Geochemical reconnaissance for uranium occurrences in the Notch Peak intrusive area, House Range, Millard County, Utah

By

R. A. Cadigan and Keith Robinson

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Abstract

Samples collected from the contact metamorphic zone of the Notch Peak intrusive area, House Range, Millard County, Utah, indicate the occurrence of low-grade uranium and thorium ore. Maximum abundances in the altered mineralized rocks in the contact zone are 450 ppm uranium and 480 ppm thorium.

Interpretation of factor analysis of the spectrochemical and delayed neutron analytical data suggests the presence of five geological factors which account for 82 percent of element covariance of 34 elements in 61 samples. The factors are identified as (1) limestone source rock reactions; (2) monzonite source rock reactions; (3) hydrothermal element group 1; (4) rare earth group; and (5) hydrothermal element group 2. The last factor effects the distribution of, primarily, beryllium, uranium, copper, molybdenum, tungsten, niobium, and secondarily, thorium, tin, and zinc; it is identified as the prime mineralization factor.

The Notch Peak intrusive area has been a tungsten producing area since before the 1940's and the location of small-scale gold placer operations. This reconnaissance study was a "follow-up" of uranium anomally data which were developed during the U.S. Dept. of Energy National Uranium Resource Evaluation (NURE) program in 1978-80.

Introduction

The Department of Energy (DOE) in 1977, selected the Delta, Utah 2-degree quadrangle of the National Topographic Map Series for uranium resource evaluation. This selection was made as a part of the National Uranium Resource Evaluation (NURE) program. The U.S. Geological Survey assigned the senior author the responsibility for assembling and evaluating all available information on uranium resources or potential resources in the Delta Quadrangle. A report (Cadigan and Ketner, 1980) was assembled and submitted to DOE.

One of the original provisions of the NURE program was that hitherto unrecognized evidence of uranium anomalies which were suggested by the Quad data would be investigated or followed up after the composite report was submitted. Evidence that the Notch Peak area (Millard County) was anomalous appeared in the senior author's interpretation of data from an aerial gamma-ray and magnetic survey of the Delta area, Utah, by Texas Instruments, Inc. (1979). The anomaly is mentioned in the Delta Quad report (Cadigan and Ketner, 1980, p. 84) and shows on Plates 3 and 3C as a radiometric and uranium anomaly, on 3B as a residual magnetism anomaly and on 4A as a stream-sediment uranium anomaly based on NURE Hydrogeochemical Stream Sediment Reconnaissance (HSSR) data compiled by Jones (1979).

Purpose and scope of investigation

This report presents the results of a field and geochemical reconnaissance of the Notch peak uranium anomaly. The approximate statistical distributions of 34 elements were determined based on 61 rock samples. Statistical analysis of element correlations and multivariate factors was done and the results interpreted. Some mineralogic relationships were examined. X-ray diffraction analysis of powdered samples was used as an aid to mineral identifications. Rudimentary work was done on a few mineral separates for descriptive purposes, but an intensive mineralogical study was not attempted. A hand-held scintillometer was used as a guide to sampling, but no systematic ground radiometric survey work was done. Some panning was done on sediments in the area to confirm the reported presence of gold. Due to expense and time constraints, only 6 of the rock samples collected were analyzed for gold and mercury.

Previous work

The intrusive was first studied by Crawford and Buranek (1941). Kerr (1946) commented on the tungsten and molybdenum mineralization; Gehman (1958) studied the geology, petrogenesis and economic deposits in some detail. Hintze (1974) mapped the area and described the stratigraphy.

Recent work on the contact and autometamorphic effects on fluid inclusions in the Notch Peak intrusive and in intruded sediments have been reported by Feldman and Papike (1981). Hover and others (1981) estimated that pressures of 2 kbars were exerted at the intrusive contact of the Notch Peak with the overlying Cambrian sediments. Hover and others (1981) also reported that they did some statistical analyses on analytical data from samples used in their study. Nabelek and Laul (1981) described the Notch Peak intrusive as being composed of three separate intrusives, a granite body and two separate quartz monzonites. The knowledge of and published abstracts from these related studies, however, were not available until after this reconnaissance study was completed. Results reported in the abstracts do not conflict with the conclusions reported here. Shallow drilling was done by Kalium Chemicals Ltd, of Denver, Colo., in the early 1970's for the purpose of locating thick parts of the tactite zone. They drilled approximately 120 holes and cored 15 or 20 of them (A. R. Kirk, written commun., 1982).

Geographic and geologic setting

Location and access

The Notch Peak intrusive area is located near the southern end of the House Range in Millard County, Utah and in the southwestern part of the Delta 2-degree Quadrangle (fig. 1). The Notch Peak area is 45 miles west of the town of Delta Utah. From Delta one may drive west about 30 miles on Highway 6 and 50, past Long Ridge, then turn north onto a well-used gravel road (Antelope Spring road) and drive 10 miles to the intersection with the Rainbow Valley road, turn west and drive 4 miles to the intersection with the North Canyon road, which bears southwest. The North Canyon road is the best access road to the center and the periphery of the intrusive. Another access road up Miller Creek reached only the southern edge of the intrusive in 1980, but does reach the Klondike mine area. Access to extreme western outcrops can be reached using the Tule Valley road north from U.S. 6 and 50. Other poorly maintained roads depending on their state of repair offer access to more remote parts of the area. For reconnaissance purposes, a 4-wheel drive vehicle is recommended.

At the time of the reconnaissance the only active mining was a small pilot-scale gold placer operation in the center of the area. Much of the area, however is included in tungsten mining claims held by Notch Peak Minerals Co. Visitors are not unwelcome but early contact with the company which operates out of Delta, is strongly recommended, if later trouble is to be

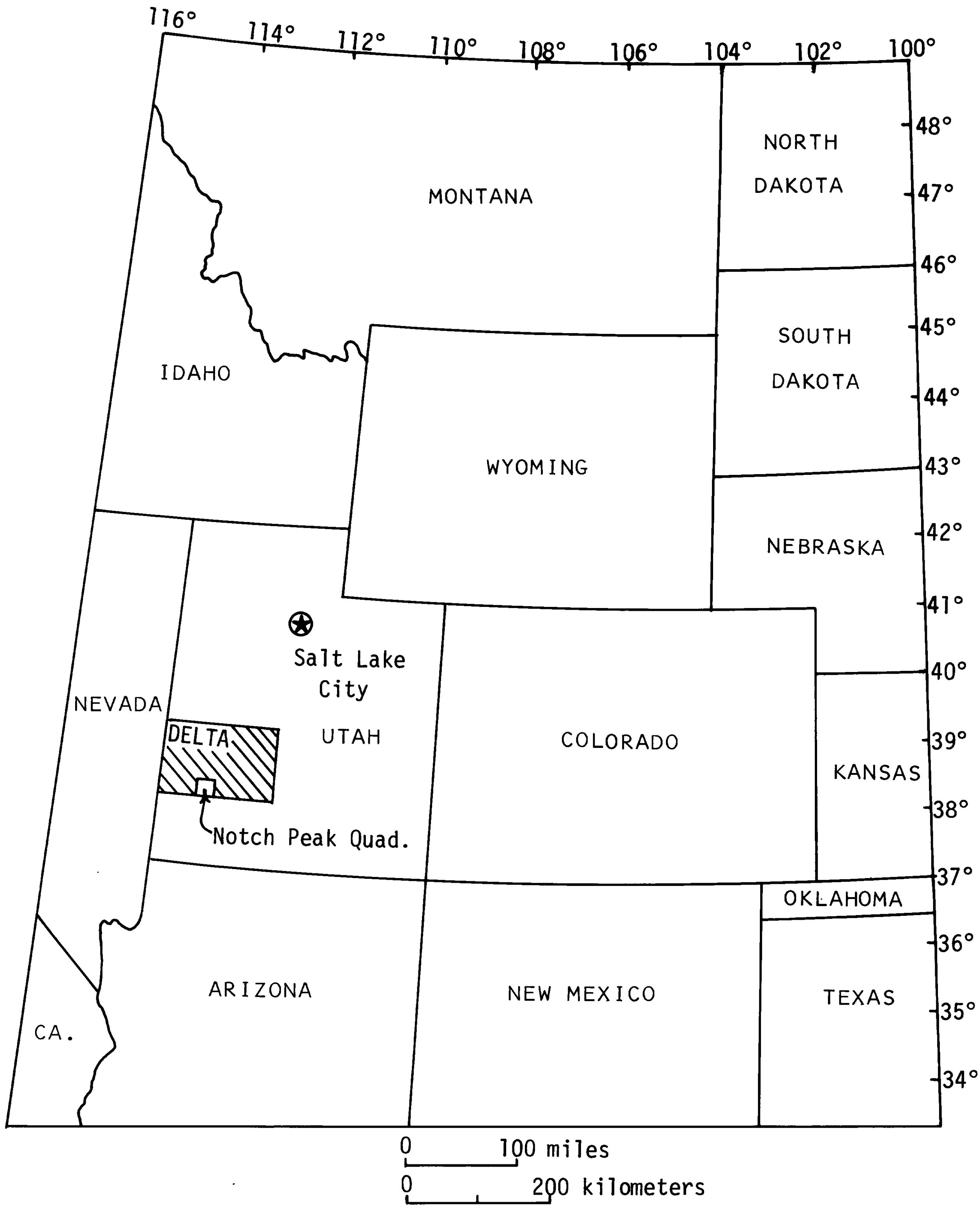

Figure 1.--Location of Delta 2° Quadrangle and Notch Peak 15' Quadrangle.

avoided. There are numerous small tungsten mines, but these were inactive in 1980.

Topography

The House Range, in the Basin and Range province, has a generally north-south orientation. It is bordered on the west by Tule Valley, a basin, and on the east by a southern extension of Whirlwind Valley, and a northern extension of the Sevier Lake bed; these are also basins. The Sevier Lake bed and Tule Valley are about 1370 m (4500 ft) in elevation. Exposures of the Notch Peak intrusive range from about 1520 m (5000 ft) to 2740 m (9000 ft), relief of 1220 m (4000 ft). Notch Peak itself is an impressive topographic feature cut in limestone which rises to 2943 m (9655 ft); it lies just south of the area of study.

The east and west flanks of the range are strongly dissected. Slopes are steeper on the west. Vegetation is sparse over the intrusive and consists of widely spaced pinion and juniper trees, groves of aspen, low shrubs and grass. The bare rock is well exposed in the valleys, particularly on the western slope. The eastern slope has more soil cover and vegetation. The top of the intrusive dome is fairly open and the north side contains some thick alluvium deposits. Topographic lineation suggests the presence of a major fault which strikes west-northwest and bisects the exposed intrusive. The northern half of the area has subsided relative to the southern half. The result has been the accumulation of sediment in the northern half of the "interior" of the exposed intrusive. Much of the northward-sloping unconsolidated sediment is alluvial gold-bearing muds and gravels.

Geology

A geologic map of the area by L. F. Hintze (1974) and a study of the Notch Peak intrusive by Gehman (1958) are detailed studies of the geology of the area.

According to Gehman (1958), the Notch Peak intrusive is a porphyritic quartz monzonite stock or pluton of possible Jurassic age which was intruded into Cambrian limestones and limy shales. The exposed intrusive is generally dome-shaped but on the west flank there are three exposed sills many meters thick injected laterally into the Cambrian rock strata.

Figure 2 is a generalized geologic map. The map delineates the exposed area of the intrusive. The intrusive is exposed in an oval-shaped area 7.2 km (4.5 miles) along its east-west axis and 4 km (2.5 miles) along its north-south axis.

The intrusion of the monzonite stock resulted in some doming of the intruded beds. The pre-intrusion dip of the rocks was to the east. This dip has been steepened on the east flank of the intrusive and changed to a mostly northerly dip on the north side, westerly on the west and southerly on the south flank.

Contacts of the limestones with the monzonite intrusive produce a 5- to 100-meter-thick contact pneumatolytic metamorphic zone. Locally along the contact metamorphic zone, hydrothermal mineralization occurred, resulting in elongated pod-shaped concentrations of W, Cu, Mo, U, Th, Au, and reportedly, Hg-bearing phases in the tactite rock deposits.

Mineralogy

Rocks in the pneumatolytic metamorphic contact zone consist of altered monzonite, tactite, skarns (green and white parallel banded metamorphosed

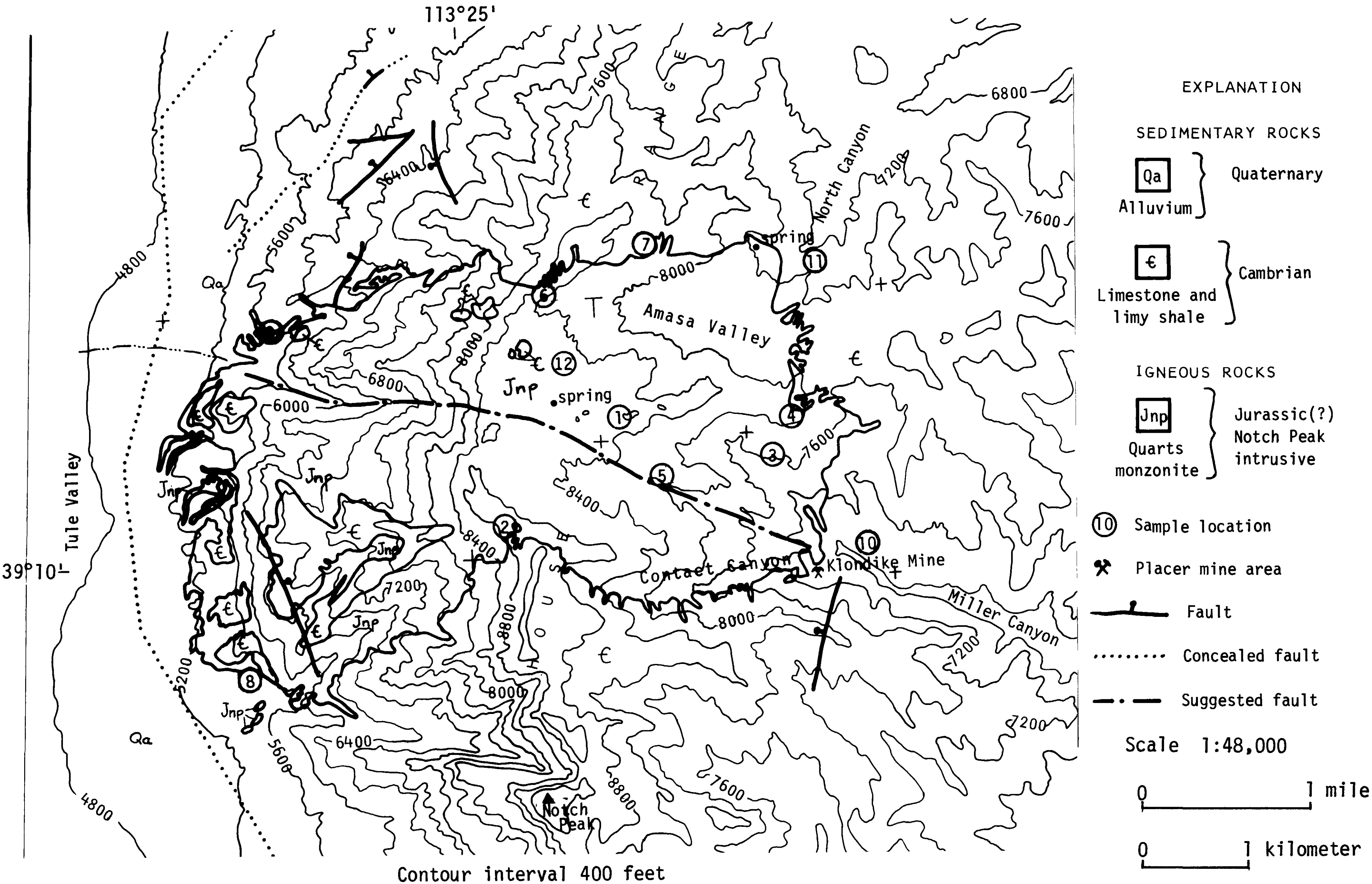

Figure 2.--Geologic map of the Notch Peak intrusive (modified from Hintze, 1974).

limestone) and altered and recrystallized limestone and marble. A more detailed description of the mineral and alteration products of metamorphism is given by Gehman (1958) who recognized contact metamorphic effects extending far up into the overlying limestones.

