UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

MINERAL RESOURCES OF THE BUTTERMILK ROADLESS AREA INYO COUNTY, CALIFORNIA

by

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Illustrations

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 geological, geochemical and mine and prospect survey of the Buttermilk Roadless Area (FP 05038) in the Inyo National Forest, Inyo County, California. The Buttermilk Roadless Area 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.

SUMMARY

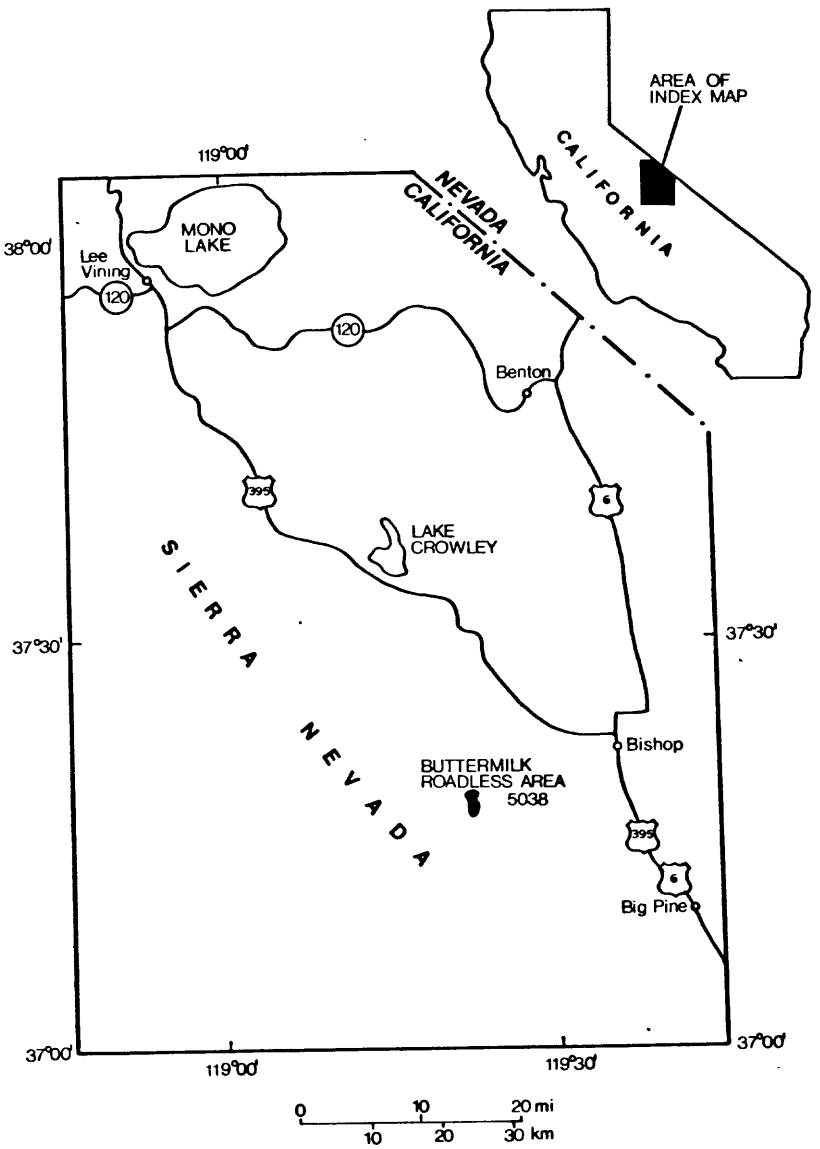
The results of geological, geochemical, and mining activity and production surveys in the Buttermilk Roadless Area indicate no potential for metallic, nonmetallic or energy resources in the area. Glacial till and other types of surficial alluvium cover the bedrock to a depth of tens and probably hundreds of feet preventing examination, evaluation, and possible production of minerals that might be present in the bedrock. No mining claims are known to be in the area and the nearest mining activity is too far removed to reasonably project mineralization into the buried bedrock of the Roadless Area. The glacial till has little potential for placer deposits because the eroded debris has had little or no sorting and concentration by natural hydraulic action.

INTRODUCTION

The Buttermilk Roadless Area (RARE II FP 05038) is on the eastern side of the Sierra Nevada about 12 mi (18 km) west of Bishop, Calif. (fig. 1). It is contiguous with the John Muir Wilderness on its west side. The roadless area is 1,000 acres (4.0 km^2) and lies at elevation between 7,700 and 8,700 ft (2,300-2,000 m) above sea level. Easy access to its eastern boundary is by unimproved dirt road that leads to McGee Creek, a major water source for Bishop.

