STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
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GEOLOGY AND MINERAL RESOURCES MAP OF THE MAHOGANY GAP QUADRANGLE, MALHEUR COUNTY, OREGON

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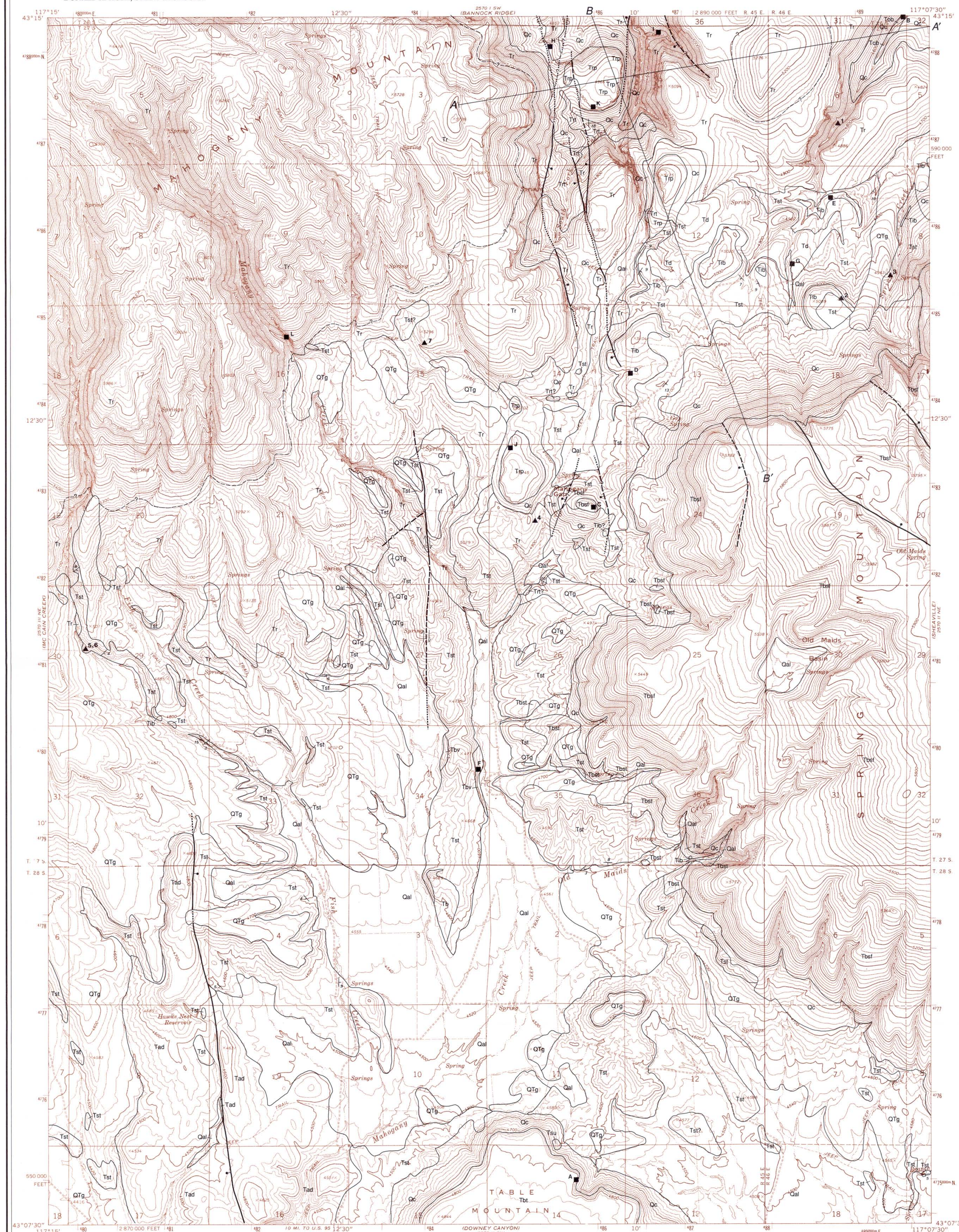
Geology and Mineral Resources Map of the Mahogany Gap Quadrangle, Malheur County, Oregon
By N.S. MacLeod

Funded jointly by the Oregon Department of Geology and Mineral Industries, the Oregon State Lottery, and the U.S. Geological Survey COGEOMAP Program as part of a cooperative effort to map the west half of the 1° by 2° Boise sheet, eastern Oregon.