The tactites form a dark brown garnetized rock zone which at some places shows a banding structure which grades into the banded metamorphosed limestone. The predominant garnet variety found in the tactite is identified from X-ray diffraction peaks as uvarovite. The garnet present in megascopic crystals is mixed with less conspicuous calcite, quartz, hornblende, biotite, chlorite, and at some places pyrite. Green-colored layers also contain diopside or diopside-augite.

The altered monzonite is typically albite, biotite, calcite, and chlorite, suggesting removal of quartz and potassium feldspar near the contact. Below the obviously altered monzonite the intrusive is porphyritic with light gray-anhedral quartz crystals, large white phonocrysts of albite or adularia, and dark brown books of biotite, in a groundmass of the same minerals. Adularia also occurs as 2-3 cm-long pink phenocrysts which can be mistaken in hand specimens for microcline or orthoclase. The presence of the adularia suggests that all of the exposed quartz monzonite has been affected by auto-metamorphic processes, and that the zone of metamorphism is of considerable thickness, probably at least 200-300 m.

Some altered rock in the tactite-skarn zone contains hematite and goethite. Some crystals resembling brown garnet are identified as wollastonite. Malachite-stained rock in one of the mineralized areas contains cuprite, hematite, goethite and a matrix of reddish jasperoid. More rarely identified in the tactite zone were tourmaline (dravite), lepidocrosite, anorthoclase, augite, anatase, and epidote.

A white sugary textured rock exposed at the top of the intrusive but not in a tactite zone (Loc. 12) contains quartz, albite, orthoclase and biotite and was identified as an aplite; it was found to contain 500 ppm Mo and 15 ppm Be.

Neither X-ray diffractometer peaks nor thin sections showed the presence of W or Mo minerals in the samples, suggesting that if present they composed less than 5 percent of the rock. Panned samples of gold-bearing sediments, however, contained scheelite and traces of a yellow unidentified molybdenum mineral in the concentrates.

The well-defined contact zone and the segregation of minerals in the zone suggest that the intrusion was accomplished by a hot plastic body which invaded the limestones, forming sills, surrounding isolated blocks of limestone and altering but not really melting or absorbing the intruded formations. There is much evidence of hydrothermal activity. Calcium and silicon were mobilized by hydrothermal solutions. Calcite was deposited in the altered monzonite and silica was deposited as chalcedony, or quartz, in the tactite zone, or reacted with calcite in the tactite and in the 10 m or more meters of metamorphosed limestone and calc-silicate minerals above the zone. The presence of abundant adularia in the monzonite 100 meters below the contact, the removal of quartz and potassic feldspar, and bleached areas in the monzonite below the tacite zone also suggests active hydrothermal solutions moving through a wide contact metamorphic zone.

The intrusive is in contact with the Cambrian Marjum Formation, Weeks Limestone, and Orr Formation and Cambrian-Ordovician Notch Peak Formation in the area of exposure of the intrusive, according to Gehman (1958). These units and others in the area are described by Hintze (1974). The intrusive is also in lateral contact with the

Holocene sediments of Tule Valley at the westernmost exposures, as well as with the gold-bearing sediments on top of parts of the intrusive.

Radioactivity

The monzonite on Notch Peak shows a surface radioactivity background which ranges from 3 to 8 times that of the surrounding Cambrian limestones. The contact between the limestone and the monzonite where it is covered can be easily recognized by the abrupt change in radioactivity. Highest values observed at the portals of some of the mines in the tactite range from 10 to 12 times the altered limestone background.

Radon was measured at two springs flowing from the intrusive. One spring located on the North Canyon road near the northern boundary of the intrusive contains 1400 picocuries of Radon-222 per liter of water; the other near the center of the intrusive, close to the trace of a major fault contains 4200 picoCuries per liter.

Acknowledgments

Barbara Korzendorfer obtained X-ray diffractometer patterns on our samples. P. H. Briggs, A. W. Haubert, and V. M. Merritt ran mercury, silver, and gold analyses on selected samples. H. T. Millard, B. A. Kenton, and F. M. Luman ran delayed neutron determinations for uranium and thorium on all samples. L. A. Bradley ran spectrographic analyses on all rock samples and mineral separates. T. W. Offield brought to my attention the abstracts on the most recent studies done on the intrusive.

Geochemical studies

Sampling and analytical methods

The rock samples used for this study were selected as representing particular types of alteration and mineralization, or on the basis of relatively high radioactivity. Samples were collected from surface exposures of monzonite, or from exposed tactite and skarn at the entrance to mine adits, in open-pits and prospect pits. Samples of 1 to 2 kg (2 or 3 lbs.) were collected where the material was plentiful. Smaller samples were collected from thin alteration bands or surfaces. Samples represent areas of 10 cm^2 or less. Sample locality descriptions and brief sample descriptions are given in table 1; sample localities are shown on fig. 2, and defined by geographic coordinates in table 3.

The focal point of the sampling was the mineralized contact zone in order to obtain information on element relations of potentially economic interest. No attempt was made to obtain a suite of samples representative of the intrusive as a whole. We observed alteration changes in color in the soil and in the alluvium where the intrusive is covered, but no attempt was made to do either soil sampling or plant sampling. In other words, geochemical exploration preliminary sampling was not attempted. All references to the contact zone in the report refer to the mineralized tactite and skarn rocks.

Elements studied

Table 2 lists the elements looked for in the samples, their lower reporting limits and the percent of samples for which numerical analytical values were obtained for each element. The lower reporting limit or limit of detection is

Table 1.--Index of sample localities (fig. 2) and sample numbers, descriptions, and major minerals identified from X-ray diffractometer graphs.

Location Number	Sample Number	General description	Major minerals identified
1	CD 80-9	Monzonite, pale gray, coarse-grained, weathered.	White material is albite with quartz and biotite.
(outcrop)	CD 80-10	Monzonite, pale brown, medium-grained, hard.	
	CD 80-52*	Monzonite, iron-stained, coarse, altered, weathered.	Quartz, orthoclase, albite, calcite, hematite(?), goethite(?), lepidocrosite(?).
	CD 80-53*	Monzonite, black, hematite-mineralized, coarse, weathered.	Biotite, quartz, albite, tourmaline, adularia, chlorite(?). (heavies): goethite, biotite, magnetite, hematite, zircon, chlorite.
	CD 80-54*	Monzonite, brown coarse, altered, weathered.	
	CD 80-38	Quartz, white, massive, vein-filling, gold-bearing(?).	
2	CD 80-19	Tactite, garnetized, brown, in contact metamorphic zone.	Mostly uvarovite , quartz, diopside.
(prospect and mine entrance in mineralized contact zone)	CD 80-20	Same	Mostly uvarovite and diopside (green).
	CD 80-21	Monzonite, gruss, pale yellow brown, coarse, altered, weathered.	
	CD 80-22	Jasperoid, reddish brown, aphanitic, Cu-mineral stains.	Quartz, hematite, goethite, biotite, cuprite(?) wollastonite(?), chlorite.
	CD 80-23	Jasperoid, reddish gray to black, aphanitic, Cu-mineral stains.	Quartz (chalcedony), hematite, biotite, goethite, chlorite(?) garnet(?).
	CD 80-24	Same as CD 80-22.	Quartz, altered biotite, hematite, goethite, cuprite(?), pyrite(?).
	CD 80-25	Same as CD 80-19.	Uvarovite, quartz, hornblend(?).
	CD 80-26	Same as CD 80-19.	Quartz, uvarovite, diopside(?), chlorite(?).
3 (outcrop)	CD 80-33	Monzonite, gray, porphyritic in coarse matrix. Weathered, 100 m below contact zone.	Adularia, albite, quartz.

*These three samples are from a hydrothermal alteration zone unrelated to the contact metamorphic zone but possibly to faults or joints. Gold-placer area.

Table 1.--Index of sample localities (fig. 2) and sample numbers, descriptions, and major minerals identified from X-ray diffractometer graphs.--*continued*

Location Number	Sample Number	General description	Major minerals identified
4	CD 80-34	Monzonite, pale reddish yellow, medium grained in dike structure.	
(small open-pit mine, contact	CD 80-35	Tactite, blk. v. fine-gr., mineralized, next to leached monzonite.	Uvarovite, quartz, calcite, albite, diopside-augite(?).
zone)	CD 80-36	Argillite, gray (hydrothermal alteration).	Uvarovite, quartz, pyrite.
	CD 80-37	Tactite, brown, 1 m from a dike.	Uvarovite, quartz, wollastonite, diopside.
5	CD 80-39	Granite, pink, pegmatitic, quartz veined, 100 m below contact.	
(outcrop)	CD 80-40	Monzonite, pale yel., prophyritic, coarse matrix, contains. common 7-cm-long pink feldspar phenocrysts.	
6	CD 80-42	Monzonite, pale gray, fine gr., 15-cm-wide dike.	
(outcrop 100 m below	CD 80-43	Monzonite, lt. gray, coarse gr. adjacent to dike (CD 80-42).	Adularia, quartz, albite, biotite, chlorite(?).
contact)	CD 80-44	Monzonite, pale gray, fine gr., 45-cm-wide dike.	Quartz, albite, orthoclase, biotite.
	CD 80-45	Monzonite, gray, coarse gr. porphyritic, 5-cm-long pink feld. phen.	
7	CD 80-46	Mineral quartz, white, vein-filling, 3 m below tactite.	
(contact zone outcrop)	CD 80-47	Monzonite, pale yel. brn., highly altered, soft, desilicified.	
	CD 80-48	Monzonite, brown to black, hard, 0.5 m above CD 80-47.	
	CD 80-49	Limestone, gray metamorphosed with bands of garnet and calc-silicates.	Quartz, calcite, uvarovite, hornblend, biotite, unknown.
	CD 80-50	Monzonite, aplite(?), gray, med. gr., hard, in dike structure which penetrates contact zone; overlies coarse monzonite.	
	CD 80-51	Monzonite, gray, coarse; underlies CD 80-50.	

Table 1.--Index of sample localities (fig. 2) and sample numbers, descriptions, and major minerals identified from X-ray diffractometer graphs.--continued

Location Number	Sample Number	General description	Major minerals identified
8	CD 80-55	Aplite, white, v. fine-gr., in dike; cuts tactite zone.	Albite, quartz.
(mine in contact zone and outcrops of monzonite sills)	CD 80-56	Tactite, brown, garnetized, with pyrite and other sulfides.	Uvarovite, calcite, quartz, pyrite, diopside, Fe-Mn minerals, hornblend?
	CD 80-57	Monzonite, pale grayish brn., altered, fine gr., lateral to to tactite zone.	
	CD 80-58	Monzonite, dk. brn., altered, fin-gr., mineralized; lateral continuation of CD 80-57.	Quartz, hornblend, calcite
	CD 80-59	Same as CD 80-58.	Albite, quartz, calcite, biotite, dravite(?)
	CD 80-60	Limestone, metamorphosed, banded green and paleogray, silicified.	
	CD 80-64	Limestone, metamorphosed with monzonite intruded; contains green and pale gray bands; below monzonite sill.	Calcite, diopside-augite, biotite, albite, hornblend, chlorite. Heavy mineral concentration, biotite, anatase, grossular, diopside, epidote.
	CD 80-65	Monzonite, pale gray, med. gr., at sill contact, with black mineralization.	Albite, biotite, calcite, chlorite(?).
	CD 80-66	Monzonite, pale gray, fine gr., hard, forms sill below CD 80-60.	
	CD 80-67	Monzonite, pale purple, course, porphyritic, dominant intrusive rock type below sill zones.	
	CD 80-68	Monzonite, pale purple, pegmatite, pink feldspar and biotite.	
9	CD 80-61	Monzonite, pink, porphyritic, coarse matrix 2-3-cm-long feldspar phenocrysts.	
(50-100 m from contact zone)	CD 80-62	Monzonite, pale purple, porphyritic in med. gr. matrix. 2-3-cm-long feldspar phenocrysts.	
	CD 80-63	Monzonite, pale pink to purple, porphyritic, coarse gr., 3-cm-long feldspar phenocrysts.	

Table 1.--Index of sample localities (fig. 2) and sample numbers, descriptions, and major minerals identified from X-ray diffractometer graphs.--continued

Location Number	Sample Number	General description	Major minerals identified
10	CD 80-27	Tactite, garnetized, brown, in contact metamorphism zone.	
(mine in contact metamorphism zone,	CD 80-28	Tactite, garnetized, brown, 30 cm above altered monzonite.	Uvarovite, diopside-augite, albite, calcite, quartz.
Klondike area)	CD 80-29	Monzonite, pale pink, fine gr., altered, 45 cm below CD 80-28, 15 cm below contact rim.	Adularia, albite, quartz, diopside-augite, tourmaline(?).
	CD 80-30	Monzonite, pale yellowish gray, coarse, altered, weathered, contains a fine quartz veins, 1.5 m below contact.	
		fault zone 200 m north of main shaft.	
	CD 80-32	Tactite, garnet, brn, mineralized, from contact zone (mine dump).	Uvarovite (zoned), calcite, diopside-augite, quartz, albite, hornblend(?).
11	CD 80-5	Monzonite, pink, coarse gr., altered, 10 m from non mineralized contact.	
(outcrop and prospect pit)	CD 80-6	Tactite, brown and gray-green banded, in contact zone.	Uvarovite garnet, diopside-augite, calcite, quartz, pyrite, hematite
	CD 80-7	Tactite, garnetized, brown and grayish green in contact zone.	Green zone, diopside-augite, chlorite, albite, calcite, pyrite, hematite.
	CD 80-8	Monzonite, pink altered, med. gr., 0.5 m above tactite, in sill.	Adularia, quartz.
12	CD 80-11	Tactite, garnetized, brown, in contact zone.	Uvarosite, quartz, calcite.
(mine and outcrop)	CD 80-12	"Aplite", white, sugar-textured, hard, in isolated dike below contact zone (surface outcrop).	
	CD 80-13	Same as CD 80-12.	Mostly adularia and quartz.
	CD 80-14	Limestone, metamorphosed, brown (garnet)-green (diopside) striped, typically, above tactite zone.	Green is diopside, albite, calcite. Brown is uvarovite, calcite, albite.
	CD 80-15	Monzonite, gray, very coarse gr., below tactite zone, altered.	
	CD 80-16	Tactite, garnetized, brown, in contact zone.	Brown material is uvarovite, calcite, quartz, hornblend(?).
	CD 80-41	Calc-silicate zone, altered monzonite.	Yellowish material is calcite and quartz.