The roadless area is included on the geologic map of the Mount Tom 15-minute quadrangle by Bateman (1965). No additional mapping was done for this study which included field checking and geochemical stream-sediment sampling in June 1981 by the U.S. Geological Survey. The U.S. Bureau of Mines, Western Field Operations Center, searched county mining claim records and other data available concerning mineral deposits, claims, leases, production, and mining activity in the area. The U. S. Bureau of Mines conducted fieldwork in October 1980, searching for prospects and claim locations. Fourteen reconnaissance lode and placer samples taken from the area were analyzed for gold, silver, and tungsten; a spectrographic analysis was run on selected samples.

Figure 1.--Location of the Buttermilk Roadless Area on the eastern flank of the Sierra Nevada, Inyo County, Calif.


AREA OF INDEX MAP
CALIFORNIA
NEVADA
CALIFORNIA
119°00'
38°00'
MONO LAKE
Lee Vining
120
120
Benton
395
LAKE CROWLEY
SIERRA NEVADA
37°30'
37°30'
Bishop
BUTTERMILK ROADLESS AREA 5038
395
Big Pine
37°00'
37°00'
119°00'
119°30'
0 10 20 mi
10 20 30 km

GEOLOGIC SETTING

The Buttermilk Roadless Area is covered entirely by unconsolidated Quaternary deposits including glacial till from at least three glacial periods recognized in the Sierra Nevada, and younger talus and alluvial fan deposits (fig. 2). Bedrock is at an unknown depth beneath these surficial deposits but it is probably several tens to hundreds of feet beneath the surface. Outcrops of Triassic and Cretaceous granitic and Triassic or older mafic metavolcanic rock occur within about 0.5 mi (0.8 km) of the roadless area but the highly faulted nature of the eastern front of the Sierra Nevada make projection of the depth of bedrock beneath alluvium very speculative.

Glacial till.--The glacial deposits are unsorted piles of rock rubble transported to their present site by the flowing glaciers. As such, they contain a wide size range (boulder to silt) and variety of rock types. Glacial deposits classified by Bateman (1965) as belonging to the Sherwin, Tahoe, and the Tioga Sierrian glaciations consist of remmants of moraines and other glacial detritus. The relative ages of these glacial deposits have been determined by erosional and overlapping relationships between moraines.

Talus and alluvial fan deposits.--The talus includes rock glaciers and some reworked till or modified moraine deposits; the alluvial fans are the debris that accumulated where a significant flattening in slope occurs and alluvium gathers. Less steep parts of the roadless area are covered with variable thicknesses of talus and alluvial fans that are younger than the glacial till deposits.

Geochemistry

The only drainage in the area with active erosion and sediment transport is McGee Creek that passes through a southern tip of the roadless area. Eroded material carried by McGee Creek is from areas above (west) and outside the Buttermilk area. Other drainages shown on the topographic map are not discrete stream channels, but rather, poorly defined areas of low topography between glacial moraines or alluvial fan surfaces. Geochemical sampling of stream sediments to define element anomalies in eroded material from erosion basins is thus of limited value in this study area.

Four samples of minus 60-mesh sediment and four nonmagnetic heavy-mineral concentrates were collected however, and analyzed for 31 elements using six-step semiquantitative emission spectrography and five additional elements (Zn, Cd, As, Sb and Bi) using atomic absorption spectroscopy or colorimetry. The results of these analyses show no anomalous amounts of any metallic element.

