

MINERS FOR GENERATIONS

2023 AMA Annual Convention & Trade Show

Nov. 6 - 9, 2023

ABSTRACTS

Alaska Miners Association 2023 Annual Convention

November 6-9, 2023

Dena'ina Civic and Convention Center, Anchorage



ALASKA MINERS

ASSOCIATION

Alaska Miners Association

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ALASKA MINERS ASSOCIATION 2023 ANNUAL CONVENTION

TRACK ONE

GEOSCIENCE INVESTIGATIONS

Mineral Resources of Alaska Mental Health Trust Lands

Dr. Karsten Eden, Chief Geologist, Trust Land Office

There are hundreds of mineral occurrences, prospects, and deposits on the nearly one million acres of the Alaska Mental Health Trust (Trust) lands. Mineral resources development by the Alaska Mental Health Trust Land Office (TLO) on behalf of the Alaska Mental Health Trust Authority (AMHTA) generates revenue through mineral development. Minerals has and will continue to generate a large portion of revenue for services to Trust beneficiaries; it is key for future revenue generation.

Decisions on the disposition of these resources require a wide range of information. For most of the Trust lands there are general earth-science information available ranging from regional reconnaissance to advanced mineral exploration. Along with adjunct geographical, topographical, hydrological, and other data they allow for broad rankings of mineral potential and locally, for prediction of mineral deposit types. Demonstration of resource potential will increase the further exploration, marketability, and accelerate ultimate exploitation of mineral deposits.

TLO has been investigating placer mineral resources potential of Icy Cape and Kodiak Island and is starting reconnaissance sampling and geological mapping on Trust land throughout the State. For the Icy Cape Gold and Industrial Heavy Minerals Project during 2022 - 2023 the TLO collected about 15,000 feet of large-volume core for analyses of the Grinder Prospect. It is preparing gold and industrial mineral resource estimates to a NI43-101-compliant indicated resource status. Stratigraphic framework and resource definition drilling has been completed and bulk samples have been collected for metallurgical testing. Ongoing research, as TLO has been informing the geologic community over the past several years, is demonstrating apparently unique and extraordinarily large-volume placer mineral sands. About half of the 78 square mile property is covered by placer-heavy-mineral-bearing sediments that extend to depths of over 200 feet.

Placer gold mineralogy and chemistry as a link to lode sources.

Erin Marsh¹, Rob Chapman², Heather Lowers¹, Renee Pillers¹, and Ryan Taylor¹

¹U.S. Geological Survey, Denver, Colorado, USA; ²University of Leeds, Leeds, UK

Alaska has abundant placer wealth yet in many placer districts, the lode source of the gold is not defined. This unknown is a big driver for the current USGS bedrock mapping and geochemical research. For comparison, over the last couple of decades, due to extensive mapping, age dating, exploration, and placer provenance studies in the Yukon - several new Au projects have been discovered (i.e. Dominion; Klondike Gold fields; Coffee). Our USGS Eastern Alaska research is focused on mapping, geochronology, and placer provenance in the area directly adjacent to the Klondike district. Presented here is our research to enhance the current limited understanding of a potentially economically important gold region through interpretation of mineralogical signatures of placer and lode gold particles.

The geology of eastern interior Alaska, from east to west, consists of the intersection and juxtaposition of two tectonic assemblages, the arc and basinal assemblages of the allochthonous Yukon-Tanana terrane and the parautochthonous continental margin Yukon-Tanana Upland (YTU; Dusel-Bacon et al., 2015). The YTU is bordered to the northwest by tectonically interleaved rock formations of the Livengood Assemblage (LG; Athey et al., 2004a,b). The region hosts various reduced intrusion-related and orogenic gold deposits and occurrences, (i.e., Ft Knox, Golden Summit, and Pogo). Placer gold samples were collected or donated from nine areas across the region. In three areas (Black Mountain, Golden Summit, and Pogo) lode samples were obtained for comparison.

Mineral inclusion chemistry indicates the different terranes in which the placers are hosted (Pb-As+/- Sb, Bi = continental margin hosted occurrences; Ag-Te+/-Bi = arc hosted occurrences; a mix of those for deposits occurring at the juxtaposition of these terranes (Pogo); Pb-As-Ni+/-Zn = hosted at the margin of the YTU and accreted terranes of the LG (Fig. 1). The inclusion chemistry also establishes placer-lode and placer-placer relationships: the overlapping inclusions and alloy chemistry from Black Mountain Area and Golden Summit Area; a difference in lode inclusion chemistry with Te and Bi at Grey Lead vs Ag at Blue Lead; increase in Ag in the alloy of the placers downstream from the Leise zone at Pogo matching Leise zone lode Ag values (pers. Comm. D. Kreiner). Mineral inclusion and alloy chemistry along with textural characteristics indicates undiscovered resources: Cu and Zn present in inclusions in placers not seen in lode sample from Black Mountain area; Zn and Bi present in inclusions in placers from Golden Summit area not present in lode sample; Bi and Te in Grey Lead but not Blue Lead at Black Mountain Area; increase in Ag in alloy chemistry and grain roughness in lower Antimony Creek in the Black Mountain Area. Alloy trace element chemistry distinguishes regional variations in placer grain composition as Hg signature from Chicken Area and Olive Creek alloy chemistry reach values >3wt%, differing from the broader regional trend of lower values (Fig. 2).

Lead isotope values are broadly similar placer Au alloy Pb isotope compositions regionally but can be distinct locally. Pb isotopic compositions of Au alloy all systematically lower in $^{207}\text{Pb}/^{204}\text{Pb}$ and $^{208}\text{Pb}/^{204}\text{Pb}$ relative to regional Cretaceous igneous rocks – possibly reflecting hydrothermal fluid signature or interaction with country rock (meta-seds) (Thompson et al., 2022).

Comparing the inclusion chemistry to adjacent regional studies the Pb-As+/-Sb, Bi signature is consistent with a Cretaceous orogenic sourced placers in the Yukon; the Ag-Te +/-Bi signature is consistent with a Jurassic orogenic sourced placers in the Yukon; and the Pogo Pb-As-Bi-Sb+/-Mo signature is similar to that of the Clear Creek and Dublin Gulch, Yukon placer samples from the reduced intrusion related gold occurrence (Chapman et al., 2022).

Athey, J.E., Layer, P.W., and Drake, J., 2004a, $^{40}\text{Ar}/^{39}\text{Ar}$ ages of rocks collected in the Livengood C-3, C-4, and B-5 quadrangles, Alaska: Alaska Division of Geological and Geophysical Surveys Raw-Data File 2004-1, 12p.

Athey, J.E., Szumigala, D.J., Newberry, R.J., Werdon, M.B., and Hicks, S.A., 2004b, Bedrock geologic map of the Livengood SW C-3 and SE C-4 Quadrangles, Tolovana mining district, Alaska, Preliminary Interpretive report 2004-3, Division of Geological and Geophysical Surveys.