Table 2.--Elements looked for, lower reporting limits and percent of samples for which numerical values were obtained.

Element	Symbol	Lower detection limit	Percent of samples for which numerical values were obtained
Elements used in the statistical study			
Iron	Fe	0.001%	95**
Magnesium	Mg	.002	100
Calcium	Ca	.002	70**
Titanium	Ti	.0002	100
Manganese	Mn	1 ppm	100
Barium	Ba	2.	100
Beryllium	Be	1.5	93
Cobalt	Co	5.	44
Chromium	Cr	1.	89
Copper	Cu	1.	100
Lanthanum	La	50.	26
Molybdenum	Mo	3.	54
Niobium	Nb	10.	77
Nickel	Ni	5.	34
Lead	Pb	10.	64
Scandium	Sc	5.	36
Tin	Sn	15.	33
Strontium	Sr	10.	93
Vanadium	V	7.	92
Tungsten	W	100.	31
Yttrium	Y	10.	57
Zirconium	Zr	15.	98
Zinc	Zn	300 ppm	13
Silicon	Si	.002%	39**
Aluminum	Al	.01%	100%
Sodium	Na	.05	87
Potassium	K	1.5	69
Cerium	Ce	200 ppm	13
Gallium	Ga	5.	70
Germanium	Ge	10.	25
Neodymium	Nd	70	21
Ytterbium	Yb	1.0	33
Thorium	Th	3.0	100
Uranium	U	0.1	100
Elements looked for but not used in the statistical study because of insufficient numerical values			
Arsenic	As	1000 ppm	0%
Gold	Au (spec.)	20	0
Boron	B	20	5
Bismuth	Bi	10	8
Cadmium	Cd	50	0
Palladium	Pd	2	0
Platinum	Pt	50 ppm	0
Antimony	Sb	200	0
Tellurium	Te	2000	0
Phosphorus	P	.02	0
Silver	Ag	0.5	7
Hafnium	Hf	100	0
Indium	In	10	5%
Lithium	Li	100	0
Rhenium	Re	50	0
Tantalum	Ta	500	0
Thallium	Ti	200	0
Praseodymium	Pr	100	0
Samarium	Sm	100	0
Europium	Eu	100	0

** Missing values were qualified G values, greater than 10%.

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.

SAMPLE	Fe%-S	Mg%-S	Ca%-S	Ti%-S	Mn ppm-S	Ag ppm-S	As ppm-S	Au ppm-S	B ppm-S	Ba ppm-S
CD80-5	.2000	.0700	.3000	.0700	100.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-6	7.0000	1.5000	10.0000G	.0700	5000.0000	.0000N	.0000N	.0000N	.0000N	5.0000
CD80-7	7.0000	1.5000	10.0000G	.1500	3000.0000	.0000N	.0000N	.0000N	.0000L	70.0000
CD80-8	1.0000	.2000	.5000	.1500	150.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-9	1.0000	.2000	.2000	.0500	100.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-10	.3000	.1000	.0700	.0200	100.0000	.7000	.0000N	.0000N	20.0000	200.0000
CD80-11	10.0000	.3000	10.0000G	.0700	7000.0000	.0000N	.0000N	.0000N	.0000N	15.0000
CD80-12	.1500	.0700	3.0000	.0150	70.0000	.0000N	.0000N	.0000N	.0000N	1500.0000
CD80-13	.1000	.0500	1.5000	.0300	70.0000	.0000N	.0000N	.0000N	.0000N	5000.0000
CD80-14	3.0000	1.5000	10.0000G	.3000	3000.0000	.0000N	.0000N	.0000N	.0000L	70.0000
CD80-15	.5000	.1500	.7000	.1500	300.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-16	5.0000	.7000	10.0000G	.0700	5000.0000	.0000N	.0000N	.0000N	.0000N	100.0000
CD80-19	10.0000	.7000	10.0000G	.0100	3000.0000	.0000N	.0000N	.0000N	.0000N	7.0000
CD80-20	10.0000	.7000	10.0000G	.0100	3000.0000	.0000N	.0000N	.0000N	.0000N	7.0000
CD80-21	7.0000	1.5000	1.0000	.5000	700.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-22	10.0000G	.1500	.3000	.0300	500.0000	30.0000	.0000N	.0000N	.0000L	15.0000
CD80-23	10.0000G	.1000	.2000	.0150	700.0000	15.0000	.0000N	.0000N	.0000L	15.0000
CD80-24	10.0000G	.1500	.2000	.0300	500.0000	15.0000	.0000N	.0000N	.0000L	10.0000
CD80-25	10.0000	.3000	10.0000G	.0150	3000.0000	.0000N	.0000N	.0000N	.0000N	2.0000
CD80-26	10.0000	.3000	10.0000G	.0300	3000.0000	.0000N	.0000N	.0000N	.0000N	7.0000
CD80-28	7.0000	1.0000	10.0000G	.1500	5000.0000	.0000N	.0000N	.0000N	.0000N	15.0000
CD80-29	.7000	.1500	.3000	.0700	150.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-30	.5000	.1500	.3000	.0700	100.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-31	.3000	.0700	.3000	.0500	150.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-32	7.0000	.7000	10.0000G	.1500	7000.0000	.0000N	.0000N	.0000N	.0000N	30.0000
CD80-33	1.0000	.3000	.7000	.0700	200.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-34	.7000	.1500	.3000	.0700	150.0000	.0000N	.0000N	.0000N	.0000L	200.0000
CD80-35	7.0000	1.0000	10.0000G	.1500	5000.0000	.0000N	.0000N	.0000N	.0000L	15.0000
CD80-36	10.0000	.3000	10.0000G	.0500	3000.0000	.0000N	.0000N	.0000N	.0000L	70.0000
CD80-37	2.0000	.7000	10.0000G	.1500	1500.0000	.0000N	.0000N	.0000N	.0000L	50.0000
CD80-38	.3000	.0300	.0700	.0070	30.0000	.0000N	.0000N	.0000N	.0000L	50.0000
CD80-39	.7000	.1500	.2000	.0700	150.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-40	1.0000	.3000	.5000	.0700	200.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-41	1.5000	.1500	7.0000	.1000	1500.0000	.0000N	.0000N	.0000N	30.0000	300.0000
CD80-42	.3000	.0700	.3000	.0200	70.0000	.0000N	.0000N	.0000N	.0000L	30.0000
CD80-43	1.5000	1.0000	.5000	.1500	300.0000	.0000N	.0000N	.0000N	.0000L	700.0000
CD80-44	.3000	.0700	.3000	.0300	70.0000	.0000N	.0000N	.0000N	.0000L	50.0000
CD80-45	1.0000	.3000	.7000	.0700	200.0000	.0000N	.0000N	.0000N	.0000L	500.0000

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Be ppm-S	Bi ppm-S	Cd ppm-S	Co ppm-S	Cr ppm-S	Cu ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S
CD80-5	1.5000	.0000N	.0000N	.0000L	5.0000	1.5000	.0000L	.0000N	15.0000	.0000L
CD80-6	3.0000	.0000N	.0000N	15.0000	15.0000	1.5000	.0000N	300.0000	15.0000	15.0000
CD80-7	3.0000	.0000N	.0000N	15.0000	30.0000	3.0000	.0000L	300.0000	.0000L	15.0000
CD80-8	1.5000	.0000N	.0000N	.0000L	7.0000	30.0000	70.0000	.0000N	15.0000	.0000L
CD80-9	1.5000	.0000N	.0000N	.0000L	10.0000	1.5000	.0000L	.0000N	.0000L	.0000L
CD80-10	.0000L	.0000N	.0000N	.0000N	5.0000	3.0000	.0000N	3.0000	.0000N	.0000L
CD80-11	1.5000	.0000N	.0000N	7.0000	7.0000	1.5000	.0000N	100.0000	.0000L	.0000L
CD80-12	15.0000	0000N	.0000N	.0000N	2.0000	1.0000	.0000N	500.0000	15.0000	.0000N
CD80-13	1.5000	.0000N	.0000N	.0000N	.0000L	2.0000	.0000N	150.0000	30.0000	.0000N
CD80-14	15.0000	.0000N	.0000N	7.0000	50.0000	3.0000	50.0000	200.0000	30.0000	15.0000
CD80-15	3 0000	.0000N	.0000N	.0000L	7.0000	1.5000	.0000L	3.0000	15.0000	.0000L
CD80-16	5.0000	.0000N	.0000N	15.0000	15.0000	7.0000	.0000N	50.0000	.0000L	7.0000
CD80-19	3.0000	.0000N	.0000N	7.0000	1.0000	50.0000	150.0000	70.0000	10.0000	.0000L
CD80-20	3 0000	.0000N	.0000N	7.0000	1.0000	200.0000	150.0000	50.0000	.0000L	.0000L
CD80-21	3.0000	.0000N	.0000N	15.0000	30.0000	30.0000	300.0000	.0000L	30.0000	15.0000
CD80-22	10.0000	2000.0000	.0000N	70.0000	2.0000	70000.0000	.0000L	100.0000	15.0000	10.0000
CD80-23	10.0000	1500.0000	.0000N	70.0000	2.0000	70000.0000	.0000N	70.0000	15.0000	15.0000
CD80-24	10.0000	1500 0000	.0000N	70.0000	3.0000	50000.0000	.0000N	70.0000	15.0000	15.0000
CD80-25	.0000L	10.0000	.0000N	.0000L	.0000L	70.0000	.0000N	50.0000	.0000L	.0000L
CD80-26	1.5000	.0000N	.0000N	7.0000	1.0000	50.0000	.0000N	30.0000	10.0000	.0000L
CD80-28	10.0000	.0000N	.0000N	10.0000	15.0000	15.0000	.0000N	100.0000	15.0000	7.0000
CD80-29	1.5000	.0000N	.0000N	.0000L	2.0000	15.0000	.0000N	.0000N	15.0000	.0000L
CD80-30	1.5000	0000N	.0000N	.0000L	1.0000	7.0000	.0000N	.0000N	15.0000	.0000L
CD80-31	1.5000	.0000N	.0000N	.0000N	1.0000	3.0000	.0000L	.0000N	15.0000	.0000L
CD80-32	10.0000	.0000N	.0000N	10.0000	7.0000	15.0000	.0000N	30.0000	15.0000	7.0000
CD80-33	1.5000	.0000N	.0000N	.0000L	3.0000	3.0000	50.0000	.0000N	10.0000	.0000L
CD80-34	2.0000	.0000N	.0000N	.0000L	2.0000	3.0000	.0000L	.0000N	10.0000	.0000L
CD80-35	3.0000	.0000N	.0000N	15.0000	7.0000	30.0000	.0000L	500.0000	15.0000	.0000L
CD80-36	2.0000	0000N	.0000N	7.0000	3.0000	15.0000	.0000L	30.0000	.0000L	.0000L
CD80-37	1.5000	.0000L	.0000N	5.0000	10.0000	7.0000	.0000L	7.0000	.0000L	.0000L
CD80-38	.0000N	200.0000	0000N	.0000N	.0000L	3.0000	.0000N	.0000L	.0000N	.0000L
CD80-39	1.5000	.0000N	.0000N	.0000L	3.0000	5.0000	.0000L	7.0000	.0000L	.0000L
CD80-40	1.5000	0000N	.0000N	.0000L	3.0000	2.0000	.0000L	.0000L	.0000L	.0000L
CD80-41	7.0000	.0000L	.0000N	.0000L	7.0000	7.0000	150.0000	70.0000	15.0000	5.0000
CD80-42	7.0000	.0000N	.0000N	.0000N	.0000L	3.0000	.0000N	.0000N	15.0000	.0000N
CD80-43	2.0000	.0000N	.0000N	7.0000	7.0000	1.5000	.0000N	.0000L	15.0000	7.0000
CD80-44	3.0000	.0000N	.0000N	.0000N	.0000L	1.0000	.0000N	.0000N	15.0000	.0000L
CD80-45	1.5000	.0000N	.0000N	.0000L	30.0000	1.5000	50.0000	.0000L	15.0000	.0000L

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Pb ppm-S	Pd ppm-S	Pt ppm-S	Sb ppm-S	Sc ppm-S	Sn ppm-S	Sr ppm-S	Te ppm-S	U ppm-S	V ppm-S
CD80-5	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	15.0000
CD80-6	.0000N	.0000N	.0000N	.0000N	.0000L	30.0000	50.0000	.0000N	.0000N	300.0000
CD80-7	.0000N	.0000N	.0000N	.0000N	5.0000	30.0000	150.0000	.0000N	.0000N	200.0000
CD80-8	20.0000	.0000N	.0000N	.0000N	.0000L	.0000N	200.0000	.0000N	.0000N	30.0000
CD80-9	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	200.0000	.0000N	.0000N	30.0000
CD80-10	70.0000	.0000N	.0000N	.0000N	.0000L	.0000N	70.0000	.0000N	.0000N	15.0000
CD80-11	.0000N	.0000N	.0000N	.0000N	.0000N	150.0000	10.0000	.0000N	.0000N	20.0000
CD80-12	10.0000	.0000N	.0000N	.0000N	15.0000	.0000N	5000.0000	.0000N	.0000N	.0000N
CD80-13	30.0000	.0000N	.0000N	.0000N	15.0000	.0000N	3000.0000	.0000N	.0000N	.0000N
CD80-14	15.0000	.0000N	.0000N	.0000N	15.0000	15.0000	700.0000	.0000N	.0000N	70.0000
CD80-15	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	15.0000
CD80-16	.0000N	.0000N	.0000N	.0000N	7.0000	30.0000	70.0000	.0000N	.0000N	20.0000
CD80-19	10.0000	.0000N	.0000N	.0000N	.0000L	15.0000	.0000L	.0000N	.0000N	20.0000
CD80-20	.0000N	.0000N	.0000N	.0000N	.0000L	30.0000	10.0000	.0000N	.0000N	50.0000
CD80-21	15.0000	.0000N	.0000N	.0000N	15.0000	.0000N	300.0000	.0000N	.0000N	200.0000
CD80-22	30.0000	.0000N	.0000N	.0000N	.0000L	30.0000	20.0000	.0000N	.0000N	70.0000
CD80-23	50.0000	.0000N	.0000N	.0000N	.0000N	30.0000	30.0000	.0000N	.0000N	70.0000
CD80-24	50.0000	.0000N	.0000N	.0000N	.0000N	30.0000	30.0000	.0000N	.0000N	70.0000
CD80-25	.0000N	.0000N	.0000N	.0000N	.0000N	30.0000	.0000L	.0000N	.0000N	150.0000
CD80-26	.0000N	.0000N	.0000N	.0000N	.0000N	30.0000	.0000L	.0000N	.0000N	100.0000
CD80-28	.0000N	.0000N	.0000N	.0000N	7.0000	30.0000	70.0000	.0000N	700.0000	100.0000
CD80-29	30.0000	.0000N	.0000N	.0000N	.0000N	.0000N	150.0000	.0000N	.0000N	15.0000
CD80-30	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	150.0000	.0000N	.0000N	15.0000
CD80-31	30 0000	.0000N	.0000N	.0000N	.0000L	.0000N	150.0000	.0000N	.0000N	7.0000
CD80-32	.0000N	.0000N	.0000N	.0000N	7.0000	50.0000	70.0000	.0000N	.0000N	150.0000
CD80-33	30.0000	0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-34	20.0000	.0000N	.0000N	.0000N	.0000L	.0000N	200.0000	.0000N	.0000N	15.0000
CD80-35	.0000N	.0000N	.0000N	.0000N	5.0000	70.0000	30.0000	.0000N	700.0000	70.0000
CD80-36	0000N	.0000N	.0000N	.0000N	5.0000	30.0000	10.0000	.0000N	.0000N	150.0000
CD80-37	.0000N	.0000N	.0000N	.0000N	7.0000	.0000L	100.0000	.0000N	.0000N	20.0000
CD80-38	30.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	7.0000
CD80-39	30.0000	.0000N	.0000N	.0000N	.0000L	.0000N	150.0000	.0000N	.0000N	20.0000
CD80-40	30.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-41	30.0000	.0000N	.0000N	.0000N	5.0000	20.0000	200.0000	.0000N	700.0000	70.0000
CD80-42	30.0000	0000N	.0000N	.0000N	.0000L	.0000N	30.0000	.0000N	.0000N	.0000L
CD80-43	30.0000	.0000N	0000N	.0000N	7.0000	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-44	30 0000	.0000N	.0000N	.0000N	.0000N	.0000N	30.0000	.0000N	.0000N	7.0000
CD80-45	30 0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	30.0000

