DEPARTMENT OF THE INTERIOR

U. S. GEOLOGICAL SURVEY

OPEN-FILE REPORT

86-83

STUDIES RELATED TO WILDERNESS

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys of certain areas 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 summarizes the results of a geological survey of the Dry Valley Rim Wilderness Study Area (CA-020-615), Lassen County, California and Washoe County, Nevada.

INTRODUCTION

The Dry Valley Rim Wilderness Study Area is located in the eastern part of the Modoc Plateau in Lassen County, northeastern California, and Washoe County, northwestern Nevada (fig. 1). The area encompasses 54,480 acres of Bureau of Land Management administered public land about 40 mi east of Susanville. The study area is bounded on the east by the lower Smoke Creek Road, the Dry Valley Road, and the Pipe Springs Road. The northern boundary is the Smoke Creek Ranch Road, the southern boundary the Wendel Road, and the western boundary the east-side Skedaddle Road. Access to the study area is provided by several light-duty dirt roads and ways that join the boundary roads. Elevations range from 3,800 to 6,200 ft. Steep rim rock walls and talus-covered canyons are common in the eastern third of the area, while the majority of the study area is gradually sloping, covered only by sparse sagebrush.

GEOLOGY

Dry Valley Rim is a 17-mi-long north-south-trending fault block that is situated to the west of and 1,500 ft above the Smoke Creek Desert. The rim provides good exposure of the thick sequences of volcanic rocks that underlie the wilderness study area. The rocks in the study area consist mostly of Tertiary basalt, andesite, and lahar with minor amounts of rhyolitic ash-flow tuff. North of the study area boundary, a flat-lying basalt flow is present that may be as young as Quaternary. Surficial deposits consist of colluvium, alluvium, and talus, as well as aeolian, lacustrine, and fluvial deposits.

The geology of the study area is shown in 1:250,000-scale published maps; Bonham (1969) describes the Nevada side of the study area and Lydon and others (1960) give the geology of the California side.

Olivine basalt flows in the area consist of fine-grained to aphanitic or glassy rocks with phenocrysts of olivine (less than 1 mm), often altered to iddingsite or with iddingsite rims. These rocks have SiO_2 contents of between 50 and 53 weight percent. M.F. Diggles (unpub. data, 1985) gives a preliminary potassium-argon age of 13.6 ± 0.2 m.y. on basalt similar to this located in the Skedaddle Mountains.

Andesite flows, often with intercalated basalt, dominate the study area. The andesite contains phenocrysts of calcic plagioclase, clinopyroxene (augite), and minor orthopyroxene (hypersthene and bronzite) in fine-grained to aphanitic plagioclase-rich matrix. The SiO_2 content of these rocks ranges from 53 to 62 weight percent. The higher-silica dacites present in the Skedaddle Mountains to the west (M.F. Diggles and others, unpub. data, 1985) are not present in this study area except as matrix in lahar. A potassium-argon age of 11.8 ± 0.8 m.y. was determined for rocks similar to these on the northwest flank of Hot Spring Peak in the Skedaddle Mountains (Trobridge Grose, written commun., 1985).

In the northern part of the study area thick sequences of lahar are exposed. These lahars are particularly dominant in the mountains south of Smoke Creek and in the northern part of Dry Valley Rim. They consist of volcanic mud-flow breccia occurring as lobate flows filling channels and as crusts on sides of channels. The flows contain poorly sorted, angular to sub-rounded clasts of basaltic, andesitic, and (or) dacitic material, locally mixed with ashy matrix. Lahars are volcanic debris flows containing at least 80 weight percent solids (Fisher and Schmincke, 1984). They follow pre-existing valleys and are often interstratified with alluvium. The lahar unit outcrops as resistant ridges and is often intercalated with flows of andesite.

In the face of Dry Valley Rim there are exposures of rhyolite ash-flow tuff. These consist of pinkish-white ashy matrix with nonwelded pumice fragments from 1 to 10 mm long. Lithic tuff that includes angular to sub-rounded clasts of aphyric basalt and porphyritic andesite also occurs. This rock unit is locally zeolitic and perlitic.

REFERENCES CITED

Bonham, H.F., 1969, Geology and mineral deposits of Washoe and Storey Counties, Nevada: Nevada Bureau of Mines Bulletin 70, 140 p.

Lydon, P.A., Gay, T.E., and Jennings, C.W., 1960, Geologic map of California, Westwood sheet: California Division of Mines and Geology, scale 1:250,000.

Fisher, R.V., and Schmincke, H.-U. 1984, Pyroclastic rocks: Berlin, Springer-Verlag, 472 p.

