

SEG 2024 Conference: Sustainable Mineral Exploration and Development

Gold Remobilization in Gossans of the Usakos Dome in the Southern Central Zone (sCZ) of the Damara Orogen, Namibia

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The Usakos Dome is located within the South Central Zone (sCZ) of the Damara belt, and it's characterized by a metamorphosed shelf-to-continental slope-type rock sequence known as the Swakop group, characterized by a metamorphosed host-rock sequence at amphibolite-facies conditions. The area exhibits a geological composition of a thin layer dominated by marble of the Okawayo Formation overlying the Spes Bona Formation, followed by quartz-biotite schists of the Oberwasser Formation. Within the Okawayo are the oxidized sulfide facies of interest to this study, gossans. Gossans are iron-rich regolith that are produced by the oxidative weathering of primary metal sulfides and they represent an evolving geochemical system, that may influence gold solubility and precipitation. This active gold geochemical cycle occurs during the transition from sulfide- to oxide facies, often coinciding with gossan formation. Understanding the dynamics of gossans is essential, particularly in areas like the Usakos Dome within the Damara belt, where gold mobility within these formations may have significant implications for mineral exploration. The study involves geological mapping in conjunction with petrography and various geochemical analysis for lithogeochemistry, petrography and geochemistry. The geological mapping reveals that the gossans in the Usakos dome are found at the contact of the Okawayo marble and Obberwasser, with a stronger presence in the Okawayo marble. These gossan outcrops consist mainly of weathered quartz-carbonate veins containing a significant amount of sulfide minerals. Thin sections reveal the mineral composition of gossans within the area typically including goethite, hematite, malachite, siderite, and quartz, the assay results show an average gold concentration of 0.2 grams per ton.