

# SEG 2022 Conference: Minerals For Our Future

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## Characterization of Gold from the Liberty Area, Washington

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Gold (Au) is a metallic element and mineral that has been used for thousands of years and is one of the foremost mediums of exchange in most countries. Societal demands for critical minerals and vital metals, like gold, supports the need for continued research into these systems. The chemistry and crystallography of gold can be used to interpret its provenance and genesis. This research will focus upon understanding the fundamental processes that control the concentration, deposition and growth of gold in the Liberty area, Washington. The area presents a unique field site for studying the controls on gold mineralization, preservation, and weathering, as it displays a variety of gold textures including nuggets, placer grains, wire gold and crystalline lode gold. This research will work on the 20-acre Gold Reserve (GR) mining claim located directly south-east of the Liberty townsite. Areas that contain gold will be identified using a metal detector and detailed mapping performed to record the mineralization structures, local faulting, contacts and other geological features. A non-destructive, Bruker Tracer 5i, portable X-ray fluorescence spectrometer (pXRF) will be used to measure the elemental signature to identify areas containing gold within quartz/carbonate mineralization of the GR claim for sampling. It is unclear how much of the placer gold found in the Liberty area is sourced from the local primary crystalline gold found in hard rock mineralization. A comparison between the two can be made by using scanning electron microscopy (SEM) to characterize the chemistry and crystallography, to determine if the placer deposits could have been sourced from the local in-situ gold. The results will improve our understanding of the paragenesis and overall evolution of the gold within the Liberty area. This knowledge can be applied to other key commodities required to fuel our global society.