EXPLANATION

CORRELATION OF MAP UNITS

Qc	Qal	Qls	Qt	Qf	Ql		QUATERNARY
Qa	Qlf						
Unconformity							
QTb							QUATERNARY OR TERTIARY
Unconformity							
Tb				Tab	Tv		TERTIARY
Tlh	Tra	Tal					

DESCRIPTION OF MAP UNITS

Quaternary Units

Qc COLLUVIUM (QUATERNARY)—Coarse, unsorted soil and rock material collected at base of slopes

Qal ALLUVIUM (QUATERNARY)—Unconsolidated silt, sand, gravel deposited by stream as semi-sorted sediment

Qa AEOLIAN DEPOSITS (QUATERNARY)—Dune sand deposited by wind in Dry Valley in the eastern part of the study area

Qls LANDSLIDE DEPOSITS (QUATERNARY)—Coarse, angular blocks of rock deposited by landslides and slumps

Qt TALUS (QUATERNARY)—Outward-sloping mass of coarse, angular rock fragments derived from cliffs and steep slopes

Qf FLUVIAL DEPOSITS (QUATERNARY)—Sedimentary deposits consisting of fairly well sorted sand and gravel transported and laid down by streams

Ql LACUSTRINE DEPOSITS (QUATERNARY)—Consist of fine sand and silt deposited on the bottom of lakes or ponds. Represent remnants of lakes that are now dry

Qlf LACUSTRINE AND FLUVIAL DEPOSITS (QUATERNARY)—Intercalated lake and stream deposits now underlying meadows

Quaternary or Tertiary Units

QTb BASALT (QUATERNARY OR TERTIARY)—Olivine basalt flow in northern part of study area, consisting of fine-grained to aphanitic or glassy rocks with phenocrysts of olivine

Tertiary Units

Tb BASALT (TERTIARY)—Olivine basalt flows consisting of fine-grained to aphanitic or glassy rocks with phenocrysts of olivine (less than 1 mm), often altered to iddingsite or with iddingsite rims

Tlh LAHAR (TERTIARY)—Volcanic debris flow and breccia. Occurs as thick sequences of flows in northern part of study area, elsewhere as lobate flows filling channels and as crusts on sides of channels. Contain poorly sorted, angular to sub-rounded clasts of basaltic, andesitic, and (or) dacitic material, locally mixed with ashy matrix

Tra RHYOLITE ASH-FLOW TUFF (TERTIARY)—Rhyolite pumice lapilli ash-flow tuff that occurs as layers tens of feet thick in the flanks of Dry Valley Rim

Tal ANDESITE AND LAHAR (TERTIARY)—Intercalated andesite and lahar flows

Tab ANDESITE AND BASALT (TERTIARY)—Intercalated andesite and basalt flows. Andesite contains phenocrysts of calcic plagioclase, clinopyroxene, and minor orthopyroxene in fine-grained to aphanitic plagioclase-rich matrix

Tv VOLCANIC ROCKS (TERTIARY)—Volcanic rocks consisting of intercalated basalt, andesite, and lahar. Locally zeolitic and perlitic.

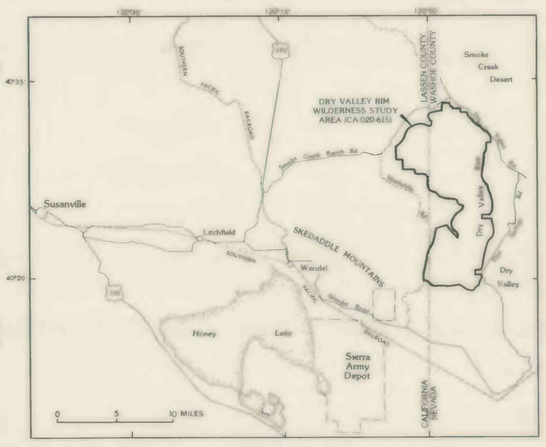
CONTACT

FAULT—Dashed where approximately located; dotted where concealed; ball and bar on down-thrown side