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	W ppm-S	Y ppm-S	Zn ppm-S	Zr ppm-S	Si%-S	Al%-S	Na%-S	K%-S	P%-S	Ce ppm-S
CD80-5	.0000N	.0000L	.0000N	70.0000	10.0000G	5.0000	2.0000	3.0000	.0000N	.0000N
CD80-6	.0000N	20.0000	300.0000	30.0000	7.0000	1.5000	.2000	.0000N	.0000N	500.0000N
CD80-7	200.0000	20.0000	300.0000	30.0000	10.0000	1.5000	.1500	.0000N	.0000N	500.0000N
CD80-8	.0000N	15.0000	.0000N	100.0000	10.0000G	7.0000	2.0000	3.0000	.0000N	.0000L
CD80-9	.0000N	.0000L	.0000N	70.0000	10.0000G	5.0000	1.5000	1.5000	.0000N	.0000N
CD80-10	.0000N	.0000L	.0000N	100.0000	10.0000G	5.0000	1.5000	3.0000	.0000N	.0000N
CD80-11	150.0000	.0000L	.0000L	30.0000	7.0000	1.5000	.0500	.0000N	.0000N	500.0000N
CD80-12	0000N	15 0000	.0000N	70.0000	10.0000G	7.0000	3.0000	5.0000	.0000N	.0000N
CD80-13	.0000N	30 0000	0000N	70 0000	10.0000G	7.0000	3.0000	7.0000	.0000N	.0000N
CD80-14	.0000N	30.0000	700.0000	150.0000	10.0000	7.0000	.7000	.0000N	.0000N	500.0000N
CD80-15	.0000N	.0000L	.0000N	70.0000	10.0000G	5.0000	3.0000	2.0000	.0000N	.0000L
CD80-16	100.0000	15.0000	.0000N	30.0000	7.0000	1.5000	.3000	.0000N	.0000N	500.0000N
CD80-19	500 0000	.0000L	.0000N	15.0000	7.0000	1.0000	.0000L	.0000N	.0000N	500.0000
CD80-20	500 0000	.0000L	.0000N	15.0000	7.0000	1.0000	.0700	.0000N	.0000N	500.0000
CD80-21	0000N	30.0000	.0000N	300.0000	10.0000	5.0000	1.5000	3.0000	.0000N	300.0000
CD80-22	1500.0000	15.0000	1000.0000	15.0000	5.0000	.7000	.0000L	1.0000	.0000N	.0000N
CD80-23	1500.0000	10.0000	1000.0000	30.0000	3.0000	.7000	.0000L	.7000	.0000N	.0000L
CD80-24	1500 0000	.0000L	700.0000	30.0000	5.0000	.7000	.0000L	.7000	.0000N	.0000N
CD80-25	200 0000	.0000L	.0000N	15.0000	7.0000	.7000	.0000L	.0000N	.0000N	500.0000N
CD80-26	200.0000	.0000L	.0000N	20.0000	7 0000	.7000	.0000L	.0000N	.0000N	500.0000N
CD80-28	700.0000	20.0000	.0000N	100.0000	10.0000	3.0000	.7000	.0000N	.0000N	500.0000N
CD80-29	.0000N	.0000L	.0000N	70.0000	10.0000G	5.0000	2.0000	3.0000	.0000N	.0000N
CD80-30	.0000N	.0000L	0000N	30.0000	10.0000G	3.0000	1.0000	2.0000	.0000N	.0000N
CD80-31	.0000N	.0000L	.0000N	20.0000	10.0000G	5.0000	1.5000	3.0000	.0000N	.0000N
CD80-32	300.0000	20.0000	.0000N	100.0000	10.0000	3.0000	.5000	.0000N	.0000N	500.0000N
CD80-33	.0000N	.0000L	.0000N	70.0000	10.0000G	7.0000	1.5000	3.0000	.0000N	.0000L
CD80-34	.0000N	.0000L	.0000N	50.0000	10.0000G	5.0000	1.5000	2.0000	.0000N	.0000N
CD80-35	3000.0000	20.0000	.0000N	150.0000	10.0000	1.5000	.3000	.0000N	.0000N	500.0000N
CD80-36	300 0000	30.0000	.0000N	30.0000	10.0000	1.5000	.0000L	.0000N	.0000N	500.0000N
CD80-37	0000L	30 0000	.0000N	200.0000	10.0000G	3.0000	.1500	.0000N	.0000N	500.0000N
CD80-38	.0000N	.0000N	.0000N	15.0000	10.0000G	.5000	.0000L	.0000N	.0000N	.0000N
CD80-39	.0000N	.0000L	.0000N	70.0000	10.0000G	7.0000	1.5000	3.0000	.0000N	.0000N
CD80-40	.0000N	.0000L	.0000N	70.0000	10.0000G	5.0000	1.5000	1.5000	.0000N	.0000L
CD80-41	0000B	.0000B	.0000B	0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B
CD80-42	.0000N	.0000N	.0000N	50.0000	10.0000G	5.0000	1.5000	3.0000	.0000N	.0000N
CD80-43	.0000N	.0000L	0000N	50.0000	10.0000G	7.0000	1.5000	3.0000	.0000N	.0000N
CD80-44	.0000N	.0000N	.0000N	70.0000	10.0000G	5.0000	1.5000	3.0000	.0000N	.0000N
CD80-45	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Ga ppm-S	Ge ppm-S	Hf ppm-S	In ppm-S	Li ppm-S	Re ppm-S	Ta ppm-S	Th ppm-S	Tl ppm-S	Yb ppm-S
CD80-5	15 0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.0000
CD80-6	.0000B	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-7	.0000B	15 0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-8	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-9	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	2.0000
CD80-10	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-11	.0000B	30.0000	.0000N	.0000L	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-12	30.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.5000
CD80-13	30.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	3.0000
CD80-14	15 0000	.0000L	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	3.0000
CD80-15	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-16	.0000B	15.0000	.0000N	.0000N	.0000L	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-19	.0000B	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-20	0000B	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-21	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-22	.0000B	.0000N	.0000N	20.0000	.0000L	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-23	.0000B	.0000N	.0000N	15.0000	.0000L	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-24	0000B	.0000N	.0000N	15.0000	.0000L	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-25	.0000B	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-26	.0000B	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-28	.0000B	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-29	15 0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-30	7.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-31	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-32	.0000B	15 0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-33	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-34	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-35	.0000B	20.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-36	.0000B	20 0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-37	7.0000	.0000L	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	3 0000
CD80-38	.0000L	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N
CD80-39	15 0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-40	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-41	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.5000
CD80-42	15.0000	0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N
CD80-43	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-44	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-45	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.5000

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Pr ppm-S	Nd ppm-S	Sm ppm-S	Eu ppm-S	Th ppm	U ppm	LAB. NO.	LATITUDE	LONGITUD
CD80-5	.0000N	0000N	.0000N	.0000N	44.4000	8.2200	229903.0000	39.1931	113.3750
CD80-6	.0000B	.0000B	.0000B	.0000B	4.4000L	11.7000	229904.0000	39.1931	113.3750
CD80-7	.0000B	200.0000N	.0000N	.0000N	4.7000L	12.0000	229905.0000	39.1931	113.3750
CD80-8	.0000N	70.0000	.0000N	.0000N	49.8000	9.4200	229906.0000	39.1931	113.3750
CD80-9	.0000N	.0000N	.0000N	.0000N	18.5000	3.7100	229907.0000	39.1792	113.3972
CD80-10	0000B	.0000B	.0000B	.0000B	24.2000	7.8900	229908.0000	39.1792	113.3972
CD80-11	.0000B	.0000B	.0000B	.0000B	2.8000L	6.9200	229909.0000	39.1875	113.4097
CD80-12	.0000B	.0000B	.0000B	.0000B	38.1000	5.9100	229910.0000	39.1875	113.4097
CD80-13	.0000B	0000B	.0000B	.0000B	38.7000	20.5000	229911.0000	39.1875	113.4097
CD80-14	.0000B	.0000N	.0000N	.0000N	14.7000	9.6800	229912.0000	39.1875	113.4097
CD80-15	.0000N	.0000N	.0000N	.0000N	28.9000	6.3000	229913.0000	39.1875	113.4097
CD80-16	0000B	.0000B	.0000B	.0000B	4.2000L	10.5000	229914.0000	39.1875	113.4097
CD80-19	.0000B	150.0000	.0000N	.0000N	17.0000L	92.4000	229915.0000	39.1695	113.4111
CD80-20	.0000B	150.0000	.0000N	.0000N	14.0000L	70.9000	229916.0000	39.1695	113.4111
CD80-21	.0000N	150.0000	.0000N	.0000N	137.0000	12.4000	229917.0000	39.1695	113.4111
CD80-22	.0000N	.0000N	.0000N	.0000N	49.0000L	263.0000	229918.0000	39.1695	113.4111
CD80-23	.0000B	.0000B	.0000B	.0000B	130.0000L	433.0000	229919.0000	39.1695	113.4111
CD80-24	.0000B	.0000B	.0000B	.0000B	140.0000L	446.0000	229920.0000	39.1695	113.4111
CD80-25	.0000B	.0000B	0000B	.0000B	6.6000L	27.5000	229921.0000	39.1695	113.4111
CD80-26	.0000B	.0000B	.0000B	.0000B	6.2000L	25.8000	229922.0000	39.1695	113.4111
CD80-28	.0000B	.0000B	.0000B	.0000B	4.9000L	17.1000	229923.0000	39.1625	113.3750
CD80-29	.0000B	.0000B	.0000B	.0000B	35.6000	8.2700	229924.0000	39.1625	113.3750
CD80-30	.0000B	.0000B	.0000B	.0000B	27.3000	3.1400	229925.0000	39.1625	113.3750
CD80-31	.0000N	.0000N	.0000N	.0000N	26.9000	6.1700	229926.0000	39.1625	113.3750
CD80-32	.0000B	.0000B	.0000B	.0000B	4.8000L	12.0000	229927.0000	39.1625	113.3750
CD80-33	.0000N	.0000N	.0000N	.0000N	20.8000	3.0900	229928.0000	39.1764	113.3778
CD80-34	.0000N	.0000N	.0000N	.0000N	30.3000	7.4800	229929.0000	39.1806	113.3722
CD80-35	.0000B	.0000N	.0000N	.0000N	9.4600	7.4200	229930.0000	39.1806	113.3722
CD80-36	.0000B	.0000N	.0000N	.0000N	6.1000L	18.3000	229931.0000	39.1806	113.3722
CD80-37	.0000B	.0000N	.0000N	.0000N	4.2000L	7.9800	229932.0000	39.1806	113.3722
CD80-38	.0000B	.0000B	.0000B	.0000B	2.5000	1.0300	229933.0000	39.1792	113.3972
CD80-39	.0000N	.0000N	.0000N	.0000N	24.5000	4.9300	229934.0000	39.1736	113.3944
CD80-40	.0000N	.0000N	.0000N	.0000N	23.9000	5.4000	229935.0000	39.1736	113.3944
CD80-41	.0000B	70.0000	0000N	.0000N	239.0000	16.2000	229936.0000	39.1875	113.4097
CD80-42	0000B	.0000B	.0000B	.0000B	16.7000	14.6000	229937.0000	39.1875	113.4097
CD80-43	.0000B	.0000B	.0000B	.0000B	20.3000	3.1400	229938.0000	39.1875	113.4097
CD80-44	0000B	.0000B	.0000B	.0000B	25.3000	9.3200	229939.0000	39.1875	113.4097
CD80-45	.0000N	.0000L	0000N	.0000N	31.7000	5.6400	229940.0000	39.1875	113.4097

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Fe%-S	Mg%-S	Ca%-S	Ti%-S	Mn ppm-S	Ag ppm-S	As ppm-S	Au ppm-S	B ppm-S	Ba ppm-S
CD80-46	1500	.0500	.3000	.0150	150.0000	.0000N	.0000N	.0000N	.0000L	100.0000
CD80-47	.7000	1500	1.5000	.0700	1500.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-48	1 5000	.1000	.7000	.0700	1500 0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-49	7.0000	.7000	10.0000G	.0700	7000.0000	.0000N	.0000N	.0000N	.0000N	20.0000
CD80-50	7000	.1500	.3000	.0700	300.0000	.0000N	.0000N	.0000N	.0000L	200.0000
CD80-51	.3000	.1000	.3000	.0300	150.0000	.0000N	.0000N	.0000N	.0000L	500.0000
CD80-52	5.0000	.2000	1.5000	.1000	1500.0000	.0000N	.0000N	.0000N	.0000L	500.0000
CD80-53	3.0000	.3000	.7000	.0700	10000.0000	.0000N	.0000N	.0000N	.0000L	1000.0000
CD80-54	1 0000	.1500	.7000	.1000	200.0000	.0000N	.0000N	.0000N	.0000L	500.0000
CD80-55	.7000	.3000	2.0000	.1500	700.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-56	7.0000	1.5000	10.0000G	.0700	7000.0000	.0000N	.0000N	.0000N	.0000L	7.0000
CD80-57	1 5000	.1500	7.0000	.3000	1500.0000	.0000N	.0000N	.0000N	.0000L	150.0000
CD80-58	1.5000	.3000	2.0000	.0700	2000.0000	.0000N	.0000N	.0000N	.0000L	30.0000
CD80-59	1.5000	.2000	5.0000	.3000	1000.0000	.0000N	.0000N	.0000N	20.0000	150.0000
CD80-60	5.0000	1.5000	10.0000G	.1000	7000.0000	.0000N	.0000N	.0000N	.0000N	5.0000
CD80-61	1.5000	.3000	.5000	.1000	150.0000	.0000N	.0000N	.0000N	.0000L	500.0000
CD80-62	1 5000	.5000	.7000	.1500	300.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-63	1.0000	.3000	.7000	.1000	200.0000	.0000N	.0000N	.0000N	.0000N	300.0000
CD80-64	2.0000	2.0000	10.0000G	.1500	1000.0000	.0000N	.0000N	.0000N	.0000L	200.0000
CD80-65	.7000	.2000	7.0000	.1000	500.0000	.0000N	.0000N	.0000N	.0000L	300.0000
CD80-66	.3000	.0300	.3000	0300	100.0000	.0000N	.0000N	.0000N	.0000L	15.0000
CD80-67	1 0000	.3000	.7000	.1000	300.0000	.0000N	.0000N	.0000N	.0000L	700.0000
CD80-68	1.5000	.2000	.5000	.1000	300.0000	.0000N	.0000N	.0000N	.0000L	300.0000

