GEOLOGIC MAP OF THE POISEL BUTTE 15-MINUTE QUADRANGLE, WASHINGTON

by

R. D. BENTLEY, N. P. CAMPBELL, and JOHN E. POWELL

WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES

GEOLOGIC MAP GM-36

1988

WASHINGTON STATE DEPARTMENT OF
Natural Resources

Brian Boyle - Commissioner of Public Lands
Art Stearns - Supervisor

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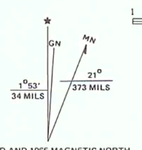
Base map from U.S. Geological Survey 15 minute Poisel Butte quadrangle, 1965

Scale 1:48,000

1 0 1 2 3 4 MILES
3000 0 3000 6000 9000 12000 15000 18000 21000 FEET
1 5 0 1 2 3 4 5 KILOMETERS

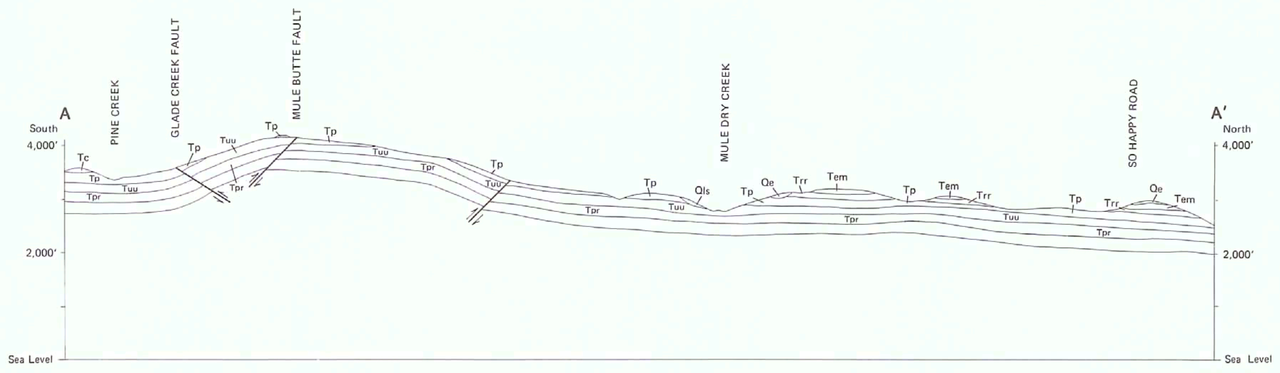
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL



UTM GRID AND 1965 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

QUADRANGLE LOCATION

Prepared in cooperation with the U. S. Department of Energy
under contract number DE-AC06-81RL10297



MAJOR ELEMENT ANALYSES OF ROCKS FROM THE POISEL BUTTE QUADRANGLE, WASHINGTON

Sample locality	Geologic unit	Sample no.	Location	SiO_2	Al_2O_3	TiO_2	Fe_2O_3	FeO	MnO	CaO	MgO	K_2O	Na_2O	P_2O_5	TOTAL
1	Tem	RDB79-097	SW/4,SE/4, sec. 30(9-19E)	51.50	14.42	3.54	2.00	11.78	0.21	9.01	3.59	1.28	2.18	0.50	100.01
2	Tp	RDB-18EE	SW/4,NE/4, sec. 18(6-19E)	52.81	15.56	1.76	2.00	8.19	0.17	10.48	6.77	0.34	1.68	0.23	99.99
3		JNG78-036	NE/4,SW/4, sec. 03(6-20E)	51.96	15.36	1.59	2.00	8.85	0.17	10.62	6.64	0.37	2.23	0.23	100.02
4		JNG78-037	NE/4,SW/4, sec. 03(6-20E)	51.88	15.60	1.53	2.00	8.95	0.18	10.35	6.68	0.47	2.13	0.22	99.99
5		JNG78-038	NE/4,SW/4, sec. 03(6-20E)	51.62	15.35	1.55	2.00	9.39	0.18	10.58	6.74	0.34	2.02	0.23	100.00
			n=4 mean	52.07	15.47	1.61	2.00	8.85	0.18	10.51	6.71	0.38	2.02	0.23	
6	Tuu	SW79-015	SE/4,SE/4, sec. 01(6-19E)	54.39	14.65	2.54	2.00	10.93	0.22	6.05	2.74	3.00	2.63	0.85	100.00
7		RDB79-116	SW/4,SE/4, sec. 05(6-19E)	54.88	15.01	2.65	2.00	9.68	0.24	6.27	2.47	3.02	2.90	0.89	100.01
8		JNG78-039	NW/4,NW/4, sec. 03(6-20E)	54.54	14.64	2.50	2.00	11.22	0.20	5.82	2.61	2.72	2.89	0.87	100.01
9		JNG78-029	Cen,SW/4, sec. 04(6-20E)	54.85	14.72	2.57	2.00	10.28	0.18	6.13	2.52	3.14	2.72	0.88	99.99
10		RDB79-098	SE/4,NW/4, sec. 31(9-19E)	54.93	14.77	2.64	2.00	10.47	0.19	5.97	2.29	2.84	3.05	0.84	99.99
11		RDB79-100	NE/4,SE/4, sec. 31(9-19E)	55.63	15.36	2.78	2.00	8.52	0.20	6.80	1.92	3.00	2.81	0.98	100.00
12		RDB79-101	NE/4,SE/4, sec. 31(9-19E)	53.78	14.79	2.63	2.00	11.18	0.27	6.46	2.35	2.84	2.85	0.85	100.00
13		RDB79-102	NE/4,SE/4, sec. 31(9-19E)	54.78	14.79	2.63	2.00	9.83	0.23	6.33	2.70	3.20	2.66	0.85	100.00
14		RDB79-115	NW/4,NW/4, sec. 35(9-19E)	54.82	14.69	2.77	2.00	10.20	0.20	6.06	2.75	2.72	2.95	0.83	99.99
			n=9 mean	54.73	14.82	2.63	2.00	10.26	0.21	6.21	2.48	2.94	2.83	0.87	
15	Tpr	RDB79-099	SE/4,NW/4, sec. 31(9-19E)	51.28	15.03	3.27	2.00	11.37	0.21	9.32	3.49	0.93	2.39	0.70	99.99
16		RDB79-113	NE/4,NE/4, sec. 34(9-19E)	50.18	14.25	2.99	2.00	11.95	0.24	8.92	5.21	1.11	2.45	0.70	100.00
17		RDB79-114	NW/4,NW/4, sec. 35(9-19E)	51.68	15.30	3.36	2.00	10.11	0.19	9.76	3.51	0.76	2.62	0.72	100.01
			n=3 mean	51.05	14.86	3.21	2.00	11.14	0.21	9.33	4.07	0.93	2.49	0.71	

