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Chemical data concerning Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado

By

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SUMMARY

A stratabound Proterozoic zinc-copper sulfide deposit is developed by the Sedalia mine, about 4 miles north-northwest of Salida, Chaffee County, Colorado. Located in 1881, the mine produced about 90,000 tons of ore, largely from the oxidized upper part of the deposit, before closing in 1918 due to a decline in the price of copper. The deposit is a significant and potentially minable source of ores valued chiefly for zinc and copper and to a lesser extent for lead, silver, and gold. An estimate of the base and precious metal contents of the primary sulfide ore (Sheridan and Raymond, 1984, p. 21), based both on samples obtained by us and data from earlier records, is as follows: copper, about 4 percent; zinc, at least 6 percent; lead, 0.5 percent; silver, 3/4 to 1 oz/ton; gold, 0.01 to 0.03 oz/ton. The deposit contains at least 1 million tons of ore, and exploration of the orebody at depth could result in greatly expanding this reserve estimate. The general geology of the Sedalia mine area and the economic geology of the ores and their host rocks are described in a report published previously (Sheridan and Raymond, 1984).

The present report contains chemical data obtained by spectrographic analyses of samples of the Proterozoic ores and rocks from the Sedalia mine and adjoining area. Also included are data concerning the gold content of the ore samples and some of the rocks. The analysts, whose careful work is greatly appreciated, are credited in tables 2 and 4 of this report.

Table 1 contains brief descriptions of the analyzed samples of ores and rocks and indicates the localities from which the samples were obtained. Plate 1, a geologic map of the Sedalia mine area, shows the localities numbered in table 1. Table 2 contains the spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area. Table 3 contains the approximate lower limits of determination for elements analyzed by the 6-step spectrographic method. Table 4 lists the gold contents of 11 samples of ore and 5 samples of rocks.

REFERENCE CITED

Sheridan, D.M., and Raymond, W.H., 1984, Preliminary report on the geology of the Sedalia mine area and its Proterozoic deposits of base-metal sulfides and gahnite, Chaffee County, Colorado: U.S. Geological Survey Open-File Report 84-0800, 27 p.

TABLE 1. -- Descriptions and sampled localities of analyzed samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado

Sample number	Description	Locality no. (pl. 1) or description of locality
ORE		
S-14-75	Sphalerite-rich ore	Dump
S-14M-75	Ore rich in copper pitch	Dump
S-64-75	Galena-bearing ore	Dump
S-119-75	Sulfide ore	Dump
S-120-75	Oxidized ore	Dump
S-84-75	Sulfide ore	600-Level, drift near winze, southwestern part of workings
S-97-75	Sulfide ore	Jackpot adit, from sill of "H" stope, 410 feet from portal
S-98-75	Chalcopyrite-rich ore, partly oxidized	300-Level, from stope, 130 feet from portal
S-100-75	Partly oxidized ore	300-Level, from drift, 175 feet from portal
S-101-75	Sulfide ore	300-Level, from stope, 110 feet from portal
S-102-75	Sulfide ore	300-Level, from small stope, 95 feet from portal
METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS		
FELDSPATHIC GNEISS (Map Unit f)		
S-50-75	Feldspathic gneiss	1
S-60C-75	White feldspathic gneiss	2
S-83-75	Calc-silicate gneiss from lenses in feldspathic gneiss	3
GAHNITE-BEARING QUARTZ-MICA SCHIST (Map Unit gs)		
S-59-75	Gahnite-bearing quartz-mica schist	4
S-8-76	Gahnite-bearing quartz-mica schist	5
S-9-76	Gahnite-bearing quartz-mica schist	6
GARNET-CORDIERITE-AMPHIBOLE GNEISS, GARNETIFEROUS QUARTZ-MICA SCHIST, AND OTHER INTERLAYERED ROCKS (Map Unit g)		
S-13A-75	Garnet-cordierite-amphibole gneiss	7
S-52-75	Garnet-biotite-quartz gneiss containing porphyroblastic laths replaced by sillimanite	Float

