

(200)
R290
no. 80-1057
Text

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

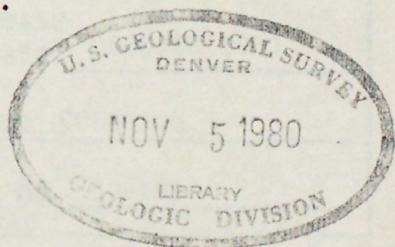
Preliminary Report on the Mineral Resource Potential
of the Powderhorn Instant Study Area,
Gunnison and Hinsdale Counties, Colorado

By

William N. Sharp and R. A. Martin,
U.S. Geological Survey
and
M. E. Lane, U.S. Bureau of Mines

Open-File Report 80-1057
1980

This report is preliminary and has not been
edited or reviewed for conformity with U.S.
Geological Survey standards.



~~REFERENCE~~
Does not circulate

MAR 08 2001

Memorandum

Date 9/19/80

To: Branch of Plans and Program Management
Publications Division

From: Chief, Office of Scientific Publications

Subject: New USGS open-file report

The following report was authorized by Henry Spall for the Director
on 8/22/80 for release in the open files: (9350-72515)

TITLE: Preliminary report on the mineral resource potential of the
Powderhorn Instant Study Area, Gunnison and Hinsdale Counties, Colorado

AUTHOR(S): William N. Sharp, USGS, and M. E. Lane, USBM

CONTENTS: 8 p., 3 over-size sheets (i.e., larger than $8\frac{1}{2} \times 11$ inches)

Map scale: 1:50,000

Depositories:

(NC) USGS Library, Room 4A100, 12201 Sunrise Valley Dr., Reston, VA 22092

(Da) USGS Library, 1526 Cole Blvd. at West Colfax Ave., Golden, CO

(Mail address: Stop 914, Box 25046, Federal Center, Denver, CO 80225)

(M) USGS Library, 345 Middlefield Rd., Menlo Park, CA 94025

(Db) USGS, Room 169, Federal Bldg., 1961 Stout St., Denver, CO 80294

(U) USGS, Room 8105, Federal Bldg., 125 South State St., Salt Lake City, UT 84138

PRICE: Fiche \$ _____ Paper \$ _____	ORIGINATING OFFICE Name: <u>DTRU, USGS, MS-902, Denver, CO</u> Address: _____ Telephone: <u>FTS- 234-2445</u>	Release date: <u>OCTOBER 1980</u> Area: <u>COLORADO</u> OFR No. <u>80-1057</u>
--	---	--

Mineral Surveys

Related to Bureau of Land Management

Instant Study Areas

In accordance with the provisions of the Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976), the Geological Survey and the Bureau of Mines have conducted mineral surveys on certain areas, which formally had been identified as "natural" and "primitive" areas prior to November 1, 1975. This report discusses the results of a mineral survey of the Powderhorn Instant Study Area, Gunnison and Hinsdale Counties, Colorado.

Contents

	Page
Mineral resource potential of the Powderhorn Instant Study Area.....	1
References.....	3

Illustrations

Map A. Geologic map of the Powderhorn Instant Study Area, Gunnison and Hinsdale Counties, Colorado.....	in pocket
Map B. Geochemical terranes and sample location map of the Powderhorn Instant Study Area, Gunnison and Hinsdale Counties, Colorado.....	"
Map C. Aeromagnetic map of the Powderhorn Instant Study Area, Gunnison and Hinsdale Counties, Colorado.....	"

Figure 1. Index map and map showing Powderhorn-Cannibal Plateau map area in relation to the San Juan volcanic field and calderas.....	Map A in pocket
---	-----------------

Tables

Table 1A.	Spectrographic analyses of samples from terrane 1, early lavas and breccias (Tpl).....	Map B in pocket
	Panned stream-sediment samples - nonmagnetic fraction.....	"
1B.	Panned stream-sediment samples - magnetic fraction.....	"
2A.	Spectrographic analyses of samples from terrane 2, ash-flow sheets (Taf).....	"
	Panned stream-sediment samples - nonmagnetic fraction.....	"
2B.	Panned stream-sediment samples - magnetic fraction.....	"
3A.	Spectrographic analyses of samples from terrane 3, late flood basaltic and andesitic lavas (Tbb).....	"
	Panned stream-sediment samples - nonmagnetic fraction.....	"
3B.	Panned stream-sediment samples - magnetic fraction.....	"
4A.	Spectrographic analyses of samples from terrane 4, early and late intrusives (Tie-Til).....	"
	Panned stream-sediment samples - nonmagnetic fractions and whole rocks.....	"
4B.	Panned stream-sediment samples - magnetic fractions.....	"
5A.	Spectrographic analyses of samples from terrane 5, whole rock samples representing rocks from altered areas.....	"
5B.	Whole rock samples representing mineralized rocks and ore rocks.....	"
6.	Spectrographic analyses of screened soil samples taken along selected drainages.....	"
7.	Spectrographic and fire assay analyses of stream-sediment and rock samples taken by the U.S. Bureau of Mines.....	"

Mineral resource potential of the
Powderhorn Instant Study Area

The Powderhorn Instant Study Area covers approximately 51,000 acres of land under BLM administration located about 80 km (50 mi) southwest of Gunnison, Colorado. A mineral resource survey, made in 1979 by the U.S. Geological Survey and the U.S. Bureau of Mines, indicates that both the mineral potential and the energy potential for the Powderhorn Instant Study Area are low. This report is based on geologic and geochemical investigations, examination of prospects, and an aeromagnetic survey. Spectrographic analyses were made of approximately 120 stream-sediment and rock samples. No mining districts are located within the study area.

