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Poster Session Abstract

Location Map of the Alkaline Intrusive and Extrusive Rocks of the Tolovana Alkaline Province with Included Carbonatites at Idaho Gulch, Tofty Ridge, Mud Creek and Flat Creek, East-Central Alaska

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There are at least 18 centers of intrusive and minor extrusive alkaline rocks in the area encompassed by the Livengood Quadrangle and the western portion of the Circle and in the eastern portion of the Tanana Quadrangles of east-central Alaska. The alkaline rocks intrude late Proterozoic and Paleozoic highly deformed volcanic and sedimentary rocks and locally minor low grade metamorphic rocks. The location map is accompanied by a tabulation of the lithologic associations, mineralogy, elemental associations and key references. Within the Tolovana (Livengood) Mining District two clusters of small intrusions are associated with Alkaline Intrusive-Hosted gold mineralization. In the Money Knob-Amy Dome and Livengood Dome area, International Tower Hill Mines has defined a gold resource of approximately 13 million troy ounces. To the south, in the Shorty, Ranney Hollow and Steel Creek areas, Fairbanks Exploration, Inc has drilled significant intercepts of Au-Ag-Cu mineralization in association with latite porphyry dikes and sills. The mineralization includes the potential for important critical and strategic elements including: As-Sb-Bi-B-Cs-In-Hg-Mo-Sn-W-Zn, as bi-products. Majority of the boreholes have average elemental concentration ratios over average crustal abundances greater than over hundred times for multiple elements. The rock, stream sediment and heavy mineral concentrate sampling of the mining district by the Alaska Division of Geological and Geophysical Surveys (ADGGS) and the U.S. Geological Survey (USGS) indicates that the anomalous area at the Shorty Creek Project includes approximately a ten by ten (10) mile square area that is bounded on the southwest by the Tolovana Hot Spring Dome Syenite Complex with a trace element suite similar to that in the Shorty Creek Project area. To the west in the Tanana Quadrangle, the Alkaline Province contains two previously known carbonatite targets at Idaho Gulch and Tofty Ridge. To the east in the Circle Quadrangle, the Alkaline Province contains two REE targets in the Mt Prindle and Roy Creek areas. In the northern portion of the province, along the trace of the Victoria Creek strike-slip fault, Fairbanks Exploration, Inc located state mining claims in 2022 and 2024 on two very large magnetic anomalies associated with extensive areas of low relief with regolith geochemistry and mineralogy indicative of magnetic phosphatic carbonatites (phoscorites) at Flat and Mud Creeks respectively. The carbonatites intrude the Ordovician Livengood Chert with fenitization at the contact zones. The local relief from the regolith surface to the top of the plateau area of the Livengood Chert at Flat Creek is 150 meters while at Mud Creek the local relief is approximately 300 meters. A tabulation of the USGS heavy mineral concentrate sample results from the Flat and Mud Creek areas is included in the poster.