TABLE 1. -- Descriptions and sampled localities of analyzed samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

S-87-75	Garnetiferous biotite-quartz gneiss containing sillimanite and andalusite	600-Level, 80 feet east of intersection with second crosscut
S-109B-75	Garnet-biotite-quartz gneiss	8
S-12-76	Biotite-quartz gneiss with minor garnet	9
S-93-75	Dark-colored rock rich in quartz	In Jackpot adit, 265 feet from portal
S-51-75	Cordierite-quartz-biotite gneiss	10
S-79-75	Gahnite-bearing cordierite-quartz-biotite gneiss	11
S-92-75	Gahnite-bearing rock rich in light-colored amphibole	In Dewey adit, 155 feet from portal
S-57A-76	Gahnite-bearing rock rich in light-colored amphibole	Dump
S-14L1-75	Gahnite- and sphalerite-bearing rock rich in light-colored amphibole	Dump
S-20A-75	Chalcopyrite- and magnetite-bearing fine-grained amphibole-rich rock	Dump
S-71-75	Impure marble	12
S-48A-76	Impure marble	13
QUARTZ-MICA SCHIST (Map Unit s)		
S-13C-75	Feldspathic variety of quartz-mica schist containing light-colored grains resembling relict phenocrysts	14
S-13H-75	Quartz-mica schist with small porphyroblasts	15
S-88-75	Feldspathic variety of quartz-mica schist containing textural features that resemble flattened pumice	16
S-13-76	Quartz-mica schist	17
S-34A-76	Dark green biotitic schist occurs along contact between map units f and g and at this locality is in contact with intrusive unit pa	18

TABLE 1. -- Descriptions and sampled localities of analyzed samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

TABLE 2a.-- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado

[Si, Al, Fe, Mg, Ca, Na, K, and Ti are reported in percent; all other elements are in parts per million. The following elements were not looked for, not found at the limit of detection (or at the value shown) or were detected but not measurable: P, As, Au (see also table 4), Pd, Pt, Sb, Te, U, Hf, Li, Re, Ta, Th, Tl, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Lu, Ir, Os, Rh, Ru. The 6-step reporting is based on the approximate mid-points of geometric number brackets as follows: 100 for bracket 120-83, 70 for 83-56, 50 for 56-38, 30 for 38-26, 20 for 26-18, 15 for 18-12, 10 for 12-8.3, etc. G, greater than 10 percent; -, not looked for; N, not detected, at limit of detection or at value shown; L, detected but too little in amount to be given a reportable value. (See table 3). Analyses by J.C. Hamilton, M.W. Solt, L.A. Bradley, N.M. Conklin, and M.J. Malcolm, U.S. Geological Survey]

Sample Number	Si	Al	Fe	Mg	Ca	Na
ORE						
S-14-75	3.	0.03	7.	2.	0.2	-
S-14M-75	3.	0.7	G	0.3	0.1	N
S-64-75	G	1.	10.	10.	2.	.07
S-119-75	G	5.	10.	10.	5.	0.5
S-120-75	G	1.5	10.	7.	5.	N
S-84-75	G	10.	G	G	0.05	-
S-97-75	G	G	G	3.	0.1	-
S-98-75	G	2.	G	7.	0.3	N
S-100-75	10.	1.	G	0.05	0.02	L
S-101-75	10.	10.	G	3.	0.2	-
S-102-75	G	2.	G	7.	0.3	0.2
METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS						
FELDSPATHIC GNEISS (Map Unit f)						
S-50-75	G	G	5.	0.2	0.7	3.
S-60C-75	G	G	0.2	0.07	0.7	5.
S-83-75	G	10.	5.	2.	10.	0.3
GAHNITE-BEARING QUARTZ-MICA SCHIST (Map Unit gs)						
S-59-75	G	3.	1.5	0.5	0.015	0.1
S-8-76	G	10.	5.	1.	0.05	0.2
S-9-76	G	7.	5.	0.7	0.1	0.2

