals permits determination of some elements that are not easily detected in stream-sediment samples. The analytical composition of a concentrate may also indicate specific minerals. For example, the barium content in a stream-sediment sample is predominantly the sum of barium in the mineral barite plus barium substituted in feldspars, clay minerals, and possibly other minerals, whereas the barium in a concentrate sample is essentially all in barite.

Rock samples

All rock samples were collected from outcrops that were considered to be representative of exposures in the vicinity of the plotted site location. Wherever possible the samples were hand cobbed to remove any obviously weathered material. All samples were crushed and pulverized to minus-100-mesh (0.149 mm) before analysis.

Minus-60-mesh (0.25-mm) stream-sediment samples

The material for the stream-sediment samples was collected primarily from first-order (unbranched) and second-order (below the junction of two first-order) streams as shown on 1:62,500-scale topographic maps. Each sample was composited from active alluvium collected from several locations within an area that may extend as much as 50 ft (15 m) from the site plotted on the map. The resulting sample was air dried and that portion passing a screen with 0.25-mm openings (a 60-mesh screen) was saved and pulverized before analysis.

Nonmagnetic heavy-mineral-concentrate samples

The bulk sample of active stream-sediment material was collected and composited in a manner similar to that used for the minus-60-mesh (0.25-mm) stream-sediment samples. Each bulk sample was passed through a 10-mesh (2.0-mm) screen to remove the coarsest material. The sediment passing through the screen was wet-panned until most of the quartz, feldspar, organic material, and clay-sized material was removed. The sample was air dried and passed through an 18-mesh (1.0-mm) sieve; the minus-18-mesh material was saved. Any light material remaining in the concentrate was then removed by allowing the heavier fraction of the sample to settle through bromoform (specific gravity 2.86). The highly magnetic material was next removed with a hand magnet from the heavy-mineral fraction. The remaining heavy-mineral material was then separated into a magnetic and a nonmagnetic fraction using a Frantz Isodynamic Separator set at 0.6 amperes, with a 15° forward setting and a 15° side setting. The resulting nonmagnetic sample was split into two equal fractions; one fraction was ground in an agate mortar prior to analysis and the other fraction was saved for future mineralogical studies.

CHEMICAL ANALYSIS

All three types of samples were analyzed for 31 elements (Ag, As, Au, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, La, Mg, Mn, Mo, Nb, Ni, Pb, Sb, Sc, Sn, Sr, Th, Ti, V, W, Y, Zn, and Zr) using a six-step semiquantitative emission spectrographic method (Grimes and Marranzino, 1968). Because of the limited amount of sample material, the nonmagnetic heavy-mineral concentrates were only analyzed spectrographically. The rock and stream-sediment samples were also analyzed for As using a colorimetric method (Ward and others, 1963) and for Zn, Sb, Cd, and Bi by atomic absorption spectrometry (Ward and others, 1969; Welsch and Chao, 1975; Viets, 1978). Those stream-sediment samples with Ag detected by the emission spectrographic method, were also analyzed by atomic absorption spectrometry for Au (Meier, 1980). Analysis for all three sample types was done partly in the field and partly in U.S. Geological Survey laboratories near Golden, Colorado.

The spectrographic analytical values are reported as the approximate geometric midpoints (0.15, 0.2, 0.3, 0.5, 0.7, and 1.0 or appropriate powers of ten of these values) of concentration ranges whose respective boundaries are 0.12, 0.18, 0.26, 0.38, 0.56, 0.83, and 1.2 (or appropriate powers of ten of these values). In general, the precision of the spectrographic method is plus or minus one reporting value of the value given by the analyst approximately 83 percent of the time and plus or minus two reporting values of the value given by the analyst 96 percent of the time (Motooka and Grimes, 1976). Because all of the samples for this report were analyzed by the same analyst using the same spectrographic instrument, our experience indicates that better precision can be expected.

Each spectrographic film includes analytical spectra for up to 22 field samples and one reference standard sample. The reference standard sample is included with each set of field samples to monitor the quality of the analyses from film to film; however, the analyses for those reference samples have been omitted from tables 2-4.

For the six elements analyzed by colorimetric or atomic absorption methods, the reporting values vary with the element and with the concentration level for any given element. Precision for these analytical methods is commonly reported as a percent relative standard deviation (% RSD), and is based on replicate analyses of samples selected to provide information at different concentration levels. In general, the precision for each method tends to be lowest for those samples containing a given element at or near its lower limit of determination. For the six elements discussed here, the reported ranges of percent relative standard deviation, as determined by replicate analysis of a limited sample set, are as follows:

Element	Range of % RSD	Source of data
As	0.0-48.9	Unpublished analyses by R. H. Hill, 1981
Zn	3.4-30.2	Ward and others, 1969, p. 21
Sb	3.7-10.7	Welsch and Chao, 1975
Cd	3.3-18.8	Viets, 1978
Bi	1.4- 4.0	Viets, 1978
Au	0.0-22.8	Meier, 1980

As an example to use in interpreting these ranges one might consider antimony, whose range is shown as 3.7-10.7% RSD. This range indicates that a reported antimony value listed in tables 2 or 3 should be within $\pm$ 10.7% (usually much less) of the mean value for that sample. The mean value would be determined by repeating the analysis of that sample five or more times. As was the case for the spectrographic analyses, a reference standard sample was analyzed with each batch of field samples to monitor the quality of the analyses.

DESCRIPTION OF TABLES 1-4

Table 1 lists the lower limits of analytical determination for the three types of samples collected for this report. Because of matrix interference problems, the spectrographic technique was modified for the analysis of nonmagnetic heavy-mineral-concentrate samples. As a result, the lower limits of determination for the elements analyzed for this type of sample are all raised two reporting values above the normal lower-limit value. Tables 2-4 list the chemical analyses for the samples of rock, minus-60-mesh (0.25-mm) stream sediment, and nonmagnetic heavy-mineral concentrate, respectively. For the three sample sets the data are arranged so that column 1 contains the USGS-assigned sample numbers. These numbers coincide with the numbers on the site location map (plate 1). In tables 2-4, rock samples are suffixed by RK, stream-sediment samples by SS, and concentrate samples by KN. Columns 2 and 3 list the latitudes (north) and longitudes (west) for the sample sites in degrees, minutes, and seconds. Columns in which the element headings show the letter "s" below the element symbol are emission spectrographic analyses. Columns in which the element headings show the letters "aa" below the element symbol are atomic absorption analyses. The last column of analyses in tables 2 and 3 contains colorimetric determinations ("cm") for arsenic. All element concentrations are given in parts per million (ppm), except those for Fe, Mg, Ca, and Ti, which are given in percent (pct).

