OPEN-FILE REPORT 0-92-08
PRELIMINARY GEOLOGIC MAP OF THE
HOOKER CREEK QUADRANGLE
MALHEUR COUNTY, OREGON AND
OWYHEE COUNTY, IDAHO

By M. L. Ferns, and N. S. MacLeod
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This unpublished Open-File Report has not been reviewed and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 1990/1991
Map Scale: 1:24,000

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Hooker Creek

The oldest unit in the quadrangle consists of interbedded rhyolite flows and tuffs that are exposed along the Idaho-Oregon border. The flows include aphyric, flow-banded rhyolites and, together with the tuffs, constitute the rhyolites of the Silver City Range that were erupted at about 16.1 Ma (Ekren and others, 1981, 1982).

Overlying basalt (Tbsf) and palagonite (Tbst) units can be traced northward into the Sheaville quadrangle, to a large shield volcano at Spring Mountain (MacLeod, 1990). The thick section of palagonite exposed on the east edge of the quadrangle may be the result of interaction between advancing basalt flows and water.

The tuff of Swisher Mountain (Ttsm) overlies Tbsf on the eastern edge of the quadrangle. Here unit Ttsm can be traced directly into the exposures mapped by Ekren and others (1981), who report an age of about 13.9 Ma for the tuff of Swisher Mountain.

Tuffaceous and diatomaceous siltstones (Tsts) are locally interbedded with arkosic sandstones and pebble conglomerates (Tscg) which crop out to the west of the older section of basalts and rhyolites exposed along the Idaho-Oregon border. The sedimentary rocks were apparently deposited in a basin flanked on both sides by lobes of the tuff of Swisher Mountain. Several areas within the basin are made up of silicified tuffaceous silt- and mudstones (Tsta). The alteration zones include apparently bedded deposits that may record hot spring discharge into a shallow lake setting.
Fluvialite deposits (Holocene and Pleistocene).  
Mainly unconsolidated deposits of stream gravels and floodplain silts deposited along Cow and Hooker creeks.

Alluvial fan and pediment gravel deposits (Holocene and Pleistocene)  
Mainly fan and pediment gravel deposits, but includes deposits of basalt colluvium on the south flank of Spring Mountain. Alluvial fan deposits consist of unconsolidated accumulations of partially- to well-rounded boulders and cobbles of rhyolite. Size of blocks and boulders decreases and degree of rounding increases westward from ridge east of the Idaho-Oregon border. Alluvial fans grade westward into pediment and terrace gravels exposed on benches and ridges above the modern course of Cow Creek. Clasts are well rounded and consist mainly of rhyolite and rhyolite vitrophyre derived from the flanks of Purser Ridge to the east but include granitic and metamorphic clasts derived from underlying sedimentary units.

Fluvialite gravel deposits (Pleistocene? and Pliocene)  
Unconsolidated, poorly to moderately well-sorted deposits of rounded pebbles, cobbles, and boulders. Clasts are mostly of local rock types, mainly rhyolite and basalt, but include granitic and metamorphic clasts derived from older gravels and conglomerates.

Arkoisic sandstone and conglomerate (Middle Miocene)  
Mainly unconsolidated to highly indurated, cross-bedded arkose sandstone with thin conglomerate lenses. Often micaceous, with both muscovite and biotite. Clasts are mainly granitic and silicic volcanic rock fragments, but include metamorphic and black cherty clasts. Strongly indurated where silica-cemented, otherwise weathers to sandy soils. Locally includes abundant wood fragments, and, at F, vertebrate fossils. Equivalent to unit Tcg of MacLeod (1990).

Tuffaceous lacustrine and fluvialite sediments (Late Miocene?)  
Mainly white to pale yellow tuffaceous siltstones and fine-grained epiclastic sandstones. Locally includes thin lenses of diatomite and crossbedded micaceous epiclastic sandstones. Equivalent in part to unit Tsu of MacLeod (1990).
Altered tuffaceous rocks (Middle Miocene) Mainly massively bedded tuffaceous siltstones which have been silicified. Includes yellow to yellowish-brown, thin banded opaline cherts interbedded with yellow silicified tuffaceous siltstones. Also includes white to brown vitreous opaline tuffs and dark bluish-black, sulfidic cherts. Interpreted as syngenic hot spring deposits emplaced in a shallow lake. Weak mercury, arsenic, and gold anomalies are associated with the alteration.

Plagioclase-phyric rhyolite vitrophyre (Miocene) Densely welded, dark purple to reddish purple, rhyolitic crystal-lithic ashflow tuff. Interior of flow devitrified. Flow top is locally marked by pumiceous carapace breccias containing blocks of black and banded red and black vitrophyre and vesicular red devitrified rhyolite porphyry. Contains about 10 - 15% broken plagioclase phenocrysts, 2 - 5% lithic fragmented minor amounts of sanidine and pigeonite crystals. Chemically a low-silica metaluminous rhyolite and mapped as part of the tuff of Swisher Mountain (Ekren and others, 1981). Age is about 13.9 Ma (Ekren and others, 1984).

Basalt flows of Spring Mountain (Miocene) Subareal and subaqueous basalt and basaltic andesite flows. Includes glomeroporphyritic olivine basalts and aphyric basalts with subophitic clinopyroxene. Includes high alumina olivine tholeiite basalt, basaltic andesite, and andesite flows erupted from the large shield volcano at Spring Mountain (MacLeod, 1990a).