Chapman, R.J., Mortensen, J.K., Allan, M.M., Walshaw, R.D., Bond, J., and MacWilliam, K., 2022, A new approach to characterizing deposit type using mineral inclusion assemblages in gold particles: *Economic Geology*, v. 117, p. 361. doi:10.5382/econgeo.4863

Dusel-Bacon, C., Holm-Denoma, C.S., Jones, J.V., Aleinikoff, J.N., and Mortensen, J.K., 2017, Detrital zircon geochronology of quartzose metasedimentary rock from paraautochthonous North America, east-central Alaska: *Lithosphere*, v.9, p.927-952 <https://doi.org/10.1130/L672.1>

Thompson, J, Marsh, E.E., Pillers, R.M., and Chapman, R., 2022, Fingerprinting placer gold alloy from the Yukon-Tanana uplands of eastern Alaska: Integrating trace element and Pb isotopic chemistry of gold: <https://conf.goldschmidt.info/goldschmidt/2022/meetingapp.cgi/Paper/11353>

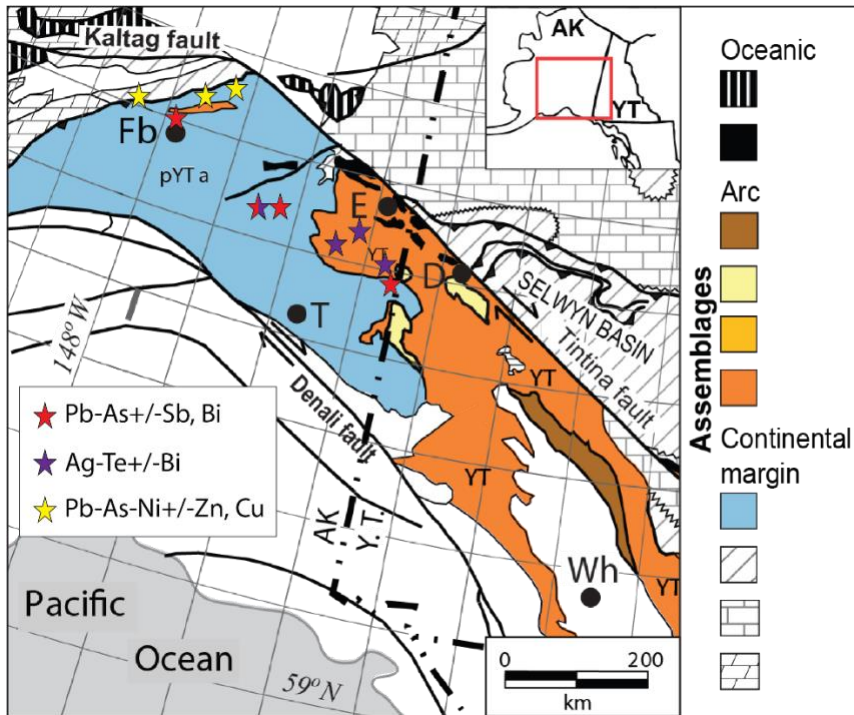


Figure 1 Terrane map of Eastern Alaska and western Yukon from Dusel-Bacon et al. (2015) with sample location and mineral inclusion chemical signature.

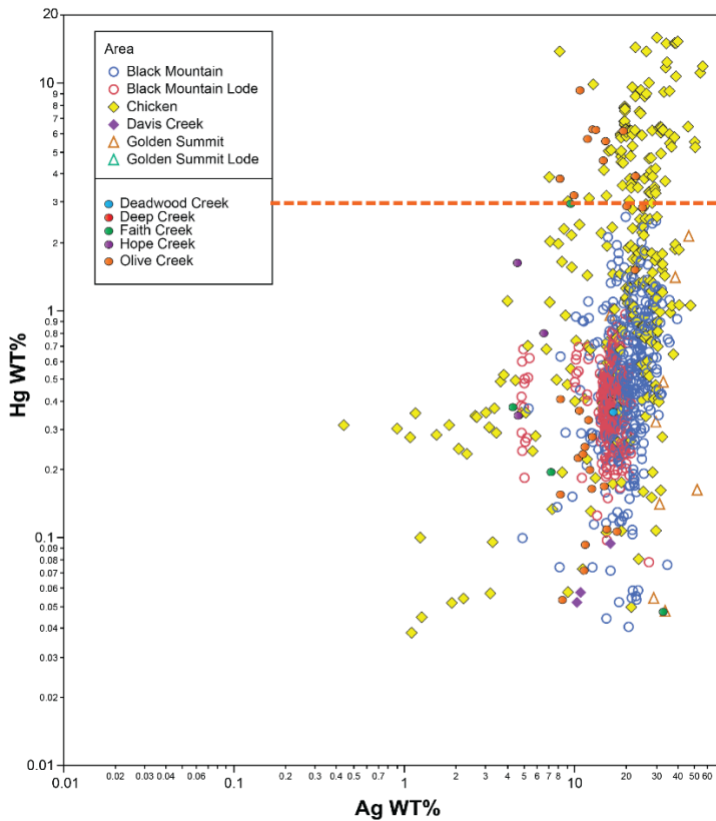


Figure 2. Mercury versus silver weight percent from electron microprobe analysis of placer grain alloy.

DGGS Earth MRI geologic mapping and geophysics program update

Evan Twelker, Abraham Emond, Rainer Newberry, Travis Naibert, Michelle Gavel, Wes Buchanan, David Szumigala, and Michael Barrera
Alaska Division of Geological & Geophysical Surveys

The Alaska Division of Geological & Geophysical Surveys is engaged in major data collection efforts in Interior and Southwest Alaska, funded through the U.S. Geological Survey's Earth Mapping Resources Initiative (Earth MRI) and the State of Alaska. The goal of these programs is to improve our understanding of the Nation's geologic framework and to identify areas that have potential for discovery of critical mineral resources. The program is regional in scope and focuses on geophysical surveys, geologic mapping, and geochemical sampling.

The 2023 Earth MRI geophysical program surveyed the northeastern portion of the Kuskokwim Mineral Belt using magnetic and radiometric sensors (fig. 1). The 2023 survey area includes the Cosna Dome (tin), Kaiyuh Hills (chromite), and Von Frank Mountain (gold) prospects, and the Ruby and Colorado Creek placer gold mining areas. The survey is divided into a mountainous portion, flown by contractor Geotech Ltd. using a helicopter platform, and a low-relief portion flown by contractor MPX Geophysics Ltd. using a fixed-wing aircraft. The survey line spacing was 400 m, and the mean ground clearance was 200 m for both survey blocks.

Alaska's gravity data coverage is sparse, particularly in areas of interest to metallic mineral exploration. The 2023 Earth MRI geophysical survey featured an experiment with "opportunistic" airborne gravimetry, made possible by a partnership with Lamont-Doherty Earth Observatory. The iMAR gravimeter installed on contractor MPX's aircraft weighs 10 kg and is capable of approximately 5 km resolution data collection—a major improvement over available data—with no modification to the aeromagnetic survey design.

Earth MRI and DGGS began an electromagnetic survey of the Seward Peninsula graphite belt, including the known resources at the Graphite Creek deposit and other prospective ground in the Kigluaik, Bendeleben, and Darby Mountains. Contractor SkyTEM completed part of the survey this fall.

DGGS geologists continued a multi-year effort to update and improve the geologic maps of the Yukon Tanana Upland in eastern Interior Alaska, as well as further investigating and understanding mineral occurrences in the region. DGGS's 500 person-day 2023 field season investigated an area of roughly 11,000 km² (4,250 mi²) including the Pogo Trend mineral deposits, the Chena Slate Belt, and the upper Salcha and Chena river drainages. This regional mapping program blends new fieldwork, geochronology, and geophysical interpretation with compilation of existing maps, industry data, and re-examination of archived USGS rock samples. Emphasis is on building a more detailed understanding of Cretaceous-Cenozoic plutonic rocks and fault systems. Geochemical sampling targeted both known and previously undocumented mineral occurrences, and we are employing litho-geochemistry and geochronology to understand suites of mineralizing and barren intrusive rocks.