Base map by U.S. Geological Survey

Topography by photogrammetric methods from aerial photographs taken 1968. Field checked 1969

Polyconic projection. 1927 North American datum
10,000-foot grid based on Oregon coordinate system, south zone

UTM GRID AND 1969 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

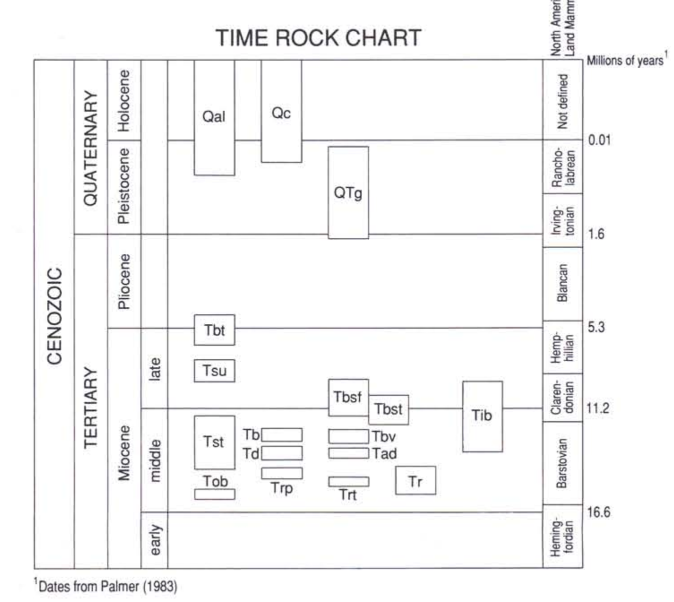
Geology by Norman S. MacLeod

Field work conducted in August 1989

Map reviewed by David R. Sherrod, U.S. Geological Survey, and Mark L. Ferns, Oregon Department of Geology and Mineral Industries

Cartography by Mark E. Neuhaus

TIME ROCK CHART



[1]Dates from Palmer (1983)

EXPLANATION

Qal — **Alluvium (Holocene and Pleistocene)**—Unconsolidated, poorly sorted to well-sorted, massive to well-bedded gravel, sand, and silt in and adjacent to stream channels and on flood plains. Locally includes slope wash and alluvial fan deposits

Qc — **Colluvium and young alluvial fan deposits (Holocene and Pleistocene)**—Unconsolidated, poorly sorted, massive to poorly bedded debris-forming mass-waste deposits on slopes. Mapped only where thick enough to completely obscure underlying rocks

QTg — **Gravel and sand deposits (Pleistocene and Pliocene?)**—Unconsolidated, poorly sorted to well-sorted, massive to well-bedded gravel, sand, and silt of eroded alluvial fans and on terraces and slopes above existing stream channels. Clasts are locally derived. Gravel and sand were deposited intermittently during Pliocene(?) and Quaternary time; consequently the unit is found at several elevations. Deposits in southwestern part of quadrangle may locally be thicker than 200 ft

Tbt — **Basalt of Table Mountain (upper Miocene or Pliocene)**—Lava flow capping Table Mountain; at some places flow is formed of stacked flow lobes. Basalt is diktytaxitic, olivine-phyric, vapor-phase mineralized, and locally very vesicular. Basalt is characterized by low silica content and high $FeO+Fe_2O_3$, TiO_2, and P_2O_5 (Table 1, map letter A). Thickness is about 40 ft. Vent for flow may be marked by a circular ridge located adjacent to and south of quadrangle boundary. Overlies micaceous arkosic sandstone and tuffaceous siltstone of unit Tsu

Tsu — **Arkosic sandstone and tuff siltstone of Table Mountain (upper Miocene?)**—Moderately to poorly indurated, cross-bedded micaceous arkosic sandstone and tuffaceous siltstone. Mainly buried by colluvium; crops out in only one small area beneath basalt of Table Mountain (unit Tbt) but probably everywhere underlies the basalt. Thickness probably between 80 and 150 ft

Basalt and basaltic andesite of Spring Mountain (upper or middle Miocene)—Lava flows and hyaloclastic tuffs and breccia that form Spring Mountain, the remnant of an old volcano. Exposures are sparse in many places owing to thick colluvium. Analyzed flows and pyroclastic rocks have silica contents ranging from 51 to 56 percent (Table 1, map letter C, and analyses from Sheaville quadrangle, in MacLeod, 1990, Table 1). Subdivided into the following units:

Tbsf — **Basalt and basaltic andesite flows (upper or middle Miocene)**—Subaerial flows and flow breccia. Dense to vesicular and porphyritic with phenocrysts of plagioclase and olivine. Flows are typically 15 to 40 ft thick. Locally overlies palagonitic hyaloclastic tuffs (unit Tbst) and tuffaceous siltstone (unit Tst). Thickness is as much as 1,000 ft

Tbst — **Basaltic tuffs and breccia (upper or middle Miocene)**—Massive to thinly bedded hyaloclastic tuff, lapilli tuff, tuff breccia, and breccia. Original glass of ash and lapilli is mostly hydrated and replaced by clay minerals (palagonitized). Locally contains antidune cross beds and bomb sags, which indicate a wet surge origin, but includes near-vent airfall deposits. Unit is a product of basaltic eruptions in a shallow lacustrine setting or a result of interactions of lava with shallow water table. Occurs at a few localities beneath subaerial flow sequence (unit Tbsf); more widespread in adjacent Sheaville quadrangle. As thick as 200 ft

Tst — **Tuffaceous sedimentary rocks (middle Miocene)**—Tuffaceous siltstone, mudstone, sandstone, and diatomite. Mostly massive to platy, white-weathering shard-rich siltstone and mudstone diagenetically altered to clay minerals and opaline silica. Locally includes volcanic sandstone and grit beds. Diatomite, formed mostly of *Melosira* (R. Geitgey, written communication, 1989), occurs in S½ sec. 4, T. 28 S., R. 45 E. Unit is poorly exposed except on steep slopes. No age-diagnostic fossils were found in Mahogany Gap quadrangle, but equivalent unit in adjacent Sheaville quadrangle contains middle Miocene Barstovian fauna. Mapped as Sucker Creek Formation by Kittleman and others (1967). Overlies rhyolite (units Trp and Tr) of middle Miocene age (about 14.5 Ma and older, Vander Meulen and others, 1987a,b) and underlies basalt of Spring Mountain. Probably 300 to 500 ft thick, but exposure is poor

Tb — **Basalt (middle Miocene)**—Columnar-jointed olivine-phyric basalt flow (or sill?). Underlain by and probably interbedded with tuffaceous siltstone of unit Tst

Tbv — **Basaltic andesite vent deposit (middle Miocene)**—Welded spatter, agglutinated bombs, blocks, lapilli, and ash with thin interbedded fountain-fed flows. Nearly aphyric, with plagioclase and clinopyroxene microphenocrysts and quartz xenocrysts; composition is iron-rich basaltic andesite (Table 1, map letter F). Exposed thickness is about 50 ft, but base is not exposed

Tad — **Dacite or andesite (Miocene?)**—Platy aphyric dacite or andesite flow or flows, locally columnar jointed and generally strongly weathered and deuterically altered. Crops out in southwest part of quadrangle and extends southward over large area of Downey Canyon quadrangle. Overlain by sedimentary rocks of unit Tst, but base is not exposed. May correlate with dacite (unit Td) in northeastern part of Mahogany Gap quadrangle. Age poorly constrained because base not exposed. Thickness exceeds 200 ft

Td — **Dacite flow (middle Miocene)**—Aphanitic dacite with sparse plagioclase microphenocrysts. Varies from very platy to irregularly jointed; commonly vesicular with stretched vesicles; base grades into flow breccia; locally formed of perlitic vitrophyre. Contains about 66 percent silica (Table 1, map letter G). Occurs in the lower part of the sedimentary rock section (unit Tst), which overlies rhyolite flows in northeastern part of quadrangle. Thickness is about 100 ft

Trp — **Porphyritic rhyolite flows (middle Miocene)**—Massive to flow-banded porphyritic rhyolite containing quartz and sanidine phenocrysts and showing ubiquitous vapor-phase alteration. Composition is evolved high-silica rhyolite (Table 1, map letters J and K). Correlates with rhyolite porphyry of Vander Meulen and others (1987a), which has K/Ar ages of 14.0±0.4 and 14.9±0.4 Ma. Thickness about 100 ft. Note that some rhyolite equivalent to unit Trp may be included in unit Tr

Trt — **Rhyolitic tuff (middle Miocene)**—Pumiceous lapilli tuff, lapillistone, tuff, and tuff breccia of near-vent air-fall, surge, and explosion-breccia origin. Occurs between flows of units Trp and Tr in north-central part of quadrangle. May correlate with air-fall tuff in adjacent Bannock Ridge quadrangle (unit Taf of Vander Meulen and others, 1987a). Thickness is as much as 250 ft