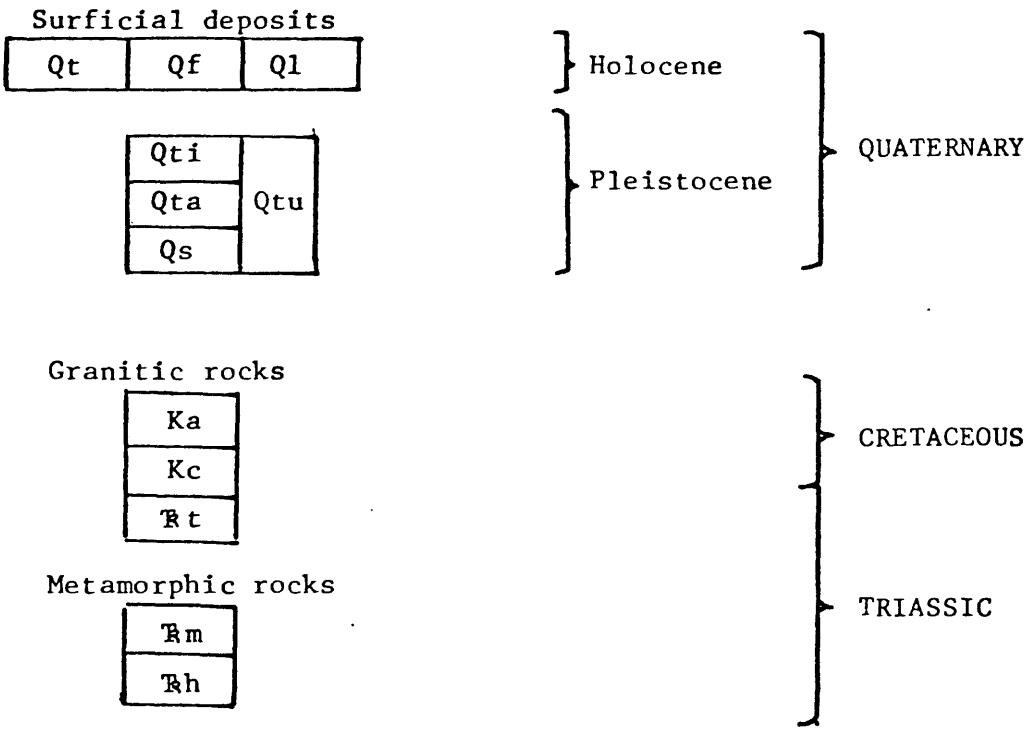
Mining Activity

Buttermilk mining district completely covers the Buttermilk Roadless Area. The Bishop Creek mining district, containing gold and tungsten deposits, is adjacent to the east.

Figure 2.--Geologic map of a part of the Mount Tom 15-minute quadrangle including the Buttermilk Roadless Area (5038). Geology from Bateman (1965).

EXPLANATION

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qt TALUS (HOLOCENE)--Includes rock glaciers and recent moraines

Qf ALLUVIAL FAN DEPOSITS (Holocene)--Pebbly and conglomeratic material with surfaces showing little dissection

Ql LANDSLIDE (HOLOCENE)

Qti TIOGA TILL (PLEISTOCENE--Glacial deposits of the Tioga Glaciation

Qta TAHOE TILL (PLEISOTCENE)--Glacial deposits of the Tahoe Glaciation

Qs SHERWIN TILL (PLEISTOCENE)--Glacial deposits of the Sherwin Glaciation

Qtu GLACIAL TILL (PLEISTOCENE)--Glacial deposits not distinguished by glaciation

Ka APLITE BODIES (CRETACEOUS)--Felsic dikes and masses, chiefly of aplite, pegmatite and alaskite

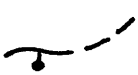
Kc ROCKS SIMILAR TO CATHEDERAL PEAK GRANITE (CRETACEOUS)--Medium- to coarse-grained, porphyritic quartz monzonite

Rt TUNGSTEN HILLS QUARTZ MONZONITE (TRIASSIC)--Light-gray medium-grained quartz monzonite

Rm MAFIC METAVOLCANIC ROCKS (TRIASSIC OR OLDER)