If a given element was looked for on the spectrographic film but not detected in a sample, then the letter "N" is entered in the tables in place of an analytical value. If an element was observed but was below the lowest reporting value, then a "less than" symbol (<) was entered in the tables in front of the lower limit of determination. If an element was observed but was above the highest reporting value, then a "greater than" symbol (>) was entered in the tables in front of the upper limit of determination. If an element was not looked for in a sample, then two dashes (--) are entered in the appropriate table in place of an analytical value. Because of the formatting used in the computer program that produced tables 2-4, some of the elements listed in these tables (Fe, Mg, Ca, Ti, Ag, and Be) carry one or more nonsignificant zeroes to the right of the significant digits. The analysts did not determine these elements to the accuracy suggested by the extra zeroes. The last column in table 2 gives the formation name for each rock sample. These names are taken from the units shown on the geologic map of the Raymond Peak Roadless Area (Armin and others, 1982).

For the semiquantitative spectrographic method used, the elements As, Bi, Cd, Sb, and Zn have lower limits of analytical determination that are usually above normal concentrations for these elements in natural materials. As a result, these elements were run by other, more sensitive methods on the rock and stream-sediment samples, and the spectrographic analyses for these five elements have been deleted from the rock and stream-sediment data sets (tables 2 and 3). In addition, the elements Ag, Au, Sn, and Th were not detected by emission spectroscopy any of the rock samples; consequently, these elements were deleted from table 2. The elements Au, Sn, W, and Th were deleted from the stream-sediment data set (table 3), and Au, Cd, and Sb were deleted from the concentrate data set (table 4) for the same reason.

Table 1.--Lower limits of analytical determination for samples of rock, minus-60-mesh (0.25-mm) stream sediment, and nonmagnetic heavy-mineral concentrate, Raymond Peak Roadless Area, California

[(--) indicates not analyzed. "aa" following the element symbol indicates atomic absorption analysis; "cm" indicates colorimetric analysis; no suffix indicates spectrographic analysis. The values listed for Fe, Mg, Ca, and Ti are in percent; all others are in parts per million]

Element	Lower limit of determination	
	Rock and stream sediment	Heavy-mineral concentrate
Fe	0.05	0.1
Mg	0.02	0.05
Ca	0.05	0.1
Ti	0.002	0.005
Mn	10	20
Ag	0.5	1.0
As	200	500
Au	10	20
B	10	20
Ba	20	50
Be	1	2
Bi	10	20
Cd	20	50
Co	5	10
Cr	10	20
Cu	5	10
La	20	50
Mo	5	10
Nb	20	50
Ni	5	10
Pb	10	20
Sb	100	200
Sc	5	10
Sn	10	20
Sr	100	200
V	10	20
W	50	100
Y	10	20
Zn	200	500
Zr	10	20
Th	200	500
Zn-aa	5	--
Cd-aa	0.05	--
Bi-aa	0.5	--
Sb-aa	1.0	--
Au-aa	0.005	--
As-cm	10	--

Table 2.--Data for rock samples, Raymond Peak Roadless Area, California

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	B-ppm s	Ba-ppm s	Be-ppm s	Co-ppm s	Cr-ppm s
RP001RK	38 42 50	119 53 3	1.5	.50	1.0	.20	1,000	10	500	1.0	5	<10
RP002RK	38 43 27	119 53 15	1.5	1.00	10.0	.30	1,500	10	1,000	<1.0	10	50
RP003RK	38 43 54	119 54 17	1.0	.50	1.0	.20	1,000	10	1,000	1.0	5	<10
RP007RK	38 37 40	119 48 35	3.0	1.00	1.5	.50	1,000	<10	2,000	<1.0	15	N
RP008RK	38 37 40	119 48 20	5.0	2.00	2.0	.50	1,500	20	700	<1.0	10	30
RP101RK	38 43 23	119 49 38	5.0	1.50	5.0	.50	2,000	20	1,500	<1.0	20	50
RP102RK	38 40 7	119 46 38	5.0	1.00	2.0	.70	1,000	10	1,000	<1.0	50	50
RP103RK	38 40 7	119 46 45	5.0	2.00	5.0	.50	2,000	10	2,000	<1.0	30	200
RP104RK	38 35 8	119 48 20	1.5	.50	1.0	.50	500	10	1,000	1.0	7	N
RP105RK	38 38 53	119 49 45	1.5	.50	1.5	.30	700	<10	1,500	1.0	5	N
RP201RK	38 43 53	119 53 50	2.0	.30	1.5	.10	200	<10	200	<1.0	<5	10
RP202RK	38 41 53	119 52 27	1.0	.50	1.5	.20	700	<10	2,000	1.0	5	N
RP204RK	38 42 4	119 52 29	5.0	1.00	2.0	.50	1,000	<10	1,000	<1.0	15	15
RP205RK	38 42 12	119 51 23	2.0	.50	1.0	.20	1,000	<10	700	1.5	5	N
RP206RK	38 41 40	119 51 32	2.0	.50	1.5	.30	700	10	1,500	<1.0	5	<10
RP207RK	38 37 27	119 52 3	3.0	1.00	2.0	.50	1,000	10	1,500	<1.0	7	<10
RP208RK	38 37 30	119 51 53	2.0	.50	1.5	.20	700	10	1,000	<1.0	5	<10
RP209RK	38 38 7	119 51 45	1.0	.15	1.0	.15	500	<10	1,000	1.0	<5	N
RP305RK	38 45 49	119 50 40	1.0	.20	1.0	.15	500	N	2,000	<1.0	N	N
RP306RK	38 45 34	119 49 22	1.0	.50	1.5	.30	1,000	N	2,000	1.0	5	N
RP307RK	38 37 51	119 51 1	2.0	.70	1.0	.50	1,000	<10	1,500	<1.0	10	N
RP308RK	38 38 13	119 50 21	1.5	.50	1.0	.30	700	<10	1,500	1.0	5	N
RP309RK	38 41 29	119 54 50	1.0	.20	1.5	.10	500	<10	1,500	1.0	5	<10
RP513RK	38 39 31	119 43 41	2.0	1.00	2.0	.50	700	10	700	1.0	15	<10
RP515RK	38 38 32	119 43 42	2.0	.30	3.0	.15	100	15	1,000	<1.0	10	10
WL0030RK	38 45 47	119 51 31	3.0	1.00	5.0	.50	500	10	700	1.5	15	10
WL0031RK	38 46 0	119 52 17	5.0	1.50	5.0	.50	700	10	1,000	1.5	15	20
WL0034RK	38 43 56	119 55 42	2.0	.20	1.0	.15	500	10	700	2.0	5	<10
WL0040RK	38 41 15	119 45 53	2.0	.20	1.0	.30	200	50	1,000	2.0	10	30
WL0447RK	38 44 9	119 55 29	1.5	.50	2.0	.20	700	N	1,000	3.0	5	<10
WL0448RK	38 40 40	119 56 1	5.0	2.00	3.0	.70	700	20	1,000	2.0	20	30
WL0449RK	38 40 42	119 54 1	3.0	1.00	3.0	.50	500	20	1,500	2.0	10	<10
WL0460RK	38 38 52	119 48 58	2.0	1.00	2.0	.50	700	20	2,000	1.5	5	<10
WL0461RK	38 39 20	119 49 20	2.0	1.00	2.0	.50	500	20	1,500	3.0	5	<10
WL0462RK	38 40 49	119 45 9	3.0	1.50	3.0	.50	500	100	700	2.0	15	50
WL0752RK	38 41 55	119 51 4	.5	.20	.5	.10	300	10	1,000	1.5	<5	N
WL0753RK	38 41 2	119 48 30	3.0	2.00	2.0	.50	500	<10	700	1.0	20	20
WL0754RK	38 40 58	119 49 1	3.0	1.50	2.0	.50	700	30	700	<1.0	20	20