TABLE 2a.-- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	Si	Al	Fe	Mg	Ca	Na
GARNET-CORDIERITE-AMPHIBOLE GNEISS, GARNETIFEROUS QUARTZ-MICA SCHIST, AND OTHER INTERLAYERED ROCKS (Map Unit g)						
S-13A-75	G	G	G	3.	0.3	0.07
S-52-75	G	G	10.	2.	0.15	0.15
S-87-75	G	10.	7.	2.	0.07	0.15
S-109B-75	G	10.	10.	0.7	0.7	0.1
S-12-76	G	G	7.	1.5	0.03	0.2
S-93-75	G	3.	3.	1.	0.3	0.07
S-51-75	G	G	7.	3.	0.2	0.3
S-79-75	G	G	3.	3.	0.3	-
S-92-75	G	G	G	10.	0.1	-
S-57A-76	G	G	G	7.	0.15	-
S-14L1-75	G	2.	7.	3.	0.15	-
S-20A-75	G	5.	G	7.	0.3	-
S-71-75	7.	2.	1.5	G	G	0.05
S-48A-76	10.	3.	2.	7.	G	0.05
QUARTZ-MICA SCHIST (Map Unit s)						
S-13C-75	G	G	5.	1.5	1.	3.
S-13H-75	G	G	7.	2.	1.	3.
S-88-75	G	G	5.	0.5	1.5	3.
S-13-76	G	10.	7.	1.5	0.03	0.3
S-34A-76	G	G	7.	7.	7.	3.
AMPHIBOLITE (Map Unit a)						
S-45-75	G	G	7.	5.	10.	3.
PORPHYROBLASTIC SCHIST (Map Unit ps)						
S-46-75	G	G	10.	1.5	5.	3.
S-110-75	G	G	10.	1.5	2.	3.

TABLE 2a.-- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	Si	Al	Fe	Mg	Ca	Na
METAMORPHOSED INTRUSIVE ROCKS						
PISTACHIO-COLORED AMPHIBOLITE (Map Unit pa)						
S-74-75	G	7.	7.	G	10.	0.2
S-15A-76	G	7.	7.	10.	7.	0.3
S-16A-76	G	7.	7.	G	5.	0.15
S-17A-76	G	7.	7.	G	7.	0.15
S-18A-76	G	7.	7.	G	7.	0.2
S-19A-76	G	7.	10.	G	10.	0.2
S-20A-76	G	7.	10.	G	7.	0.3
S-21A-76	G	7.	10.	G	7.	0.2
S-33A-76	G	7.	7.	10.	7.	0.2
S-35A-76	G	7.	10.	10.	7.	0.3
S-36A-76	G	7.	10.	10.	7.	0.3
S-37A-76	G	7.	10.	10.	7.	0.3
S-45A-76	G	7.	10.	10.	7.	0.3
S-46A-76	G	7.	10.	10.	7.	0.15
METAGABBRO (Map Unit mg)						
S-69-75	G	G	10.	3.	G	3.
METABASALT (Map Unit mb)						
S-76-75	G	G	10.	3.	10.	1.