Tr — **Rhyolite flows (middle Miocene)**—Consists of two sequences of flows. The older flows are massive to strongly flow banded, slightly porphyritic rhyolite that shows ubiquitous vapor-phase alteration. Contains sparse plagioclase and sanidine and traces of clinopyroxene and orthopyroxene phenocrysts. Base or top of flows locally perlitic. Pumiceous tuff breccia and lapilli tuff occur locally between flow units. Mostly unevolved low-silica rhyolite (Table 1, map letters H and I). The younger flows are lithologically similar to and probably the same as rhyolite of unit Trp (compare analyses of unit Tr rhyolite, Table 1, map letter L, with unit Trp rhyolite, map letters J and K). The two flow sequences were not mapped separately in the field, but the possible contact between them is shown on the map by a dashed queried line near a topographic bench where perlite is common. Small patches of tuffaceous sedimentary rock (unit Tst) mapped adjacent to this possible contact may be interbedded between the two flow sequences or overlie both. Correlates with the middle Miocene rhyolite flows of units Trf and Trp of Vander Meulen and others (1987a) in the adjacent Bannock Ridge quadrangle. Unit is as thick as 800 ft

Tob — **Basalt flow (middle Miocene)**—Vesicular aphyric olivine basalt flow and flow breccia. Underlies rhyolite (unit Tr) in northeast corner of quadrangle. Sedimentary rocks may lie between the basalt and rhyolite, as suggested by colluvium containing tuffaceous siltstone and petrified wood. Basalt is tholeiitic, with high content of total Fe, TiO_2, and P_2O_5, and low Al_2O_3 (Table 1, map letter B) and is similar in composition to basalt flow (unit Tob) along Succor Creek in northernmost part of adjacent Sheaville quadrangle (MacLeod, 1990, Table 1, map letter A). Correlates with tholeiitic basalt interbedded in Miocene sedimentary rocks in adjacent Bannock Ridge quadrangle (unit Tb of Vander Meulen and others, 1987a). Base not exposed in quadrangle, but unit is about 50 ft thick in Bannock Ridge quadrangle

Tib — **Basalt and basaltic andesite intrusions (upper or middle Miocene)**—Mostly sills of olivine-phyric basalt and basaltic andesite; a few bodies with poorly exposed contacts may be flows. Tuffaceous rocks adjacent to intrusions are locally fused. Analyzed intrusions are chemically similar to and probably related to basalt of Spring Mountain (compare unit Tib analyses of Table 1, map letters D and E, with analyses of basalt of Spring Mountain, map letter C, and in MacLeod, 1990, Table 1, map letters B-H), but other intrusions may be of different age. Sills may be normal intrusions or may be invasive (fed by surface flows)

MAP SYMBOLS

Contact — Approximately located; dashed and queried contact shows possible contact between two types of rhyolite in unit Tr

Fault — Dashed where approximately located; dotted where buried; queried where uncertain. For faults in which direction of offset is known or inferred, ball and bar is placed on downthrown side of faults with apparent vertical displacement, and arrows show direction of horizontal offset

72 **Strike and dip of beds**

L **Location of whole-rock sample analyzed in Table 1**

7 **Location of mineralized sample analyzed in Table 2**

GEOLOGY

The Mahogany Gap quadrangle is in the southern part of the Owyhee Uplands, an area mapped earlier by Kittleman and others (1967). The oldest known rock in the quadrangle is a basalt flow in the northeast corner. The basalt underlies an extensive sequence of rhyolite flows that forms Mahogany Mountain in the northern part of the quadrangle. The rhyolite extends northward into the Bannock Ridge quadrangle to the 15.5-Ma Mahogany Mountain caldera (Rytuba and others, 1985; Vander Meulen and others, 1987a,b; Vander Meulen, 1989), the margin of which reportedly lies less than a mile north of the Mahogany Gap quadrangle. The rhyolite likely was derived from the magma system that produced the caldera. The ash-flow tuff of Leslie Gulch of Kittleman and others (1965), which was erupted during the formation of the caldera (Vander Meulen, 1989), fills parts of the caldera but does not extend into the Mahogany Gap quadrangle. Stratigraphic relations indicate the rocks in the quadrangle are all younger than the tuff of Leslie Gulch. A second rhyolite flow sequence occurs in the northern part of the quadrangle, locally separated from the older rhyolite by pumiceous pyroclastic rocks. Similar rhyolites farther north are about 14 to 15 Ma (Vander Meulen and others, 1987a).

