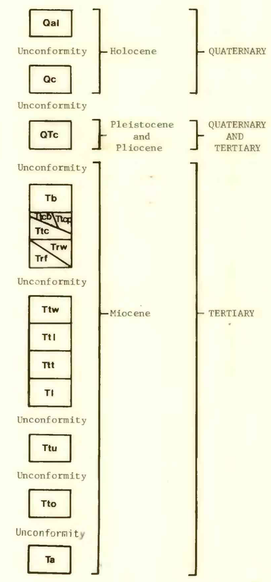
DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT

83-285

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal — ALLUVIUM (Quaternary)--Unconsolidated poorly bedded gravel, sand, and minor silt. Includes talus, stream, and terrace deposits

Qc — CONGLOMERATE (Quaternary)--Weakly consolidated to unconsolidated conglomerate and pebble sandstone. Surface of unit is commonly mantled by residual pebble to cobble size fragments

QTc — CONGLOMERATE (Quaternary and Tertiary)--Weakly consolidated poorly bedded conglomerate and sandstone. Locally includes fanglomerate and lag gravel

Tb — BASALT FLOWS (Miocene)--Dense black aphyric to weakly porphyritic basalt flows. Flows are locally vesicular and weather dark red brown to tan. Phenocrysts consist of up to 1 percent plagioclase in an aphanitic groundmass. Flow breccia present at base of flows locally

Ttc (Ttcb) (Ttcp) — TROUT CREEK FORMATION (Miocene)--Formation, first described by Smith (1927), consists of gray to tan tuffaceous sandstone and siltstone and shale interstratified with white to tan diatomite. Pumice lapilli tuff and tuffaceous conglomerate are present locally. Black aphyric vesicular basalt flows and clastic basaltic sandstone and conglomerate (Ttcb) are present locally near the top of the formation. Palagonite tuff (Ttcp), which is brown to tan, also occurs near the top of the formation.

Trw Trf — RHYOLITE DOMES AND FLOWS (Miocene)--Rhyolite of Willow Butte (Trw) and Flagstaff Butte (Trf) consists of domes and associated flows and flow breccia. Rhyolite of Willow Butte is gray to black, aphyric to weakly porphyritic with phenocrysts of sanidine in a glassy groundmass. Contorted flow foliation is common. Flow breccia is monolithologic and contains clasts as much as several meters in diameter. K-Ar date on sanidine from Willow Butte of 13.8±0.3 m.y. (Rytuba and others, 1981). Rhyolite of Flagstaff Butte is tan to dark gray porphyritic with 2 to 5 percent phenocrysts of sanidine in a partly devitrified glassy groundmass. Vapor phase cavities are locally abundant. Locally black aphyric glassy rhyolite with well developed flow foliation is present

Ttw — TUFF OF WHITEHORSE CREEK (Miocene)--Unwelded to densely welded peralkaline ash-flow tuff composed of several ash flows as well as interstratified air-fall tuffs. Basal ash flow consists of light-gray to white unwelded aphyric tuff with abundant white to gray pumice in a light-gray ash matrix. Lithic fragments are locally abundant. Above this tuff are beds of air-fall tuff consisting of interstratified pumice-rich and ash-rich layers. Above air-fall tuff is an ash-flow tuff which is unwelded near base and densely welded at top; locally it is columnar jointed. Ash-flow tuff is light gray, aphyric, and pumice rich at base; it grades upward into a dark-gray to black unwelded tuff containing abundant lithic fragments. Upper welded zone is tan to brown and contains as much as 3 percent phenocrysts of sanidine. Lithophysal zones are common near base of welded zone. Tuff locally rests on basalt, which in places is so obscured by talus from tuff that it may be locally included in this unit. K-Ar date on sanidine of 15.0±0.3 m.y. (Rytuba and others , 1981)

Ttl — TUFF OF LONG RIDGE (Miocene)--Unwelded to densely welded, vapor-phase recrystallized tuff. Basal part consists of brick-red unwelded to partly welded tuff with black obsidian and lithic fragments. Phenocrysts total less than 5 percent and include sanidine as much as 3 mm long, plagioclase, quartz, augite, and hypersthene. Apatite occurs as inclusions in both ilmenite and hypersthene. Magnetite occurs as inclusions in hypersthene. Above unwelded zone is a black, nearly aphyric basal vitrophyre 0.5 to 2 m thick. Phenocrysts total less than 1.5 percent and consist of ilmenite, magnetite, fayalite, alkali feldspar, aenigmatite, and ferrohedenbergite with inclusions of apatite. Above basal vitrophyre, tuff is green to gray-green, densely welded aphyric comendite. Original eutaxitic texture has been destroyed by vapor-phase recrystallization. Above aphyric comendite, unit consists of interstratified green aphyric to weakly porphyritic welded tuff and brown porphyritic densely welded tuff. Brown porphyritic tuff is a soda trachytic rhyolite containing 7.5 percent potassium-feldspar phenocrysts, 0.3 percent clinopyroxene, 1.5 percent fayalite, and 0.3 percent opaques in a recrystallized groundmass of quartz and potassium feldspar. Secondary flow folds and lineation are common. K-Ar date on sanidine of 15.8±0.6 m.y. (Rytuba and others, 1981)

