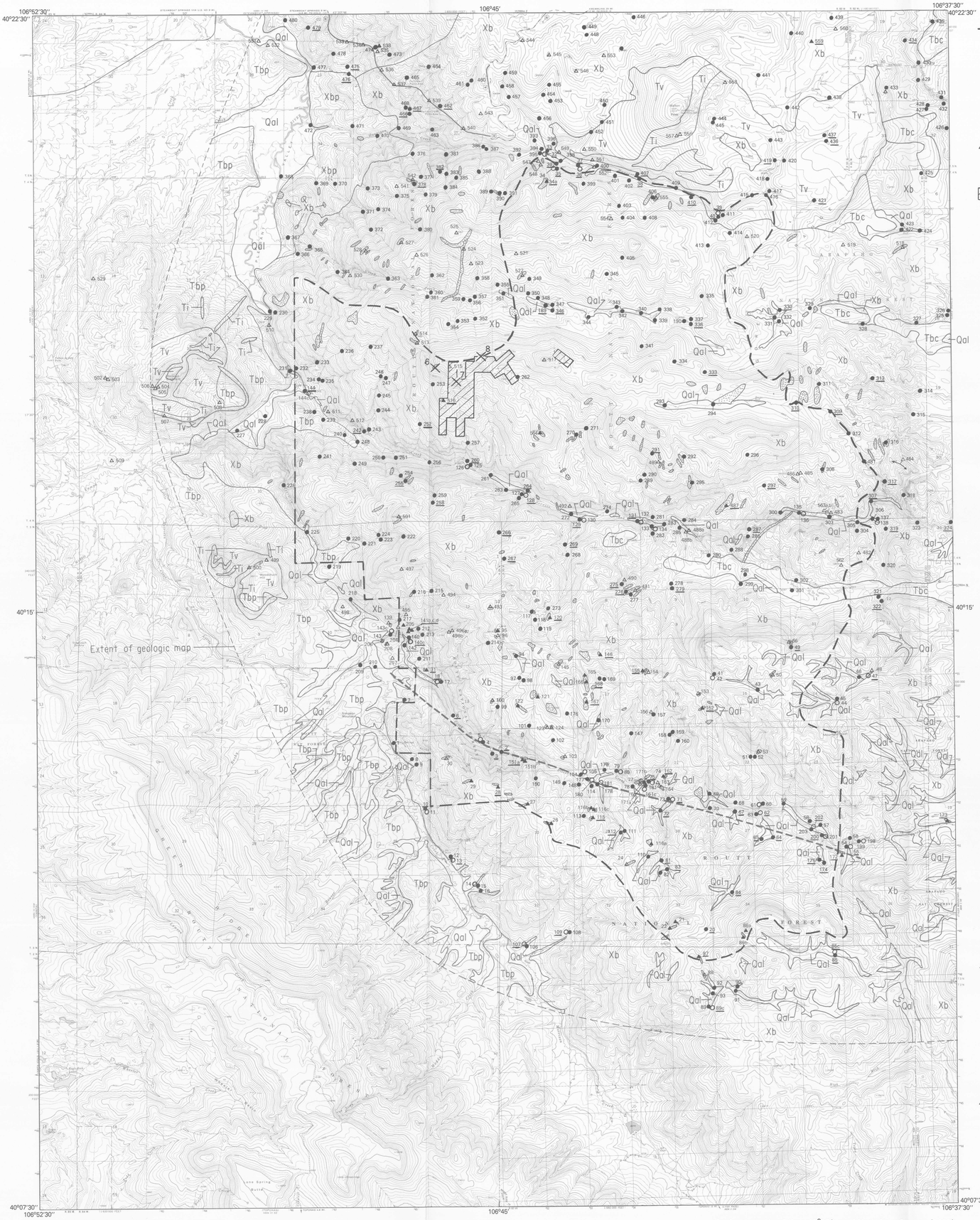
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1639
PAMPHLET ACCOMPANIES MAP



Base from U.S. Geological Survey, 1:24,000
Blacktail Mountain, 1969; Gore Mountain, 1980;
Green Ridge, 1972; Walton Peak, 1956

SCALE 1:48 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

CONTOUR INTERVAL 40 FEET

Geology north of lat 40°15' modified from Snyder (1980); south of lat 40°15' mapped by P. W. Schmidt assisted by D. K. Allerton, G. J. Cavallo, A. A. Kleiman, and Leslie A. Sparrow, 1982