TABLE 2b.-- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	K	Ti	Mn	Ag	B	Ba	Be	Bi	Cd	Co
ORE										
S-14-75	N	0.003	1,500	20	N	L3	N	30	1,500	20
S-14M-75	N	0.001	500	2	L	20	7	N	100	20
S-64-75	N	0.1	3,000	70	L	20	N	70	L	5
S-119-75	N	0.1	1,500	10	N	10	N	15	50	10
S-120-75	N	0.05	700	30	N	7	N	N	L	5
S-84-75	7.	0.1	1,500	20	N	700	N	15	500	15
S-97-75	N	0.15	700	30	L	20	N	30	100	50
S-98-75	N	0.1	2,000	70	L	20	N	15	700	150
S-100-75	N	0.02	100	1.5	L	50	3	L	N	N
S-101-75	N	0.15	700	10	N	15	N	30	70	500
S-102-75	0.7	0.07	3,000	3	L	100	N	20	500	30
METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS										
FELDSPATHIC GNEISS (Map Unit f)										
S-50-75	5.	0.07	200	N	N	1,500	3	N	N	N
S-60C-75	5.	0.01	200	N	N	1,500	3	N	N	N
S-83-75	N	0.1	1,500	N	N	70	3	N	N	N
GAHNITE-BEARING QUARTZ-MICA SCHIST (Map Unit gs)										
S-59-75	1.5	0.07	700	N	L	500	N	N	N	N
S-8-76	3.	0.1	1,000	N	N	1,000	1.5	N	N	N
S-9-76	3.	0.1	2,000	N	N	500	3	N	N	N
GARNET-CORDIERITE-AMPHIBOLE GNEISS, GARNETIFEROUS QUARTZ-MICA SCHIST, AND OTHER INTERLAYERED ROCKS (Map Unit g)										
S-13A-75	N	0.07	700	N	N	70	N	N	N	15
S-52-75	3.	0.3	1,000	N	N	200	N	N	N	5
S-87-75	3.	0.15	700	N	30	300	N	N	N	N
S-109B-75	1.	0.07	10,000	N	N	700	N	N	N	N
S-12-76	3.	0.15	700	N	N	1,000	7	N	N	N
S-93-75	N	0.05	200	N	N	70	N	N	N	N
S-51-75	3.	0.3	2,000	N	N	1,500	3	N	N	15
S-79-75	0.7	0.3	1,500	N	N	200	3	N	N	7
S-92-75	N	0.1	1,500	5	N	200	N	70	N	7
S-57A-76	0.7	0.1	1,500	3	N	70	N	200	N	7
S-14L1-75	3.	0.03	700	5	N	7	N	30	500	30
S-20A-75	N	0.1	1,000	7	N	3	N	N	700	30
S-71-75	N	0.015	2,000	N	N	15	N	N	N	N
S-48A-76	N	0.03	7,000	N	N	3	N	N	N	N

TABLE 2b. -- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	K	Ti	Mn	Ag	B	Ba	Be	Bi	Cd	Co
QUARTZ-MICA SCHIST (Map Unit s)										
S-13C-75	7.	0.2	500	N	N	1,000	7	N	N	N
S-13H-75	3.	0.3	1,500	N	N	3,000	1.5	N	N	N
S-88-75	3.	0.2	500	N	N	1,500	3	N	N	N
S-13-76	3.	0.15	300	N	N	1,500	N	N	N	N
S-34A-76	3.	0.3	700	N	N	500	N	N	N	20
AMPHIBOLITE (Map Unit a)										
S-45-75	3.	0.3	1,000	N	N	2,000	N	N	N	30
PORPHYROBLASTIC SCHIST (Map Unit ps)										
S-46-75	3.	0.7	700	N	N	1,000	1.5	N	N	15
S-110-75	3.	0.7	700	N	N	1,000	2	N	N	30
METAMORPHOSED INTRUSIVE ROCKS										
PISTACHIO-COLORED AMPHIBOLITE (Map Unit pa)										
S-74-75	N	0.15	1,500	1.5	N	30	N	N	70	70
S-15A-76	N	0.15	700	N	N	5	2	N	N	30
S-16A-76	N	0.1	700	N	N	10	N	N	N	30
S-17A-76	N	0.1	700	N	N	3	N	N	N	30
S-18A-76	N	0.1	700	N	N	20	N	N	N	30
S-19A-76	N	0.15	700	N	N	3	N	N	N	50
S-20A-76	N	0.15	700	N	N	5	N	N	N	50
S-21A-76	N	0.15	700	N	N	3	N	N	N	50
S-33A-76	N	0.7	1,000	N	N	10	2	N	N	50
S-35A-76	N	0.2	1,000	N	N	5	1.5	N	N	70
S-36A-76	N	0.2	1,000	N	N	7	1.5	N	N	70
S-37A-76	N	0.2	1,000	N	N	7	3	N	N	70
S-45A-76	N	0.1	1,000	N	N	70	3	N	N	30
S-46A-76	N	0.07	700	N	N	7	1.5	N	N	30
METAGABBRO (Map Unit mg)										
S-69-75	N	0.3	1,000	N	N	150	N	N	N	50
METABASALT (Map Unit mb)										
S-76-75	N	0.7	1,500	N	N	70	1.5	N	N	20

