PRELIMINARY REPORT ON THE GEOLOGY AND GOLD MINERALIZATION OF THE SOUTH PASS GRANITE-GREENSTONE TERRAIN, WIND RIVER MOUNTAINS, WESTERN WYOMING (USA); W.D. Hausel, Geological Survey of Wyoming, Laramie, Wyoming 82071

The South Pass granite-greenstone terrain lies near the southern tip of the Wind River Mountains of western Wyoming. This Archean supracrustal pile has been Wyoming's most prolific source of gold and iron ore. From 1962 to 1983, more than 90 million tons of iron ore were recovered from oxide-facies banded iron formation, and an estimated 325,000 ounces of gold were mined from metagreywacke-hosted shears and associated placers (1).

Precambrian rocks at South Pass are unconformably overlain by Paleozoic sediments along the northeast flank, and a Tertiary pediment buries Archean supracrustals on the west and south. To the northwest, the supracrustals terminate against granodiorite of the Louis Lake batholith; to the east, the supracrustals terminate against granite of the Granite Mountains batholith. The Louis Lake granodiorite is approximately 2,630 $\pm$ 20 m.y. old (2), and the Granite Mountains granite averages 2,600 m.y. old (3).

The geometry of the greenstone belt is best expressed as a synform that has been modified by complex faulting and folding. Metamorphism is amphibolite grade surrounding a small island of greenschist facies rocks.

The youngest of the Archean supracrustal successions is the Miners Delight Formation. This unit yielded a Rb-Sr isochron of 2,800 m.y. (2). A sample of galena from the Snowbird Mine within the Mienrs Delight Formation yielded a model age averaging 2,750 m.y. (4). The Snowbird mineralization appears to be syngenetic and is hosted by metavolcanics of calc-alkaline affinity.

Based on regional mapping by Bayley and others (5) and by the author (in progress), four mappable supracrustal units are present. The uppermost unit, the Miners Delight Formation is greater than 1,600 m thick and consists of metagreywacke, metavolcanics, metaconglomerate, graphitic schist, and tremolite-actinolite schist. Underlying, and in fault contact with turbidites in the Miners Delight Formation, are metatholeiites of the Roundtop Mountain Formation. These metatholeiites are amphibolites, greenstones, and pillow metabasalts. The geometry of the pillows, which has been used for determining the tops and bottoms of units (5, 6) has only produced ambiguous conclusions due to the intense deformation.

The Roundtop Mountain greenstones are underlain(?) by quartzite, metapelite, and banded iron formation of the Goldman Meadows Formation. This unit, in turn, is underlain(?) by mafic and ultramafic schists tentatively named the Diamond Springs ultramafics. This ultramafic unit consists of amphibolite, serpentinite, metaperidotite, and tremolite-talc-chlorite schist. Harper (6) interprets this unit to represent a dismembered ophiolite sequence.

Mining districts occur on both limbs of the South Pass synform. While the South Pass - Atlantic City District occurs along the northwestern limb, the Lewiston District is found on the eastern limb (7). Gold mineralization in the South Pass - Atlantic City District is found chiefly in shear zones in

metagreywacke adjacent to metagabbro sills and dikes. Wall-rock studies of the auriferous shears, show Si and K have been enriched and Ca and Mg have been leached. Mineralogically, these chemical changes are expressed as weak phyllic alteration of the wall rock. Analyses for native gold from the Diana Mine show high Au/Ag and low Au/Cu ratios (8). The gold analyses and wall-rock alteration are characteristic of a hypothermal vein.

The Lewiston District on the eastern flank of the synform includes strike-trending, metagreywacke - hosted, auriferous shears along the limb of a major fold (9). A few major lodes are localized where the strike shears intersect cross-cutting shears. Wall rocks show distinct chloritic and hematitic alteration as well as weak phyllic alteration.

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