**DESCRIPTIVE MODEL OF HOT-SPRING Au-Ag**

**MODEL** 25a

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**DESCRIPTION** Fine-grained silica and quartz in silicified breccia with gold, pyrite, and Sb and As sulfides (see fig. 105).

**Figure 105.** Cartoon cross section of hot-spring Au-Ag deposit.



**GENERAL REFERENCE** [Berger (1985)](http://pubs.usgs.gov/bul/b1693/html/bull4ofn.htm#berger_1985).

**GEOLOGICAL ENVIRONMENT**

**Rock Types** Rhyolite.

**Textures** Porphyritic, brecciated.

**Age Range** Mainly Tertiary and Quaternary.

**Depositional Environment** Subaerial rhyolitic volcanic centers, rhyolite domes, and shallow parts of related geothermal systems.

**Tectonic Setting(s)** Through-going fracture systems related to volcanism above subduction zones, rifted continental margins. Leaky transform faults.

**Associated Deposit Types** Epithermal quartz veins, hot-spring Hg, placer Au.

**DEPOSIT DESCRIPTION**

**Mineralogy** Native gold + pyrite + stibnite + realgar; or arsenopyrite ± sphalerite ± chalcopyrite ± fluorite; or native gold + Ag-selenide or tellurides + pyrite.

**Texture/Structure** Crustified banded veins, stockworks, breccias (cemented with silica or uncemented). Sulfides may be very fine grained and disseminated in silicified rock.

**Alteration** Top of bottom of system: chalcedonic sinter, massive silicification, stockworks and veins of quartz + adularia and breccia cemented with quartz, quartz + chlorite. Veins generally chalcedonic, some opal. Some deposits have alunite and pyrophyllite. Ammonium feldspar (buddingtonite) may be present.

**Ore Controls** Through-going fracture systems, brecciated cores of intrusive domes; cemented breccias important carrier of ore.

**Weathering** Bleached country rock, yellow limonites with jarosite and fine-grained alunite, hematite, goethite.

**Geochemical Signature** Au + As + Sb + Hg + Tl higher in system, increasing Ag with depth, decreasing As + Sb + Tl + Hg with depth. Locally, NH4, W.

**EXAMPLES**

McLaughlin, USCA ([Averitt, 1945](http://pubs.usgs.gov/bul/b1693/html/bull4ofn.htm#averitt_1945)and [Becker, 1888](http://pubs.usgs.gov/bul/b1693/html/bull4ofn.htm#becker_1888))

Round Mountain, USNV ([Tingley and Berger, 1985](http://pubs.usgs.gov/bul/b1693/html/bull4ofn.htm%22%20%5Cl%20%22tingley_and_berger_1985))

Delamar, USID ([Lindgren, 1900](http://pubs.usgs.gov/bul/b1693/html/bull4ofn.htm#lindgren_1900))