Analysis by XRF, Department of Geology, Washington State University, Pullman, WA; all analyses normalized to 100 percent on a volatile-free basis.

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

Qas ALLUVIUM, sidestream facies—Stream deposits of silt, sand, and gravel dominantly of basaltic composition; largely confined to valley bottoms; includes local lacustrine, paludal, and eolian deposits in depressions; deposited by tributaries of the Yakima River (sidestream facies of Waitt, 1979)

Qe EOLIAN DEPOSITS—Silt and fine sand; pale-orange to brown; locally contains multiple caliche deposits and tephra beds; includes the Palouse Formation and all younger loess

Qls LANDSLIDE DEPOSITS—Clay, silt, sand, and gravel; unstratified and poorly sorted; surface commonly hummocky; deposited by rotational-translational slides and flows

Qaf ALLUVIAL FAN DEPOSITS—Sand and gravel of diverse composition with basalt clasts dominant in larger sizes; cone-shaped deposits; little or no caliche development; surface relatively undissected

Qafo OLDER ALLUVIAL FAN DEPOSITS—Sand and gravel; semiconsolidated fanglomerate; primarily basalt clasts cemented by iron-stained clays; surface of fans commonly dissected and capped by well-developed caliche

Qfs CATASTROPHIC FLOOD SLACKWATER SEDIMENTS—Silt, with minor amounts of sand and gravel; rhythmically bedded and graded; deposited by lower energy slackwater floods or surges of catastrophic floods; includes the Touchet beds; locally contains clastic dikes, tephra beds, and ice-rafted fragments

ELLENSBURG FORMATION

Teu ELLENSBURG FORMATION UNDIFFERENTIATED—Gravel, sand, silt, and clay, white to light reddish-brown; weakly to moderately indurated fluvial and laharic deposits; dominated by pumiceous dacitic, andesitic, and basaltic clasts; grades downward into thin units of fluvial sand and clay, locally pebbly sand, with mixed volcanic clasts and locally hyaloclastic units; base defined as the top of the lowermost flow of the Columbia River Basalt Group, but the unit includes all conformably underlying sediments of similar lithology beyond the lowermost Columbia River basalt flow pinchout; top of the unit defined as below Thorp Gravel or other Pliocene(?)-Pleistocene units; to the east intertongues with flows of Yakima Basalt Subgroup

Tc Snipes conglomerate (informal usage)—Silt, sand, and gravel; light yellow-tan to reddish-orange; weakly to strongly indurated fluvial deposits; dominated by well-rounded quartzite pebbles with significant numbers of granite, gneiss, and andesite clasts; from the ancestral Columbia River; interfingers with white fluvial and laharic deposits of the Ellensburg Formation; usually confined to that part of the Ellensburg Formation above the Elephant Mountain Member but also present in all interbeds within the Saddle Mountains Basalt; described by Russell (1893) and Waring (1913); may be correlative with the Hood River Conglomerate (Buwalda and Moore, 1927, 1929)

Trr Rattlesnake Ridge Member of Schmincke (1967)—Clay, silt, and sandstone; white to light greenish-gray; weakly to moderately indurated fluvial and laharic deposits; dominated by clayey and tuffaceous siltstone and sandstone; locally contains lenses of quartzite conglomerate; stratigraphic position defined by overlying Elephant Mountain Member of the Saddle Mountains Basalt and the next basalt stratigraphically below

