COMPARING PALEOPROTEROZOIC FELSIC VOLCANIC CENTERS ACROSS WISCONSIN

IMPPLICATIONS FOR TECTONIC HISTORY AND SULFIDE MINERALIZATION

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REGIONAL GEOLOGY

The rocks containing the Crandon deposit are part of the Pembine-Wausau Terrane and formed ~1.85 billion years ago. These formed in a bimodal setting as part of the Penokean Orogeny. Arc-derived sediments eventually covered the ocean vent systems. The accretion of the Marshfield Terrain resulted in lower grade metamorphism and small intrusions to the Crandon deposit (Schulz and Cannon, 2007). This is true for the rocks from the Eisenberry suite as well. The Lobo deposit is a part of the Wisconsin Magmatic Terranes (DeMatties, 1994) composed of plutonic, volcanic, and sedimentary rocks that were accreted during the collision of the Pembine-Wausau terrane and Superior craton during the Paleoproterozoic Penokean orogeny (May and Dinkowitz, 1996). The host rocks of the Lobo deposit are primarily sericite-altered lapilli tuff. The Wolf River is formed in a composite deposit and the lobo deposit is one of its clusters. The Flambeau Cu-Zn Deposit in Northwestern Wisconsin is only 4 miles from the Eisenberry deposit but is geochemically distinct indicating a different environment that it formed in.

VMS DEPOSITS

TECTONIC SETTING AND IMPORTANCE

Volcanogenic Massive Sulfide (VMS) deposits form in marine environments where high temperature hydrothermal fluids combine with cold sea water causing the precipitation of sulfide minerals. The ore zones typically occur as polymetallic lenses with immediate host rocks being either volcanic or sedimentary producing major sources of Zn, Cu, Pb, Ag, and Au (Galley et al, 2007). Hydrothermal vent systems seep metals from volcanic strata though hot seawater rock interactions and re-precipitate them when the fluid cools at the surface. Types of precipitated minerals combine with cold sea water causing the precipitation of sulfide minerals. The ore zones typically occur as polymetallic lenses with immediate host rocks being either volcanic or sedimentary producing major sources of Zn, Cu, Pb, Ag, and Au (Galley et al, 2007). Hydrothermal vent systems seep metals from volcanic strata though hot seawater rock interactions and re-precipitate them when the fluid cools at the surface. Types of precipitated metals are determined based on the composition of the surrounding rock and on the temperature of the water moving through the system. Therefore, rock compositions of these systems requires careful trace element analysis.

FELSIC ROCK IMAGES AND ANALYSIS

CONCLUSIONS

The goal of this study was to better understand the volcanic and tectonic setting of Volcanogenic Massive Sulfide (VMS) deposits in Wisconsin by comparing the petrographic and geochemical (trace elements) from five different felsic volcanic suites across the state. Preliminary data supports the know geology of the region. However, a more thorough comparison of the different deposits is needed to better understand the interconnectivity of each rock suite.

REFERENCES


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