Table 2.--Data for rock samples, Raymond Peak Roadless Area, California

Sample	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zr-ppm s	Zn-ppm aa
RP001RK	<5	20	N	N	<5	30	7	200	70	N	20	100	30
RP002RK	20	30	7	N	5	50	10	700	100	<50	20	100	20
RP003RK	<5	20	<5	N	<5	50	5	200	50	N	20	70	30
RP007RK	15	50	N	N	<5	50	7	700	150	N	20	100	50
RP008RK	7	50	N	N	5	20	10	300	150	N	20	150	65
RP101RK	30	50	N	N	15	50	15	2,000	200	N	20	100	40
RP102RK	20	50	N	N	20	50	15	1,500	200	N	20	150	75
RP103RK	50	50	N	N	70	50	20	2,000	200	N	20	150	55
RP104RK	5	50	N	N	<5	70	5	500	100	N	N	70	65
RP105RK	7	50	N	N	<5	70	5	700	70	N	10	100	65
RP201RK	30	50	10	N	7	20	5	200	100	N	N	30	10
RP202RK	<5	50	N	N	<5	70	5	700	30	N	<10	100	35
RP204RK	7	30	N	N	5	20	10	700	150	N	10	70	40
RP205RK	<5	50	N	N	<5	70	5	200	70	N	20	70	35
RP206RK	<5	50	N	N	N	70	<5	700	70	N	10	100	60
RP207RK	10	50	N	N	5	50	7	1,000	150	N	10	100	50
RP208RK	5	50	N	N	<5	50	<5	700	100	N	<10	150	60
RP209RK	<5	30	N	N	N	50	<5	300	50	N	<10	50	45
RP305RK	N	20	N	N	<5	30	<5	300	50	N	N	50	40
RP306RK	<5	50	N	N	<5	30	5	300	50	N	20	50	55
RP307RK	5	20	N	N	<5	50	5	500	70	N	N	70	65
RP308RK	<5	30	N	N	<5	50	<5	500	50	N	N	50	60
RP309RK	<5	30	N	N	<5	50	<5	300	50	N	10	50	35
RP513RK	10	50	<5	N	<5	20	10	300	150	N	15	100	70
RP515RK	10	50	N	N	<5	30	15	700	150	N	15	150	10
WL0030RK	10	30	N	N	7	20	10	500	200	N	15	100	50
WL0031RK	10	30	N	N	10	20	7	700	200	N	15	50	60
WL0034RK	<5	30	N	N	<5	30	5	300	50	N	15	70	30
WL0040RK	20	30	7	N	20	50	7	700	200	N	<10	150	40
WL0447RK	<5	30	N	<20	<5	30	5	300	50	N	20	150	35
WL0448RK	20	50	N	<20	10	20	15	700	500	N	20	500	55
WL0449RK	<5	50	N	<20	<5	30	7	700	150	N	15	200	60
WL0460RK	5	50	N	N	5	50	7	1,000	100	N	15	100	65
WL0461RK	<5	50	N	<20	<5	30	5	500	100	N	15	300	70
WL0462RK	20	50	N	<20	30	20	10	500	200	N	20	200	55
WL0752RK	<5	N	N	N	N	30	<5	200	70	N	N	50	40
WL0753RK	20	30	N	N	15	30	15	700	300	N	15	50	45
WL0754RK	15	30	N	N	30	30	15	700	300	N	15	100	10