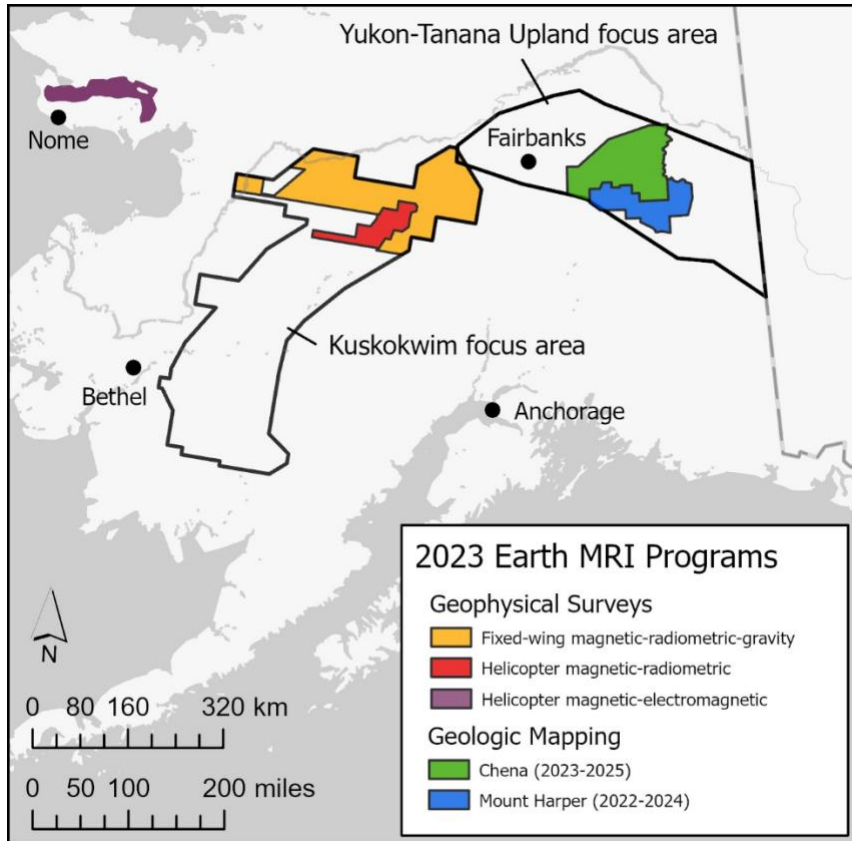


Figure 1. Location of DGGs Earth MRI geological and geophysical surveys during 2023.

Geochemistry of lithium-bearing rare metal granites of the Seward Peninsula

George Case¹

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The rare metal granite (RMG) mineral system encompasses tin (Sn) granite/greisen, Sn-tungsten (W) vein, and related skarn deposits. This system is characterized by magmatic and magmatic-hydrothermal activity related to highly evolved granites and is the major lode source of Sn worldwide. Some RMGs can contain economic concentrations of other lithophile critical minerals. The western Seward Peninsula tin granite belt (TGB) comprises a suite of middle Cretaceous RMGs and associated hydrothermal systems that are enriched in multiple critical minerals including tin (Sn), tantalum (Ta), W, and lithium (Li). At the Lost River Sn mine and Kougarok Sn-Ta prospect, intact cupolas are preserved below the surface, in contrast to deeply exhumed plutons at Ear Mountain and Cape Mountain with 20 – 40 km² of surface exposure. This provides an opportunity to study the RMG mineral system at different stages of magmatic and magmatic-hydrothermal evolution. Recent industry exploration at Lost River and Kougarok has investigated lithium resource potential in these rocks, which are interpreted to be analogous to those of the Cornwall (United Kingdom) and Erzgebirge (Germany/Czech Republic) districts. While previous studies have primarily focused on Sn-W ore genesis and distribution, this study characterizes the Li chemistry and hydrothermal alteration of the TGB granites using modern, comprehensive, whole-rock geochemistry.

The Kougarok prospect is characterized by a series of granite dikes and plugs that intruded quartz-biotite schist. The main intrusive phase, a medium-grained zinnwaldite leucogranite (ZLG), has a primary magmatic composition of quartz, plagioclase, zinnwaldite (KLiFeAl(AlSi₃)O₁₀(OH,F)₂), and K-feldspar, with minor fluorite. The least-altered ZLG samples contain extremely elevated concentrations of Li (~2,000 – 5,000 ppm), Ta (60 ppm), Sn (80 – 200 ppm), cesium (Cs, 150 – 230 ppm), and rubidium (Rb, 2,600 – 4,100 ppm), relative to average continental crust. Such high lithophile element abundances and Rb/strontium (Sr) ratios exceeding 200 indicate the ZLG is highly geochemically evolved. Intense alteration, typified by greisen assemblages of massive quartz-fluorite-tourmaline-topaz, mica-quartz-tourmaline-topaz, or tourmaline-fluorite is focused near the ZLG cupola, and along fracture zones within the granite. Mica-rich greisen is further enriched in lithophile elements, with Li abundances as high as 6,200 ppm and moderately elevated W concentrations (30 – 215 ppm). Lithium and Rb exhibit a strong positive correlation in their abundance because of almost exclusive incorporation in mica. In contrast, quartz-rich greisenization destroyed feldspars and micas, replacing the protolith with quartz ± fluorite ± tourmaline ± topaz, which resulted in strong depletion in Li and Rb relative to the ZLG, moderate depletion of Ta and Cs relative to ZLG, and extreme enrichment in Sn (>20,000 ppm), arsenic (As, 4,000 – 12,000 ppm), and bismuth (Bi, 40 – 320 ppm). Greisen alteration at Erzgebirge, in contrast, is dominated by mica-quartz veins and is enriched in both Li and Sn.

At Lost River, zinnwaldite leucogranite and quartz porphyry intrude marble, resulting in extensive Sn-W skarn; exogreisen, veins and breccia are more common than at Kougarak. Like Kougarak, quartz-rich endogreisenization typically removes Li and adds Sn, W, +/- Pb-Zn-Ag sulfides. However, fluorite-lepidolite ($K(Li,Al)_3(Al,Si,Rb)_4O_{10}(F,OH)_2$)± wolframite veins and breccias in marble increase Li abundance locally to >10,000 ppm over 1-2 m.

The Onanatur granite complex (OGC), ~125 km northeast of Lost River, is one of the most deeply-exhumed TGB plutons. It is characterized by coarse grained, equigranular to porphyritic phases. Reanalysis of legacy rock samples from this area show maximum enrichments in Li, Ta, Sn, and Cs of ~240 ppm, 30 ppm, 30 ppm, and 60 ppm, respectively, and Rb/Sr ratios ~40 – 170. These concentrations and Rb/Sr values – intermediate between average crust and the Lost River-Kougarak plutons – support previous interpretations that the OGC represents a less-evolved precursor composition to the finer-grained mineralized plutons emplaced at higher levels.

These observations suggest multi-stage, magmatic and magmatic-hydrothermal input of Li, Sn, Ta, and Cs at the Kougarak and Lost River mineral systems. This carries significant economic implications, as the zones of highest Sn enrichment do not necessarily correspond to the highest Li and Ta grades. Although Li-Cs-Ta pegmatites are, to-date, the main bedrock source of lithium, rare metal granite mineral systems should be evaluated for their Li resource potential. Ongoing work aims to elucidate the source of TGB magmas and examine the role of fractionation vs source enrichment in concentrating lithophile critical minerals.

