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Structural and Stratigraphic Control of Archean Gold Mineralization Within the South Pass Greenstone Terrain, Wyoming

Archean (2.5 b.y.) supracrustal rocks in the southern Wind River Mountains have been Wyoming's most prolific source of gold and iron ore. These rocks form a greenstone succession of metavolcanics and metasediments that are infolded in a sea of "granite". The supracrustals are metamorphosed to amphibolite grade with a small island of greenschist facies rocks.

Structurally, the supracrustal pile is a tightly folded synform modified by complex folding and faulting. The basal unit of the synform, tentatively named the Diamond Springs ultramafics, consists of mafic and ultramafic schists and hornfels. This unit is overlain by quartzite, pelitic schist, and oxide facies banded iron formation collectively grouped into the Goldman Meadows Formation. The Goldman Meadows metasediments underlie metatholeiites of the Roundtop Mountain Greenstones which are in turn overlain by, and in fault contact with, calc-alkaline metavolcanics and metagreywacke of the Miners Delight Formation. Metasediments of the Miners Delight are the principal host for gold in the South Pass greenstone belt.

Two separate mining districts — South Pass-Atlantic City and Lewiston are found along opposing limbs of the synform. Geologically, these districts are similar in that most of the gold from these two areas was mined from shears in Miners Delight metasediments. More than 90 million tons of iron ore and an estimated 325,000 ounces of gold were mined from the South Pass-Atlantic City district. No

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estimates or records of gold production are known for the Lewiston district. Gold mineralization is localized in (1) shear zones, (2) veins, (3) stratabound deposits, and (4) placers.