COLUMBIA RIVER BASALT GROUP

YAKIMA BASALT SUBGROUP

SADDLE MOUNTAINS BASALT

Tem ELEPHANT MOUNTAIN MEMBER, Elephant Mountain flow—Fresh surfaces are black, weathers gray-black; fine grained; sparsely to slightly phyric with colorless plagioclase micro-phenocrysts; Elephant Mountain chemical type of Wright and others (1973); normal and transitional magnetic polarity (Choiniere and Swanson, 1979); K-Ar age about 10.5 m.y. (McKee and others, 1977); single flow in map area

Tp POMONA MEMBER, Pomona flow—Fresh surfaces are gray to blue-black, weathers gray; fine grained; abundantly to slightly phyric, with abundant white to colorless plagioclase microphenocrysts; sparse plagioclase glomerocrysts; sparse olivine phenocrysts; invasive contacts common into Ellensburg Formation; well-developed entablature with fanning columns, where more than 150 ft thick, well-developed 0.5-1-m-diameter columns dominate the flow; Pomona chemical type (Wright and others, 1973); reversed magnetic polarity (Rietman, 1966; Choiniere and Swanson, 1979); K-Ar age about 12 m.y. (McKee and others, 1977); single flow in map area. This flow is the Wenas basalt of Smith (1903)

Tuu UMATILLA MEMBER, Umatilla flow—Fresh exposures are gray-black, weathers reddish-brown; very fine grained and sparsely plagioclase phyric; Umatilla chemical type (Wright and others, 1973); normal magnetic polarity; single flow in map area

WANAPUM BASALT

Tpr PRIEST RAPIDS MEMBER, Priest Rapids flows—Fresh exposures are gray-black, weathers rusty brown; medium to coarse grained; aphyric, with rare plagioclase phenocrysts; diktytaxitic; well-developed colonnade with 0.5-1.5-m-diameter columns; lower flow of Rosalia chemical type, upper flow of Lolo chemical type (Swanson and others, 1979); reversed magnetic polarity (Rietman, 1966); age approximately 13.6 m.y. (Mckee and others, 1977); two flows in map area

Tr ROZA MEMBER, Roza flow—Fresh exposures are gray-black, weathers reddish-brown; fine to medium grained, with plagioclase phenocrysts and glomerocrysts generally 0.5-1.0 cm; phenocrysts commonly a few hundred per square meter of surface area; well-developed colonnade, with columns having diameters to 1 m; locally diktytaxitic; Frenchman Springs chemical type (Wright and others, 1973); normal magnetic polarity; laboratory results indicate transitional polarity after demagnetization (Rietman, 1966); resembles plagioclase-phyric flows of Frenchman Springs Member, but phenocrysts generally more abundant and smaller in average size; one flow in map area

FRENCHMAN SPRINGS MEMBER

Tfu Union Gap flows—Fresh exposures are gray-black, weathers gray to reddish-gray; fine to medium grained; generally aphyric with rare plagioclase phenocrysts up to 2 cm; phenocrysts average 1 to 5 glomerocrysts per 10 square meters of surface area; colonnade with 1.5-2.0-m-diameter columns and locally pillowed base; some flows have hackly entablature; Frenchman Springs chemical type (Wright and others, 1973); normal magnetic polarity; one of these flows covers most of the map area

Tfk Kelley Hollow flow—Fresh exposures are gray-black, weathers reddish-gray; fine to medium grained; phyric with abundant plagioclase phenocrysts and glomerocrysts as large as 2 cm; phenocryst abundance highly varied, from 1 to 100 glomerocrysts per square meter of surface area; thin entablature and well-developed colonnade with 0.5-1.5-m-diameter columns; Frenchman Springs chemical type (Wright and others, 1973); normal magnetic polarity

Tfg Ginkgo flows—Fresh exposures are gray-black, weathers reddish-gray; fine to medium grained; phyric with abundant plagioclase phenocrysts and glomerocrysts as large as 2 cm; 100 to 200 glomerocrysts per square meter of surface area; thin entablature and well-developed colonnade with 0.5-1.5-m-diameter columns and pillowed base; Frenchman Springs chemical type (Wright and others, 1973); normal magnetic polarity

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EXPLANATION

Contact

Normal fault — *Dashed where approximately located; dotted where concealed. Bar and ball on downthrown block*

Thrust fault — *Dashed where approximately located; dotted where concealed. Sawteeth on upper plate*

Lineament from aerial photographs

Anticline — *Showing trace of crest surface and direction of plunge; dashed where approximately located; dotted where concealed*

Syncline — *Showing trace of trough surface and direction of plunge; dashed where approximately located; dotted where concealed*

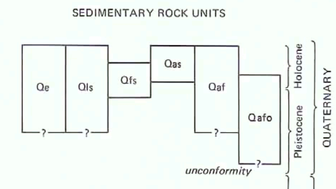
Anticlinal bend or monoclinal flexure — *Dashed where approximately located; dotted where concealed. Arrows on side with greater inclination*

Inclined 3 — Horizontal

Strike and dip of beds

9 Geochemical sample locality

CORRELATION OF MAP UNITS



EXPLANATION