BLM Mining Claims are going virtual in Alaska

Shelea Alonso, U.S. Department of the Interior, Bureau of Land Management (BLM)

The Bureau of Land Management's (BLM's) Mineral & Land Records System (MLRS) is a state-of-the-art system used for mineral and land records transactions, tracking, mapping, and more, offering an empowering online experience. The BLM plans to bring all case types for Alaska, including mining claims, into MLRS in late 2024. We invite you to discover the benefits of the MLRS. MLRS is an additional option for interacting with BLM and is not mandatory. You may continue doing business as you always have to include visiting in person, calling over the phone, sending postal mail, or writing an email.

Join us to learn how MLRS offers enhanced methods to interact with the BLM through researching current and historical land information, filing cases, seeing real-time status updates, processing select payment transactions, and finding answers in the Help Center page. Experience how MLRS offers a fast and accurate option to pay for mining related fees. This session will include:

An MLRS Overview:

New to Alaska, MLRS is a modern, scalable, nationwide, online application for managing and tracking public land records. MLRS is being developed in modules, with the first one released in 2021 for mining claims in the Lower 48. As of 2023, additional modules have been released in the Lower 48 for fluid minerals, geothermal energy, land tenure, solid minerals, and other case types, as well as for land use authorizations and realty billing which include Alaska. The final MLRS module, tentatively slated for completion in late 2024, will incorporate all remaining Alaska cases.

A Live Demonstration

During our live demonstration we will highlight some of MLRS's many customer-centric features:

Research:

The smart search bar and the interactive map open new possibilities for you to find and learn about new and historic cases. The map enables research on areas of interest or existing cases based on location, legal land description, or serial number. You can also use the national BLM geospatial layers such as surface management agency, public land survey system, and administrative units to assist with reviewing map data.

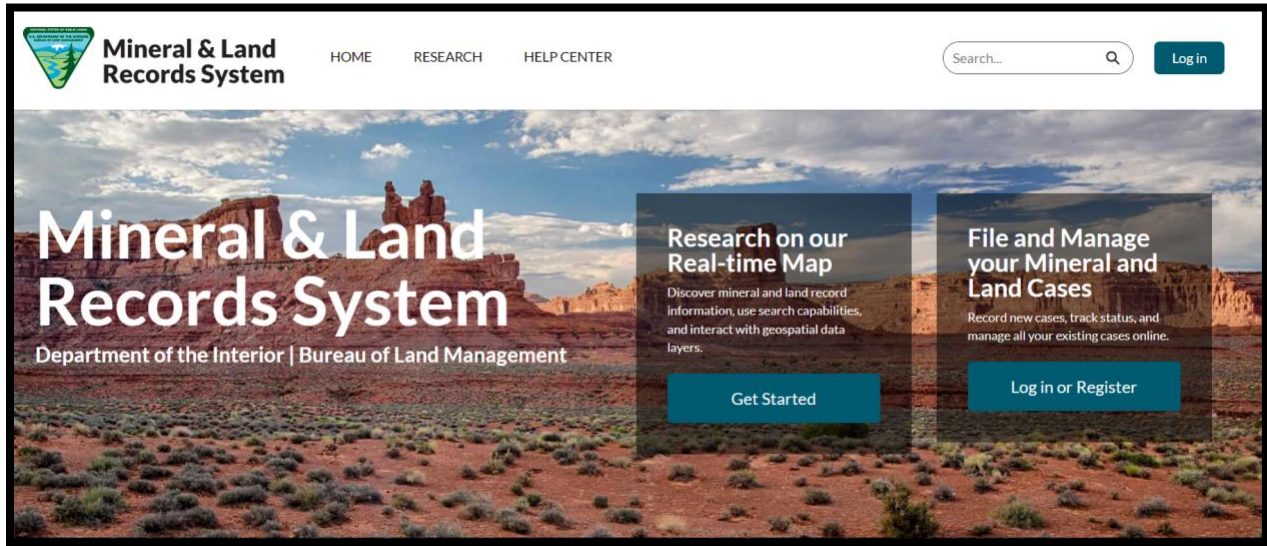
Case Management:

See how you can easily track the status of active cases, and any associated bills, or fees that may be pending. There are many supported transaction types available to include: filing new claims, amendments, transfer of interest, relinquishment, appeals, and document upload. MLRS uses Pay.gov to allow individuals and businesses to make secure online payments for new filings and annual maintenance fees.

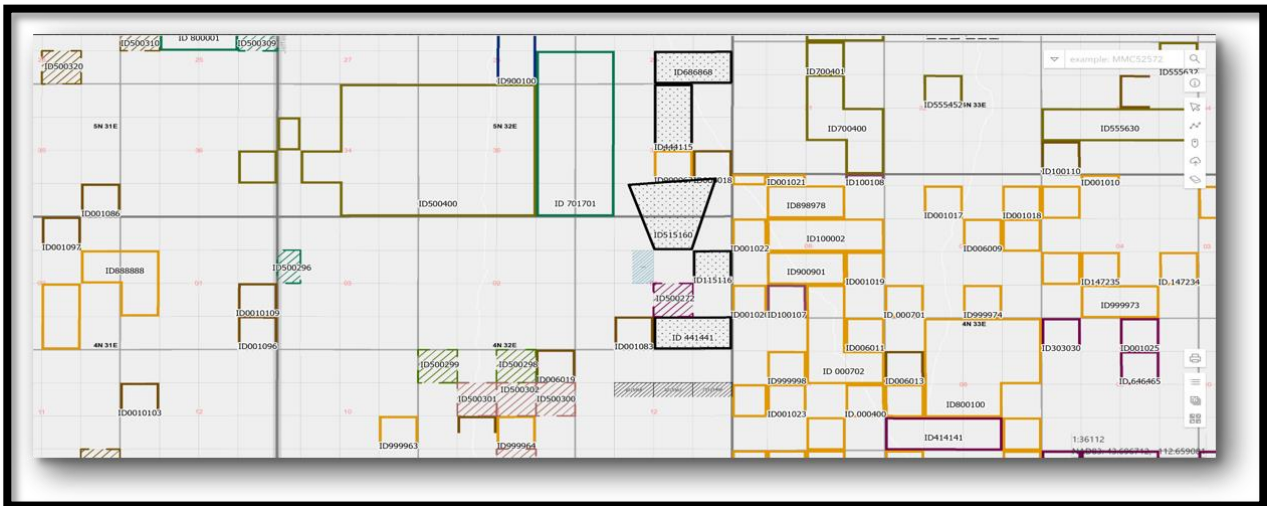
Customer Self-Service:

Access the Help Center to review a knowledge base full of learning materials and answers to frequently asked questions.

The Mineral & Land Records System Home Page



The MLRS Research Map



EXPLORATION PROJECT HIGHLIGHTS

Heading to Valhalla – with Sun as our Focus, Ambler Mining District, Alaska *Bonnie Broman, Sorin Posescu, Valhalla Metals Inc.*

Mineralization was discovered at the Sun deposit over 50 years ago, and since that time the project has gone through several periods of intense exploration followed by periods of dormancy – the most recent of which ended when Valhalla Metals Inc. acquired 100% ownership of the Sun deposit in 2018. In September 2022, the project took another significant step forward when Valhalla began trading on the Toronto Stock Exchange (TSX) and raised over \$C10 million to advance the project and welcome Marubeni, a well-established Japanese copper producer, as a strategic investor.

