**Abstract**

The United States defense, energy, and manufacturing industries are dependent on foreign antimony sources and could be affected if the global antimony supply declined. Although antimony deposits are available, they are less effective and more expensive. Thus, domestic antimony supplies are key. The Stibnite mining district, including the historic Yellow Pine deposit in central Idaho, contains an estimated 4,200 metric tons of antimony, making it the largest domestic antimony deposit.

Many fundamental questions about the ore system that formed the ore deposits within the Yellow Pine-Stibnite mining district remain unanswered, but if answered could provide unprecedented insight into fluid source, alteration patterns, ore-controlling fault geometry, key rock units ages, regional stratigraphic context, as well as relationships to the adjacent caldera complex.

Mineral Resources Program Context

This project addresses one of the five MRP science priorities for FY15—Characterization and Identification of Critical Mineral Resources. Likewise this project answers the call of the EU Strategic plan for mineral resources that are imported from other countries.

**Fluid Inclusions and Alteration**

Stibnite Fluid Inclusions

- The primary survey of inclusions in the Yellow Pine deposit on central Idaho’s interest in large-scale development of the Yellow Pine deposit.
- The study of inclusions provides insight into the fluid dynamics and the evolution of the deposit.

Quartz Fluid Inclusions

- The study of inclusions in quartz provides insight into the timing and evolution of mineralization.
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**Structural Controls and Timing**

Geochronology

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Regional Geologic Influences

Stratigraphic Correlation and Ore Body Geometry Control

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Questions Being Addressed:

What will numerous fluid inclusion analyses reveal about source(s) of the hydrothermal fluids, transported metals, base, and sulfur?

What time-space relationships do patterns in alteration assemblages reveal?

What age data will garnet pseudosection, zircon, apatite or zircon provide? What age data will schelite (bis alteration) reveal with U-Pb lower ablation methods?

What is the geometry and effect of ore-controlling fault?

Was the entire mineralizing system tilted to the east?

Was the ore deposit by using hydrothermal system or by two unrelated ore-deposited systems that experienced the same area?

What role did the metasedimentary host rocks play in ore-body geometry and ore zoning?

Is there a genetic relationship between the gold-antimony-rendezvous and Eocene volcanic rock?

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