Table 2.--Data for rock samples, Raymond Peak Roadless Area, California

Sample	Cd-ppm aa	Bi-ppm aa	Sb-ppm aa	As-ppm cm	FORMATION NAME
RP001RK	<.05	N	1	N	BURNSIDE LAKE ADAMELLITE OF PARKER (1961)
RP002RK	.15	.5	2	<10	METASEDIMENTARY ROCK, UNDIVIDED
RP003RK	<.05	N	1	N	BURNSIDE LAKE ADAMELLITE OF PARKER (1961)
RP007RK	.10	<.5	1	N	EARLY ANDESITE
RP008RK	.10	N	1	N	EARLY ANDESITE
RP101RK	.10	N	2	N	EARLY ANDESITE
RP102RK	<.05	N	2	N	EARLY ANDESITE
RP103RK	.10	N	2	N	EARLY ANDESITE
RP104RK	<.05	N	2	N	GRANODIORITE OF KINNEY LAKES
RP105RK	<.05	N	1	N	GRANODIORITE OF CHARITY VALLEY
RP201RK	.15	.5	5	2,800	METASEDIMENTARY ROCK, UNDIVIDED
RP202RK	N	N	1	N	GRANODIORITE OF CHARITY VALLEY
RP204RK	<.05	N	1	N	GRANODIORITE OF CHARITY VALLEY
RP205RK	N	<.5	1	N	GRANODIORITE OF CHARITY VALLEY
RP206RK	<.05	N	2	N	GRANODIORITE OF THORNBURG CANYON
RP207RK	<.05	N	2	N	GRANODIORITE OF KINNEY LAKES
RP208RK	<.05	N	1	10	GRANODIORITE OF CHARITY VALLEY
RP209RK	<.05	<.5	2	N	GRANODIORITE OF CHARITY VALLEY
RP305RK	<.05	N	4	N	GRANODIORITE OF FREEL PEAK
RP306RK	.15	<.5	2	N	GRANODIORITE OF FREEL PEAK
RP307RK	<.05	<.5	3	N	GRANODIORITE OF CHARITY VALLEY
RP308RK	<.05	<.5	2	N	GRANODIORITE OF CHARITY VALLEY
RP309RK	<.05	N	3	N	BURNSIDE LAKE ADAMELLITE OF PARKER (1961)
RP513RK	.30	<.5	1	N	EARLY ANDESITE
RP515RK	.25	.5	<1	40	EARLY ANDESITE
WL0030RK	N	N	<1	N	GRANODIORITE OF FREEL PEAK
WL0031RK	<.05	N	<1	N	BRYAN MEADOW GRANODIORITE
WL0034RK	N	<.5	<1	N	BURNSIDE LAKE ADAMELLITE OF PARKER (1961)
WL0040RK	N	N	1	N	EARLY ANDESITE
WL0447RK	.10	N	2	N	BURNSIDE LAKE ADAMELLITE OF PARKER (1961)
WL0448RK	.10	.5	2	N	GRANODIORITE OF FAITH VALLEY
WL0449RK	.10	N	1	N	GRANODIORITE OF CHARITY VALLEY
WL0460RK	N	N	2	N	GRANODIORITE OF CHARITY VALLEY
WL0461RK	.05	<.5	1	N	GRANODIORITE OF CHARITY VALLEY
WL0462RK	.10	N	2	N	EARLY ANDESITE
WL0752RK	N	N	2	N	GRANODIORITE OF CHARITY VALLEY
WL0753RK	.10	N	1	N	EARLY ANDESITE
WL0754RK	.05	N	1	N	EARLY ANDESITE

Table 3.--Data for stream-sediment samples, Raymond Peak Roadless Area, California

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	B-ppm s	Ba-ppm s	Be-ppm s
RP001SS	38 42 50	119 53 3	3	1.0	2.0	.5	1,000	<.5	15	1,000	1.0
RP003SS	38 43 54	119 54 17	3	.7	2.0	.3	700	<.5	15	1,000	1.0
RP007SS	38 37 40	119 48 35	5	1.0	2.0	.5	1,000	<.5	10	1,000	1.0
RP008SS	38 37 40	119 48 20	7	1.0	1.0	.7	1,000	2.0	10	1,000	<1.0
RP101SS	38 43 23	119 49 38	5	1.0	2.0	.5	1,000	<.5	<10	1,000	<1.0
RP102SS	38 40 7	119 46 38	5	.7	1.0	.5	1,000	<.5	15	1,500	1.0
RP103SS	38 40 7	119 46 45	5	.5	.5	.7	1,000	<.5	20	500	N
RP104SS	38 35 8	119 48 20	5	1.5	3.0	.5	1,000	N	<10	1,000	<1.0
RP105SS	38 38 53	119 49 45	5	.7	2.0	.5	1,000	N	10	1,000	<1.0
RP106SS	38 41 7	119 55 22	3	2.0	5.0	.5	700	N	10	500	1.0
RP202SS	38 41 53	119 52 27	5	1.0	2.0	.7	1,000	<.5	<10	1,000	<1.0
RP203SS	38 41 58	119 52 34	5	.7	1.0	.3	1,000	N	15	500	1.0
RP204SS	38 42 4	119 52 29	15	.5	1.0	.5	2,000	<.5	<10	200	<1.0
RP205SS	38 42 12	119 51 23	3	.7	2.0	.5	1,000	<.5	<10	500	1.0
RP206SS	38 41 40	119 51 32	5	.7	2.0	.5	1,000	<.5	10	1,000	<1.0
RP207SS	38 37 27	119 52 3	5	1.0	2.0	.5	700	<.5	<10	700	1.0
RP208SS	38 37 30	119 51 53	5	1.0	2.0	.5	1,000	<.5	<10	1,000	<1.0
RP209SS	38 38 7	119 51 45	10	.5	1.5	.7	1,000	<.5	10	700	<1.0
RP305SS	38 45 49	119 50 40	5	.5	1.0	.5	1,500	N	<10	500	<1.0
RP306SS	38 45 34	119 49 22	15	1.0	1.5	.5	2,000	N	10	500	<1.0
RP307SS	38 37 51	119 51 1	7	1.5	2.0	.5	2,000	N	10	700	<1.0
RP308SS	38 38 13	119 50 21	2	.5	.7	.3	700	N	20	500	1.5
RP309SS	38 41 29	119 54 50	5	1.5	2.0	.5	1,500	N	10	700	<1.0
RP513SS	38 39 31	119 43 41	3	1.0	1.0	.5	1,000	N	10	500	1.0
RP514SS	38 38 42	119 43 44	3	1.0	3.0	.5	700	N	10	700	<1.0
RP515SS	38 38 32	119 43 42	3	1.0	3.0	.5	700	N	<10	500	<1.0
WL0030SS	38 45 47	119 51 31	2	2.0	2.0	.5	1,000	N	10	1,000	<1.0
WL0031SS	38 46 0	119 52 17	5	5.0	5.0	.5	1,000	N	10	1,000	<1.0
WL0034SS	38 43 56	119 55 42	2	1.5	1.5	.5	700	N	20	1,000	1.0
WL0040SS	38 41 15	119 45 53	2	.7	1.0	.5	700	N	30	1,000	1.0
WL0447SS	38 44 9	119 55 29	3	1.5	3.0	.5	1,000	N	50	1,000	2.0
WL0448SS	38 40 40	119 56 1	5	1.5	2.0	.5	1,000	N	30	1,000	2.0
WL0449SS	38 40 42	119 54 1	5	2.0	5.0	1.0	1,000	N	20	1,000	2.0
WL0460SS	38 38 52	119 48 58	5	2.0	3.0	.5	1,000	N	20	1,500	2.0
WL0461SS	38 39 20	119 49 20	5	2.0	5.0	.7	1,000	N	30	1,000	3.0
WL0462SS	38 40 49	119 45 9	5	1.5	2.0	.7	1,000	N	70	1,000	5.0
WL0621SS	38 35 56	119 46 49	5	1.5	1.5	.5	1,000	N	10	700	1.0
WL0622SS	38 36 32	119 45 58	2	1.5	1.5	.5	700	.5	10	500	<1.0
WL0752SS	38 41 55	119 51 4	3	1.5	3.0	.5	1,000	N	10	700	1.0
WL0753SS	38 41 2	119 48 30	3	1.0	2.0	.5	500	N	<10	500	<1.0
WL0754SS	38 40 58	119 49 1	2	1.5	1.5	.5	500	N	<10	700	1.0

