

OPEN-FILE REPORT O-92-13
PRELIMINARY GEOLOGIC MAP OF THE
SACRAMENTO BUTTE QUADRANGLE
MALHEUR COUNTY, OREGON

By M. L. Ferns
Oregon Department of Geology and Mineral Industries

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This unpublished Open-File Report has not been reviewed and may not meet all Oregon Department of Geology and Mineral Industries' standards.

Field work conducted in 1991
Map Scale: 1:24,000

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Sacramento Butte

The distinctive porphyritic rhyolite exposed at Sacramento Butte makes up the oldest rock unit (Ttip) exposed in the Sacramento Butte Quadrangle. The rhyolite contains about 15% phenocrysts of sanidine, plagioclase, and quartz as large as 8 mm in diameter. The rhyolite is peralkaline in composition and petrographically and chemically similar to the uppermost rhyolite flow exposed at Iron Point. Evans (1991) considers the Iron Point rhyolite to be a crystal-rich ashflow tuff.

The basalt and ferroandesite flows of unit Tbvclie stratigraphically above unit Ttip and are in turn overlain by sediments and tuffs of unit Tscb. A thin light gray, vitric, welded ash-flow tuff exposed in the upper part of unit Tscb is petrographically and chemically identical to the Devine Canyon Tuff. The ashflow is peralkaline, with sanidine, quartz, and green, pleochroic clinopyroxene phenocrysts. Trace element patterns, including distinctive high Zr abundances, suggest that the Tscb ashflow is the thin, distal edge of the Devine Canyon Tuff, which erupted from a large caldera complex in the Burns region at about 9.2 Ma.

Thin basalt and basaltic andesite flows locally appear within the Tscb section, which is overlain by the thick section of heavily weathered olivine-basalt flows that make up unit Tbwbl. Individual flows are locally separated by palagonite breccias. The unit includes quartz tholeiites.

SACRAMENTO BUTTE

- Qfc** Alluvial fan deposits (Quaternary) Mainly unconsolidated and poorly sorted accumulations of coarse gravel deposited along the flank of Cedar Mountain.
- Qss** Lacustrine sediments (Quaternary) Mainly unconsolidated lacustrine deposits of light colored fine sand and silt, may include evaporite deposits.
- Qsl** Lacustrine and eolian deposits (Quaternary) Mainly unconsolidated lacustrine deposits of pale brown fine to medium grained sand deposited along the south and east sides of Barren Valley. Includes rounded gravels along ancient shorelines and wave cut terraces. Also includes higher elevation deposits of wind-blown sand marginal to the shoreline.
- QTb** Olivine basalt (Pliocene?) Gray and grayish-black diktytaxitic olivine basalt flows with well preserved flow tops. Locally heavily mantled by windblown silt. Includes holocrystalline basalts with less than 2% olivine pheno-crysts as large as 3mm in diameter in a groundmass of interlocking plagioclase lathes and subophitic clinopyroxene. Includes high alumina basalts (Analyses 1, Table 1, Mustang Butte quadrangle). Equivalent to unit Qb of Walker, 1977.
- QTs** Unconsolidated fluvial and lacustrine deposits (Pliocene?) Unconsolidated accumulations of sand, silt, and gravel separating QTb from underlying Tbwb flows. Upper part of section contains caliche deposits.
- Tbwb** Olivine basalt flows of Wrangle Butte (Pliocene and Late Miocene?) Bluish and grayish-black, olivine basalt flows and interbedded palagonitic breccias. Includes hyalophitic pillow basalts with 2 mm diameter olivine and plagioclase phenocrysts with ophitic and subophitic clinopyroxene. Chemically, includes quartz tholeiites (Sample, Table 1, Wrangle Butte quadrangle). Equivalent to part of unit Tb of Evans (1991) and QTb of Walker (1977).
- Its** Tuffaceous sand and siltstones (Pliocene and Late Miocene) Mainly yellowish white to yellowish brown tuffaceous silt and sandstones. Includes reworked lapilli tuffs and bentonitic claystones. Equivalent to upper part of unit Ts of Evans (1991).

