

An Integrated Geological and Geochemical Study of the Selena Carbonate Replacement Deposit, White Pine County, Nevada

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The Selena carbonate replacement deposit (CRD) is a recently discovered blind Ag–Pb–Zn ± Au–Cu system located in the historic Limousine Butte mining district on the western flank of the southern Cherry Creek Range, White Pine County, Nevada. The deposit is located within a region with known prolonged magmatic and hydrothermal activity, spanning from mid Jurassic through to the Eocene, and is spatially associated with the concealed Butte Valley porphyry system, as well as proximal to distal disseminated gold mineralization. Previous research has focused on the Eocene Cherry Creek Stock and its associated hydrothermal mineralization and the Golden Butte deposit, whereas the Selena CRD system has not previously been examined in detail and has no historic mining. The close spatial relationship between Selena and the Cretaceous Butte Valley porphyry suggests a genetic link between porphyry-related magmatism and CRD mineralization. Dating of NW-SE striking parallel quartz feldspar rhyolite dikes returned an age of 160.77 ± 0.98 Ma, and geophysical data implies a deeper magnetic high beneath the Selena property. [SMJ2.1] This research will constrain the timing, source, and evolution of mineralizing fluids at Selena and define regional and district scale fluid flow pathways. Petrography, stable isotope geochemistry ($\delta^{13}\text{C}$ and $\delta^{18}\text{O}$), and geochronology will be used to refine the genetic model for the relationship between porphyry Cu and CRD mineralization and improve our understanding of Mesozoic magmatism and hydrothermal systems in eastern Nevada.