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Be ppm-S	Bi ppm-S	Cd ppm-S	Co ppm-S	Cr ppm-S	Cu ppm-S	La ppm-S	Mo ppm-S	Nb ppm-S	Ni ppm-S
CD80-46	2.0000	.0000N	.0000N	.0000N	.0000L	3.0000	.0000N	30.0000	10.0000	.0000L
CD80-47	1.5000	.0000N	.0000N	.0000L	7.0000	5.0000	150.0000	10.0000	15.0000	5.0000
CD80-48	15.0000	.0000N	.0000N	.0000L	1.5000	5.0000	.0000N	20.0000	15.0000	.0000L
CD80-49	7.0000	.0000N	.0000N	10.0000	5.0000	7.0000	.0000N	300.0000	15.0000	7.0000
CD80-50	3.0000	.0000N	.0000N	.0000L	3.0000	20.0000	.0000L	.0000L	15.0000	.0000L
CD80-51	1.5000	.0000N	.0000N	.0000N	1.0000	3.0000	.0000L	.0000N	10.0000	.0000L
CD80-52	1.5000	.0000N	.0000N	7.0000	7.0000	7.0000	.0000L	.0000L	10.0000	5.0000
CD80-53	1.5000	.0000N	.0000N	10.0000	3.0000	7.0000	.0000L	7.0000	10.0000	15.0000
CD80-54	1.5000	.0000N	.0000N	.0000L	5.0000	3.0000	.0000L	.0000N	10.0000	.0000L
CD80-55	7.0000	.0000N	.0000N	.0000L	15.0000	10.0000	100.0000	.0000L	50.0000	.0000L
CD80-56	1.5000	.0000N	.0000N	10.0000	15.0000	70.0000	.0000N	10.0000	.0000N	10.0000
CD80-57	1.5000	.0000N	.0000N	.0000L	20.0000	7.0000	150.0000	3.0000	70.0000	5.0000
CD80-58	1.5000	.0000N	.0000N	7.0000	15.0000	10.0000	1000.0000	.0000N	15.0000	.0000L
CD80-59	2.0000	.0000N	.0000N	5.0000	30.0000	7.0000	100.0000	10.0000	70.0000	.0000L
CD80-60	1.5000	.0000N	.0000N	10.0000	15.0000	15.0000	.0000N	15.0000	.0000L	30.0000
CD80-61	1.5000	.0000N	.0000N	.0000L	3.0000	1.5000	.0000L	.0000N	15.0000	.0000L
CD80-62	2.0000	.0000N	.0000N	7.0000	7.0000	2.0000	150.0000	.0000N	20.0000	5.0000
CD80-63	1.5000	.0000N	.0000N	.0000L	3.0000	1.5000	.0000L	.0000N	15.0000	.0000L
CD80-64	.0000L	.0000N	.0000N	10.0000	50.0000	7.0000	.0000L	.0000L	10.0000	15.0000
CD80-65	7.0000	.0000N	.0000N	.0000L	7.0000	30.0000	150.0000	7.0000	30.0000	.0000L
CD80-66	3.0000	.0000N	.0000N	.0000N	.0000L	1.5000	.0000N	.0000N	15.0000	.0000L
CD80-67	1.5000	.0000N	.0000N	.0000L	3.0000	3.0000	.0000L	.0000N	10.0000	.0000L
CD80-68	2.0000	.0000N	.0000N	.0000L	7.0000	15.0000	70.0000	.0000L	30.0000	.0000L

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Pb ppm-S	Pd ppm-S	Pt ppm-S	Sb ppm-S	Sc ppm-S	Sn ppm-S	Sr ppm-S	Te ppm-S	U ppm-S	V ppm-S
CD80-46	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	70.0000	.0000N	.0000N	.0000N
CD80-47	.0000N	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	70.0000
CD80-48	.0000N	.0000N	.0000N	.0000N	.0000L	.0000N	500.0000	.0000N	.0000N	20.0000
CD80-49	.0000N	.0000N	.0000N	.0000N	.0000N	30.0000	15.0000	.0000N	.0000N	200.0000
CD80-50	30.0000	.0000N	.0000N	.0000N	.0000N	.0000N	150.0000	.0000N	.0000N	20.0000
CD80-51	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B	.0000B
CD80-52	20.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	50.0000
CD80-53	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	150.0000	.0000N	.0000N	30.0000
CD80-54	20.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-55	15.0000	.0000N	.0000N	.0000N	10.0000	.0000N	700.0000	.0000N	.0000N	50.0000
CD80-56	.0000N	.0000N	.0000N	.0000N	5.0000	30.0000	20.0000	.0000N	.0000N	70.0000
CD80-57	.0000N	.0000N	.0000N	.0000N	30.0000	.0000N	300.0000	.0000N	.0000N	70.0000
CD80-58	.0000N	.0000N	.0000N	.0000N	10.0000	.0000N	30.0000	.0000N	.0000N	30.0000
CD80-59	.0000N	.0000N	.0000N	.0000N	20.0000	.0000N	300.0000	.0000N	.0000N	70.0000
CD80-60	.0000N	.0000N	.0000N	.0000N	5.0000	15.0000	30.0000	.0000N	.0000N	70.0000
CD80-61	30.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-62	20.0000	.0000N	.0000N	.0000N	5.0000	.0000N	300.0000	.0000N	.0000N	50.0000
CD80-63	30.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-64	.0000N	.0000N	.0000N	.0000N	10.0000	.0000N	300.0000	.0000N	.0000N	70.0000
CD80-65	15.0000	.0000N	.0000N	.0000N	5.0000	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-66	30.0000	.0000N	.0000N	.0000N	.0000N	.0000N	30.0000	.0000N	.0000N	.0000L
CD80-67	30.0000	.0000N	.0000N	.0000N	.0000L	.0000N	300.0000	.0000N	.0000N	30.0000
CD80-68	30.0000	.0000N	.0000N	.0000N	.0000L	.0000N	150.0000	.0000N	.0000N	70.0000

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	W ppm-S	Y ppm-S	Zn ppm-S	Zr ppm-S	Si%-S	Al%-S	Na%-S	K%-S	P%-S	Ce ppm-S
CD80-46	150.0000	.0000N	.0000N	70.0000	10.0000G	1.5000	.7000	.7000	.0000N	.0000N
CD80-47	.0000L	15.0000	.0000N	100.0000	10.0000G	7.0000	3.0000	1.5000	.0000N	.0000L
CD80-48	.0000L	.0000L	.0000N	100.0000	10.0000G	7.0000	1.5000	1.5000	.0000N	.0000N
CD80-49	1000.0000	15 0000	.0000N	20.0000N	7.0000	2.0000	.3000	.0000N	.0000N	500.0000N
CD80-50	.0000N	10.0000	.0000N	70.0000	10.0000G	7.0000	2.0000	3.0000	.0000N	.0000L
CD80-51	.0000N	.0000L	.0000N	50.0000	10.0000G	7.0000	2.0000	3.0000	.0000N	.0000N
CD80-52	0000L	15.0000	.0000N	30.0000	10.0000G	7.0000	1.5000	2.0000	.0000N	.0000L
CD80-53	.0000L	15.0000	.0000N	70.0000	10.0000G	7.0000	1.5000	1.5000	.0000N	.0000N
CD80-54	.0000N	.0000L	.0000N	70.0000	10.0000G	7.0000	1.5000	2.0000	.0000N	.0000L
CD80-55	.0000N	30.0000	.0000N	150.0000	10.0000G	7.0000	3.0000	.7000	.0000N	200.0000
CD80-56	.0000N	10.0000	300 0000	30.0000	7.0000	2.0000	.1500	.0000N	.0000N	500.0000N
CD80-57	.0000N	50.0000	0000N	150.0000	10.0000	7.0000	3.0000	1.5000	.0000N	300.0000
CD80-58	.0000N	30.0000	0000N	300.0000	10.0000G	.3000	.0500	.0000N	.0000N	1500.0000
CD80-59	150.0000	50.0000	.0000N	150 0000	10.0000	7.0000	3.0000	1.5000	.0000N	200.0000
CD80-60	300.0000	15.0000	300 0000	30.0000	7.0000	3.0000	.0700	.0000N	.0000N	500.0000N
CD80-61	.0000N	10.0000	.0000N	70.0000	10.0000G	7.0000	2.0000	3.0000	.0000N	.0000L
CD80-62	.0000N	15.0000	0000N	70.0000	10.0000G	7.0000	1.5000	2.0000	.0000N	.0000L
CD80-63	0000N	15.0000	0000N	50.0000	10.0000G	5.0000	2.0000	3.0000	.0000N	.0000L
CD80-64	.0000N	15.0000	.0000L	70.0000	7.0000	7.0000	.3000	.7000	.0000N	500.0000N
CD80-65	.0000N	30.0000	.0000N	100.0000	10.0000G	7.0000	1.5000	3.0000	.0000N	200.0000
CD80-66	.0000N	0000L	.0000N	30.0000	10.0000G	3.0000	2.0000	3.0000	.0000N	.0000N
CD80-67	.0000N	10 0000	0000N	30.0000	10.0000G	7.0000	2.0000	3.0000	.0000N	.0000L
CD80-68	.0000N	20 0000	.0000N	150.0000	10.0000G	5.0000	1.5000	3.0000	.0000N	.0000L

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Ga ppm-S	Ge ppm-S	Hf ppm-S	In ppm-S	Li ppm-S	Re ppm-S	Ta ppm-S	Th ppm-S	Tl ppm-S	Yb ppm-S
CD80-46	5.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N
CD80-47	20.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.5000
CD80-48	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-49	.0000B	30.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-50	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.0000
CD80-51	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-52	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-53	10.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-54	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-55	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	3.0000
CD80-56	15.0000	20.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-57	10.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	5.0000
CD80-58	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	300.0000	.0000N	3.0000
CD80-59	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	5.0000
CD80-60	15.0000	20.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000B
CD80-61	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.5000
CD80-62	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.5000
CD80-63	15.0000	.0000N	.0000N	.0000N	.0000L	.0000N	.0000N	.0000N	.0000N	1.5000
CD80-64	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	1.5000
CD80-65	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	3.0000
CD80-66	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-67	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000L
CD80-68	15.0000	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	.0000N	2.0000

Table 3.--Basic analytical data and other parameters for 61 rock samples from the Notch Peak intrusive area.--continued

SAMPLE	Pr ppm-S	Nd ppm-S	Sm ppm-S	Eu ppm-S	Th ppm	U ppm	LAB. NO.	LATITUDE	LONGITUD
CD80-46	.0000B	.0000B	0000B	.0000B	12.0000	2.7500	229941.0000	39.1958	113.3958
CD80-47	0000N	70 0000	.0000N	.0000N	42.0000	4.5600	229942.0000	39.1958	113.3958
CD80-48	0000B	.0000B	.0000B	.0000B	32.2000	11.3000	229943.0000	39.1958	113.3958
CD80-49	.0000B	.0000B	.0000B	.0000B	6.0000L	17.3000	229944.0000	39.1958	113.3958
CD80-50	.0000N	.0000N	.0000N	.0000N	35.8000	5.4300	229945.0000	39.1958	113.3958
CD80-51	0000N	.0000N	.0000N	.0000N	17.8000	1.9000	229946.0000	39.1958	113.3958
CD80-52	0000N	.0000N	.0000N	.0000N	20.3000	4.4100	229947.0000	39.1833	113.3917
CD80-53	.0000N	.0000N	.0000N	.0000N	18.4000	4.0100	229948.0000	39.1833	113.3917
CD80-54	.0000N	.0000N	.0000N	.0000N	24.6000	3.0700	229949.0000	39.1833	113.3917
CD80-55	.0000B	150.0000	.0000N	.0000N	125.0000	24.8000	229950.0000	39.1570	113.4472
CD80-56	.0000B	0000B	.0000B	.0000B	3.5000L	8.5900	229951.0000	39.1570	113.4472
CD80-57	.0000B	150.0000	.0000N	.0000N	190.0000	48.5000	229952.0000	39.1570	113.4472
CD80-58	100.0000	300.0000	0000N	.0000N	483.0000	46.3000	229953.0000	39.1570	113.4472
CD80-59	.0000B	150 0000	.0000N	.0000N	198.0000	38.5000	229954.0000	39.1570	113.4472
CD80-60	.0000B	.0000B	.0000B	.0000B	3.1000L	6.4600	229955.0000	39.1570	113.4472
CD80-61	.0000N	.0000N	0000N	.0000N	42.1000	5 8200	229956.0000	39.1889	113.4444
CD80-62	.0000N	70.0000	.0000N	.0000N	65.2000	10.4000	229957.0000	39.1889	113.4444
CD80-63	.0000N	.0000N	0000N	.0000N	41.4000	6.2000	229958.0000	39.1889	113.4444
CD80-64	0000B	.0000N	0000N	.0000N	12.4000	3.6300	229959.0000	39.1570	113.4472
CD80-65	0000B	70.0000	.0000N	.0000N	133.0000	48.2000	229960.0000	39.1570	113.4472
CD80-66	.0000B	.0000B	.0000B	.0000B	34.3000	18.5000	229961.0000	39.1570	113.4472
CD80-67	.0000N	.0000N	.0000N	.0000N	33.0000	4.3900	229962.0000	39.1570	113.4472
CD80-68	.0000N	70 0000	.0000N	.0000N	99.7000	14.7000	229963.0000	39.1570	113.4472

the minimum value that can be consistently observed and reported. The upper reporting limit is the maximum value that can be discerned before saturation of the discriminating element occurs. Numerical values are those that range between and include the reporting limits. Frequency distributions containing some values that lie outside the reporting limits are called censored distributions (Cohen, 1959, 1961; Miesch, 1967).

This study is based on determinations of the 34 elements listed in the first half of table 2. Distributions of these 34 elements are believed to be sufficiently uncensored for purposes of a statistical study of the type presented. Zn, La, Sn, Ce, Go and Yb, despite significant censoring of their distributions are included in this study because of interest in their modes of occurrence as well as their economic importance. It is important to emphasize the tenativeness of any conclusions suggested by calculations much affected by these elements.

The 20 elements listed in the second half of table 2 were not included in the statistical study because of the small percentages of samples from which numerical values for those elements were obtained.

Chemical analyses were performed using a six-step technique described by Myers, Havens and Dunton (1961). Uranium and thorium were determined by delayed neutron analysis using the technique described by Millard (1976). Six samples were selected for analysis for gold, silver and mercury. Gold was determined by fire assay followed by atomic absorption. Mercury was done by atomic absorption. Silver was done by fire assay and acid leach.