Tuffaceous siltstone and mudstone with interbedded dacite and andesite(?) flows and basaltic vent deposits overlie the rhyolite. They, in turn, are overlain by basaltic flows that form Spring Mountain. The basalt first erupted to produce palagonitic tuffs as a consequence of interaction of basaltic magma and shallow ground water or lake water, then formed subaerial flows that accumulated to form a 1,000-ft-high volcano.

The youngest volcanic unit is a diktytaxitic basalt flow that forms Table Mountain adjacent to the south boundary of the quadrangle. During the Quaternary period, alluvial fans developed on the slopes of Mahogany and Spring Mountains, and sand and gravel were deposited on terraces developed at progressively lower elevations as the area was eroded.

STRUCTURE

The volcanic and sedimentary rocks of the Mahogany Gap quadrangle are offset by a few north- to northwest-striking faults. Well-exposed near-horizontal slickensides on a north-trending fault-line scarp in the center of the quadrangle show right-lateral strike-slip displacement; a fault in the southwest corner of the quadrangle parallel to this strike-slip fault may have had similar right-lateral motion (note that the direction of relative vertical displacement changes along the fault). The remaining faults appear to have normal displacement, as do most faults in the region. Normal faults define a 1,500-ft-wide north-south-oriented complex graben in the north-central part of the quadrangle and extending into the Bannock Ridge quadrangle (Vander Meulen and others, 1987a). The pumiceous pyroclastic rocks of unit Trt are unusually thick within the graben, suggesting synchronous deposition and graben development.

The sedimentary rocks in the Sheaville quadrangle to the east are strongly folded, perhaps in response to loading by the volcano at Spring Mountain (MacLeod, 1990). The sedimentary rocks are too poorly exposed in the Mahogany Gap quadrangle to determine if they are folded in a similar manner.

MINERAL RESOURCES

Metallic mineral resources

The Mahogany Gap quadrangle lies near a broad belt of gold and silver mines and prospects (informally called the "Weiser Hot-Springs Belt") that extends from the DeLamar and Silver City Mines in Idaho southeast of the quadrangle into the Owyhee region north of the quadrangle. Exploration has been intense in and near this belt during the last decade, and several large-volume low-grade gold deposits have been identified and are now being explored. Few indications of mineralization were noted during the mapping of the Mahogany Gap quadrangle, although Mahogany Mountain was examined only cursorily.

Sinter deposits of an old (in section) hot spring in the central-western part of the quadrangle showed no anomalous trace elements (Table 2, map numbers 5 and 6). A few scattered small areas of chalcedonic alteration showed no unusual concentrations of trace elements, other than moderate arsenic (As) in two samples (Table 2, map numbers 1 and 2) and slightly elevated levels of a few other elements such as lead (Pb), molybdenum (Mo), antimony (Sb), and gold (Au).

Nonmetallic resources

Diatomite occurs within the sequence of tuffaceous siltstone and mudstone of unit Tst in S½ sec. 4, T. 28 S., R. 45 E. The diatomite is exposed along Fish Springs Creek at the locale indicated by the 9°E.-dipping attitude and along a small creek 4,000 ft to the west-northwest. The diatomite, which consists of 80-90 percent *Melosira* diatoms with little fragmentation (R. Geitgey, written communication, 1989), contains only a few thin tuffaceous mudstone interbeds. The thickness and volume of the diatomite could not be determined, owing to the limited exposures in this area.

Agate, jasper, and petrified wood were noted at many localities in the quadrangle. Agate with an attractive blue color occurs in rhyolite outcrops and float in secs. 22 and 23, T. 27 S., R. 45 E., near Mahogany Gap. Small prospect pits beside the Mahogany Gap road may have been bulldozed in search of this blue agate.

WATER RESOURCES

Intermittent streams drain most parts of the Mahogany Gap quadrangle. Sections of many of these streams contain water year round. Springs are abundant throughout the quadrangle, especially on the flanks of Spring and Mahogany Mountain. The only habitation in the quadrangle is one small ranch beside Mahogany Creek (sec. 35, T. 27 S., R. 45 E.), which was not occupied at the time the field work was done. Much of the area is grazed by cattle, and a few small reservoirs have been constructed to provide water for them. The water resources are sufficient for the current land use.

