Re-thinking the Comstock: Volcanic Domes and Arcuate Structures

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THE COMSTOCK LODGE

Near this spot was the heart of the Comstock Lode, the fabulous 2½ mile deposit of high-grade ore that produced nearly $400,000,000 in silver and gold. After the discovery in 1859, Virginia City boomed for 20 years, helping bring Nevada into the Union in 1864 and to build San Francisco.

Seven major mines operated during the boom; their sites are today marked by large yellow dumps, several of which are visible from here—the Sierra Nevada a mile to your left, the Union, Ophir, Con, Virginia and, on the high hill to the southeast, the combination. The Lode was worked from both ends, north up Gold Canyon and south from the Sierra Nevada and the Utah Mines.

Nevada Centennial Marker No. 13
Introduction

- Discovery of the first lode deposit in 1859

- Comstock and Silver City Lodes collectively produced in excess of 8.2 million oz gold and 192 million oz silver

- Early 20th century, external events overtook the Comstock
  - 1906 San Francisco earthquake
  - World Wars I & II, including the “War Act”
  - The great depression

- Intermittent mining activity since 1950
The Comstock District is located within a series of volcanic centers formed during the Miocene period.

The Tertiary volcanic rocks are made up of several magmatic suites erupted between ~27Ma to ~14.9Ma (Castor et al., 2005; Hudson et al., 2009).

Below the Miocene volcanic sequence is unconformable contact with Mesozoic and locally plutonic intrusions (Gianella, 1936; Hudson, 2003; Castor et al., 2005).
Local Geology

- Newly-recognized, multiple sub-parallel northwest-trending faults are now collectively referred to as the Silver City fault zone

- The individual faults within that zone are the Gold Canyon, Silver City, Billie the Kid, and the Drysdale

- Precious metals mineralization is structurally controlled by the Silver City fault zone and an east-dipping quartz porphyry intrusive

- Grades are enhanced by a series of northerly-striking (N5E) and northeast-striking (N50E and N70E) vein filled structures that cross the Silver City fault zone
Hartford Complex

- Hartford Complex includes the historic Billie the Kid, Lucerne, and Justice pits, and the Woodville bonanza.

- This area was extensively drilled by Goldspring from 2007-2009, and again in 2010.

- Economic mineralization in the resource area is hosted primarily within the Alta Andesite and the quartz porphyry, and to a lesser extent within the meta-igneous rocks.
Arcuate Features – Structural Control for Mineralization

- **Compilation**
  - GoldSpring has been compiling historic maps of the Comstock and Silver City underground workings

- **Regional Imagery Interpretation**
  - Specific Lineaments and arcuate features were recognized
  - Comparison was made with the historic underground workings
Numerical Modeling

- Numerical modeling was limited to a mineralized envelope that independently approximated the Silver City fault zone.
- 3-dimensional variograms showed the greatest continuity for gold along N65E, plunge 60°.
- Next-greatest continuity was N25W, reflecting the strike of the Silver City fault zone.
Numerical Modeling

- Down-plunge continuity for silver is significantly greater – possibly indicating the silver is more related to the east-west and northeast trending faults.
- Gold variogram reaches a peak, then drops to a valley, then rises again. Suggests a hole-effect model with a periodicity of 150’ – essentially the spacing between the sub-parallel faults making up the Silver City fault zone.
- Numerical model plotted on plan and section compares favorably with geological interpretation.
Summary

- The Virginia Range and the Comstock Mining District contain numerous arcuate features that played a significant role in the genesis and deposition of epithermal precious metal mineralization.

- This realization provided valuable insights which have guided successful exploration and development, as well as the numerical modeling of GoldSpring’s Comstock Mine Project.
Results Confirmed

- Behre Dolbear authored a NI 43-101 report published yesterday – May 17, 2010
- The report found GoldSpring’s modeling procedures to be reasonable
- The report confirmed Measured and Indicated resources totaling 22,913,000 tons at 0.028 opt gold and 0.370 opt silver
- Contained metal was 637,000 oz gold and 8,484,000 oz silver
Thank you

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