TABLE 2b. -- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	Cr	Cu	La	Mo	Nb	Ni	Pb	Sc	Sn	Sr
ORE										
S-14-75	7	1,500	N	7	N	5	1,000	N	N	N
S-14M-75	7	20,000	N	50	20	L	200	N	N15	10
S-64-75	5	50,000	N	N	L	L	50,000	N	N	50
S-119-75	15	15,000	L	N	10	5	20	10	N	5
S-120-75	L	50,000	N	7	N	7	3,000	N	N	100
S-84-75	2	30,000	100	N	20	5	70	N	30	15
S-97-75	2	70,000	150	N	20	N	30	L	30	L
S-98-75	7	G	150	N	L	20	300	L	50	10
S-100-75	3	700	N	30	15	N	50	N	N	15
S-101-75	1.5	30,000	300	30	30	70	70	N	15	15
S-102-75	1.5	20,000	L	N	10	N	30	N	N15	L
METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS										
FELDSPATHIC GNEISS (Map Unit f)										
S-50-75	N	15	L	N	30	N	15	5	10	70
S-60C-75	L	10	L	N	30	N	30	10	N	100
S-83-75	3	15	70	N	20	N	30	7	N	70
GAHNITE-BEARING QUARTZ-MICA SCHIST (Map Unit gs)										
S-59-75	2	500	N	N	15	N	N	L	N	10
S-8-76	5	700	N	3	15	N	15	5	N	15
S-9-76	1	5,000	L	N	20	N	N	N	N	10
GARNET-CORDIERITE-AMPHIBOLE GNEISS, GARNETIFEROUS QUARTZ-MICA SCHIST, AND OTHER INTERLAYERED ROCKS (Map Unit g)										
S-13A-75	N	30	50	N	20	N	N	5	15	7
S-52-75	7	200	L	10	15	5	10	15	N10	7
S-87-75	N	150	N	5	30	N	N	N	N10	5
S-109B-75	1.5	5	L	N	15	N	N	N	N	N
S-12-76	N	20	50	N	30	N	N	N	N10	15
S-93-75	N	70	50	5	10	N	N	N	N	N
S-51-75	50	300	L	N	10	7	20	15	N	30
S-79-75	50	300	50	N	20	7	150	7	N	30
S-92-75	N	1,500	100	N	10	N	10	L	15	10
S-57A-76	N	10,000	100	7	20	N	30	N	N	N
S-14L1-75	3	15,000	70	7	10	L	70	N	N	N
S-20A-75	1	15,000	70	10	10	N	10	N	N	N
S-71-75	3	100	N	N	N	N	1,000	N	N	30
S-48A-76	7	20	N	N	N	N	70	N	N	70
QUARTZ-MICA SCHIST (Map Unit s)										
S-13C-75	1	10	70	N	30	N	10	7	N10	70
S-13H-75	7	20	70	N	15	5	30	15	N	700
S-88-75	N	7	L	N	30	N	15	5	N10	150
S-13-76	N	7	70	N	30	N	N	5	N	30