Au, Ag, U, and Th were also looked for in the six step spectrographic analysis, but only Ag was detected and in only four samples.

Six samples were analyzed for Hg and Au as a check on the reported occurrence of those elements. The results are summarized below

Sample No.	Hg (parts per billion)	Au (ppm)
CD 80-6	10	<.05
CD 80-10	<10	<.05
CD 80-24	<10	6.3
CD 80-41	70	<.05
CD 80-53	30	2.9
CD 80-57	10	<.05

The high Au sample was collected at location 2, and consisted of a reddish brown, malachite-azurite-stained jasperoid rock, from a mineralized contact zone deposit.

Statistical Analysis

To use as much of the available data as possible, values which fell below the lower reporting limits were arbitarily assigned a value below the reporting limit. Arbitrary values were selected from the six-step scheme. The scale of which is a continuous one: . . . 10, 7, 5, 3, 2, 1.5, 1., .7, and so on. Values reported as "less than" or "L" values (see table 3) were usually given a value equal to 2 or 4 "steps" below the lower reporting limit. Thus, for Cr, with a lower reporting limit of 1 ppm, a "less than" value was assigned an arbitrary value of 0.5 ppm. Similarly, rather than using zero for the "none detected" as N values, a low value, 8 "steps" below the detection limit was arbitrarily substituted for N and used as the data value. This treatment was based on the assumption that all elements are present, that there are no truly zero values, and that some prediction of sub-detection values is justified for censored distributions (Cohen, 1959, 1961; Miesch, 1967). Three elements, Fe, Ca, and Si occurred in some samples in amounts that exceeded the upper reporting limits and were reported as "greater than" 10 percent (10G). Values of 20 percent were substituted for Fe and Si values with the "G" qualifier, and values of 30 were substituted for Ca values with the "G" qualifier. Numerical values were transformed to logarithms essentially for calculating statistical measures as discussed in a previous report (Cadigan, 1969) because most element abundance frequencies tend to be log-normal. Correlation analysis of all possible pairs of the selected elements was done. Based on a symmetrical correlation matrix R-mode factor analysis was done and tentative interpretations of the factors made as appropriate. Basic analytical data as received from the laboratories is listed on in table 3. These data were transformed to logarithms as necessary, the qualifiers removed and a statistical data matrix set up for the statistical analytical procedures to follow.

Figures 3 - 7 illustrate the frequency distributions of the elements in the statistical data matrix as used for correlation and factor analysis. All frequency distributions illustrated are logarithmic except those of Al and Na, which did not follow the log-normal pattern and so are plotted as arithmetic distributions. Numbers to the left of the histograms are class midpoints in natural logarithms, except for Al and Na. Class intervals were selected by the computer program.

Table 4 is the array of $\underline{r}$ linear correlation coefficients of all possible pairs of the 34 elements. Coefficients of $\pm$ 0.250 or higher are significant at the 5 percent level; coefficients of $\pm$ 0.325 or higher are significant at the 1 percent level. The highest positive correlation is between Co and Fe, 0.874. The highest negative correlations between Ge and K, -0.866. U and Th have a significant positive correlation of 0.385.

```
HISTOGRAM FOR VARIABLE   1 (Fe%-S    )

     -1.973E 00 XXXXX
     -1.313E 00 XXXXXXXXXXXXX
     -6.526E-01 XXXXXXXXXXXXXXX
      7.416E-03 XXXXXXXXXXXXX
      6.674E-01 XXXXXXXXXXXXXXXXXX
      1.327E 00 XXXXXXXX
      1.987E 00 XXXXXXXXXXXXXXXXXXXXXXX
      2.647E 00
      3.307E 00 XXXXX

HISTOGRAM FOR VARIABLE   2 (Mg%-S    )

     -3.247E 00 XXXXXXX
     -2.727E 00 XXXXXXXX
     -2.207E 00 XXXXXXX
     -1.687E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     -1.167E 00 XXXXXXXXXXXXXXXXXXXXX
     -6.466E-01 XX
     -1.266E-01 XXXXXXXXXXXXXXX
      3.934E-01 XXXXXXXXXX
      9.134E-01 XX

HISTOGRAM FOR VARIABLE   3 (Ca%-S    )

     -2.279E 00 XXX
     -1.519E 00 XXXXXXXXXXXXXXXXXXXXXXXXXX
     -7.593E-01 XXXXXXXX
      7.389E-04 XXXXXXXXXXXXXXXX
      7.607E-01 XXXXXXXXXX
      1.521E 00 XX
      2.281E 00 XXXXX
      3.041E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

HISTOGRAM FOR VARIABLE   4 (Ti%-S    )

     -4.697E 00 XXXXX
     -4.167E 00 XXXXXXXXXX
     -3.637E 00 XXXXXXXXXXX
     -3.107E 00 XXXXX
     -2.577E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     -2.047E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     -1.517E 00
     -9.868E-01 XXXXX
     -4.568E-01 XX

HISTOGRAM FOR VARIABLE   5 (Mn ppm-S)

      3.766E 00 XX
      4.496E 00 XXXXXXXXXXXXXXX
      5.226E 00 XXXXXXXXXXXXXXXXXXXXX
      5.956E 00 XXXXXXXXXXXXXXX
      6.686E 00 XXXXXXXX
      7.416E 00 XXXXXXXXXXX
      8.146E 00 XXXXXXXXXXX
      8.876E 00 XXXXXXXXXXXXXXXX

HISTOGRAM FOR VARIABLE  10 (Ba ppm-S)

      1.183E 00 XXXXX
      2.163E 00 XXXXXXXX
      3.143E 00 XXXXXXXXXXXXXXXX
      4.123E 00 XXXXXXXXXXXXX
      5.103E 00 XXXXXXXXXXXXXXXXXXXXX
      6.083E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      7.063E 00 XXX
      8.043E 00 XX

HISTOGRAM FOR VARIABLE  11 (Be ppm-S)

     -9.590E-01 XX
     -4.690E-01 XXXXX
      2.103E-02
      5.110E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      1.001E 00 XXXXXXXXXXXXXXXX
      1.491E 00 XX
      1.981E 00 XXXXXXXX
      2.471E 00 XXXXXXXXXXXXX
```

Figure 3.--Histograms of abundances of Fe, Mg, Ca, Ti, Mn, Ba, and Be. Numbers shown are natural logarithms of the class midpoints. From the statistical matrix.

```
HISTOGRAM FOR VARIABLE  14 (Co ppm-S)

    2.650E-01 XXXXXXXXXXXXXXXX
    7.950E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    1.325E 00
    1.855E 00 XXXXXXXXXXXXXXXXXXXX
    2.385E 00 XXXXXXXXXXX
    2.915E 00 XXXXXXXX
    3.445E 00
    3.975E 00
    4.505E 00 XXXXX

HISTOGRAM FOR VARIABLE  15 (Cr ppm-S)

   -4.031E-01 XXXXXXXXXXX
    1.769E-01 XXXXXXXXXXX
    7.569E-01 XXXXXXXX
    1.337E 00 XXXXXXXXXXXXXXXXXXXXXXX
    1.917E 00 XXXXXXXXXXXXXXXXXXXX
    2.497E 00 XXXXXXXXXXXXXXX
    3.077E 00 XX
    3.657E 00 XXXXXXXXXX

HISTOGRAM FOR VARIABLE  16 (Cu ppm-S)

    7.000E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    2.100E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    3.500E 00 XXXXXXXXXXX
    4.900E 00 XXXXX
    6.300E 00
    7.700E 00
    9.100E 00
    1.050E 01 XXXXX

HISTOGRAM FOR VARIABLE  17 (La ppm-S)

    1.083E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    1.863E 00
    2.643E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    3.423E 00
    4.203E 00 XXXXXXXX
    4.983E 00 XXXXXXXXXXXXXXX
    5.763E 00 XX
    6.543E 00 XX

HISTOGRAM FOR VARIABLE  18 (Mo ppm-S)

   -7.390E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    1.910E-01 XXXXXXXXXXXXXXXX
    1.121E 00 XXXXX
    2.051E 00 XXXXXXXXXXX
    2.981E 00 XXXXXXXXXX
    3.911E 00 XXXXXXXXXXX
    4.841E 00 XXXXXXXX
    5.771E 00 XXXXXXXX

HISTOGRAM FOR VARIABLE  19 (Nb ppm-S)

    9.131E-01 XXXXX
    1.353E 00
    1.793E 00 XXXXXXXXXXXXXXXXXX
    2.233E 00 XXXXXXXXXXXXXXXXXX
    2.673E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    3.113E 00 XX
    3.553E 00 XXXXXXXX
    3.993E 00 XX
    4 433E 00 XXX

HISTOGRAM FOR VARIABLE  20 (Ni ppm-S)

    2.150E-01 XXXXX
    6.450E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    1.075E 00
    1.505E 00 XXXXXXXX
    1.935E 00 XXXXXXXX
    2.365E 00 XXX
    2.795E 00 XXXXXXXXXXXXX
    3.225E 00 XX
```

Figure 4.--Histograms of abundances of Co, Cr, Cu, La, Mo, Nb, and Ni. Numbers shown are natural logarithms of class midpoints. From the statistical data matrix.

```
HISTOGRAM FOR VARIABLE  21 (Pb ppm-S)

     -3.831E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      2.369E-01
      8.569E-01
      1.477E 00
      2 097E 00 XXX
      2.717E 00 XXXXXXXXXXXXXXXXXXXXXXX
      3.337E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      3.957E 00 XXXXX

HISTOGRAM FOR VARIABLE  25 (Sc ppm-S)

      2.150E-01 XXXXXXXXXXXXXXXXXXXXXXX
      6.450E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      1.075E 00
      1.505E 00 XXXXXXXXXXXXX
      1.935E 00 XXXXXXXX
      2.365E 00 XXXXX
      2.795E 00 XXXXXXXX
      3.225E 00 XX

HISTOGRAM FOR VARIABLE  26 (Sn ppm-S)

     -2.168E-02 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      6.483E-01
      1.318E 00 XX
      1.988E 00
      2.658E 00 XXXXX
      3.328E 00 XXXXXXXXXXXXXXXXXXXXXXX
      3.998E 00 XXX
      4.668E 00
      5.338E 00 XX

HISTOGRAM FOR VARIABLE  2( (Sr ppm-S)

      1.183E 00 XXXXXXX
      2.163E 00 XXXXX
      3.143E 00 XXXXXXXXXXXXXXXXXX
      4.123E 00 XXXXXXXXXXX
      5.103E 00 XXXXXXXXXXXXXXXXXXXX
      6.083E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      7.063E 00
      8.043E 00 XXX

HISTOGRAM FOR VARIABLE  30 (V ppm-S )

      7.355E-01 XXXXX
      1.395E 00 XXX
      2.055E 00 XXXXX
      2.715E 00 XXXXXXXXXXXXXXXXXXXXXXX
      3.375E 00 XXXXXXXXXXXXXXXXXXXXX
      4.035E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXX
      4.695E 00 XXXXXXXX
      5.355E 00 XXXXX
      6.015E 00 XX

HISTOGRAM FOR VARIABLE  31 (W ppm-S )

      2.009E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      2.809E 00 XXXXXXXX
      3.609E 00
      4.409E 00 XX
      5.209E 00 XXXXXXXXXX
      6.009E 00 XXXXXXXXXX
      6.809E 00 XXX
      7.609F 00 XXXXXXX

HISTOGRAM FOR VARIABLE  32 (Y ppm-S )

      8.931E-01 XXXXXXX
      1.293E 00
      1.693E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      2.093E 00
      2.493E 00 XXXXXXXX
      2.893E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
      3.293E 00 XXXXXXXXXXXXX
      3.693E 00
      4.093E 00 XXX
```

Figure 5.--Histograms of abundances of Pb, Sc, Sn, Sr, V, W, and Y. Numbers shown are natural logarithms of class midpoints. From the statistical data matrix.

```
HISTOGRAM FOR VARIABLE  33 (Zn ppm-S)

     2.968E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     3.488E 00
     4.008E 00 XXX
     4.528E 00
     5.048E 00
     5.568E 00 XXXXXXX
     6.088E 00
     6.608E 00 XXX
     7.128E 00 XXX

HISTOGRAM FOR VARIABLE  34 (Zr ppm-S)

     2.181E 00 XX
     2.651E 00 XXXXXXXX
     3.121E 00 XXX
     3.591E 00 XXXXXXXXXXXXXXXXXXXXX
     4.061E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     4.531E 00 XXXXXXXXXXX
     5.001E 00 XXXXXXXXXX
     5.471E 00 XXXXX

HISTOGRAM FOR VARIABLE  35 (Si%-S    )

     1.219E 00 XX
     1.459E 00
     1.699E 00 XXX
     1.939E 00 XXXXXXXXXXXXXXXXXXXX
     2.179E 00
     2.419E 00 XXXXXXXXXXXXXXX
     2.659E 00
     2.899E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

HISTOGRAM FOR VARIABLE  36 (Al%-S    )

     7.200E-01 XXXXXXXXXXXXXXX
     1.560E 00 XXXXXXXXXXX
     2.400E 00 XXX
     3.240E 00 XXXXXXXXXX
     4.080E 00
     4.920E 00 XXXXXXXXXXXXXXXXXXXXX
     5.760E 00
     6.600E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

HISTOGRAM FOR VARIABLE  37 (Na%-S    )

     2.050E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     5.750E-01 XXXXXXX
     9.450E-01 XX
     1.315E 00
     1.685E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     2.055E 00 XXXXXXXXXXXXXXX
     2.425E 00
     2.795E 00
     3.165E 00 XXXXXXXXXXXXXXX

HISTOGRAM FOR VARIABLE  38 (K%-S     )

    -2.369E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    -1.789E 00
    -1.209E 00
    -6.293E-01 XXXXXXXX
    -4.926E-02 XX
     5.307E-01 XXXXXXXXXXXXXXXXXXXXXXX
     1.111E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     1.691E 00 XXX

HISTOGRAM FOR VARIABLE  40 (Ce ppm-S)

     2.618E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     3.248E 00
     3.878E 00 XXXXXXXXXXXXXXXXXXXXXXXXXX
     4.508E 00
     5.138E 00 XXXXX
     5.768E 00 XXX
     6.398E 00 XXX
     7.028E 00 XX
```

Figure 6.--Histograms of abundances of Zn, Zr, Si, Al, Na, K, and Ce. Numbers shown are natural logarithms of class midpoints. From the statistical data matrix.

```
HISTOGRAM FOR VARIABLE  41 (Ga ppm-S)

    -4.381E-01 XXXXXXXXXXXXXXXXXXXXXXXXXXXX
     7.185E-02
     5.819E-01 XX
     1.092E 00
     1.602E 00 XX
     2.112E 00 XXXXXXX
     2.622E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     3.132E 00 XX
     3.642E 00 XXX

HISTOGRAM FOR VARIABLE  42 (Ge ppm-S)

    -1.294E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    -6.644E-01
    -3.444E-02
     5.956E-01 XXX
     1.226E 00
     1.856E 00
     2.486E 00 XXXXXXXXXXXXXXX
     3.116E 00 XXXXXXXXXX

HISTOGRAM FOR VARIABLE  50 (Yb ppm-S)

    -2.394E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
    -1.864E 00
    -1.334E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXX
    -8.043E-01
    -2.743E-01
     2.557E-01 XXXXXXXXXXXXXXXX
     7.857E-01 XXX
     1.316E 00 XXXXXXXXXX
     1.846E 00 XXX

HISTOGRAM FOR VARIABLE  52 (Nd ppm-S)

     1.389E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     1.969E 00
     2.549E 00 XX
     3.129E 00
     3.709E 00
     4.289E 00 XXXXXXXX
     4.869E 00 XXXXXXXXXX
     5.449E 00 XX

HISTOGRAM FOR VARIABLE  55 (Th ppm   )

     1.246E 00 XXXXXXXXXXXXXXX
     1.906E 00 XXXXXXXX
     2.566E 00 XXXXXXXXXXXXX
     3.226E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     3.886E 00 XXXXXXXXXXXXXXXXXX
     4.546E 00 XXXXX
     5.206E 00 XXXXXXXXXX
     5.866E 00 XX

HISTOGRAM FOR VARIABLE  56 (U ppm    )

     4.096E-01 XXX
     1.170E 00 XXXXXXXXXXXXXXXXXX
     1.930E 00 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
     2.690E 00 XXXXXXXXXXXXXXXXXXXXXXXXX
     3.450E 00 XXXXXXX
     4.210E 00 XXXXXXXX
     4.970E 00
     5.730E 00 XXXXX
```

Figure 7.--Histograms of abundances of Ga, Ge, Yb, Nd, Th, and U. Numbers shown are natural logarithms of class midpoints. From the statistical data matrix.