The Powderhorn Instant Study Area is underlain entirely by volcanic rocks of Tertiary age along the northern side of the San Juan volcanic field (Map A). Despite its proximity to known mineralized areas near Lake City on the west and Powderhorn on the north and northeast, no evidence was seen in the geologic, geochemical, or geophysical surveys made of the Powderhorn Instant Study Area to indicate that any significant mineral resources occur within the study area. Surface geology did not indicate exposed centers of mineralization, nor were any geologic environments interpreted that might indicate hidden centers of this kind. Geochemical sampling results (Map B; tables 1-7) all can be explained by sources in the different bedrock terranes; no anomalous metal concentrations were detected that might indicate proximity to mineral deposits. Results of aeromagnetic (Map C) and gravity surveys (map not included in this report) also can be explained by the known or reasonably inferred distribution of bedrock types, without invoking special circumstances that might indicate a mineral resource potential.

Whereas several periods of mineralization can be documented in the volcanic rocks exposed in mining areas near Lake City to the west (Slack, 1976; Slack and Lipman, 1979; Steven and others, 1977), none of these episodes affected rocks within the Powderhorn Instant Study Area. The nearest altered and mineralized rocks related to these periods of mineralization are in the Slumgullion Pass area, 10 km south of the Powderhorn Instant Study Area (Map B) where sampling during the present study did find anomalous concentrations of several metals (table 5). These altered and mineralized rocks are overlain unconformably by the late basalt lava flows that cap the high plateau underlying the southern part of the Powderhorn Instant Study Area. No evidence was seen, however, to warrant extrapolating the altered and mineralized rocks northward beneath the basalt cover as far as the study area.

Numerous small mines and prospects in the area of Precambrian rocks near Powderhorn, Colorado, were established to explore for base and precious metals, thorium, niobium, titanium, rare-earth elements, and other mineral occurrences. Some of these occurrences could well underlie the volcanic rocks exposed in the Powderhorn Instant Study Area. If so, however, they would be at depths of 400-1,500 m, and would have no geological, geochemical, or presently available geophysical expression. Under these circumstances, the exploration or development of such deposits would be economically unfeasible.

References

Hedlund, D. C., and Olson, J. C., 1975, Geologic map of the Powderhorn Quadrangle, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-1368, 1:24,000.

Irving, J. D., and Bancroft, H., 1911, Geology and ore deposits near Lake City, Colorado: U.S. Geological Survey Bulletin 478.

Lipman, P. W., 1976, Geologic map of the Lake City caldera area, western San Juan Mountains, southwestern Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-962.

Lipman, P. W., Fiskes, F. S., Mehnert, H. H., Naeser, C. W., Leudke, R. G., and Steven, T. A., 1976, Multiple ages of mid-Tertiary mineralization and alteration in the western San Juan Mountains, Colorado: Economic Geology, v. 71, no. 3, p. 571-588.

Lipman, P. W., Steven, T. A., Leudke, R. G., and Burbank, W. S., 1973, Revised volcanic history of the San Juan, Uncompahgre, Silverton, and Lake City calderas in the western San Juan Mountains, Colorado: U.S. Geological Survey Journal of Research, v. 1, no. 6, p. 627-642.

Lipman, P. W., Steven, T. A., and Mehnert, H. H., 1970, Volcanic history of the San Juan Mountains, Colorado, as indicated by K-Ar dating: Geological Society of America, v. 81, no. 8, p. 2329-2352.

Mehnert, H. H., Slack, J. F., and Cebula, G. T., 1979, K-Ar age of alunite alteration at Red Mountain, Lake City area, western San Juan Mountains, Colorado: U.S. Geological Survey Open-File Report 79-1642.

Olson, J. C., 1974, Geologic map of the Rudolph Hill Quadrangle, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-1177.

Olson, J. C., and Hedlund, D. C., 1973, Geologic map of the Gateview Quadrangle, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-1071.

Plouff, Donald, and Pakiser, L. C., 1972, Gravity study of the San Juan Mountains, Colorado: U.S. Geological Survey Professional Paper 800-B, p. 183-190.

Slack, J. F., 1976, Hypogene zoning and multistage vein mineralization in the Lake City area, western San Juan Mountains, Colorado: Stanford University, Ph. D. thesis.

Slack, J. F., and Lipman, P. W., 1979, Chronology of alteration, mineralization, and caldera evolution in the Lake City area, western San Juan Mountains, Colorado, in Ridge, J. D., ed., Papers on mineral deposits of western North America, 5th IAGOD Symposium, Salt Lake City, Utah, 1978, v. II: Nevada Bureau of Mines and Geology, Report 33, p. 151-158.

Steven, T. A., 1967, Geologic map of the Bristol Head Quadrangle, Colorado: U.S. Geological Survey Geologic Quadrangle Map GQ-631.

Steven, T. A., and Lipman, P. W., 1976, Calderas of the San Juan volcanic field, southwestern Colorado: U.S. Geological Survey Professional Paper 958.

Steven, T. A., Lipman, P. W., Fisher, F. S., U.S. Geological Survey, and Bieniewski, C. L., and Meeves, H. C., U.S. Bureau of Mines, 1977, Mineral resources of study areas contiguous to the Uncompahgre Primitive Area, San Juan Mountains, southwestern Colorado: U.S. Geological Survey Bulletin 1391-E.

U.S. Geological Survey, 1972, Aeromagnetic map of the Ridgway-Pagosa Springs area, southwestern Colorado: Geophysical Investigations Map GP-840.