Table 3.--Data for stream-sediment samples, Raymond Peak Roadless Area, California

Sample	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s	Sc-ppm s	Sr-ppm s
RP001SS	10	70	20	30	7	N	20	50	15	500
RP003SS	10	70	30	50	5	N	30	30	10	500
RP007SS	20	70	30	50	N	N	30	30	15	1,000
RP008SS	20	70	30	30	<5	N	30	30	10	300
RP101SS	10	70	15	50	N	N	10	30	10	700
RP102SS	20	50	20	30	N	N	20	30	10	700
RP103SS	50	70	50	30	<5	N	30	50	10	200
RP104SS	20	200	20	30	N	N	30	30	20	700
RP105SS	10	50	15	30	N	N	10	30	10	1,000
RP106SS	15	50	15	50	N	N	15	30	15	500
RP202SS	20	70	10	30	N	N	20	20	15	1,000
RP203SS	10	30	10	50	<5	<20	5	50	7	300
RP204SS	10	50	20	100	N	<20	<5	20	7	100
RP205SS	10	15	15	70	N	N	<5	30	10	500
RP206SS	15	70	20	30	5	N	20	30	10	1,000
RP207SS	10	50	10	50	N	N	7	30	10	700
RP208SS	20	100	15	50	N	N	20	30	15	1,000
RP209SS	20	50	20	30	N	N	10	20	7	1,000
RP305SS	7	30	7	30	N	N	N	20	10	300
RP306SS	20	70	10	30	5	N	10	20	15	500
RP307SS	30	200	20	30	N	N	30	20	30	1,000
RP308SS	7	10	7	30	5	N	5	70	5	300
RP309SS	20	100	20	30	N	N	20	30	20	700
RP513SS	30	50	20	30	N	N	30	20	10	500
RP514SS	30	30	20	30	N	N	15	20	10	500
RP515SS	15	50	15	30	N	N	10	20	10	500
WL0030SS	30	200	50	20	N	N	50	20	20	1,000
WL0031SS	30	100	50	30	N	N	50	50	20	1,500
WL0034SS	20	100	30	20	N	N	20	30	10	700
WL0040SS	20	20	30	30	N	N	20	20	10	500
WL0447SS	15	50	20	30	5	<20	20	20	15	700
WL0448SS	15	50	20	50	15	N	20	30	10	700
WL0449SS	20	70	20	30	10	N	30	20	20	700
WL0460SS	20	30	50	50	7	N	20	30	15	1,000
WL0461SS	20	50	20	50	N	N	20	20	10	700
WL0462SS	20	50	50	50	<5	N	30	30	10	1,000
WL0621SS	20	100	20	30	N	N	20	30	15	500
WL0622SS	15	50	15	20	N	N	15	20	15	500
WL0752SS	15	100	10	50	N	N	20	30	15	700
WL0753SS	15	70	15	30	N	N	15	30	15	700
WL0754SS	15	70	10	30	N	N	15	30	15	1,000

Table 3.--Data for stream-sediment samples, Raymond Peak Roadless Area, California

Sample	V-ppm s	Y-ppm s	Zr-ppm s	Zn-ppm aa	Cd-ppm aa	Bi-ppm aa	Sb-ppm aa	Au-ppm aa	As-ppm cm
RP001SS	150	20	100	80	.55	N	2	--	10
RP003SS	150	20	70	80	.30	N	1	--	10
RP007SS	200	15	70	50	.10	N	2	--	N
RP008SS	300	15	150	70	.15	N	5	.008	40
RP101SS	150	20	150	40	<.05	.5	1	--	<10
RP102SS	150	15	100	80	.15	<.5	3	--	<10
RP103SS	200	15	100	110	.20	N	2	--	<10
RP104SS	300	15	100	50	.05	N	1	--	N
RP105SS	200	15	100	40	<.05	N	1	--	N
RP106SS	100	15	50	40	.30	N	<1	--	N
RP202SS	200	15	100	45	.05	N	2	--	N
RP203SS	100	20	200	60	.15	<.5	2	--	N
RP204SS	500	50	300	30	.15	N	2	--	N
RP205SS	100	30	200	55	<.05	N	1	--	N
RP206SS	200	15	70	45	.10	<.5	2	--	N
RP207SS	150	30	100	40	<.05	N	2	--	N
RP208SS	200	20	100	40	.10	N	2	--	N
RP209SS	500	15	150	55	<.05	N	2	--	N
RP305SS	100	30	200	50	.15	<.5	1	--	N
RP306SS	200	30	200	40	.15	<.5	2	--	N
RP307SS	300	15	100	35	.10	<.5	2	--	N
RP308SS	100	10	100	90	.20	<.5	5	--	40
RP309SS	200	15	70	35	.15	N	2	--	N
RP513SS	100	10	100	65	.35	N	1	--	N
RP514SS	100	10	100	50	.30	<.5	1	--	N
RP515SS	100	10	100	40	.30	N	1	--	N
WL0030SS	150	15	100	35	.10	1.5	2	--	N
WL0031SS	200	10	150	45	.08	1.0	N	--	N
WL0034SS	100	15	150	50	.22	1.0	2	--	N
WL0040SS	100	15	100	95	.23	3.5	3	--	20
WL0447SS	200	30	500	75	.40	1.0	2	--	N
WL0448SS	300	20	500	70	.25	<.5	2	--	N
WL0449SS	700	20	300	60	<.05	N	2	--	N
WL0460SS	200	20	150	70	.20	<.5	2	--	<10
WL0461SS	300	20	200	45	<.05	.5	2	--	N
WL0462SS	300	20	300	70	.08	1.0	3	--	10
WL0621SS	200	20	70	65	.10	N	2	--	N
WL0622SS	150	20	100	60	.15	<.5	2	.005	<10
WL0752SS	200	20	200	50	<.05	N	2	--	N
WL0753SS	200	20	70	45	<.05	N	2	--	N
WL0754SS	200	10	100	45	<.05	N	2	--	N