Tbca

Basaltic andesite (Pliocene or Late Miocene) A single flow of aphyric, bluish black platy basaltic andesite. Presumably correlative with basaltic andesite flows off of Cedar Mountain. Equivalent to unit Tob of Walker (1977).

Tstcb

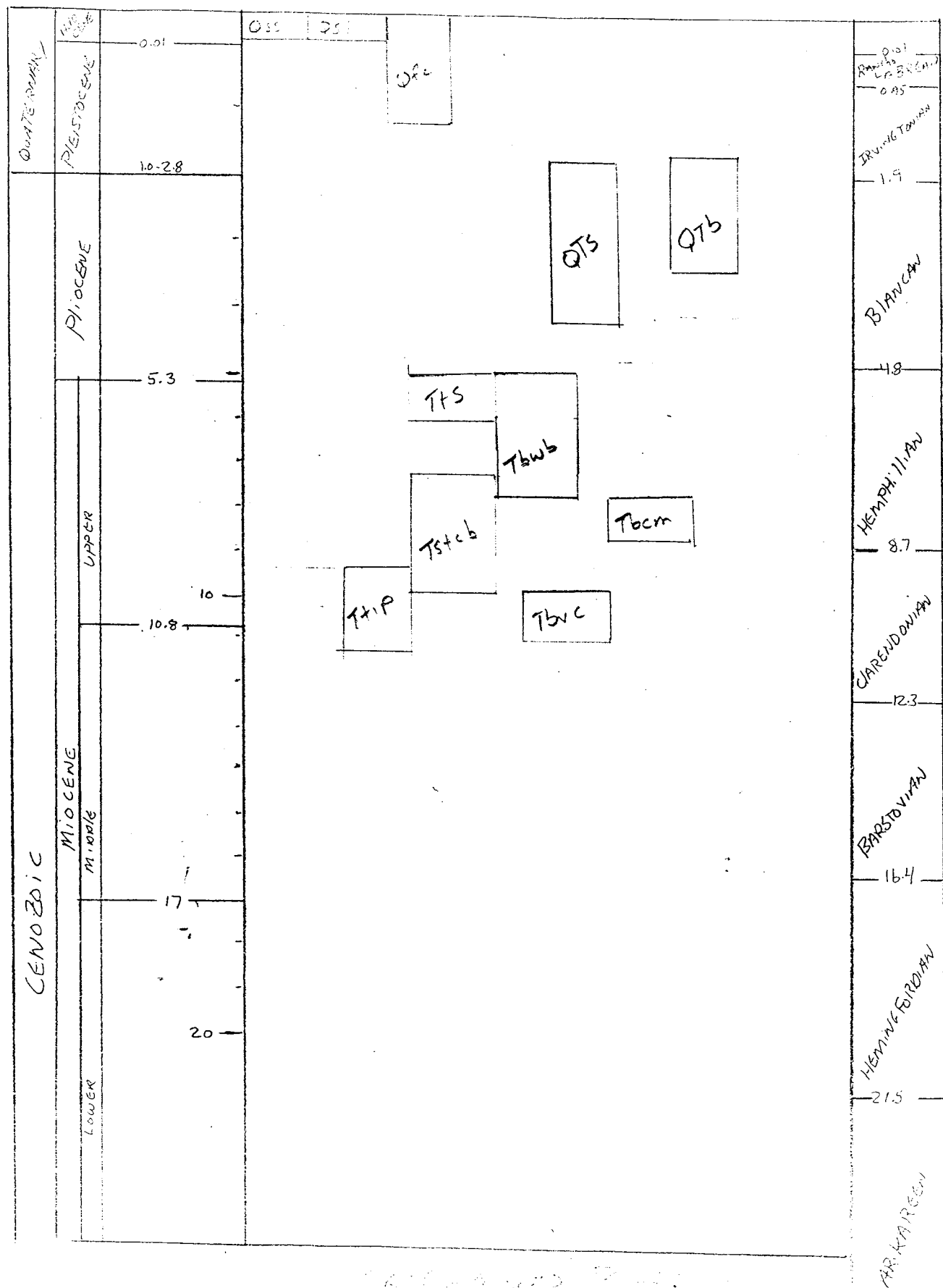
Tuffaceous siltstones, sandstones, and ashflow tuff (Late Miocene) Mainly pale yellowish-white to white, tuffaceous siltstones in the Sacramento Butte quadrangle. Section thickens eastward in the Lambert Rock quadrangle, where, at Chalk Basin, over 450 feet of sediments are exposed (Evans, 1991). Includes a light gray vitric welded ashflow tuff about 3 feet thick which is locally exposed near the top of the unit on Bull Creek. Ashflow contains less than 1% lithic fragments and about 3% sanidine and quartz phenocrysts approximately 3mm in diameter. Accessory minerals include a green pleochroic clinopyroxene. The ashflow is peralkaline with normative acmite and is chemically and petrographically identical to the Devine Canyon Tuff mapped by Greene (1973) west of Crowley (Sample, Table 1). The Devine Canyon Tuff has been dated by K/Ar methods at about 9.2 Ma (Greene, 1973). Equivalent to unit Ts of Evans (1991) and Ts of Walker (1977).

