TEI-850

TEI-850

GEOLOGIC MAP OF
THE SILENT BUTTE QUADRANGLE,
NYE COUNTY, NEVADA

By E. B. Ekren, R. E. Anderson, Paul P. Orkild, and E. N. Hinrichs

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

metadc502042

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GEOLOGIC MAP OF THE SILENT BUTTE
QUADRANGLE, NYE COUNTY, NEVADA*

By

E. B. Ekren, R. E. Anderson, Paul P. Orkild,
and E. N. Hinrichs

September 1964

Report TEI-850

This report is preliminary and
has not been edited for conformity
with Geological Survey format.

*Prepared on behalf of the U.S. Atomic Energy Commission.

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
DESCRIPTION OF MAP UNITS

- Qac** ALLUVIUM AND COLLUVIUM.
BASALT OF BASALT RIDGE (0-100 ft)-dense black porphyritic basalt containing phenocrysts of labradorite and clinopyroxene as much as 1/8 inch in length.
- Td** FEEDER DIKE.
- Tet** THIRSTY CANYON TUFF.
TRAIL RIDGE MEMBER (8-75 ft)-simple cooling unit; brown to purplish-gray weakly to densely welded quartz-free ash-flow tuff containing 15 to 30 percent phenocrysts-principally alkali feldspar, minor pyroxene, and an occasional grain of olivine. Includes basal pumice-rich ash-fall tuff except where ash fall is 30 ft or more thick; then mapped separately.
- Ttsu** SPEARHEAD MEMBER.
Upper unit (0-100 ft)-simple cooling unit; purple- to ashen-gray weakly to densely welded quartz-free ash-flow tuff containing 15 to 30 percent phenocrysts-principally alkali feldspar with very minor pyroxene, biotite, and olivine. Characteristically contains abundant devitrified lensoids of scoriaceous pumice; local thick vapor-phase zones. In most areas includes basal pumice-rich ash-fall tuff, but in places ash fall is mapped separately.
- Ttsl** Lower unit (0-300 ft)-multiple-flow compound cooling unit; alternating zones of weakly welded to moderately well welded pink-gray vitric crystal-poor to moderately crystal-rich ash-flow tuff containing phenocryst assemblage similar to that of upper unit; local zones of well-developed vapor-phase crystallization. Includes nonwelded pumice-rich bedded tuff base.
- Tbr** RHYOLITE AND TRACHYANDESITE OF BLACK MOUNTAIN AREA.
RHYOLITE LAVA FLOWS (0-300 ft)-medium-gray porphyritic pumice-lentils containing about 25 percent phenocrysts consisting of about 80 percent clear to milky-white sodium-rich alkali feldspar, about 10 percent clinopyroxene and orthopyroxene, and minor plagioclase, iron oxide, and olivine. Groundmass consists of alkali feldspar, quartz, and minor mafic minerals.
- Tbt** TRACHYANDESITE LAVA FLOWS (0-50 ft)-medium to dark pink-gray porphyritic andesite containing about 25 percent phenocrysts in a dense trachytic groundmass of anorthoclase, pyroxene, and iron oxide. Phenocrysts consist of large (as much as 1 cm) zoned andesine or labradorite and minor small phenocrysts of clinopyroxene, olivine, and magnetite.
- Tpat** PIAPU CANYON FORMATION.
TUFF OF AMONIA TANKS (0-250 ft)-multiple-flow compound cooling unit throughout most of area; locally two separate cooling units; light-tan to light-gray, pink, and orange generally pumice-rich nonwelded to weakly welded ash-flow tuff; locally densely welded and devitrified in upper and middle parts; contains many large crystal-rich pumice blocks that locally are as much as 4 ft long; matrix contains 5 to 20 percent phenocrysts of alkali feldspar, quartz, minor plagioclase, biotite, clinopyroxene, and magnetite; commonly weathers to scuffy cavernous surface. Where two cooling units occur the lower has a feebly developed vapor-phase zone at top, a gray to pink-gray weakly to densely welded upper part, and a conspicuous pink vitric shard-rich pumice-poor nonwelded base.
- Tpr** RAINIER MESA MEMBER (200-600 ft)-multiple-flow compound cooling unit; gray or pink gray to purple-gray ash-flow tuff containing 15 to 25 percent phenocrysts of clear quartz and alkali feldspar in approximately equal amounts and plagioclase, biotite, and occasional clinopyroxene (phenocryst proportions vary widely between separate flows); unit characteristically contains higher percentage of quartz and plagioclase than tuff of Amonia Tanks (Tpat). Upper part (150-550 ft) is gray to purple-gray densely welded devitrified tuff containing white to light-pink collapsed pumice; vapor-phase crystals occur throughout but are most abundant at top; alteration of matrix to clay and replacement of pumice by zeolites is common; characteristically weathers to alternating massive cliffs and shaly slopes (variation in competency may be related to variation in degree of alteration and/or devitrification). Lower part (15-50 ft) is dark-gray vitrophyre that grades downward to vitric pink to pale-brown nonwelded tuff containing subangular pumice lapilli.
- Tps** TUFF, TUFFACEOUS SEDIMENT, AND RHYOLITE.
Tuff and tuffaceous sediment (1-100 ft)-in Palate Mesa Exploratory well rock above rhyolite (Tpr) is dominantly buff to white ash-fall tuff and tuffaceous sediment containing minor beds of tuffaceous conglomerate that are rich in fragments of rhyolite; ash-fall tuff contains 5 to 20 percent quartz and sandstone phenocrysts, rich in fine to coarse pumice as large as 4 mm. In drill hole rock below rhyolite is yellowish-green, greenish-gray, and orange ash-fall and ash-flow tuff and tuffaceous sediment; ash-fall tuff and tuffaceous sediment are collitized and contain 5 to 20 percent purple, brownish-gray, and reddish-brown volcanic lithic fragments as much as 10 cm in diameter. In canyon north of drill hole rock exposed below rhyolite is mostly well-bedded white to buff vitric tuffaceous sediment with lithics of rhyolite and welded tuff; upper part is massive and contains abundant angular blocks of vesiculated rhyolite.
- Tprh** Rhyolite (0-300 ft)-gray to light greenish-gray, conspicuously flow banded, vitric to devitrified; contains about 30 percent phenocrysts consisting of 80 to 90 percent alkali feldspar and minor quartz, plagioclase, and clinopyroxene; basal blocky flow breccia developed locally.
- Trg** RHYOLITE OF GRASS SPRING CANYON (150 ft)-medium- to light-gray crystal-rich massive to coarsely foliate rhyolite containing about 25 percent phenocrysts of alkali feldspar, quartz, plagioclase, pyroxene, biotite, olivine, and magnetite; exposed only in north-east corner of quadrangle.

