A Geochemical and Petrographic Analysis of Metamorphic Lithologies Proximal to the Cripple Creek and Victor Alkaline Diatreme Complex

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An inquiry worthy of primary investigation in this project concerns the formation of an alteration halo around the alkaline magmatic center of Cripple Creek and Victor as a result of Oligocene magmatic and hydrothermal activity and the consequent enrichment or depletion of elements contained within lithologies that are proximal to the diatreme. To accomplish this, a field study was conducted; samples of metamorphic lithologies were taken from viable outcrops. The samples were prepared in a lab for Energy Dispersive X-Ray Fluorescence (EDXRF) spectrometry by producing powders of each sample and were modified for petrographic microscopy by cutting thin section blanks. Geochemical information was obtained using the EDXRF and observations were made concerning the relative abundances of diagnostic compounds contained within the samples. This chemical data was cross-referenced with data received from the Newmont Mining Corporation laboratory, which was obtained using inductively coupled plasma spectrometry, to provide comprehensive evidence of possible hydrothermal fluid interaction and alteration of the wall-rock material in question. A petrographic analysis of samples in thin section was also conducted and observations about mineralogy and texture were made. The combination of chemical and textural information permitted further investigation of units that are contained within a region that is suspected to have been hydrothermally altered by the various episodes of magmatic activity associated with the evolution of the diatreme. The extent of the alteration halo was partly clarified by the chemical composition of units directly contiguous to the diatreme.

Awards Won:

Geological Society of America &amp

American Geosciences Institute: First Award of $2,000