Table 4.--Data for concentrate samples, Raymond Peak Roadless Area, California

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	B-ppm s	Ba-ppm s
RP001KN	38 42 50	119 53 3	.5	.20	10.0	>2.0	1,500	N	N	200	50
RP003KN	38 43 54	119 54 17	2.0	1.50	10.0	1.5	2,000	5.0	N	100	100
RP007KN	38 37 40	119 48 35	7.0	5.00	10.0	1.5	1,000	N	N	<20	10,000
RP008KN	38 37 40	119 48 20	15.0	2.00	7.0	1.0	1,000	2.0	700	N	10,000
RP101KN	38 43 23	119 49 38	.5	2.00	7.0	>2.0	1,000	N	N	70	200
RP102KN	38 40 7	119 46 38	30.0	.50	2.0	1.5	500	N	N	50	>10,000
RP103KN	38 40 7	119 46 45	10.0	1.50	10.0	2.0	1,000	N	N	50	10,000
RP104KN	38 35 8	119 48 20	7.0	5.00	10.0	1.0	1,500	N	N	N	3,000
RP105KN	38 38 53	119 49 45	1.0	2.00	10.0	2.0	1,000	N	N	N	500
RP106KN	38 41 7	119 55 22	1.0	3.00	15.0	1.0	700	N	N	<20	100
RP202KN	38 41 53	119 52 27	1.5	2.00	7.0	1.5	1,000	N	N	<20	300
RP203KN	38 41 58	119 52 34	.5	1.00	10.0	>2.0	1,000	N	N	N	150
RP204KN	38 42 4	119 52 29	.5	.70	10.0	>2.0	1,000	N	<500	20	150
RP205KN	38 42 12	119 51 23	.1	.07	10.0	>2.0	500	N	N	N	150
RP206KN	38 41 40	119 51 32	2.0	3.00	10.0	2.0	1,000	N	N	<20	700
RP207KN	38 37 27	119 52 3	.5	1.00	10.0	>2.0	1,000	N	N	N	200
RP208KN	38 37 30	119 51 53	1.0	2.00	10.0	2.0	700	N	N	N	150
RP209KN	38 38 7	119 51 45	3.0	3.00	10.0	2.0	2,000	N	N	<20	3,000
RP305KN	38 45 49	119 50 40	.2	.20	10.0	>2.0	1,000	N	N	N	100
RP306KN	38 45 34	119 49 22	.2	1.00	10.0	>2.0	1,000	N	N	N	100
RP307KN	38 37 51	119 51 1	1.0	3.00	2.0	.7	300	N	N	<20	1,500
RP308KN	38 38 13	119 50 21	5.0	.20	2.0	>2.0	300	N	N	20	3,000
RP309KN	38 41 29	119 54 50	2.0	10.00	10.0	.5	1,000	N	N	N	200
RP513KN	38 39 31	119 43 41	1.0	1.00	2.0	.7	500	N	N	N	>10,000
RP514KN	38 38 42	119 43 44	1.5	5.00	15.0	.5	1,000	N	N	N	>10,000
RP515KN	38 38 32	119 43 42	1.0	3.00	10.0	.5	700	N	N	N	>10,000
WL0030KN	38 45 47	119 51 31	3.0	5.00	10.0	2.0	1,500	N	N	100	500
WL0031KN	38 46 0	119 52 17	5.0	7.00	10.0	2.0	2,000	N	N	N	200
WL0034KN	38 43 56	119 55 42	3.0	5.00	10.0	2.0	1,500	N	N	200	300
WL0040KN	38 41 15	119 45 53	7.0	2.00	5.0	2.0	700	N	N	300	>10,000
WL0447KN	38 44 9	119 55 29	1.5	1.00	10.0	1.5	2,000	N	N	500	100
WL0448KN	38 40 40	119 56 1	1.0	3.00	7.0	>2.0	1,000	N	N	<20	500
WL0449KN	38 40 42	119 54 1	2.0	5.00	7.0	1.5	1,000	N	N	<20	70
WL0460KN	38 38 52	119 48 58	3.0	3.00	5.0	2.0	1,000	N	N	20	10,000
WL0461KN	38 39 20	119 49 20	3.0	3.00	10.0	2.0	1,000	N	N	N	150
WL0462KN	38 40 49	119 45 9	5.0	.50	1.5	1.0	1,000	N	N	50	>10,000
WL0621KN	38 35 56	119 46 49	3.0	5.00	10.0	2.0	1,000	1.5	N	50	5,000
WL0622KN	38 36 32	119 45 58	2.0	3.00	5.0	>2.0	1,000	7.0	N	<20	7,000
WL0752KN	38 41 55	119 51 4	2.0	3.00	7.0	2.0	1,500	<1.0	N	<20	700
WL0753KN	38 41 2	119 48 30	3.0	3.00	5.0	1.5	1,000	N	N	50	300
WL0754KN	38 40 58	119 49 1	2.0	3.00	5.0	2.0	1,000	N	N	N	150