Sun is the eastern-most deposit known within the highly prospective Ambler Mining District and is characterized as a volcanogenic massive sulfide (VMS) deposit containing high grade zinc, copper, lead, silver and gold mineralization. On a worldwide comparison basis, Sun ranks in the second quartile for size and the second quartile for metal value.

Valhalla completed an updated Canadian NI 43-101 compliant resource in May 2022 with Sun estimated to contain an Indicated resource of **1.71 million tonnes (MT)** grading **4.32% Zn, 1.48% Cu, 1.11% Pb, 60.0 g/t Ag, and 0.21 g/t Au (4.09% CuEq)**; and an Inferred resource grading **9.02 MT of 4.18% Zn, 1.21% Cu, 1.46% Pb, 81.7 g/t Ag, and 0.25 g/t Au (4.10% CuEq)***. A total of 97 holes (19,123m) have been drilled since the deposit was first discovered in 1966 and are used to define the current resources at Sun and SW Sun. These holes have only been extended to ~200m below surface within the Main Sun prospect, so the potential to upgrade and increase the overall size of Sun is highly prospective down-dip and along strike. Mineralization at Sun is hosted by at least two polymetallic massive and semi-massive sulfide horizons containing primarily pyrite, sphalerite, chalcopyrite, galena, and tetrahedrite-tennantite with other accessory sulfide minerals.

Helicopter supported Lidar and orthophotographic studies in addition to a ground gravity survey, diamond drill program, historic drill hole relogging program, and new camp construction were completed in 2023. Four diamond drill holes totaling 1,104m were completed using two EF-75 drill rigs operated by Major Drilling. Six holes totaling 1,416m and located in and around the planned drilling were also relogged with the intent to standardize the logging codes resulting from several drill campaigns.

Forward progress is being made on the Ambler Mining District Industrial Access Project (AMDIAP) with the BLM recently releasing the draft supplemental EIS. Valhalla intends to continue to advance the Sun deposit by drilling down dip and along strike of the current resource area to confirm, upgrade and expand the existing resource base, as well as to obtain representative samples for metallurgical testing. In addition, exploration efforts including drilling and downhole geophysics in other areas of the

Track 1. Exploration Project Highlights

property will continue, both to further refine existing prospects and to generate new ones.

Note: *The following metal prices were used to calculate CuEq: copper - \$3.00/lb; zinc - \$1.10/lb; lead - \$1.00/lb; silver - \$18/oz; and gold - \$1,300/oz

Exploration Update on the Nikolai Ni-Cu-Co-PGE Project, Alaska

Gabe Graf, Chief Geoscientist - Alaska Energy Metals Corporation

In March 2023, Millrock Resources was rebranded as Alaska Energy Metals Corporation (AEMC) and shifted its focus from a project generator to delineating and developing a large polymetallic exploration target (nickel, copper, cobalt, chrome, iron, platinum, palladium, and gold) at the Nikolai Project. The project (formerly known by others as the MAN Project) is located within Alaska's Delta Mining District, approximately 130 kilometers south of Delta Junction and approximately 280 kilometers southeast of Fairbanks, Alaska (Figure 1). The Eureka zone consists of disseminated Ni-Cu-Co-PGE mineralization initially discovered by a subsidiary of INCO, and further expanded by Pure Nickel Inc. The project may represent a large, secure, US domestic source of nickel and other metals needed for a transition to electrical vehicles.

AEMC completed multiple capital raises (~US\$9M) leading up to its inaugural exploration program in 2023. The 2023 exploration program was completed with one diamond drill, which consisted of eight holes drilled at approximately 300-meter spacing, along a 1.2-kilometer strike length along the main Eureka Zone. Total drilling for the 2023 exploration program equaled 4,138 meters (Figure 2). CSAMT surveys, totaling twenty-seven-line kilometers, were completed to map subsurface geology and to analyze whether known mineralization could be detected within the Eureka Zone using this survey method. Sixteen line-kilometers of EM surveys were completed over the Canwell claim block where CSAMT surveys had detected ultramafic rocks in the subsurface. Additionally, the historical MAN database was purchased, and the data is currently being evaluated to determine if an inaugural Inferred Mineral Resource Estimate can be calculated from this historical dataset.

Results for the first two drill holes EZ-23-001 & EZ-23-002 have been received, with assay results for the remaining six holes pending. Drill hole EZ-23-001 intersected the mineralized Eureka Zone from 220.1m to 561.7m, with assays grading 341.6m @ 0.23% Ni, 0.08% Cu, 0.02% Co, 0.32% Cr, 9.94% Fe, 0.107 g/t Pd, 0.051 g/t Pt and 0.011 g/t Au (0.34% NiEq). A second mineralized intrusive was intersected from 608.7m to 616.6m (EOH), with assays grading 49.4m @ 0.15 Ni%, 0.02 Cu%, 0.02% Co, 0.44 Cr%, 10.25% Fe, 0.017 g/t Pd, 0.031 g/t Pt and 0.008 g/t Au (0.21% NiEq) and is still open at depth.

Drill hole EZ-23-002 intersected the mineralized Eureka Zone from 7.5m to 304.1m, with assays grading 296.6m @ 0.23% Ni, 0.09% Cu, 0.02% Co, 0.30% Cr, 9.92% Fe, 0.115 g/t Pd, 0.052 g/t Pt and 0.013 g/t Au (0.35% NiEq). The second mineralized intrusive unit encountered in EZ-23-001 was also intersected in EZ-23-002, with assays grading 61.8m @ 0.15 Ni%, 0.03 Cu%, 0.01% Co, 0.43 Cr%, 9.87% Fe, 0.019 g/t Pd, 0.028 g/t Pt and 0.009 g/t Au (0.19% NiEq). In addition to being open at depth, there is potential this zone of mineralization may extend along the entirety of the previously defined Eureka Zone.

Work leading up to the 2024 exploration campaign will involve the modeling of new assay data and lithological information to evaluate and constrain the mineralizing system. A Ni-Cu-Co-PGE-Au deportment study is underway to better understand the

Track 1. Exploration Project Highlights

mineralogy and potential recovery of the mineralization. Following the department work, metallurgical testing will be completed to determine the floatation and magnetic recovery performance of the mineralization.

