UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Geologic Map of Tertiary Volcanic Rocks in the Mountain Spring Peak Quadrangle, Iron County, Utah

By

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DESCRIPTION OF MAP UNITS

Qac — ALLUVIUM AND COLLUVIUM (QUATERNARY)--Unconsolidated, poorly sorted stream, fan and slope-wash deposits of gravel, sand, and silt; in the western half of the quadrangle an extensive colluvial mantle of the unit Tbr conceals the underlying unit Tbt; probably less than 10 m thick

QTa — OLDER ALLUVIUM (QUATERNARY, PLIOCENE AND MIOCENE?)--Weakly consolidated stream and fan deposits of gravel, sand, and silt; a few tens of meters thick

Tb — BASALT (MIOCENE?)--Fine-grained vesicular dark lava flow containing olivine phenocrysts. Occurs in one small outcrop south of the Pine Valley Road; possibly correlates with widespread mid-Miocene flows in the southwestern part of the Frisco Quadrangle to the north (Best and others, 1980)

FORMATION OF BLAWN WASH (MIOCENE)

Tbr — Rhyolite member of Broken Ridge--A sequence of gray, red-brown, and lavender felsitic lava flows with locally autobrecciated margins and vitrophyric bases; strongly flow layered and commonly show spherulitic, vuggy, and lithophysal fabrics. One exceptionally porphyritic rhyolite with abundant phenocrysts of smokey quartz, sanidine, plagioclase, and minor biotite occurs at the base of the sequence at the north end of Broken Ridge; other rhyolite flows are weakly porphyritic and even aphyric in places, and the sparse phenocrysts, generally less than 1-2 mm across, consist of smokey quartz, alkali feldspar, and plagioclase. Topaz and rare fluorite have been noted in vugs. Individual flows may be only a few tens of meters thick, whereas the entire sequence may be as much as two to three hundred meters thick. Lindsey and Osmonson (1978) report an age of 20 m.y. on a similar topaz rhyolite flow in The Tetons Quadrangle to the north of Broken Ridge

Tbrg — Vertically flow layered, somewhat brecciated, perlitic green glass--Contains sparse phenocrysts of quartz and feldspar; occurs locally and may represent feeder masses for the topographically higher bodies of weakly porphyritic rhyolite

Tbrd — Rhyolite dike in north-central part of quadrangle--Abundant, large (as much as 1 cm) phenocrysts of quartz, plagioclase, and lesser smaller sanidine and biotite in a felsitic matrix; somewhat altered

Tbt — Tuff member--A sequence of light-colored, weakly consolidated ash-flow tuffs and minor water-laid, air-fall and base-surge deposits which generally are obscured by colluvium consisting of unit Tbr debris; fairly clean quartz sandstone occurs locally; pumice lapilli are abundant in the tuffaceous parts of the unit and phenocrysts of quartz, feldspar, and biotite are sparse; locally abundant fragments as much as 1 m in diameter of Lund Tuff Member, green perlitic glass, and dark-colored rhyolite suggest that this member is locally derived and represents an explosive facies from the same magmas which formed the fluidal rhyolite flows of unit Tbr. Maximum thickness, about 100 m

Ta — ANDESITE (MIOCENE)--Large plagioclase and smaller pyroxene phenocrysts in a red-brown felsitic matrix; occurs only in northwest corner of quadrangle. Thickness no more than 20 m

Tcb — BAUERS TUFF MEMBER OF THE CONDOR CANYON FORMATION (MIOCENE)--Gray, buff, and lavender, firmly welded ash-flow tuff containing about 10 percent phenocrysts of plagioclase, sanidine, and biotite; only a few meters thick. Age--22 m.y. (Fleck and others, 1975)

Tha — HORNBLENDE ANDESITE (MIOCENE)--Platy, gray rock with abundant acicular black hornblende and lesser green augite phenocrysts in a very fine grained trachytic matrix rich in plagioclase; locally phenocryst poor or even aphyric. Thickness ranges from 50 to 100 m

Ti — ISOM FORMATION (OLIGOCENE)--Densely welded, vuggy, eutaxitic red-brown to lavender ash-flow tuff with less than 20 percent phenocrysts of plagioclase and minor amounts of minute black pyroxene; weathers into grus. At least two cooling units occur in the southwestern part of the quadrangle where the total thickness is at least 150 m and quite possibly greater. Age--25 m.y. (Fleck and others, 1975)