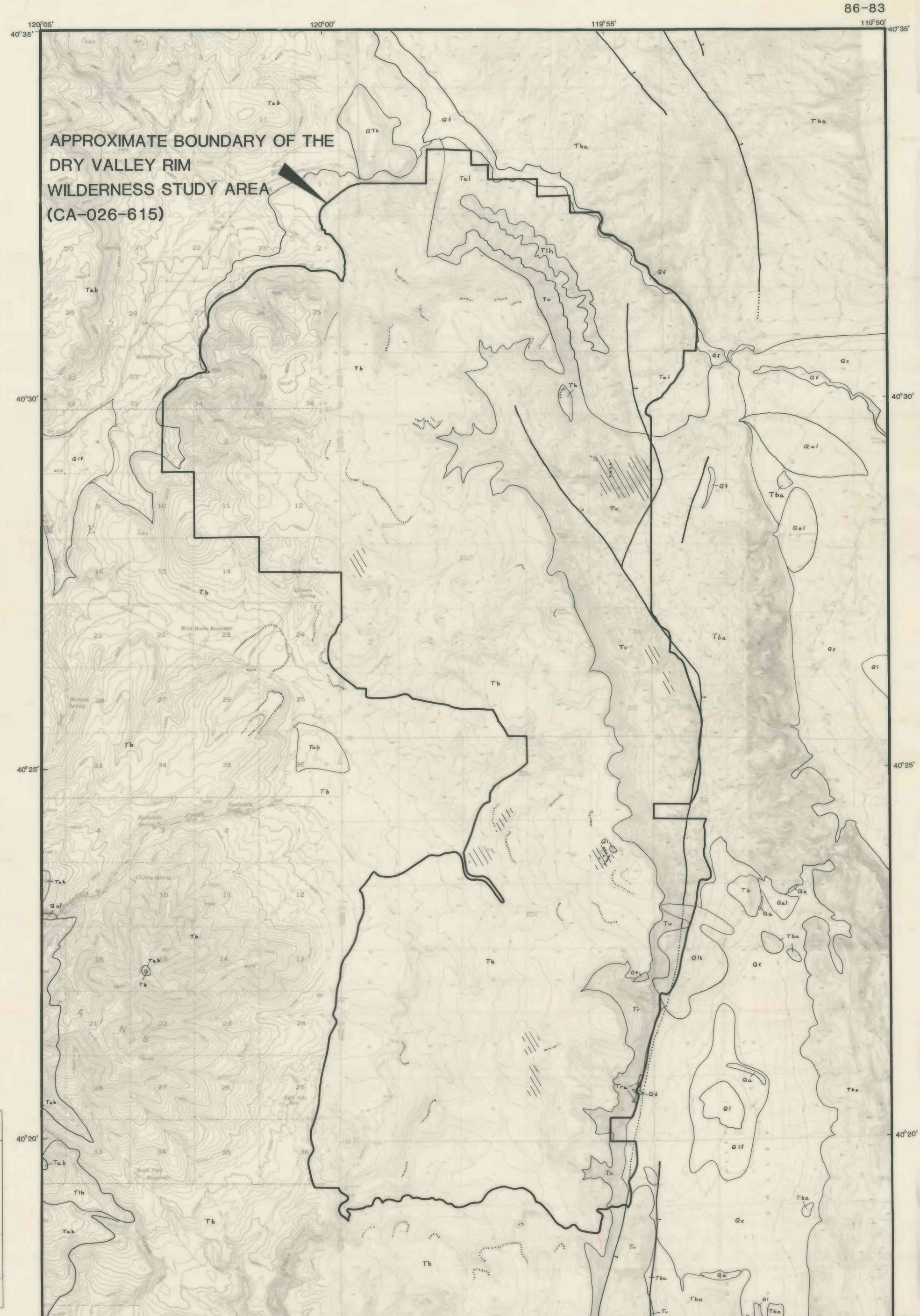
DIKE

EDGE OF FLOW

AREA OF IRON-OXIDE STAINING



INDEX MAP



Base from U.S. Geological Survey Shinn Mtn. 1954, Wendel 1954, California 1:62,500, Smoke Creek Ranch 1980, Salt Marsh 1980, Red Rock Canyon 1980, Sheepshead Spring 1981, Parker Canyon 1980, and Sand Pass 1980, Nevada, 1:24,000.

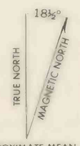
Scale 1:48,000

1 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

Contour interval 40 and 20 feet
National geodetic vertical datum of 1929

AREA OF MAP



APPROXIMATE MEAN DECLINATION, 1986

Geology by M.F. Diggles, L.D. Batatian, and D.A. Dellinger, 1985.

Any use of trade names is for descriptive purposes only and does not imply endorsement by the U.S. Geological Survey.

This map is preliminary and has not been reviewed for conformity with U. S. Geological Survey editorial standards and stratigraphic nomenclature.

GEOLOGIC MAP OF THE DRY VALLEY RIM WILDERNESS STUDY AREA, LASSEN COUNTY, CALIFORNIA, AND WASHOE COUNTY, NEVADA

By

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