EXPLANATION FOR SYMBOLS RELATED TO RESOURCE POTENTIAL

APPROXIMATE BOUNDARY OF THE SERVICE CREEK ROADLESS AREA

SAMPLE LOCALITY SITE, SHOWING NUMBER--Number underscored when sample contained anomalous concentrations for selected elements

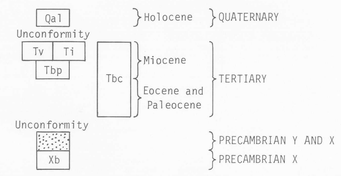
- ●99 Stream-sediment sample--See table 1 in pamphlet
- ○42 Stream panned-concentrate sample--See table 2 in pamphlet
- ▲△122 Rock sample--Solid where analyzed, open where not; see table 3 in pamphlet
- x6 Prospect pit--See table 4 in pamphlet

UNPATENTED MINING CLAIMS

EXPLANATION FOR GEOLOGIC BASE

(Note: The following correlation and description are for the geologic base map shown in gray)

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal ALLUVIUM (HOLOCENE)--Mostly coarse to medium sand deposited along major drainages and upland tributary areas or encatchment basins within the roadless area. Cobbles and boulders common along major drainages

Tv VOLCANIC AND RELATED ROCK (MIOCENE)--Includes both a dark olivine trachybasaltic lava flow and a scoria agglomerate and conglomerate consisting of red oxidized to black unoxidized trachybasalt scoria, bombs, and rounded alluvial fragments; commonly cemented with white calcite

Ti INTRUSIVE ROCK (MIOCENE)--Includes both a gray feldspar-porphyry intrusive of intermediate (trachyandesite?) composition and dark olivine trachybasalt dikes

Tbp BROWNS PARK FORMATION (MIOCENE)--Buff, calcareous to noncalcareous, silt to siltstone, sand to sandstone, and gravel to conglomerate, with minor chert beds, rare porcellanite beds or fragments of silicic tuff. Conglomerate cobbles predominately Precambrian rock

Tbc CONGLOMERATE (MIOCENE AND PALEOCENE)--Unconsolidated alluvial conglomerate consisting of Precambrian pebbles

PRECAMBRIAN INTRUSIVE AND INCLUDED ROCK (PRECAMBRIAN Y AND X)--Small and irregularly shaped inclusions and intrusions of rock that are randomly scattered throughout the quartz monzonite (Xb). (Shown only as stippled areas of outcrop on the map. Some outcrop areas shown on the map have been exaggerated for cartographic purposes)

Intrusive rock--Variable in composition, commonly fine-grained gabbro and diorite and fine- to coarse-grained pegmatites

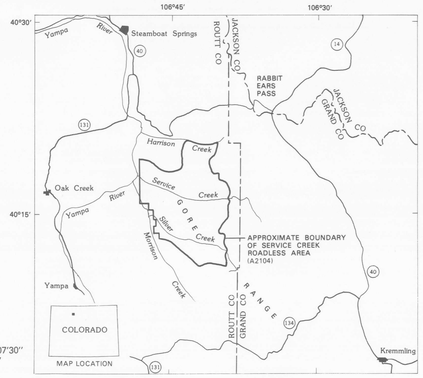
Included rock--Highly variable in texture and composition; commonly consists of gabbro, diorite, peridotite, felsic gneiss, amphibolite metavolcanics, and calc-silicate rock

Xb QUARTZ MONZONITE (PRECAMBRIAN X)--Batholithic intrusion of pink to gray to light-gray rock ranging from massive to gneissic biotite granite, quartz monzonite, and granodiorite. Locally migmatitic in some areas. Texture variable, ranging from fine (almost aphanitic) grained, to medium grained, to coarse grained. The coarse-grained rock either equigranular or more commonly porphyritic, containing from 5 to 30 percent large phenocrysts of potassium feldspar crystals. Textures locally in sharp contact or gradational

Note: Surficial units, namely glacial deposits, not shown north of Harrison Creek

CONTACT--Approximately located

LINEAR FEATURE--As seen on aerial photographs and reflected in topographic and drainage features



INDEX MAP SHOWING LOCATION OF SERVICE CREEK ROADLESS AREA

GEOLOGIC AND MINERAL RESOURCE POTENTIAL MAP OF THE SERVICE CREEK ROADLESS AREA, ROUTT COUNTY, COLORADO

By

Paul W. Schmidt and Tom G. Lovering, U. S. Geological Survey

and

Steven E. Kluender, U. S. Bureau of Mines

1984

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Service Creek Roadless Area in the Routt National Forest, Routt County, Colo. Service Creek Roadless Area (A2104) was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