Ttt — TUFF OF TROUT CREEK MOUNTAINS (Miocene)--Unwelded to densely welded vapor-phase recrystallized comenditic ash-flow tuff. Basal part consists of unwelded porphyritic gray tuff containing 26 percent anorthoclase phenocrysts, 1 percent ferrohedenbergite, 1 to 5 percent aenigmatite, 1 percent fayalite, and 1 percent quartz. Ilmenite occurs as inclusions in clinopyroxene and all phases contain apatite inclusions. Sparse phenocrysts of augite and hypersthene also are present. Tuff grades upward into densely welded green to green-gray porphyritic tuff containing large vapor-phase cavities. At top of unit, large (as much as 20 cm long) black porphyritic glass flamme are present. In areas where tuff is less than 20 m thick, top consists of porphyritic black vitrophyre which forms a ledge 1 to 2 m thick. Top of tuff forms a distinctive flat terrace along canyon walls. In areas where thickness is greater than 20 m, tuff above vitrophyre is green to gray green, densely welded, and vapor-phase recrystallized. Phenocrysts of anorthoclase vary from about 5 to 25 percent of tuff. Tuff is locally columnar jointed. This unit and the tuff of Long Ridge were included together in a tuff and rhyolite unit (Ttr) by Walker and Repenning (1965). K-Ar date on sanidine of 15.9±0.3 m.y. (Greene, 1976)

Tl — LAHARS (Miocene)--White to gray lahars composed of basaltic andesite and andesite clasts up to a meter in diameter in a gray ash matrix

Ttu — TUFFS UNDIFFERENTIATED (Miocene)--Light-gray to brown densely welded porphyritic rhyolite ash-flow tuff containing 5 percent potassium feldspar phenocrysts and up to 2 percent lithic fragments of andesite in a vapor phase recrystallized groundmass of quartz and potassium feldspar. Flow foliation is common and large vapor phase cavities, up to several cm are present. Basal vitrophyre consists of a black partly hydrated obsidian up to 2 m thick. Airfall tuffs below the basal vitrophyre are gray to tan weakly consolidated pumice lapilli and ash tuffs. Included locally in the unit is the Tuff of Oregon Canyon which is obscured by talus from the overlying tuff. Tuff of Oregon Canyon is white to green densely welded porphyritic comendite containing 5.5 percent sanidine, 4 percent quartz, and 1 percent arfvedsonite in a finely crystalline groundmass of quartz, potassium feldspar, and arfvedsonite

Tto — TUFF OF OREGON CANYON (Miocene)--Unwelded to densely welded light-blue-green to white comenditic tuff. Gray to tan air-fall tuffs occur at the base of the unit and are overlain by gray basal vitrophyre 1 to 2 m thick. Above vitrophyre tuff is blue green to white and vapor-phase recrystallized. Phenocrysts consist of 5.5 percent sanidine, 4 percent quartz, and 1 percent arfvedsonite; they occur in a finely crystalline groundmass of quartz, potassium feldspar, and arfvedsonite. Arfvedsonite gives rock a blue-green color and indicates rhyolite is peralkaline. Flattened pumice fragments are replaced by quartz, potassium feldspar, and arfvedsonite. Lithic fragments of porphyritic andesite are locally abundant. Top 10 m of tuff is red brown and unwelded to partly welded. Dark-gray to brown partly flattened pumice as much as 10 cm long occur in a red-brown ash matrix. Lithic fragments are abundant in this upper zone. Phenocrysts in top 10 m of tuff consist of 4 percent sanidine, 1.3 percent quartz, and 0.2 percent clinopyroxene. Transition zone from blue-green lower part of tuff to upper red-brown part is gradational over approximately 2 m and consists of red-brown pumice in a green matrix. Unit forms cliffs and locally displays columnar jointing. K-Ar date on sanidine of 16.1±0.2 m.y. (E. H. McKee, written commun., 1981)

Ta — ANDESITE AND QUARTZ LATITE FLOWS (Miocene)--Black to dark-gray iron-rich andesite and quartz latite flows, which commonly have vesicular tops; locally contain interflow breccia. Weathers tan to brown and forms steep talus slopes composed of platy andesite and quartz latite

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Based by U.S. Geological Survey 1981

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SCALE 1:24000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

CONTACT--Dashed where approximately located

FAULT--Dotted where concealed and dashed where uncertain. Ball and bar on downthrown side

STRIKE AND DIP OF BEDS

This map is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature Any use of trade names is for descriptive purposes only and does not imply endorsement by the USGS.

GEOLOGIC MAP OF THE POLE CANYON QUADRANGLE, HARNEY COUNTY, OREGON

By

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