GEOCHEMISTRY

Sample preparation

Samples for whole-rock analysis (WRA) (Table 1) were crushed to minus 1/4-in. in a steel-jawed Braun chipmunk crusher and split in a Jones-type splitter in the Oregon Department of Geology and Mineral Industries (DOGAMI) laboratory. A split of about 100 g of each sample was ground to minus 200 mesh in agate grinding media by X-Ray Assay Laboratories (XRAL) of Don Mills, Ontario.

Samples for trace-element analysis (Table 2) were crushed to minus 1/4-in. and split as indicated above. Each sample split was ground to about minus 200 mesh in chrome-steel grinding media in an Angstrom disk mill in the DOGAMI laboratory. Each minus-200-mesh split was split again to produce two subsamples, one for gold and one for other trace elements to be determined.

Chemical analysis

Whole-rock analysis: X-ray fluorescence (XRF) analyses were performed by XRAL. XRAL used a fused button for its analyses (1.3 g of sample roasted at 950 °C for one hour, fused with 5 g of lithium tetraborate, and melt cast into a button). Loss on ignition (LOI) was determined by the roasting.

Trace-element analysis:

1. Gold—Bondar-Clegg, Ltd., of North Vancouver, British Columbia, performed the analyses for gold. The method employed was fire assay preconcentration of the gold in a 20-g sample (gold was collected in added silver), acid dissolution of the resulting bead, and directly coupled plasma (DCP) emission spectrometer finish. The detection limit was 1 ppb.

2. Other trace elements—Geochemical Services, Inc., (GSI) of Torrance, California, performed the analyses for 15 other trace elements. The method employed a proprietary acid dissolution and organic extraction of a 5-g sample. The finish was by induction coupled plasma (ICP) emission spectrometry. GSI considers the digestion to provide total metal contents except for gallium and thallium. The detection limit for a given element varies slightly as a result of GSI's monitoring process; in all samples Te was below the detection limit of about 0.5 ppm.

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Table 1. Whole-rock analyses, Mahogany Gap quadrangle, Oregon[1]

Map letter	Laboratory no.	1/4	1/4	Sec.	T. (S.)	R. (E.)	UTM coordinates	Elev. (ft)	Lithology	Map unit	Oxides (wt. percent) SiO_2	Al_2O_3	TiO_2	Fe_2O_3	MnO	CaO	MgO	K_2O	Na_2O	P_2O_5	LOI	Total	Trace elements (ppm) Cr	Rb	Sr	Y	Zr	Nb	Ba
A	AXB514	SW	NE	14	28	45	477501N 48576E	4,790	Olivine basalt	Tbt	46.4	15.0	2.55	14.3	0.21	9.74	7.57	0.62	2.41	0.71	0.69	100.2	244	32	275	20	216	20	390
B	AXB502	SE	SE	31	26	46	478837N 48957E	4,480	Olivine basalt	Tob	50.3	14.8	1.59	12.9	0.24	9.83	6.02	0.57	2.76	0.36	0.62	100.0	78	27	433	18	112	27	354
C	AXB509	SW	NE	23	27	45	478278N 48598E	5,170	Olivine basalt	Tbsf	51.0	16.4	1.20	9.84	0.20	8.70	5.11	1.34	3.26	0.60	1.16	98.8	134	31	654	10	166	11	548
D	AXB505	NW	SW	13	27	45	478427N 48635E	5,010	Aphyric basalt	Tib	51.4	16.5	1.25	9.79	0.18	8.25	5.72	1.31	3.38	0.65	1.93	100.4	116	32	676	31	197	22	618
E	AXB503	NE	NW	7	27	46	478629N 48870E	4,820	Aphyric basalt	Tib	51.6	16.7	1.20	9.5	0.19	8.23	5.42	1.41	3.29	0.65	1.54	99.7	102	43	695	18	192	25	643
F	AXB515	SE	NE	34	27	45	477973N 48464E	4,620	Basaltic andesite	Tbv	53.0	13.9	2.18	12.2	0.39	7.01	3.26	1.76	3.43	0.81	1.16	99.1	23	52	396	42	216	32	721
G	AXB504	NW	SW	7	27	46	478552N 48826E	4,900	Dacite	Td	65.6	14.7	1.03	5.32	0.20	2.31	1.03	3.20	5.03	0.28	1.23	99.9	13	97	395	36	638	33	1510
H	AXB506	NE	NW	2	27	45	478809N 48553E	4,820	Rhyolite	Tr	73.6	13.1	0.24	2.32	0.08	0.93	0.06	4.43	4.47	0.03	0.47	99.7	15	126	139	76	434	22	1990
I	AXB507	NW	NW	1	27	45	478819N 48675E	4,560	Porphyritic rhyolite	Tr	73.7	13.1	0.23	2.29	0.09	0.93	0.05	4.54	4.44	0.03	0.16	99.6	16	134	119	78	449	23	1920
J	AXB517	NW	NW	23	27	45	478341N 48501E	5,100	Porphyritic rhyolite	Trp	78.0	11.9	0.14	0.77	0.01	< 0.01	< 0.01	4.71	4.43	0.05	0.23	100.3	16	132	< 10	110	388	38	222
K	AXB508	NW	SE	2	27	45	478736N 48597E	4,900	Rhyolite	Trp	79.0	11.1	0.12	0.51	0.01	0.06	0.02	4.48	4.02	0.03	0.54	99.9	21	134	21	111	341	27	695
L	AXB518	NW	NE	16	27	45	478464N 48250E	5,300	Rhyolite	Tr	79.1	11.2	0.12	0.63	0.01	0.04	< 0.01	4.22	4.17	0.03	0.77	100.3	18	128	< 10	115	351	41	291