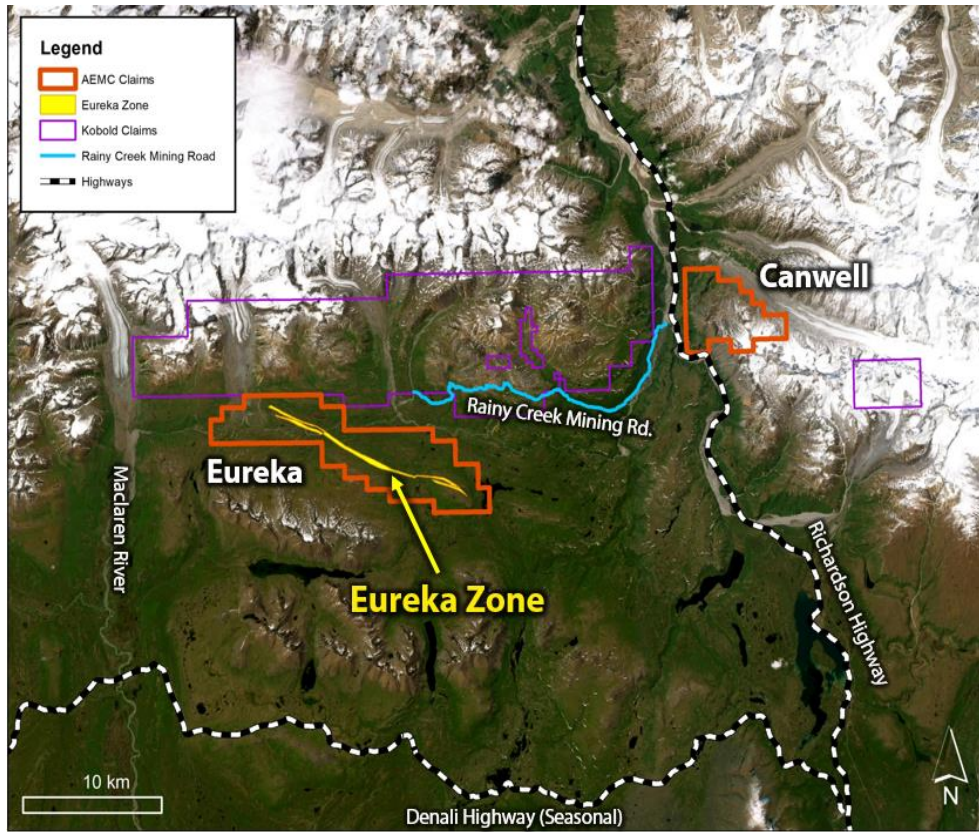


Figure 1. Location of the Nikolai Project

Track 1. Exploration Project Highlights

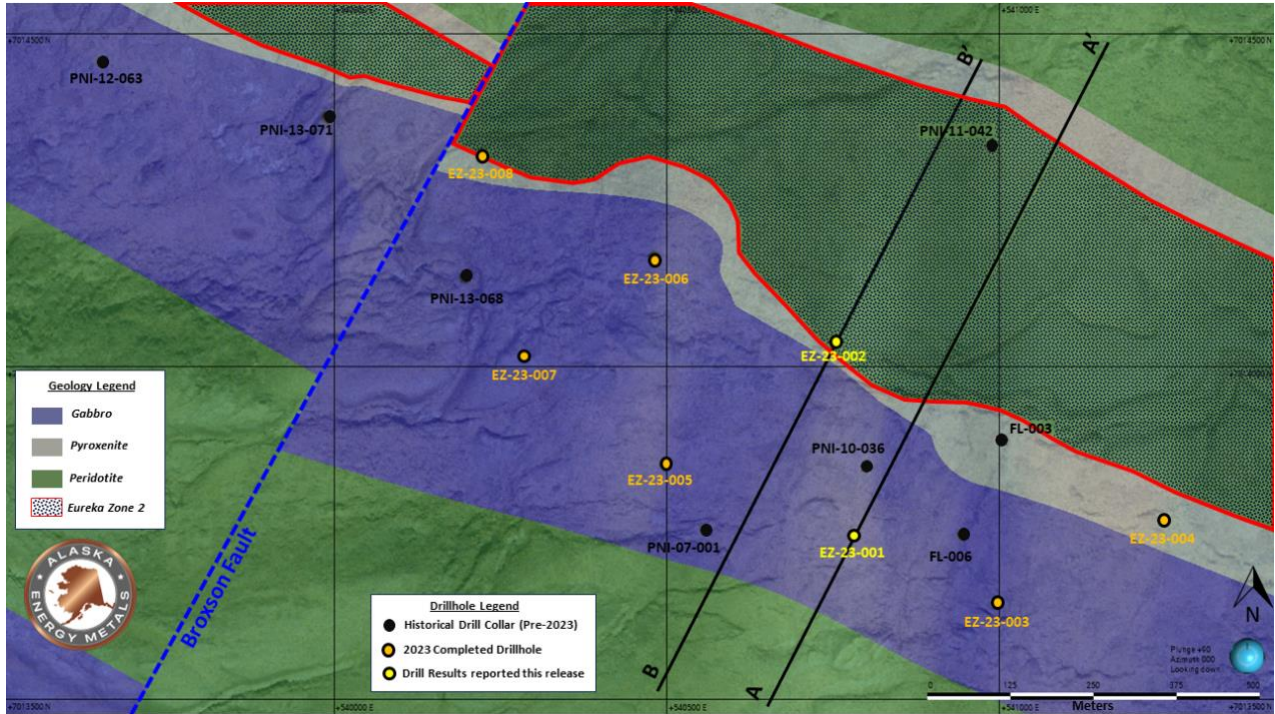


Figure 2. Drill hole location map, surface geology and surface trace of Eureka Zone 2 mineralization.

Welcome to Valhalla – A New Focus for the Sun Deposit, Ambler Mining District, Alaska

Bonnie Broman, Sorin Posescu, Valhalla Metals Inc.

Mineralization was discovered at the Sun deposit over 50 years ago, and since that time the project has gone through several periods of intense exploration followed by periods of dormancy – the most recent of which ended when Valhalla Metals Inc. acquired 100% ownership of the Sun deposit in 2018. In September 2022, the project took another significant step forward when Valhalla began trading on the Toronto Stock Exchange (TSX) and raised over \$C10 million to advance the project and welcome Marubeni, a well-established Japanese copper producer, as a strategic investor.

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Valhalla completed an updated Canadian NI 43-101 compliant resource on October 1, 2021 with Sun estimated to contain an Indicated resource of **1.71 million tonnes (MT)** grading **4.32% Zn, 1.48% Cu, 1.11% Pb, 60.0 g/t Ag, and 0.21 g/t Au (4.09% CuEq)**; and an Inferred resource grading **9.02 MT of 4.18% Zn, 1.21% Cu, 1.46% Pb, 81.7 g/t Ag, and 0.25 g/t Au (4.10% CuEq)***. A total of 97 holes (19,123m) have been drilled since the deposit was first discovered in 1966 and are used to define the current resources at Sun and SW Sun. These holes have only been extended to ~200m below surface within the Main Sun prospect, so the potential to upgrade and increase the overall size of Sun is highly prospective down-dip and along strike. Mineralization at Sun is hosted by at least two polymetallic massive and semi-massive sulfide horizons containing primarily pyrite, sphalerite, chalcopyrite, galena, and tetrahedrite-tennantite with other accessory sulfide minerals.

Helicopter VTEM and magnetic surveys were completed in 2019 with detailed conductive plate modeling done in 2022. Comprehensive 2D and 3D modelling confirms the known Sun resources and further defines believed mineralization along strike and down-dip to greater depths at Sun, SW Sun, and Picnic Creek. Several other previously untested VTEM anomalies were also identified, including a large 2km circular shaped anomaly referred to as the Western Anomaly. A soil geochemical program was completed in 2021 over the Western Anomaly showing coincident anomalous metals in soils. This detailed modeling demonstrates there are several exciting new targets to explore across the property in addition to expanding mineralization down-dip and along strike of Sun, SW Sun, and Picnic Creek.

Forward progress is being made on the Ambler Mining District Industrial Access Project (AMDIAP) with the BLM currently working on a supplemental EIS. Valhalla intends to advance the Sun deposit by drilling down dip and along strike of the current resource area to confirm, upgrade and expand the existing resource base, as well as to obtain representative samples for metallurgical testing. In addition,

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exploration efforts including drilling and downhole geophysics in other areas of the property will continue, both to further refine existing prospects and to generate new ones.

Note: *The following metal prices were used to calculate CuEq: copper - \$3.00/lb; zinc - \$1.10/lb; lead - \$1.00/lb; silver - \$18/oz; and gold - \$1,300/oz

Doyon Internal Exploration- A 3 million acre problem

Matthew Hanson, Doyon Natural Resources Development Corporation

In 1972 the Alaska Native Claims Settlement Act, commonly referred to as “ANCSA”, created 12 Alaska Native Regional Corporations and allowed them to select 44 million acres of land. Doyon, Limited, being the largest region, was permitted to select 12.5 million acres. Because several villages did not have federal land to select in their area, some land was selected instead for its mineral potential. For Doyon, this ended up being approximately 3 million acres.