Tbvc

Basalt and ferroandesite (Miocene) Bluish-black to bluish-gray, platy tholeiitic andesite, basaltic andesite, and basalt flows. Includes distinctive glomeroporphyritic flows with plagioclase phenocrysts as large as 2 cm in diameter, plagioclase and orthopyroxene glomerocrysts, and rare quartz xenocrysts. At least three flows with an aggregate thickness of 200 feet exposed north of Mooreville. Analyzed samples (Samples 4 and 5, table 1 contain high abundances of K₂O and show a large degree of iron enrichment. Xenocryst-bearing flows are petrographically and chemically similar to the Square Mountain ferro-latitude (Bonnichsen and others, 1988). Equivalent to unit Tba of Sherrod and others (1988). Age based on K/Ar dates of 11.7 and 11.2 Ma (Hart and Mertzman, 1982) from presumably correlative rocks in the Sheephead Mountains to the south.

Ttip

Rhyolite porphyry (Late Miocene?) Pale gray, white, and pinkish white, coarsely porphyritic rhyolite containing about 15% phenocrysts of sanidine, plagioclase, and quartz. phenocrysts are as large as 8 mm in diameter and are set in a microfelsitic groundmass. Chemically a peralkaline rhyolite (Analyses 1 and 2, Table 1). Petrographically and chemically similar to the upper rhyolite flow exposed at Iron Point (Analyses 3, Table 1), which is considered by Evans (1991) to be an ashflow tuff. Part of unit Tsv of Walker (1977).



LAB #	Quadrangle	1/4	1/4	Sec.	T.(S.)	R.(E.)	Lithology	Unit	SiO2	Al2O3	TiO2	Fe2O3	MnO	CaO	MgO	K2O	Na2O	P2O5	LOI	Cr	Co	Ni	Cu	Zn	Rb	Sr	Y	Zr	Nb	BA	LI
AZB-107	Sacramento Butte	SW	NW	14	28	40	Rhyolite	Trip	75.8	11.6	0.12	1.33	0.03	0.71	0.23	4.87	3.89	0.04	0.93	-10	<5	<5	7.7	89.	242	11	167	257	89	133	49.4
AZB-108	Sacramento Butte	NW	NW	1	28	40	Rhyolite	Trip	76.4	11.2	0.13	1.54	0.03	0.39	0.3	4.86	3.75	0.04	0.85	-10	<5	<5	13.4	114.	223	23	191	265	109	343	23.1


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MAP SYMBOLS

————— Contact -- approximately located

 Fault contact -- dashed where approximately located, dotted where concealed. Ball and bar on down throw side

 Strike and dip of beds

X Location of whole rock sample analyzed in Table 1