PREPARED IN COOPERATION WITH THE
U.S. ATOMIC ENERGY COMMISSION

TEI-850
OPEN FILE

EXPLANATION

Qac
Alluvium and colluvium

Td
Basalt of Basalt Ridge
Tb, flows
Tb, feeder dike

UNCONFORMITY
Ttsu
Ttsl
Tbr

Thirsty Canyon Tuff
Trail Ridge Member
Spearhead Member:
Ttsu, upper unit
Ttsl, lower unit
Stipple pattern shows ash-fall tuff

Tbr
Tbt
Rhyolite and trachyandesite of
Black Mountain area
Tbr, rhyolite lava flows
Tbt, trachyandesite lava flows

UNCONFORMITY
Tpat
Tpr

Tuff of Amonia Tanks
Rainier Mesa Member
Tprh

Tuff, tuffaceous sediment, and rhyolite
Tps, tuff and tuffaceous sediment
Tprh, rhyolite

UNCONFORMITY
Tg
Rhyolite of Grass Spring Canyon

Contact
Dashed where gradational or inferred

Fault, showing dip
Dashed where approximately located; dotted where concealed.
Bar and ball on downthrown side

Anticline
Showing trace of axial plane and plunge of axis. Dashed where approximately located. The anticlines are believed to be formed over buried topographic highs and are not products of compressive forces

Strike and dip of bedding

Horizontal bedding

Strike and dip of flow layering or compaction foliation

Vertical joint

This report is preliminary and has not
been edited or approved for publication
with the Geological Survey, Washington,
and measurements

Base by U.S. Geological Survey, 1962

SCALE 1:24,000

Geology mapped in 1962

GEOLOGIC MAP OF THE SILENT BUTTE QUADRANGLE, NYE COUNTY, NEVADA

By
E.B. Ekren, R.E. Anderson, Paul P. Orkild, and E.N. Hinrichs
1964