Perseverance: The Perseverance Mine was a small lead and silver mine south of the Yukon River. It was discovered in 1918 and only operated for a short time. It was reported to have produced around 275 tons of hand sorted ore which was quite rich at 73% lead and 104 ounces per ton silver.

Perseverance lies at the north end of the Ruby Terrane, a Proterozoic to Paleozoic schist belt that runs roughly northeast-southwest for 45 miles. At the South end of the Ruby Terrane lies Illinois Creek and Waterpump Creek. The Doyon database has only 2 samples taken from the old mine cut. In 1999 Tom Bundtzen took 2 channel samples which contained 41% and 48% lead and 1235 ppm and 1430 ppm silver, but because the mine was on patented claims at the time no further work was done; however, in 2007 the Estate of Joe Manga transferred ownership of the claims to Doyon.

In early June Doyon visited the property for the first time in almost 25 years. The remains of the original shaft was located and hand samples of massive galena were collected, and the trace of the vein was followed for around a hundred feet along an old dozer cut.

A small auger crew collected 200 samples in late June. There were some anomalous results from the portion of the grid sampled, but due to wide sampling space it is difficult to tie together the more anomalous lead values. The 2024 season will include infilling the skipped lines of the grid and extending to the north focusing on the areas mapped as limestone.

Lake Sithylemenkat: At the north end of the Ray Mountains the Sithylemenkat pluton was historically explored for tin and uranium. During placer tin exploration niobium and tantalum were also collected in the concentrate. More recently in 2012 DGGS collected samples enriched in dysprosium and other REE's. In 2014 Doyon had an airborne radiometric survey flown over the area.

This summer Doyon flew a small crew of 4 out and two very tight soil sampling grids were done over the area with enriched REEs and a second location with a radiometric anomaly. Assays confirmed the system is enriched in REEs and further work is planned to test the range of enrichment and the size of the system.

American Creek: Located just south of Eagle the American Creek Nickel prospect is a serpentinitized peridotite with awaruite Ni_2Fe or Ni_3Fe . Grades 2,000-2,500 ppm Ni were confirmed by a small sampling program along the road this summer. Metallurgical

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testing to check the amount of nickel easily separated by magnet will take place this winter.

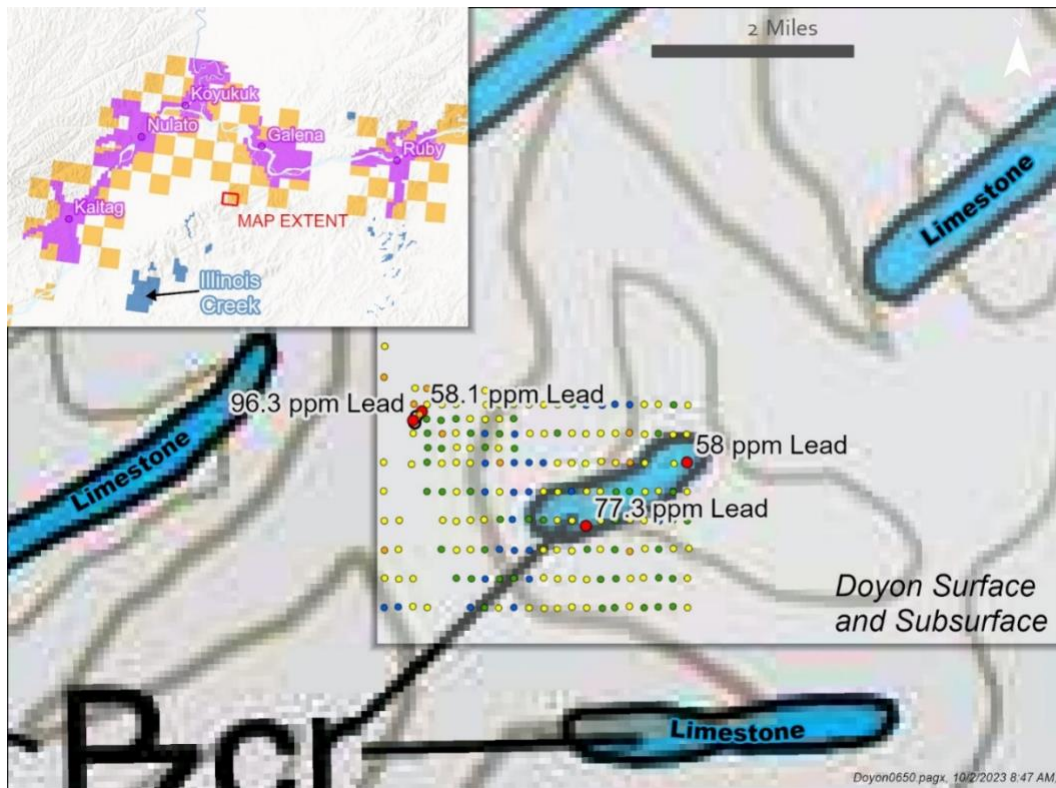


Figure (1) Perseverance Soil Grid



Figure (2) Massive argentiferous galena from mine shaft

The Wiseman East Project

Evan Garity, Exploration Manager, Wiseman Metals

The initial exploration efforts for copper in the Wiseman East District were done by Bear Creek Mining Company (BCMC) between 1967 and 1973. BCMC staked claims on multiple copper bearing skarn and porphyry prospects throughout the district during this time. The claims were then optioned to Midwest Oil Company (MCO) in 1973. MCO focused exploration efforts on the Venus and Evelyn Lee prospects. Field work included more advanced exploration at Venus and Evelyn Lee consisting of diamond drilling and detailed field mapping. MCO also completed preliminary mapping at other prospects (Victor, Hurricane, Ginger, Luna, and Eva) during this time. In 1971 Doyon had selected land around the BCMC claims under ANSCA, while the BCMC claims remained in effect. In 1977 BCMC allowed their claims to lapse, and the land was subsequently conveyed to Doyon. In the late 1970s WGM explored the Doyon lands, including a drill program at the Luna prospect in 1978. This was followed by a pause of exploration activity from 1980 until 1989. Exploration activity then resumed in 1990 when Doyon entered into an exploration agreement with Central Alaska Gold Company. This was followed by an agreement with Venture Resources Corporation in the late 1990s. These exploration programs only saw reconnaissance field work completed, focused mainly on confirming mineralization at known prospects. No further work was completed by either company. Additional work was not completed until a 2012 IP survey conducted by Doyon over the Victor prospect. Doyon completed no further work on the project. In 2021 Doyon held a competitive bidding process for the right to explore the project. The rights to explore the project was awarded to Mine Discovery Fund (MDF) in 2022. MDF then formed Wiseman Metals (WM) to undertake exploration on the land.

Exploration work undertaken by WM over the past two years has confirmed the original work and expanded upon it. The 2022 field season included soil sampling, field mapping, RC drilling and airborne and IP geophysics. The field mapping and RC drilling was focused on the Venus and Evelyn Lee prospects, while soil sampling was undertaken at the Luna, Ginger, Hurricane, Evelyn Lee, and Venus prospects. A district scale airborne magnetic and radiometric survey was flown in the summer of 2022. Petrographic analysis of the RC drilling and mapping samples were also conducted with samples from the 2022 field season. The work from the 2022 program was used to identify the targets for the 2023 field program.