TABLE 2b. -- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	Cr	Cu	La	Mo	Nb	Ni	Pb	Sc	Sn	Sr
S-34A-76	500	100	N	N	N	150	N	15	N	1,000
AMPHIBOLITE (Map Unit a)										
S-45-75	300	15	N	N	10	70	15	20	N	300
PORPHYROBLASTIC SCHIST (Map Unit ps)										
S-46-75	50	200	50	N	10	20	15	20	N	500
S-110-75	100	3	N	N	10	50	10	30	N	500
METAMORPHOSED INTRUSIVE ROCKS										
PISTACHIO-COLORED AMPHIBOLITE (Map Unit pa)										
S-74-75	2,000	500	N	N	N	1,000	50	30	15	30
S-15A-76	2,000	70	N	N	N	700	N	15	N	15
S-16A-76	2,000	10	N	N	N	700	N	15	N	10
S-17A-76	2,000	70	N	N	N	700	N	15	N	15
S-18A-76	2,000	30	N	N	N	700	N	15	N	30
S-19A-76	2,000	30	N	N	N	700	N	15	N	30
S-20A-76	2,000	150	N	N	N	700	N	15	N	30
S-21A-76	2,000	50	N	N	N	700	N	15	N	20
S-33A-76	2,000	20	N	N	N	700	N	15	N	30
S-35A-76	3,000	70	N	N	N	700	N	15	N	20
S-36A-76	2,000	70	N	N	N	700	N	15	N	15
S-37A-76	2,000	3	N	N	N	700	N	15	N	15
S-45A-76	1,500	70	N	N	N	700	N	15	N	15
S-46A-76	1,500	50	N	N	N	700	N	15	N	10
METAGABBRO (Map Unit mg)										
S-69-75	100	50	N	N	N	70	15	30	N	200
METABASALT (Map Unit mb)										
S-76-75	70	15	N	N	N	50	N	30	N10	500

TABLE 2b.-- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	V	W	Y	Zn	Zr	Ce	Ga	Ge	In	Yb
ORE										
S-14-75	N	N	30	G	N	N	N	N	N	2
S-14M-75	15	1,500	N20	20,000	N	N	-	N20	N	-
S-64-75	10	N	10	10,000	50	N	N	N	N	N2
S-119-75	30	N	50	15,000	100	N	15	N	N	7
S-120-75	N	100	30	3,000	30	N	5	N	N	-
S-84-75	N	N	30	G	300	L	30	N	N	-
S-97-75	L	N	70	100,000	500	L	50	N	N	15
S-98-75	20	N	50	15,000	50	L	-	N	N	-
S-100-75	15	300	20	5,000	70	N	-	15	N	-
S-101-75	L	N	100	70,000	500	300	100	N	N	15
S-102-75	N	N	100	7,000	150	L	70	N	N	10
METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS										
FELDSPATHIC GNEISS (Map Unit f)										
S-50-75	7	N	100	N	300	L	20	N	N	15
S-60C-75	7	N	70	N	50	L	30	N	N	15
S-83-75	7	N	100	N	200	L	15	N	N	15
GAHNITE-BEARING QUARTZ-MICA SCHIST (Map Unit gs)										
S-59-75	7	N	30	7,000	300	N	15	N	N	5
S-8-76	7	N	100	20,000	500	N	30	N	N	15
S-9-76	7	N	100	15,000	500	L	20	N	N	15
GARNET-CORDIERITE-AMPHIBOLE GNEISS, GARNETIFEROUS QUARTZ-MICA SCHIST, AND OTHER INTER-LAYERED ROCKS (Map Unit g)										
S-13A-75	7	N	70	700	500	N	30	N	N	-
S-52-75	10	N	70	700	150	L	20	N	N	7
S-87-75	N	N	70	N	500	N	20	N	N	15
S-109B-75	N	N	700	N	500	L	10	N	N	70
S-12-76	N	N	150	N	500	L	30	N	N	20
S-93-75	N	N	100	700	100	L	N	N	N	10
S-51-75	70	N	70	3,000	150	L	30	N	N	7
S-79-75	50	N	30	50,000	300	L	30	N	N	5
S-92-75	N	N	100	100,000	500	300	30	N	N	20
S-57A-76	N	N	70	100,000	300	L	30	N	N	10
S-14L1-75	N	N	20	G	100	L	15	N	10	-
S-20A-75	N	N	150	G	100	N	20	N	N	20
S-71-75	N	N	15	300	50	-	7	N	N	1.5
S-48A-76	N	N	30	N	70	-	7	N	N	2
QUARTZ-MICA SCHIST (Map Unit s)										
S-13C-75	7	N	150	N	500	L	30	N	N	15
S-13H-75	30	N	50	N	200	L	20	N	N	7
S-88-75	N	N	150	N	700	L	30	N	N	30
S-13-76	7	N	70	N	500	L	15	N	N	7