Palagonite tuffs and breccias (Middle Miocene) Pale yellow brown to greenish brown, massive to thinly bedded hyaloclastic tuff, lapilli tuff, tuff breccia, and breccia deposits. Original ash and lapilli large replaced by hydrous clay minerals. Occurs under flows of Tbsf and equivalent to unit Tbst of MacLeod (1990a).

Rhyolite of Silver City (Middle Miocene) reddish to purple-gray and gray, aphyric, flow-foliated rhyolite and rhyolite vitrophyre flows and breccias. Includes flow-foliated vitrophyres with thin interbedded pumiceous ash flows and air fall tuffs. Flow at Sheaville is capped with a perlitic carapace that contains chalcedony-filled spherulites. Includes metaluminous, high-silica rhyolites characterized by high K2O/Na2O ratios (Analyses, Table 1). Considered to be part of the rhyolite of Silver City by Ekren and others (1981) and thus about 16.1 Ma in age (Ekren and others, 1984).
Basalt (Middle Miocene) Dark grayish- and bluish-black to black, aphyric olivine basalt flows and breccias. Includes hyaloclastite breccias. Part of unit Tblb of Ekren and others (1981) and dated at 17 Ma (Pansze, 1971).
| Laboratory | 1/4 | 1/4 Sec. T. | R. Map | Ag | As | Au | Cu | Hg | Mo | Pb | Sb | Ti | Zn | Bi | Cd | Ga | Se | Te | Ba | Co | Cr | Fe | Li | Mn | Ni |
|------------|-----|------------|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| A2B-009    | NW  | NE 28 28S 46E Tscg | 0.203 | 2.72 | <1 | 7.20 | 0.13 | 5.0% | 3.13 | 3.76 | <0.5 | 5.2% | <0.25 | <1 | <1 | <0.5 | <0.5 | 85.6 | 2 | 93 | 0.32 | 6 | 79 | 1 |
| A2B-010    | NW  | NE 24 29S 46E TsaT | 0.152 | 2.93 | 2 | 6.03 | <1 | 3.97 | 1.80 | 0.28 | <0.5 | 7.20 | <0.25 | <1 | <1 | <0.5 | <0.5 | 66.2 | 2 | 171 | 0.44 | 72 | 146 | 1 |
| A2B-011    | NW  | NW 24 29S 46E TsaT | 0.183 | 5.59 | 6 | 8.63 | <1 | 4.54 | 2.60 | 0.64 | <0.5 | 21.0 | 0.393 | <1 | <1 | <0.5 | <0.5 | 173.3 | 3 | 140 | 0.65 | 70 | 144 | 4 |
| A2B-012    | SE  | SE 4 29S 46E Tscg | 0.171 | 1.0 | <1 | 3.32 | <1 | 2.53 | 2.50 | 0.21 | <0.5 | 10.5 | <0.25 | <1 | <1 | <0.5 | <0.5 | 49.5 | 3 | 72 | 0.21 | 6 | 95 | 1 |
| A2B-013    | SE  | SW 24 28S 46E TsaT | 0.158 | 13.0 | 2 | 6.83 | <1 | 3.05 | 1.57 | 0.37 | <0.5 | 9.01 | <0.25 | <1 | <1 | <0.5 | <0.5 | 36.1 | 1 | 81 | 0.32 | 81 | 181 | 1 |
| A2B-014    | NW  | SW 25 29S 46E TsaT | 0.169 | 1.23 | 5 | 7.76 | <1 | 5.42 | 5.14 | <0.25 | <0.5 | 25.4 | <0.25 | <1 | <1 | <0.5 | <0.5 | 175.4 | 4 | 130 | 0.8 | 130 | 172 | 1 |
| A2B-015    | NW  | SW 25 29S 46E TsaT | 0.167 | 5.07 | <1 | 7.40 | <1 | 8.61 | 3.33 | <0.25 | <0.5 | 11.9 | <0.25 | <1 | <1 | <0.5 | <0.5 | 80.4 | 4 | 177 | 0.8 | 53 | 155 | 1 |
| A2B-021    | NW  | SW 25 29S 46E TsaT | 0.168 | 1.09 | <1 | 16.3 | <1 | 3.06 | 2.06 | <0.25 | <0.5 | 21.7 | <0.25 | <1 | <1 | <0.5 | <0.5 | 100.4 | 4 | 113 | 0.91 | 83 | 173 | 3 |
REFERENCES


Macleod, N.S., 1990a, Geology and Mineral Resources Map of the Mahogany Mountain Quadrangle: Oregon Department of Geology and Mineral Industries Geological Map Series GMS-65, scale 1:24,000

Macleod, N.S., 1990b, Geology and Mineral Resources Map of the Sheaville quadrangle, Malheur County, Oregon, and Owyhee County, Idaho: Oregon Department of Geology and Mineral Industries Geological Map Series GMS-64.

MAP SYMBOLS

——
\textbf{Contact} -- approximately located

—-—-
\textbf{Fault contact} -- dashed where approximately located, dotted where concealed. Ball and bar on down throw side

\textbf{\textdegree}
\textbf{Strike and dip of beds}

\textbf{X}
\textbf{Location of whole rock sample analyzed in Table 1}

\textbf{X}
\textbf{Location of mineralized sample analyzed in Table 2}