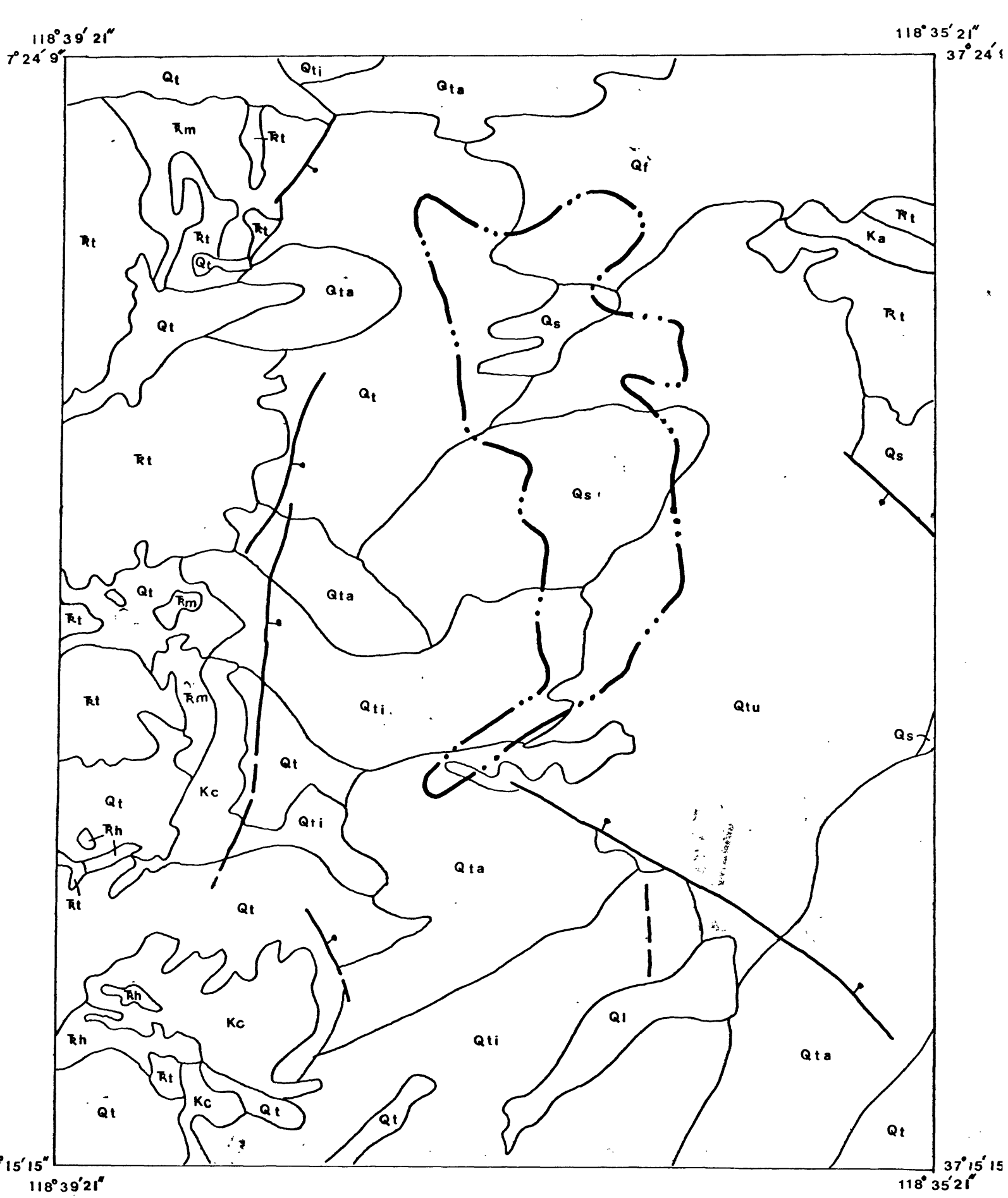
Rh PELITIC HORNFELS (TRIASSIC OR OLDER)

CONTACT



FAULT--Dashed where approximately located. Bar on downthrown side

BOUNDARY OF ROADLESS AREA


118°39'21"
7°24'9"
118°35'21"
37°24'
Qt
Qti
Qta
Tm
Tt
Qf
Ka
Qs
Kc
Th
Ql
37°15'15"
118°39'21"
118°35'21"
0
1
2 Miles
0
1
2
3 Kilometers

Small-scale placer gold mining was done prior to 1913 in Deep Canyon, 5 mi (8 km) northeast of the study area. The discovery of placer scheelite prompted tungsten exploration. Production started in 1916 and 85,000 short ton units (stu)[1] of tungsten trioxide (WO_3) were produced in the Tungsten Hills, east of the Buttermilk area, by 1919 when tungsten prices dropped sharply; about 100,000 stu were produced prior to 1941.

Lode claims for tungsten were located in the 1940's on the eastern slope of the Sierra Nevada. The closest prospect, the Basin, 1 mi (1.6 km) west of the roadless area, produced about 100 tons of tungsten ore for testing. In 1963, tungsten ore from the Sonny Boy Mine, 1.5 mi (2.4 km) to the northwest, was milled at a portable mill set up 1 mi (1.6 km) northwest of the study area.

There is no evidence that mining or prospecting have been done in the roadless area. The nearest active prospects are in the Bishop Creek district in the Tungsten Hills. These prospects produce less than 200 stu of tungsten annually.

Mining claims

According to Inyo County records, 15 lode claims and 7 placer claims were located in the Buttermilk mining district. Descriptions are vague, and some of these unpatented claims may lie in the study area. During the fieldwork, no prospects or claim markers were found. No mineral leases or patented claims are in or near the study area.

MINERAL RESOURCE POTENTIAL

Examination of the Buttermilk Roadless Area and sample analyses failed to reveal any indication of mineral resources. The surveys show no potential for metallic, nonmetallic or energy resources in the area. The entire area is covered by a considerable thickness of glacial debris and bedrock which might prove a target for exploration is at variable depths probably measured in tens or hundreds of feet. Bedrock exposures are no closer than about 0.5 mi (0.8 km) from the roadless area and have no known mineral deposits so that subsurface exploration at this time does not seem warranted. Analyses of gravel samples taken where gold or other heavy minerals would tend to accumulate contain no valuable heavy minerals. Glacial till which comprises most of the surficial deposits in the area is not particularly good as host for placer deposits because of the lack of natural hydraulic action to concentrate minerals of differing specific gravity.

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[1] A unit containing 20 pounds of tungsten trioxide (WO_3), or 15.86 pounds of tungsten.

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