TABLE 2b. -- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	V	W	Y	Zn	Zr	Ce	Ga	Ge	In	Yb
S-34A-76	200	N	15	N	30	N	15	N	N	3
AMPHIBOLITE (Map Unit a)										
S-45-75	200	N	30	N	100	-	15	N	N	3
PORPHYROBLASTIC SCHIST (Map Unit ps)										
S-46-75	150	N	30	N	150	L	20	N	N	5
S-110-75	200	N	30	N	150	N	20	N	N	3
METAMORPHOSED INTRUSIVE ROCKS										
PISTACHIO-COLORED AMPHIBOLITE (Map Unit pa)										
S-74-75	150	N	15	N	50	N	10	N	N	N
S-15A-76	150	N	10	N	20	N	7	N	N	-
S-16A-76	70	N	N	N	20	N	7	N	N	-
S-17A-76	100	N	N	N	20	N	7	N	N	-
S-18A-76	100	N	N	N	20	N	7	N	N	-
S-19A-76	150	N	10	N	20	N	7	N	N	-
S-20A-76	150	N	10	N	20	N	7	N	N	-
S-21A-76	150	N	10	N	20	N	7	N	N	-
S-33A-76	100	N	N	N	15	N	7	N	N	1.5
S-35A-76	150	N	L	N	15	N	7	N	N	-
S-36A-76	200	N	L	N	15	N	7	N	N	-
S-37A-76	150	N	L	N	20	N	7	N	N	-
S-45A-76	100	N	L	N	15	N	7	N	N	-
S-46A-76	100	N	L	N	15	N	7	N	N	-
METAGABBRO (Map Unit mg)										
S-69-75	300	N	30	300	700	-	20	N	N	5
METABASALT (Map Unit mb)										
S-76-75	500	N	30	N	70	-	20	N	N	3

TABLE 2b.-- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	Pr	Nd
ORE		
S-14-75	-	-
S-14M-75	-	-
S-64-75	-	-
S-119-75	N	N
S-120-75	-	-
S-84-75	N	70
S-97-75	N	150
S-98-75	N	L
S-100-75	-	-
S-101-75	N150	200
S-102-75	N	L
METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS		
FELDSPATHIC GNEISS (Map Unit f)		
S-50-75	N	70
S-60C-75	N	L
S-83-75	N	70
GAHNITE-BEARING QUARTZ-MICA SCHIST (Map Unit gs)		
S-59-75	-	-
S-8-76	-	-
S-9-76	N	N
GARNET-CORDIERITE-AMPHIBOLE GNEISS, GARNETIFEROUS QUARTZ-MICA SCHIST, AND OTHER INTERLAYERED ROCKS (Map Unit g)		
S-13A-75	N	70
S-52-75	N	70
S-87-75	-	-
S-109B-75	N	N
S-12-76	N	70
S-93-75	N	N
S-51-75	N	70
S-79-75	N	L
S-92-75	N	150
S-57A-76	N	100
S-14L1-75	N	70
S-20A-75	N	70
S-71-75	-	-
S-48A-76	-	-
QUARTZ-MICA SCHIST (Map Unit s)		
S-13C-75	N	70
S-13H-75	N	70
S-88-75	N	L
S-13-76	N	70