MINERAL RESOURCE POTENTIAL SUMMARY STATEMENT

The Service Creek Roadless Area, near Steamboat Springs, Colo., was studied by the U.S. Bureau of Mines in 1980 and by the U.S. Geological Survey in 1975-76 and 1982. Geologic mapping and geochemical sampling during this study show no evidence of a potential for the occurrence of any major mineral deposit near the ground surface within the roadless area. A search of courthouse records has shown that no mining activity has been recorded for the area. There are, however, single and multielement geochemical anomalies of certain rare-earth and metallic minerals, randomly scattered throughout the roadless area. These anomalies, although locally clustered in some areas, especially along and south of a linear feature just south of Silver Creek, are not indicative of the presence of a resource. Therefore, the potential of the roadless area for the occurrence of metallic mineral resources is low.

The area is underlain by an essentially homogeneous plutonic intrusive; therefore, the nature of the geologic terrain precludes the occurrence of oil and gas resources.

INTRODUCTION

The Service Creek Roadless Area encompasses about 62 sq mi of the Routt National Forest in the scenic mountainous region of the Gore Range in northern Colorado. The area lies just south-southwest of Rabbit Ears Pass, about 12 mi southeast of Steamboat Springs and about 17 mi northwest of Kremmling (see index map).

Geologic mapping that included the Service Creek Roadless Area was published at a scale of 1:250,000 by Tweto (1975). Geologic mapping and geochemical sampling of the northern part of the roadless area, north of lat 40°15', was done in detail by George Snyder in 1975-76 (Snyder,1980). Much of the detailed geologic description and interpretations, as well as the geology north of lat 40°15', were simplified for this report. In 1980, the U.S. Bureau of Mines carried out both field investigations and a search of courthouse records to evaluate the mineral resources of roadless area (Kluender, 1982).

South of lat 40°15', reconnaissance geologic mapping and geochemical sampling (with limited additional sampling done to the north) were carried out by the U.S. Geological Survey from mid-August till early September in 1982.

GEOLOGY

For purposes of reporting on the geology in the area, and especially on units outside and north of the roadless area, much of the descriptive text and pertinent data is taken from Snyder (1980).

The Service Creek Roadless Area is dominated by a 1.7-b.y.-old batholith of quartz monzonite (Xb): a rock unit that is variable in color, composition, texture, and weathering characteristics. The quartz monzonite continues to the northwest, east, and south of the roadless area; however, to the northeast and west, it is either discontinuous or overlain by younger rocks.

Intrusions of younger Precambrian amphibolitic and pegmatitic rocks and inclusions of older Precambrian metavolcanic, metasedimentary, and igneous rocks (shown as stippled areas on the map) are randomly scattered and randomly oriented throughout the quartz monzonite in the roadless area. Both the intrusions and inclusions are small irregularly shaped bodies that reflect no regional pattern. Most outcrop areas are subdued, and many were recognized by float only.

Two rock units mantle the quartz monzonite in parts of the roadless area. To the north, especially at the headwaters of Harrison Creek, a volcanic flow of Miocene age (Tv) locally enters into the roadless area. Along the western boundary of the roadless area, sedimentary rocks of the Tertiary Browns Park Formation (Tbp) locally overlap the quartz monzonite in the roadless area.

Two surficial units were mapped within the roadless area: a conglomerate of Tertiary age (Tbc) and recent alluvial deposits (Qal) deposited along stretches of present-day drainages and upland valley fills. The conglomerate is in part contemporary with the Browns Park Formation and was deposited by streams that were active along and east of the eastern boundary of the study area.

No major tectonic events were observed in the roadless area, and no faults or folds were mapped. There are linear features seen on aerial photographs reflected by topographic and drainage features; however, no ground observations support any tectonic events.

GEOCHEMISTRY

Geochemical sampling of the Service Creek Roadless Area north of lat 40°15' was done by George Snyder (USGS) in 1975-76, and mainly south of lat 40°15' by Paul Schmidt in 1982. A total of 440 samples was taken in the roadless area for geochemical analysis of which 380 were stream-sediment samples sized to a minus-80 mesh, 40 were panned heavy-mineral concentrates from bulk stream-sediment samples, and 20 were rock samples from outcrops.

Analytical results for selected elements are given in tables 1-3 (in pamphlet). Only those elements are listed that are present in anomalous concentrations in some of the samples. Anomaly thresholds for the various elements in each sample medium were established subjectively by a method based partly on the total frequency distribution for each element, and partly on anomaly thresholds previously established in other study areas containing similar rocks. All anomaly thresholds fall within the upper 10 percent of reported element concentrations for stream-sediment samples.