NEEDLES RANGE FORMATION (OLIGOCENE)--Purple-gray to red-brown, firmly welded, crystal-rich ash-flow tuffs in which phenocrysts of plagioclase, biotite, hornblende, and quartz constitute nearly half of the rock; compressed pumice lapilli are locally conspicuous. Age--29 m.y. (Fleck and others, 1975). Individual tuff sheets (Lund and Wah Wah Springs) can be individually mapped. Perhaps the Needles Range Formation and its parts should be assigned higher stratigraphic rank (Best and others, 1979)

Tl — Lund Tuff Member--Crystal-rich ash-flow tuff characterized by about 10 percent quartz, 10 percent biotite, and lesser amounts of hornblende phenocrysts, together with about 25 percent plagioclase. Black vitrophyre a few meters thick lies at the base in the eastern part of the quadrangle where the unit is 400 m or more thick

Tw — Wah Wah Springs Tuff Member--Crystal-rich ash-flow tuff characterized by abundant plagioclase, hornblende, and biotite phenocrysts and less than 2 percent quartz phenocrysts. A black vitrophyre occurs at the base of the unit where the total thickness exceeds 230 m

ESCALANTE DESERT FORMATION (OLIGOCENE)--A sequence of crystal-poor, lithic, rhyolitic to quartz-latitic ash-flow tuffs, andesitic and rhyolitic lava flows, and volcanic sandstone described by Grant (1978) and Campbell (1978) and here used along with its constituent members described below

Teu — ESCALANTE DESERT FORMATION, UNDIVIDED (OLIGOCENE)

Teb — Beers Spring Member--Olive-brown, well-sorted volcanic sandstone; exposed only in the northwest corner of the quadrangle where it is at least 15 m thick

Tef — Quartz latite flow member--Lavender gray, somewhat platy with less than 10 percent phenocrysts (highly altered) of plagioclase, biotite, and hornblende. In The Tetons Quadrangle to the north, this unit overlies the Lamerdorf Tuff Member (Tel). Exposed thickness 175 m

Tel — Lamerdorf Tuff Member--Orange-brown to lavender, firmly welded quartz-latitic ash-flow tuff containing about 10 percent phenocrysts of chalky white plagioclase and lesser biotite; dark-colored lithic fragments and extremely flattened pumice lapilli are conspicuous. No more than 100 m thick

Ter — Rhyolite member--Variegated lavender, brown, red to pink, platy, flow-layered, felsitic rhyolite with phenocrysts of chalky plagioclase (often weathered out leaving pits) and inconspicuous biotite; hornblende appears in some thin sections. Presumed to be an extrusion about 200 m thick

Td — Dacite sill--Gray, strongly porphyritic with phenocrysts of andesine, biotite, hornblende, and quartz in a spherulitic matrix. Margin of sill is brecciated. Appears to have intruded the unit Tea during accumulation of the Escalante Desert Formation

Tea — Andesite member--Black, massive, generally nonvesicular, with phenocrysts of plagioclase and augite; weathers into brown blocks. Maximum thickness is 360 m

Tem — Tuff member of Marsden Spring--White, orange, pale-green or gray crystal-poor and locally lithic-rich ash-flow tuff; phenocrysts of quartz, feldspar, and biotite are less than 1 mm across and comprise only a few percent of the rock; lithic fragments include pink and gray felsite and, near the base of the tuff, pink quartzite. Unit includes a tuff containing abundant plagioclase and biotite phenocryst in exposures two miles southwest of Herd Pass. Thickness 300 m

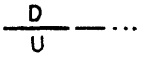
Tv — VOLCANIC ROCKS, UNDIVIDED (MIOCENE AND (OR) OLIGOCENE)--Hydrothermally altered rocks of uncertain identity

P — PALEOZOIC SEDIMENTARY ROCKS, UNDIVIDED

EXPLANATION OF SYMBOLS

HYDROTHERMALLY ALTERED ROCKS

CONTACT--Dashed where approximately located



FAULT--Dashed where approximately located; dotted where concealed. Ball and bar, or "D", on downthrown side

STRIKE AND DIP OF BEDDING

STRIKE AND DIP OF FOLIATION IN LAVA FLOWS AND ASH-FLOW TUFFS

Inclined

Vertical

Horizontal

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