[1]XRF analyses by XRAL.

Table 2. Trace-element analyses, Mahogany Gap quadrangle, Malheur County, Oregon[2]

Map no.	Laboratory no.	1/4	1/4	Sec.	T. (S.)	R. (E.)	UTM coordinates	Elev. (ft)	Lithology	Map unit	Ag (ppm)	As (ppm)	Au (ppb)	Cu (ppm)	Hg (ppm)	Mo (ppm)	Pb (ppm)	Sb (ppm)	Tl (ppm)	Zn (ppm)	Bi (ppm)	Cd (ppm)	Ga (ppm)	Se (ppm)	Sn (ppm)	U (ppm)
1	AXB411	NE	SW	6	27	46	478715N 48879E	4,660	Altered rhyolite float	Tr	0.051	45.8	< 1	5.13	0.45	2.29	3.51	9.78	< 0.47	33.4	< 0.24	0.10	1.09	< 0.95	< 5	1.0
2	AXB412	SW	SE	7	27	46	478512N 48882E	5,060	Chalcedonic alteration in basalt sill	Tib	0.015	184	6	7.71	0.15	8.15	11.0	6.22	< 0.48	8.17	< 0.24	0.12	1.89	1.74	12	1.4
3	AXB413	SE	SE	7	27	46	478540N 48938E	4,940	Chalcedonic alteration in siltstone	Tst	0.018	14.2	< 1	4.91	< 0.09	1.45	1.23	0.44	< 0.46	9.46	< 0.23	< 0.09	1.14	< 0.91	7	1.2
4	AXB414	NE	SW	23	27	45	478259N 48531E	4,960	Green alteration in rhyolite	Tr	0.047	< 0.94	< 1	1.49	< 0.09	< 0.09	3.76	< 0.24	< 0.47	21.3	< 0.23	< 0.09	5.29	< 0.94	18	2.1
5	AXB420	SW	NW	29	27	45	478111N 48012E	4,860	Opaline sinter in old hot spring deposit	Tst	0.016	11.8	< 1	5.46	< 0.09	3.38	0.87	0.44	< 0.46	2.51	< 0.23	< 0.09	< 0.46	< 0.92	< 5	0.7
6	AXB421	SW	NW	29	27	45	478111N 48012E	4,860	Opaline sinter in old hot spring deposit	Tst	0.023	7.66	< 1	3.85	< 0.09	2.42	0.86	0.52	< 0.47	2.37	< 0.23	< 0.09	< 0.47	< 0.93	6	1.0
7	AXB422	SW	NE	15	27	45	478463N 48402E	5,220	Jasper in rhyolite	Tr	0.014	13.8	< 1	5.31	0.27	3.68	3.08	3.11	< 0.47	11.6	< 0.23	0.11	0.47	< 0.94	< 5	0.7

[2]Gold analyses by Bondar-Clegg; other trace element analyses by GSI. Te, all samples, < 0.5 ppm.

GEOLOGIC CROSS SECTIONS

Qal and Qc not shown