Table 4.--Data for concentrate samples, Raymond Peak Roadless Area, California

Sample	Be-ppm s	Bi-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
RP001KN	N	N	15	70	10	2,000	50	<50	N	100
RP003KN	N	N	15	100	10	>2,000	100	N	30	50
RP007KN	N	N	50	1,000	50	300	<10	<50	100	50
RP008KN	N	N	70	700	150	200	<10	N	150	200
RP101KN	N	N	15	200	<10	1,500	15	50	20	20
RP102KN	N	N	100	100	200	200	200	N	150	100
RP103KN	N	N	30	200	300	500	10	<50	50	100
RP104KN	N	N	70	2,000	20	200	N	N	150	<20
RP105KN	N	N	15	200	<10	1,000	15	<50	50	N
RP106KN	N	100	30	500	10	>2,000	10	50	100	50
RP202KN	N	N	20	700	15	>2,000	70	<50	70	70
RP203KN	N	N	15	150	10	2,000	20	70	20	100
RP204KN	N	N	20	50	20	>2,000	20	50	20	150
RP205KN	N	N	15	20	10	>2,000	20	<50	N	70
RP206KN	N	N	30	700	30	2,000	<10	<50	100	20
RP207KN	N	N	15	150	<10	1,500	70	100	N	50
RP208KN	N	N	30	1,000	15	300	15	<50	50	<20
RP209KN	<2	N	30	500	30	500	10	<50	50	100
RP305KN	N	N	10	70	<10	500	30	200	N	50
RP306KN	N	N	15	200	10	700	<10	200	N	30
RP307KN	N	N	20	500	20	100	N	<50	50	<20
RP308KN	2	N	30	70	20	700	10	100	N	100
RP309KN	N	N	50	1,000	10	500	N	N	150	20
RP513KN	N	N	20	200	20	100	<10	<50	70	50
RP514KN	N	N	30	1,000	10	70	N	N	150	N
RP515KN	N	N	30	500	10	150	N	N	70	N
WL0030KN	2	<20	30	700	10	300	N	50	100	N
WL0031KN	<2	N	20	700	10	150	N	50	100	N
WL0034KN	<2	N	20	300	N	1,000	N	70	70	20
WL0040KN	3	N	20	100	70	100	15	N	50	70
WL0447KN	2	N	<10	150	10	300	N	N	N	<20
WL0448KN	<2	N	15	1,000	50	500	50	100	20	200
WL0449KN	N	<20	30	1,000	10	200	N	<50	100	N
WL0460KN	<2	N	20	500	15	300	10	50	30	30
WL0461KN	<2	N	20	1,000	<10	500	10	50	50	20
WL0462KN	<2	<20	20	150	50	100	10	N	50	700
WL0621KN	N	N	30	1,500	50	100	10	N	100	50
WL0622KN	N	N	50	500	30	200	15	50	100	1,500
WL0752KN	<2	N	20	1,000	50	300	10	50	50	20
WL0753KN	N	N	20	700	15	200	N	50	100	20
WL0754KN	<2	N	20	700	10	500	<10	50	70	50

Table 4.--Data for concentrate samples, Raymond Peak Roadless Area, California

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
RP001KN	50	30	<200	300	500	1,000	N	>2,000	5,000
RP003KN	100	20	<200	200	1,000	700	N	>2,000	5,000
RP007KN	70	N	700	300	N	300	N	>2,000	5,000
RP008KN	70	N	700	200	<100	100	N	>2,000	500
RP101KN	50	30	N	200	N	1,000	N	>2,000	1,000
RP102KN	20	N	2,000	150	100	70	N	2,000	N
RP103KN	50	N	700	300	N	200	N	>2,000	700
RP104KN	100	N	200	500	N	70	N	>2,000	<500
RP105KN	70	N	500	200	100	500	N	>2,000	5,000
RP106KN	100	N	200	200	<100	500	N	>2,000	2,000
RP202KN	50	<20	500	200	500	1,000	N	>2,000	>5,000
RP203KN	50	50	N	200	100	700	N	>2,000	>5,000
RP204KN	100	30	N	200	150	2,000	N	>2,000	>5,000
RP205KN	50	30	N	200	100	2,000	N	>2,000	>5,000
RP206KN	100	<20	300	200	100	200	N	>2,000	2,000
RP207KN	50	50	N	300	100	1,500	N	>2,000	5,000
RP208KN	70	N	<200	200	200	300	N	>2,000	>5,000
RP209KN	70	50	1,500	200	N	500	N	>2,000	>5,000
RP305KN	50	100	N	100	<100	1,500	N	>2,000	3,000
RP306KN	70	100	N	150	N	1,500	N	>2,000	5,000
RP307KN	50	N	500	100	<100	150	N	700	1,500
RP308KN	20	20	200	150	N	300	N	>2,000	5,000
RP309KN	100	N	<200	150	N	100	N	700	<500
RP513KN	20	N	5,000	200	N	50	N	2,000	N
RP514KN	70	N	2,000	200	N	20	N	200	N
RP515KN	70	N	2,000	200	N	100	N	1,000	N
WL0030KN	100	20	700	700	100	150	N	>2,000	1,000
WL0031KN	100	30	200	700	N	100	N	2,000	<500
WL0034KN	100	20	500	700	100	500	N	>2,000	1,000
WL0040KN	20	<20	2,000	500	N	50	N	2,000	<500
WL0447KN	30	<20	500	300	N	100	N	500	<500
WL0448KN	70	100	200	300	100	300	N	2,000	500
WL0449KN	100	50	200	300	N	100	N	1,500	500
WL0460KN	50	<20	500	300	N	100	N	2,000	1,000
WL0461KN	70	50	300	300	N	200	N	2,000	1,000
WL0462KN	15	N	5,000	200	N	50	1,000	2,000	500
WL0621KN	100	50	200	300	N	100	N	1,000	1,000
WL0622KN	70	30	700	300	N	200	N	2,000	1,000
WL0752KN	100	50	200	300	N	200	N	1,000	1,500
WL0753KN	50	20	200	300	N	100	N	1,500	1,000
WL0754KN	100	30	200	300	N	150	N	1,500	1,000

DESCRIPTION OF TABLES 5-7

Tables 5, 6, and 7 give summary statistics for the analyses of the samples of rock, minus-60-mesh (0.25-mm) stream sediment, and nonmagnetic heavy-mineral concentrate listed in tables 2, 3, and 4, respectively. All values in the Range of values and Percentiles columns are significant to the number of digits shown.

Table 5.--Summary statistics for the analyses of the 38 rock samples in table 3, Raymond Peak Roadless Area, California

[All concentrations are in parts per million except those for Fe, Mg, Ca, and Ti, which are in percent. "aa" following the element symbol indicates atomic absorption analysis; "cm" indicates colorimetric analysis; no element prefix indicates emission spectrographic analysis. "N" means not detected at the lower limit of determination shown in parentheses.