Of the samples collected in the roadless area and analyzed for selected elements, some stream-sediment samples (table 1, in pamphlet) contained anomalous concentrations of silver, barium, cobalt, chromium, lanthanum, manganese, nickel, lead, tin, thorium, uranium, and yttrium; some stream panned-concentrate samples (table 2, in pamphlet) contained anomalous concentrations of barium, lanthanum, molybdenum, niobium, lead, tin, thorium, vanadium, tungsten, and yttrium; and some rock samples (table 3, in pamphlet) contained anomalous concentrations of boron, barium, chromium, copper, nickel, scandium, tin, and zinc. Of these anomalous concentrations, only cobalt, chromium, lanthanum, lead, nickel, thorium, uranium, and yttrium were reported in any appreciable number of samples.

MINING DISTRICTS AND MINERALIZED AREAS

A field investigation to assess the mineral resource potential of the Service Creek Roadless Area and a search of courthouse records to obtain claim locations within or adjacent to the area were conducted during 1980 by the U.S. Bureau of Mines (Kluender, 1982).

Field studies included a reconnaissance of known prospects and mineralized areas. Grab samples were taken at the workings examined, and panned-concentrate samples were taken from stream gravels of major drainages of the area. During field reconnaissance, 21 samples were taken: complete analytical results are available upon request from the U.S. Bureau of Mines, Intermountain Field Operations Center, Denver, Colo.

Service Creek Roadless Area has very little history of mining activity, and no mineral production has been recorded. Except for a group of 18 claims located on Service Peak (T. 4 N., R. 84 W.) in the Service Creek drainage (map), the search of county mining records disclosed no other claims lying within or adjacent to the area.

No mines were present within or adjacent to the roadless area at the time of the field investigation. Examination of three prospect pits north of Service Creek disclosed no apparent mineralized areas. Assay results of three samples taken from the pit walls (table 4, in pamphlet) showed minor amounts of several elements, but these do not indicate the presence of a resource.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Geologic mapping and geochemical sampling of the Service Creek Roadless Area failed to identify any favorable geologic or geochemical environment for the occurrence of metallic mineral deposits near the ground surface. The roadless area lies north of the Colorado mineral belt (Tweto and Sims, 1963), and although former mining activity is recorded both north and south of the roadless area, it occurred outside the roadless area and in a different geologic environment. Moreover, the roadless area is dominated by an essentially homogeneous batholith that lacks any major tectonic structures such as large-scale faults and any dominant veins or zones of alteration that would be conducive to or suggestive of mineralization.

Geochemically analyzed rock samples that were taken from small intrusive bodies or inclusions in the quartz monzonite show anomalous values. The small inclusions and intrusions of rock within the quartz monzonite are randomly spaced and widely scattered throughout the roadless area and show neither pattern nor areal distribution that would suggest the presence of substantially mineralized areas.

Although the many geochemical samples show anomalous metallic values in the area, these anomalies merely reflect the presence of small, widely scattered inclusions and veins or dikes in the quartz monzonite country rock. The mineral occurrences in these inclusions and veins are individually not large enough to be more than mineralogical curiosities, and taken together they are much too widely dispersed to constitute a resource. Moreover, nothing about the pattern or distribution of these occurrences, combined with the geologic setting, is suggestive of any known examples of substantially mineralized areas. We therefore believe that the roadless area has a low potential for the occurrence of metallic mineral resources, based on the results of this study.

Because the area is underlain by an essentially homogeneous crystalline rock, the nature of the geological terrain precludes the occurrence of oil and gas resources.

REFERENCES

Kluender, S. E., 1982, Mineral resource investigation of the Service Creek Roadless Area, Routt County, Colorado: U.S. Bureau of Mines Open-File Report MLA 123-82, scale 1:62,500.

Snyder, G. L., 1980, Geologic map of the northernmost Gore Range and southernmost Northern Park Range, Grand, Jackson, and Routt Counties, Colorado: U.S. Geological Survey Miscellaneous Investigations Series Map I-1114, scale 1:48,000.

Tweto, Ogden, 1975, Preliminary geologic map of the Craig 1° X 2° quadrangle, northwestern Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-666, scale 1:250,000.

Tweto, Ogden, and Sims, P. K., 1963, Precambrian ancestry of the Colorado Mineral Belt: Geological Society of America Bulletin, v. 74, p. 991-1014.

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For sale by Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225