Table 4.--Correlation matrix of r values for all possible pairs of elements.

	1 Fe%-S	2 Mg%-S	3 Ca%-S	4 Ti%-S	5 Mn ppm-S	6 Ba ppm-S	7 Be ppm-S	8 Co ppm-S	9 Cr ppm-S	10 Cu ppm-S
1Fe%-S	1.00000	.65571	.58862	.12038	.78601	-.61753	.26471	.87432	.32095	.62424
2Mg%-S	.65571	1.00000	.71260	.50620	.70953	-.30137	.09019	.60233	.67068	.06749
3Ca%-S	.58862	.71260	1.00000	.24018	.83253	-.47554	.19130	.42110	.41231	.03468
4Ti%-S	.12038	.50620	.24018	1.00000	.27644	.28787	.07955	.17150	.77568	-.23404
5Mn ppm-S	.78601	.70953	.83253	.27644	1.00000	-.52534	.24612	.65352	.44931	.25631
6Ba ppm-S	-.61753	-.30137	-.47554	.28787	-.52534	1.00000	-.14415	-.48582	.07273	-.47158
7Be ppm-S	.26471	.09019	.19130	.07955	.24612	-.14415	1.00000	.35771	.09103	.34933
8Co ppm-S	.87432	.60233	.42110	.17150	.65352	-.48582	.35771	1.00000	.40066	.68522
9Cr ppm-S	.32095	.67068	.41231	.77568	.44931	.07273	.09103	.40066	1.00000	-.07281
10Cu ppm-S	.62424	.06749	.03468	-.23404	.25631	-.47158	.34933	.68522	-.07281	1.00000
11La ppm-S	.01749	.17101	.06482	.37294	.07883	.21479	-.03379	-.01920	.40359	-.00125
12Mo ppm-S	.53498	.32777	.63243	-.13322	.61709	-.41166	.48127	.51983	.12558	.34761
13Nb ppm-S	-.13725	-.09084	-.05445	.45416	-.07150	.26956	.41276	-.02225	.18861	.02561
14Ni ppm-S	.60808	.59611	.32160	.32453	.56505	-.29897	.24133	.75283	.52006	.38679
15Pb ppm-S	-.44078	-.48719	-.78127	-.15330	-.73684	.49855	-.02803	-.32513	-.30489	.00031
16Sc ppm-S	.03963	.40418	.43275	.55900	.26629	.22753	.20300	.15290	.61563	-.13540
17Sn ppm-S	.80383	.49253	.69631	-.10707	.73437	-.73658	.35502	.68586	.12686	.48050
18Sr ppm-S	-.51347	-.09120	-.25396	.48985	-.34945	.82744	.14733	-.33623	.30617	-.39860
19V ppm-S	.78596	.70865	.51795	.46133	.68670	-.37578	.10874	.65176	.58770	.35729
20W ppm-S	.70893	.25047	.47334	-.19651	.59837	-.60307	.37886	.65190	-.03572	.61556
21Y ppm-S	.30100	.46046	.49211	.62521	.47183	.12690	.22357	.35774	.68336	.09030
22Zn ppm-S	.51850	.30298	.17659	-.01798	.30481	-.44551	.31952	.67175	.25771	.57534
23Zr ppm-S	-.30745	.04370	-.11232	.58267	-.10931	.43722	.06406	-.19586	.46124	-.25758
24Si%-S	-.81522	-.44899	-.57264	.09201	-.64468	.68278	-.32191	-.77531	-.19752	-.66635
25Al%-S	-.54605	-.16413	-.33096	.44553	-.38139	.81619	-.04354	-.50175	.20587	-.46959
26Na%-S	-.66226	-.43331	-.41830	.27526	-.49151	.71839	-.01697	-.61868	.04560	-.44350
27K%-S	-.66229	-.56827	-.75984	.07736	-.75500	.75427	-.08212	-.52851	-.20696	-.21964
28Ce ppm-S	.07338	.09456	.03640	.18520	.06960	.08762	-.00763	.00328	.23632	.10622
29Ga ppm-S	-.72234	-.31076	-.48846	.28106	-.57566	.72013	-.20687	-.64231	.04270	-.49663
30Ge ppm-S	.65686	.61205	.83245	-.04419	.76494	-.68866	.11938	.45530	.14823	.11855
31Yb ppm-S	-.50997	-.17199	-.14573	.39716	-.33222	.54686	-.07157	-.43381	.29667	-.32219
32Nd ppm-S	.05670	.12443	.10235	.21033	.11322	.01367	-.00882	.01644	.28721	.10004
33Th ppm	-.25127	-.35168	-.45426	.19720	-.34894	.40425	.18296	-.12005	.07690	.19019
34U ppm	.52962	.03608	.19704	-.16300	.29315	-.47352	.50677	.55236	-.01370	.77213

Table 4.--Correlation matrix of r values for all possible pairs of elements.--continued

	11 La ppm-S	12 Mo ppm-S	13 Nb ppm-S	14 Ni ppm-S	15 Pb ppm-S	16 Sc ppm-S	17 Sn ppm-S	18 Sr ppm-S	19 V ppm-S	20 W ppm-S
1Fe%-S	.01749	.53498	-.13725	.60808	-.44078	.03963	.80383	-.51347	.78596	.70893
2Mg%-S	.17101	.32777	-.09084	.59611	-.48719	.40418	.49253	-.09120	.70865	.25047
3Ca%-S	.06482	.63243	-.05445	.32160	-.78127	.43275	.69631	-.25396	.51795	.47334
4Ti%-S	.37294	-.13322	.45416	.32453	-.15330	.55900	-.10707	.48985	.46133	-.19651
5Mn ppm-S	.07883	.61709	-.07150	.56505	-.73684	.26629	.73437	-.34945	.68670	.59837
6Ba ppm-S	.21479	-.41166	.26956	-.29897	.49855	.22753	-.73658	.82744	-.37578	-.60307
7Be ppm-S	-.03379	.48127	.41276	.24133	-.02803	.20300	.35502	.14733	.10874	.37886
8Co ppm-S	-.01920	.51983	-.02225	.75283	-.32513	.15290	.68586	-.33623	.65176	.65190
9Cr ppm-S	.40359	.12558	.18861	.52006	-.30489	.61563	.12686	.30617	.58770	-.03572
10Cu ppm-S	-.00125	.34761	.02561	.38679	.00031	-.13540	.48050	-.39860	.35729	.61556
11La ppm-S	1.00000	-.20137	.40964	-.04920	.04277	.39372	-.24221	.23496	.26110	-.15470
12Mo ppm-S	-.20137	1.00000	-.05858	.36123	-.50526	.21851	.75889	-.23207	.30164	.70834
13Nb ppm-S	.40964	-.05858	1.00000	-.01272	.13010	.38245	-.26737	.48807	.04950	-.10599
14Ni ppm-S	-.04920	.36123	-.01272	1.00000	-.23489	.21862	.44124	-.10186	.61455	.33831
15Pb ppm-S	.04277	-.50526	.13010	-.23489	1.00000	-.29544	-.52076	.32598	-.40099	-.45326
16Sc ppm-S	.39372	.21851	.38245	.21862	-.29544	1.00000	-.01100	.44210	.17562	-.07535
17Sn ppm-S	-.24221	.75889	-.26737	.44124	-.52076	-.01100	1.00000	-.59349	.53066	.80380
18Sr ppm-S	.23496	-.23207	.48807	-.10186	.32598	.44210	-.59349	1.00000	-.22972	-.54444
19V ppm-S	.26110	.30164	.04950	.61455	-.40099	.17562	.53066	-.22972	1.00000	.40803
20W ppm-S	-.15470	.70834	-.10599	.33831	-.45326	-.07535	.80380	-.54444	.40803	1.00000
21Y ppm-S	.46606	.30916	.46479	.33510	-.31849	.74396	.15376	.33145	.49533	.10611
22Zn ppm-S	-.19772	.43565	-.08977	.69499	-.07046	.01029	.52575	-.18993	.35006	.34164
23Zr ppm-S	.45767	-.23578	.44267	-.10919	.03137	.54448	-.43354	.57226	-.03644	-.38543
24Si%-S	.11831	-.66692	.08693	-.60767	.42869	-.07839	-.84358	.51716	-.57367	-.75305
25Al%-S	.30708	-.44063	.42098	-.18980	.43594	.26862	-.69758	.82551	-.20609	-.62842
26Na%-S	.29415	-.38449	.52059	-.39139	.43408	.20082	-.67890	.74522	-.35042	-.53943
27K%-S	.11982	-.58910	.38509	-.35430	.72858	-.09832	-.79859	.66348	-.47529	-.59311
28Ce ppm-S	.82365	-.19620	.39170	-.12833	.03359	.28262	-.21991	.09932	.18281	-.08891
29Ga ppm-S	.16889	-.59051	.24013	-.26248	.50618	.14492	-.80755	.72514	-.43956	-.75949
30Ge ppm-S	-.24232	.63167	-.36272	.28149	-.70442	.04901	.85183	-.57691	.47000	.60488
31Yb ppm-S	.52925	-.33055	.53562	-.31546	.20282	.44056	-.56267	.65002	-.18252	-.53767
32Nd ppm-S	.82119	-.11636	.45472	-.07605	-.12270	.37863	-.19156	.05737	.20240	-.07426
33Th ppm	.59776	-.32579	.66272	-.14970	.44794	.20546	-.48342	.44846	-.07517	-.23796
34U ppm	.17936	.40860	.31164	.21998	-.08523	.10857	.45473	-.30069	.29941	.55102

Table 4.--Correlation matrix of r values for all possible pairs of elements.--continued

	21 Y ppm-S	22 Zn ppm-S	23 Zr ppm-S	24 Si%-S	25 Al%-S	26 Na%-S	27 K%-S	28 Ce ppm-S	29 Ga ppm-S	30 Ge ppm-S
1Fe%-S	.30100	.51850	-.30745	-.81522	-.54605	-.66226	-.66229	.07338	-.72234	.65686
2Mg%-S	.46046	.30298	.04370	-.44899	-.16413	-.43331	-.56827	.09456	-.31076	.61205
3Ca%-S	.49211	.17659	-.11232	-.57264	-.33096	-.41830	-.75984	.03640	-.48846	.83245
4Ti%-S	.62521	-.01798	.58267	.09201	.44553	.27526	.07736	.18520	.28106	-.04419
5Mn ppm-S	.47183	.30481	-.10931	-.64468	-.38139	-.49151	-.75500	.06960	-.57566	.76494
6Ba ppm-S	.12690	-.44551	.43722	.68278	.81619	.71839	.75427	.08762	.72013	-.68866
7Be ppm-S	.22357	.31952	.06406	-.32191	-.04354	-.01697	-.08212	-.00763	-.20687	.11938
8Co ppm-S	.35774	.67175	-.19586	-.77531	-.50175	-.61868	-.52851	.00328	-.64231	.45530
9Cr ppm-S	.68336	.25771	.46124	-.19752	.20587	.04560	-.20696	.23632	.04270	.14823
10Cu ppm-S	.09030	.57534	-.25758	-.66635	-.46959	-.44350	-.21964	.10622	-.49663	.11855
11La ppm-S	.46606	-.19772	.45767	.11831	.30708	.29415	.11982	.82365	.16889	-.24232
12Mo ppm-S	.30916	.43565	-.23578	-.66692	-.44063	-.38449	-.58910	-.19620	-.59051	.63167
13Nb ppm-S	.46479	-.08977	.44267	.08693	.42098	.52059	.38509	.39170	.24013	-.36272
14Ni ppm-S	.33510	.69499	-.10919	-.60767	-.18980	-.39139	-.35430	-.12833	-.26248	.28149
15Pb ppm-S	-.31849	-.07046	.03137	.42869	.43594	.43408	.72858	.03359	.50618	-.70442
16Sc ppm-S	.74396	.01029	.54448	-.07839	.26862	.20082	-.09832	.28262	.14492	.04901
17Sn ppm-S	.15376	.52575	-.43354	-.84358	-.69758	-.67890	-.79859	-.21991	-.80755	.85183
18Sr ppm-S	.33145	-.18993	.57226	.51716	.82551	.74522	.66348	.09932	.72514	-.57691
19V ppm-S	.49533	.35006	-.03644	-.57367	-.20609	-.35042	-.47529	.18281	-.43956	.47000
20W ppm-S	.10611	.34164	-.38543	-.75305	-.62842	-.53943	-.59311	-.08891	-.75949	.60488
21Y ppm-S	1.00000	.13385	.42428	-.20344	.16522	.13069	-.16861	.34245	-.04687	.15200
22Zn ppm-S	.13385	1.00000	-.25448	-.64919	-.36281	-.46640	-.32807	-.22343	-.31515	.22767
23Zr ppm-S	.42428	-.25448	.99999	41575	.49660	.44438	.30006	.31252	.44312	-.40540
24Si%-S	-.20344	-.64919	.41575	99998	.59483	.58659	.61324	.03031	.68463	-.60883
25Al%-S	.16522	-.36281	.49660	.59483	1.00000	.80736	.74236	.14605	.85319	-.62960
26Na%-S	.13069	-.46640	.44438	.58659	.80736	1.00000	.77525	.24290	.75924	-.64775
27K%-S	-.16861	-.32807	.30006	.61324	.74236	.77525	1.00000	.09197	.78262	-.86582
28Ce ppm-S	.34245	-.22343	.31252	.03031	.14605	.24290	.09197	1.00000	.04309	-.19883
29Ga ppm-S	-.04687	-.31515	.44312	.68463	.85319	.75924	.78262	.04309	1.00000	-.70286
30Ge ppm-S	.15200	.22767	-.40540	-.60883	-.62960	-.64775	-.86582	-.19883	-.70286	1.00000
31Yb ppm-S	.43104	-.26047	.61544	.45500	.64630	.64835	.45753	.37815	.59508	-.54187
32Nd ppm-S	.42039	-.21389	.36933	.02537	.10704	.20521	.02092	.83875	.02292	-.11192
33Th ppm	.24994	-.11887	.47257	.20084	.42136	.56301	.61587	.61513	.36980	-.70796
34U ppm	.27398	.43393	-.13733	-.62881	-.41378	-.25164	-.21126	.33153	-.49467	.16490