Element	Range of values	Percentiles				
		50	75	90	95	98
Fe	0.5 - 5	2.	3	5	5	5
Mg	0.15- 2	0.5	1	1.5	2	2
Ca	0.5 - 10	1.5	2	5	5	7
Ti	0.1 - 0.7	0.3	0.5	0.5	0.5	0.7
Mn	100 -2000	700	1000	1000	1500	2000
B	N(10)- 100	10	15	20	30	70
Ba	200 -2000	1000	1500	2000	2000	2000
Be	<1 - 3	1	1.5	2	2	3
Co	N(5)- 50	7	15	20	20	30
Cr	N(10)- 200	<10	20	50	50	100
Cu	N(5)- 50	5	15	20	30	30
La	N(20)- 50	50	50	50	50	50
Mo	N(5)- 10	N(5)	N(5)	<5	7	7
Nb	N(20)- <20	N(20)	N(20)	<20	<20	<20
Ni	N(5)- 70	<5	7	20	30	50
Pb	20 - 70	30	50	70	70	70
Sc	<5 - 20	7	10	15	15	15
Sr	200 -2000	500	700	1000	1500	2000
V	30 - 500	100	200	200	300	300
W	N(50)- <50	N(50)	N(50)	N(50)	N(50)	<50
Y	N(10)- 20	15	20	20	20	20
Zr	30 - 500	100	150	150	200	300
Zn-aa	10 - 75	50	60	65	70	70
Cd-aa	N(0.05)- 0.3	<0.05	0.1	0.15	0.2	0.25
Bi-aa	N(0.5)- 0.5	N(0.5)	<0.5	0.5	0.5	0.5
Sb-aa	<1 - 5	1.5	2	2	3	4
As-cm	N(10) -2800	N(10)	N(10)	<10	10	40

Table 6.--Summary statistics for the analyses of the 41 minus-60-mesh (0.25-mm) stream-sediment samples in table 3, Raymond Peak Roadless Area, California

[All concentrations are in parts per million except those for Fe, Mg, Ca, and Ti, which are in percent. "aa" following the element symbol indicates atomic absorption analysis; "cm" indicates colorimetric analysis; no element prefix indicates emission spectrography analysis. "N" means not detected at the lower limit of determination shown in parentheses. Only 2 samples were analyzed for Au-aa; thus, Au has been deleted from this table]

Element	Range of values	Percentiles				
		50	75	90	95	98
Fe	2 - 15	5	5	7	10	15
Mg	0.5 - 5	1	1.5	2	2	3
Ca	0.5 - 5	2	2	3	5	5
Ti	0.3 - 1	0.5	0.5	0.7	0.7	0.7
Mn	500 -2000	1000	1000	1500	2000	2000
Ag	N(0.5) - 2	N(0.5)	<0.5	<0.5	<0.5	1
B	<10 - 70	10	15	30	30	50
Ba	200 -1500	1000	1000	1000	1000	1500
Be	N(1)- 5	1	1	2	2	3
Co	7 - 50	20	20	30	30	30
Cr	10 - 200	70	70	100	200	200
Cu	7 - 50	20	20	50	50	50
La	20 - 100	30	50	50	50	70
Mo	(5) - 15	N(5)	<5	5	7	10
Nb	N(20)- <20	N(20)	N(20)	N(20)	<20	<20
Ni	N(5)- 50	20	30	30	30	50
Pb	20 - 70	30	30	50	50	50
Sc	5 - 30	10	15	20	20	20
Sr	100 -1500	700	1000	1000	1000	1000
V	100 - 700	200	200	300	500	500
Y	10 - 50	15	20	30	30	30
Zr	50 - 500	100	200	300	300	500
Zn-aa	30 - 110	50	70	80	90	95
Cd-aa	<0.05 - 0.55	0.15	0.20	0.30	0.35	0.40
Bi-aa	N(0.5)- 3.5	N(0.5)	<0.5	1	1	1.5
Sb-aa	N(1) - 5	2	2	3	3	5
As-cm	N(10)- 40	N(10)	<10	10	20	40

Table 7.--Summary statistics for the analyses of the 41 nonmagnetic heavy-mineral-concentrate samples in table 4, Raymond Peak Roadless Area, California

[All concentrations are in parts per million except those for Fe, Mg, Ca, and Ti, which are in percent. All analyses are by emission spectrography. "N" means not detected at the lower limit of determination shown in parentheses.

Element	Range of values	Percentiles				
		50	75	90	95	98
Fe	0.1 - 30	2	3	7	10	20
Mg	0.07- 10	3	3	5	5	7
Ca	1.5 - 15	10	10	10	10	15
Ti	0.5 - >2	2	>2	>2	>2	>2
Mn	300 - 2000	1000	1000	1500	2000	2000
Ag	N(1) - 7	N(1)	N(1)	<1	2	5
As	N(500) - 700	N(500)	N(500)	N(500)	N(500)	500
B	N(20) - 500	<20	50	100	200	300
Ba	50 - >10000	500	7000	>10,000	>10,000	>10,000
Be	N(2) - 3	N(2)	<2	<2	2	2
Bi	N(20) - 100	N(20)	N(20)	N(20)	<20	50
Co	<10 - 100	20	30	50	70	70
Cr	20 - 2000	500	700	1000	1000	1500
Cu	N(10)- 300	15	30	50	150	200
La	70 - >2000	500	1000	>2000	>2000	>2000
Mo	N(10)- 200	10	15	50	70	150
Nb	N(50)- 200	<50	50	100	100	200
Ni	N(5)- 150	50	100	150	150	150
Pb	N(20)- 1500	50	100	150	200	1000
Sc	15 - 100	70	100	100	100	100
Sn	N(20)- 100	20	30	50	100	100
Sr	N(200)- 5000	200	700	2000	2000	5000
V	100 - 700	200	300	500	700	700
W	N(100)- 1000	N(100)	100	150	500	700
Y	20 - 2000	200	500	1500	1500	2000
Zn	N(500)- 1000	N(500)	N(500)	N(500)	N(500)	700
Zr	200 - >2000	>2000	>2000	>2000	>2000	>2000
Th	N(500)- >5000	1000	5000	>5000	>5000	>5000

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