TABLE 2b.-- Semiquantitative 6-step spectrographic analyses of 55 samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado (continued)

Sample Number	Pr	Nd
S-34A-76	-	-
AMPHIBOLITE (Map Unit a)		
S-45-75	-	-
PORPHYROBLASTIC SCHIST (Map Unit ps)		
S-46-75	N	70
S-110-75	-	-
METAMORPHOSED INTRUSIVE ROCKS		
PISTACHIO-COLORED AMPHIBOLITE (Map Unit pa)		
S-74-75	-	-
S-15A-76	-	-
S-16A-76	-	-
S-17A-76	-	-
S-18A-76	-	-
S-19A-76	-	-
S-20A-76	-	-
S-21A-76	-	-
S-33A-76	-	-
S-35A-76	-	-
S-36A-76	-	-
S-37A-76	-	-
S-45A-76	-	-
S-46A-76	-	-
METAGABBRO (Map Unit mg)		
S-69-75	-	-
METABASALT (Map Unit mb)		
S-76-75	-	-

Table 3.--Approximate visual lower limits of determination for the elements analyzed by the 6-step spectrographic method at the Denver U.S. Geological Survey laboratory

[Revised February 1972. Some combinations of elements affect the limits of determination. In favorable materials, values lower than these may be detected. In unfavorable materials these limits of determination may not be attained. (*) Values for Al below 0.1 percent may result from grinding with high alumina ceramic plates]

Percent		Percent	
Fe	0.001	Si	0.002
Mg	0.002	Al	0.01*
Ca	0.002	Na	0.05
Ti	0.0002	K	0.7
		P	0.2
Parts per million		**Parts per million**	
Mn	1	Ce	200
Ag	0.5	Ga	5
As	1000	Ge	10
Au	20	Hf	100
B	20	In	10
Ba	2	Li	100
Be	1.5	Re	50
Bi	10	Ta	500
Cd	50	Th	200
Co	5	Ti	50
Cr	1	Yb	1
Cu	1	Pr	100
La	50	Nd	70
Mo	3	Sm	100
Nb	10	Eu	100
Ni	5		
Pb	10	Gd	50
Pd	2	Tb	300
Pt	50	Dy	50
Sb	200	Ho	20
Sc	5	Er	50
		Tm	20
		Lu	30
Sn	10		
Sr	5	Ir	50
Te	2000	Os	50
U	500	Rh	2
V	7	Ru	10
W	100		
Y	10		
Zn	300		
Zr	10		

Table 4. -- Gold content of sixteen samples of Proterozoic ores and rocks from the Sedalia mine area, Chaffee County, Colorado.

[Au determined by fire assay and atomic absorption methods by J.G. Crock, A.W. Haubert, and Joseph Haffty, U.S. Geological Survey. < = less than]

Sample number	Au (parts per million)
ORE	
S-14-75	0.10
S-14M-75	<0.1 [1]
S-64-75	.40
S-119-75	.16
S-120-75	.4 [1]
S-84-75	.12
S-97-75	.30
S-98-75	.64
S-100-75	.08
S-101-75	.14
S-102-75	.08

METAMORPHOSED SEDIMENTARY AND VOLCANIC ROCKS:-- ROCKS INTERLAYERED WITH GARNET-CORDIERITE-AMPHIBOLE GNEISS, etc, (Map Unit g)

Sample no.	Au (parts per million)
S-92-75	<0.1 [1]
S-57A-76	2.2 [1]
S-14L1-75	<0.1 [1]
S-20A-75	<0.1 [1]

METAMORPHOSED INTRUSIVE ROCKS--PISTACHIO-COLORED AMPHIBOLITE (Map Unit pa)

Sample No.	Au (parts per million)
S-20A-76	<0.1 [1]

[1] Au was extracted on these seven samples by HBr/Br_2 procedure rather than preconcentration by fire assay.