Table 4.--Correlation matrix of r values for all possible pairs of elements.--continued

	31 Yb ppm-S	32 Nd ppm-S	33 Th ppm	34 U ppm
1Fe%-S	-.50997	.05670	-.25127	.52962
2Mg%-S	-.17199	.12443	-.35168	.03608
3Ca%-S	-.14573	.10235	-.45426	.19704
4Ti%-S	.39716	.21033	.19720	-.16300
5Mn ppm-S	-.33222	.11322	-.34894	29315
6Ba ppm-S	.54686	01367	.40425	-.47352
7Be ppm-S	-.07157	-.00882	.18296	.50677
8Co ppm-S	-.43381	.01644	-.12005	.55236
9Cr ppm-S	.29667	.28721	.07690	-.01370
10Cu ppm-S	-.32219	.10004	.19019	.77213
11La ppm-S	.52925	.82119	.59776	.17936
12Mo ppm-S	-.33055	-.11636	-.32579	.40860
13Nb ppm-S	.53562	.45472	.66272	.31164
14Ni ppm-S	-.31546	-.07605	-.14970	.21998
15Pb ppm-S	.20282	-.12270	.44794	-.08523
16Sc ppm-S	.44056	.37863	.20546	.10857
17Sn ppm-S	-.56267	-.19156	-.48342	.45473
18Sr ppm-S	.65002	.05737	.44846	-.30069
19V ppm-S	-.18252	.20240	-.07517	.29941
20W ppm-S.	-.53767	-.07426	-.23796	.55102
21Y ppm-S	.43104	.42039	.24994	.27398
22Zn ppm-S	-.26047	-.21389	-.11887	.43393
23Zr ppm-S	.61544	.36933	.47257	-.13733
24Si%-S	.45500	.02537	.20084	-.62881
25Al%-S	.64630	.10704	42136	-.41378
26Na%-S	.64835	.20521	.56301	-.25164
27K%-S	.45753	.02092	.61587	-.21126
28Ce ppm-S	.37815	.83875	.61513	.33153
29Ga ppm-S	.59508	.02292	.36980	-.49467
30Ge ppm-S	-.54187	-.11192	-.70796	.16490
31Yb ppm-S	1.00000	.41313	.59926	-.06654
32Nd ppm-S	.41313	1.00000	.54067	.35202
33Th ppm	.59926	.54067	1 00000	.38469
34U ppm	-.06654	.35202	.38469	1.00000

The symmetrical 34x34 correlation matrix_of Table 4 is the basis for an R-mode varimax factor analysis. From the results of the factor analysis, five factors were chosen as yielding the most reasonably interpreted element groups. Table 5 gives the reordered oblique projection matrix for five factors. Table 6 is the varimax factor matrix from which the oblique projection matrix was derived. The communalities in table 6 indicate the degree to which covariance in the correlation matrix is accounted for by the five factors. For example, communalities for U and Th are .89 and .92 respectively indicating that 89 percent of U covariance and 92 percent of Th covariance are accounted for by the five factors.

The five factors account for 82 percent of the total covariance in the correlation matrix, a high percentage. The factors as shown in table 5 have been interpreted in terms of their cause and affect relationship to the results of contact metamorphism which occurred when the Notch Peak intruded into the Cambrian limestones and shales.

Factor 1 is interpreted as the limestone source rock reaction, suggesting that elements involved were either contributed by the limestones or that their covariances were a product of the metamorphism of the limestone. The suggested affects could include both parallel migrations of certain elements, and the formation of new minerals with fixed element associations; both sets of affects would create convariances among the elements listed under factor 1 in table 5. The element group is dominated by Ca associated with Mn and Mg as might be expected. The negative association of K with Ca seems to fit the loss of K from the monzonite-limestone reaction zone - - K feldspars are rare. Explanation of the negative covariance of Pb with factor 1 is not attempted here. No attempt is made to fit the other elements into an interpretive scheme because of a lack

Table 5. Reordered oblique projection matrix produced from a five factor varimax factor matrix (table 6). Primary component elements (*) are listed under the factors. Secondary components are shown in parentheses.

Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Limestone source rock reactions	Monzonite source rock reactions	Hydrothermal group #1 elements	Rare earth group elements	Hydrothermal group #2 elements
*Ca	*Sr	*Ni	*Ce	*Be
*Ge	*Al	*Ce	*Nd	*U
*Mn	*Ba	*V	*La	*Cu
*Y	*Ti	*Zn	*Th	*Mo
	*Ga	*Cr		*W
	*Zr	*Mg		*Nb
	*Na	*Fe		
	*Yb			
	*Sc			
	*Si			
* -Pb	*-Sn			
* -K				
(Mg)	(Cr)	(Ti)	(U)	(Th)
(Sc)	(K)	(Cu)	(Nb)	(Sn)
(Mo)	(Nb)	(-Si)	(Y)	(Zn)
(Cr)	(-Cu)		(Yb)	(-Si)
(Ti)	(-W)			(-Mg)
(-Th)	(-U)			(-Ti)
	(-Fe)			(-Cr)

Table 6.--Reordered varimax factor matrix obtained by factor analysis of the 34 x 34 correlation matrix. For each factor, primary element component loadings are marked with an asterisk (*), and secondary element component loadings are shown in parentheses (__). [The -S symbol indicates spectrochemical analysis].

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Communalities
Ca%-S	* .918	.138	.186	.030	.104	.91
Ge ppm-S	* .888	-.263	.184	-.170	.043	.92
5Mn ppm-S	* .783	.020	(.453)	.075	.144	.84
Sn ppm-S	* .679	-.342	.380	-.182	.394	.91
Mo ppm-S	* .622	-.021	.136	-.233	(.595)	.81
Ga ppm-S	*-.593	(.565)	-.238	-.049	-.319	.83
K%-S	*-.848	.335	-.259	.027	-.025	.90
Pb ppm-S	*-.868	-.016	-.060	-.037	.007	.76
Sr ppm-S	-.393	* .850	-.118	-.054	.009	.89
Ti%-S	.108	* .748	-.413	.167	-.193	.81
Al%-S	-.473	* .731	-.156	.031	-.201	.82
Sc ppm-S	.326	* .719	.101	.242	.135	.71
Zr ppm-S	-.115	* .682	-.061	.330	-.086	.60
Yb ppm-S	-.258	* .658	-.259	(.401)	-.037	.73
Y ppm-S	.351	* .630	.307	.355	.222	.79
Ba ppm-S	-.521	* .622	-.257	-.034	-.207	.77
Na%-S	(-.476)	* .614	-.412	.148	-.011	.80
Cr ppm-S	.282	* .603	(.587)	.206	-.146	.85
Nb ppm-S	-.200	* .545	-.064	(.397)	(.449)	.70
Ni ppm-S	.158	.083	* .861	-.157	.144	.82
Co ppm-S	.309	-.166	* .793	.028	.381	.90
V ppm-6	(.404)	.037	* .736	.250	.006	.77
Fe%-S	(.498)	-.290	* .695	.110	.263	.90
Zn ppm-S	.009	-.149	* .693	-.244	(.394)	.72
Mg%-S	(.593)	.212	* .638	.058	-.180	.84
Si%-S	-.449	.318	*-.549	.006	(.491)	.85
Nd ppm-S	.078	.149	-.029	*.916	.032	.87
Ce ppm-S	-.033	.100	-.001	*.915	.014	.85
La ppm-S	-.029	.303	.078	*.857	-.080	.84
Th ppm	(-.580)	.292	-.039	*.624	.331	.92
Be ppm-S	.088	.213	.098	-.099	*.784	.69
U ppm	.076	-.257	.240	(.411)	*.771	.89
Cu ppm-S	-.075	(.446)	(.489)	.189	*.608	.85
W ppm-s	(.500)	-.388	.248	-.036	*.553	.77

of detailed mineralogic information and the obviously complicated geochemistry of the contact zone.

Factor 2 is interpreted as the monzonite source rock reaction. Elements grouped under this factor include the major elements Al, Na, Si, K, the main source of which would be the intrusive. The negatively associated elements, Sn, Cu, W, U, Fe apparently decrease as the monzonite rock elements increase (away from the contact zone?).

Factor 3 is interpreted to be a hydrothermal depositional grouping of elements dominated by the Ni, Co, V, Fe, Zn, and Mg associations. The formation of sulfides is suggested by the association of these elements.

Factor 4 is interpreted to be a rare earth element grouping dominated by Ce, Nd, and La, with causes of this grouping not apparent. U and Th are included in the element group, Th as a primary component and U as a secondary component.

Factor 5 is interpreted to be a second hydrothermal depositional grouping of elements. The dominant position held by Be and U suggest that the factor is similar to the "beryllium-belt" mineralization reported by Cohenour (1963), who reported a regional zone of anomalous Be extending from east to west across north central Utah. A Be-U factor was also reported in Cadigan and Ketner (1980, p. 28) which resulted from factor analysis of the beryllium tuff data from drill core in the Spor Mountain-Thomas Range area 50-60 km north of Notch Peak.

The Factor 5 element group contains nearly all of the economically significant elements that occur in the contact zone. Insufficient Au and Hg analyses were obtained to include these two elements in the statistical analysis. Elements considered to be important in the factor 5 grouping are Be, U, Cu, Mo, W, Th, Sn, and Zn.

The factor analysis results suggest major factors affecting the distribution of elements in and near the Notch Peak contact metamorphism zone. Further information could be developed by computing factor scores after the method of Steiner (1965), and as described in a previous paper (Cadigan, p. 5, 1982), but this would go beyond the scope of this paper. The purpose of the study is to examine the data for significant information bearing on U and Th resources. For this reason, scores for only factor 5 were computed to establish the geographic distribution of the second hydrothermal grouping of elements the Be-U group The results are listed in table 7. The samples most affected by the factor 5 hydrothermal minerlization are from localities 2, 12, 10, 7 and 4. Of the 12 samples with anomalous scores (3.0 or more) 6 are from locality 2, 2 each are from localities 12, and 10, and 1 each are from localities 7 and 4. Locality 2 as shown in fig. 2, is near the southern margin of the intrusive. The factor scores suggest that the locality 2 area is most affected by the Be-U mineralization episode.

To test the effects on the factor analysis of including Zn and Ce, a second factor analysis was run without them. The results showed little significant change. The factors remained the same. Factor 2 in this report became factor 5, factor 3 became factor 2, and factor 5 became factor 3. The advantage of retaining Zn and Ce is that they fall into the logical groups, Zn with the mineralization factor, and Ce with the rare earth factor, which reinforces the interpretation of the factors.

Table 7.--Scores for factor 5, the Be-U mineralization factor. Scores of +3.0 or more are considered to be anomalous. Only these anomalous scores are shown together with sample and locality numbers.

Score	Sample No.	Locality No.
14.83	CD 80-23	2
13.68	CD 80-24	2
13.29	CD 80-22	2
6.30	CD 80-19	2
5.97	CD 80-20	2
4.78	CD 80-41	12
4.59	CD 80-49	7
3.68	CD 80-28	10
3.39	CD 80-35	4
3.14	CD 80-14	12
3.13	CD 80-26	2
3.11	CD 80-32	10

Uranium and Thorium

Factor analysis of the sample data suggests that U and Th are associated with two groups of elements, a rare earth group in which Th is more important than U and a mineralization group in which U is more important than Th. Different geographic locations of high U and high Th samples support the different trace element associations of the two elements suggested by the results of the factor analysis.

Uranium values in 31 samples of altered quartz monzonite ranged from 1.9 to 48.5 ppm with a geometric mean of 7.4 ppm and a median value which was approximately the same. Thorium values in the same samples ranged from 16.7 to 483 ppm with a geometric mean of 43.6 ppm and a median value of approximately 35 ppm. The average Th/U ratio is approximately 6.

Uranium values in the 21 samples of tactite and skarn from the contact zone ranged from 3 to 446 ppm with a geometric mean of 19.3 ppm and an approximate median of 15. Few reliable Th values could be determined for contact zone samples, which suggests that U values may be generally higher than Th values in the contact zone. Anomalously high U values were found in the contact zone at location 2, the south central part of the dome. Anomalously high Th values were found in the contact zone at location 8, the southwestern part of the dome. The highest U values represent low-grade ore of approximately 0.06 percent U_3O_8.

Summary and Conclusions

The results of the geochemical study of anomalous radioactivity suggested by an airborne gamma spectrometer survey and anomalously high U in stream sediments confirmed that low ore-grade uranium occurrences are present in the Notch Peak area.

The major feature of economic significance at Notch Peak is the presence of anomalous amounts of U, Th, W, Au, and Be, associated with a Jurassic(?) quartz monzonite dome intruded into Cambrian limestones. Hydrothermal alteration, metamorphism, and mineralization occurred along the intrusive contact. Alteration effects extended to considerable distance into both igneous intrusive and intruded sedimentary rocks. Thick (1-10 m) pods of tactite and a skarn zone many meters thick formed along the contact.

The tactites have been mined in the past as tungsten ores, but the low grade of ore and cost of transportation caused the operator to shut down the mining. Small scale placer gold mining has continued sporadically over the years and is presently active on the north side of the intrusive dome. Five geochemical factors have been computed for the altered rocks, tactites, skarns and ore minerals along the contact zone. These factors in order of their effect on the element distribution are limestone source rock reactions, monzonite source rock reactions, hydrothermal group number 1 elements, rare earth group elements, and hydrothermal group number 2 elements. The last factor seems to be, commercially, the most important factor controlling as it did the distribution of Be, U, Cu, Mo, W, Nb and to a lesser extent Th, Sn, and Zn and possibly Au.

Some shallow drilling has been done in the area for the purpose of locating the thicker parts of the tactite mineralization along the contact zone. Based on field observations, there appears to be much low grade tungsten ore in place. Little or no geochemical prospecting has been done. It is unlikely that U or Th have been recovered from the ores, (A. R. Kirk, written commun., 1982).

It is apparent, however, that at locality 2 there is U-ore present in grades ranging from 0.01-0.1 percent U_3O_8. At locality 8, low grade Th ore is present with anomalous amounts of rare earths including Ce in the 200-1500 ppm range. This combination of elements suggests the presence of the mineral monazite; none was recognized in the X-ray diffraction patterns which only suggests that if present it constitutes less than five percent of the rock.

The area has visible reserves of low grade W-ore. No attempt has been made to develop Th and U reserves, and the area generally appears favorable for geochemical exploration along the southern and western flanks of the intrusive dome. The suggested major northwest-striking fault bisecting the dome also suggests the presence of exploration targets. One of the mines called the Klondike is located near the suggested fault, on the eastern flank of the intrusive dome.

No potential reserve figure for U-ore greater than 100 tons of 0.01% grade is warranted by the results of this study, but there appears to be much that is not known about the mineral potential of the Notch Peak intrusive area.

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