The 2023 field season consisted of geological mapping, IP surveys and RC drilling. The geological mapping focused on general mapping of the Eva and Victor deposits, while more detailed mapping was conducted at Venus and Evelyn Lee. IP surveys and RC drilling were done at Victor, Ginger, Evelyn Lee, Venus and Eva. The recent work undertaken by WM has confirmed the previously discovered skarn and porphyry mineralization. The work has also led to a better understanding of the mineralized systems. This understanding has already helped discover at least one new Cu mineralized porphyry at Eva. In 2024 we seek to continue our exploration success and discover additional porphyry deposits within the district. We also seek to better understand the main controls on the mineralized porphyries within the district.

The Ni-Cu-Co-PGE Eureka Zone: Unlocking Alaska's Critical and Strategic Minerals for America's Future

Gabe Graf, Millrock Resource Inc.

The Nikolai Project (formerly known as the MAN Project) is located within Alaska's Delta Mining District, approximately 130 kilometers by road south of Delta Junction and approximately 280 kilometers southeast of Fairbanks (Figure 1). The Eureka zone consists of disseminated Ni-Cu-Co-PGE mineralization initially discovered by a subsidiary of INCO, and further expanded by Pure Nickel Inc. as reported in their press releases ranging between 2007-2014. Historical drillhole assay results reported by Pure Nickel Inc. (TSX-V: GGO) (Pure Nickel Inc., News Release, October 29th, 2013), indicate an area of mineralization with an estimated true width ranging from 94.8 to 320 meters, and grades ranging from 0.20 to 0.25% nickel, 0.05 to 0.15% copper, 0.016 to 0.019% cobalt, 39 to 96 ppb platinum, 62 to 156 ppb palladium and 11 to 31 ppb Au, with a calculated nickel equivalent (NiEq) ranging from 0.33% to 0.47%.

Millrock has recently resampled historical core and the new assay results confirm the existence of low-grade Ni-Cu-Co-PGE mineralization immediately below and adjacent to the Core Eureka Zone ("CEZ"). The new zone is named the Lower Eureka Zone ("LEZ"). Along with the Upper Eureka Zone ("UEZ"), hole FL-003 intersected 346 meters of nickel mineralization representing an approximate true width of 275 meters (Figure 2). The LEZ mineralized zone assay results returned 135.6 meters grading 0.20% Ni, 0.05% Cu, 0.016% Co, 0.062 ppm Pd, 0.026 ppm Pt, and 0.014 ppm Au (including eight historical intervals), providing evidence for a significant amount of mineralized tonnage below the CEZ.

Initial nickel and copper deportment studies completed by Millrock indicate very encouraging results for the recoveries and processing of the nickel-sulfide mineralization. In these low-grade nickel sulfide deposits, it is extremely important for the economics to fully understand the distribution and recoverability of nickel and copper. Nickel sulfide and nickel alloys accounted for ~94% of the total nickel within the CEZ composite sample (only 5.1% of total nickel in silicates). Pentlandite was the principal nickel bearing sulfide and carried ~92% of the total nickel in the CEZ composite. Interlocking between pentlandite and pyrrhotite was rarely observed, which will be favorable to the pentlandite separation from pyrrhotite. Nickel sulfide and nickel alloys accounted for ~80% of the total nickel within the UEZ composite sample (18.9% of total nickel in silicates). Pentlandite was the principal nickel bearing sulfide and carried ~64% of the total nickel in the UEZ composite. The remaining potentially recoverable nickel was in the form of nickel alloy and nickel metal, which accounted for ~16%.

Copper sulfides accounted for ~71% to 75% of the total copper within the CEZ and UEZ composites. Chalcopyrite is the dominant copper sulfide and accounts for ~67% to 71% of the copper in the composite samples. Bornite, chalcocite, cuprite, malachite, and azurite were also present, in the composite samples. The remainder of the copper (~24% to 28%) was present in valleriite (Cu-Fe-Mg sulphate). An additional composite

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sample of the newly defined LEZ has been submitted for additional department studies.

Based on the historical data currently available to Millrock a clear exploration target has been established with a potential block of mineralized rock measuring 400 meters by 300 meters by 400 meters. Drill density is not presently sufficient to calculate an Inferred Resource. However, it is estimated that the exploration target contains between 140 million tonnes and 211 million tonnes, with grades ranging from 0.28% NiEq to 0.42% NiEq. Additionally, significant upside potential exists, as historical geophysical reports indicated a VTEM anomaly ~3.5 km in length and 400-600m in width in this part of the Eureka Zone. The developed exploration target accounts for only 12% of the length of the VTEM anomaly.

An exploration drill program has been designed consisting of seven holes totaling approximately 2750 meters. If successful, the program would, along with historical drill hole information, provide a drill density on 200-meter centers. This drill hole density is believed to be adequate to allow calculation of an Inferred Resource, given the apparent relative continuity and homogeneity of the mineralized zone. The grade and scale of the potential mineralized Eureka Zone appears to be comparable to Canada Nickel's Crawford Main Zone (606Mt @ 0.26% Ni), Gigametals Turnagain deposit (1073Mt @ 0.22% Ni) and Stillwater Critical Minerals Stillwater West Deposit (157Mt @ 0.20% Ni). Millrock believes these low-grade Ni-Cu-Co-PGE deposits will be the future for nickel production. Options to fund the initial exploration drill program are currently being explored, with the plan for drill rigs to be turning on the project next summer.

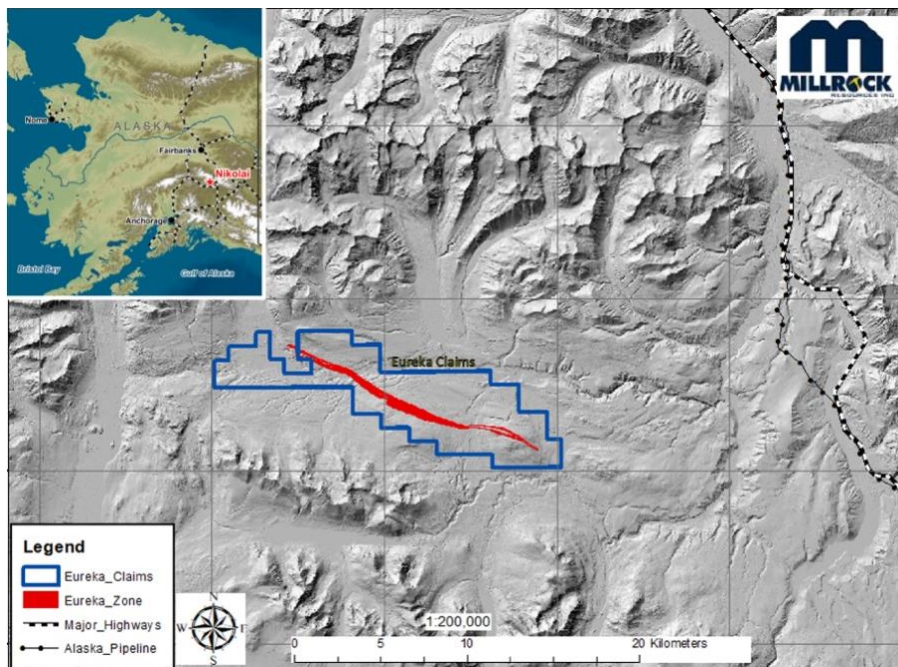


Figure 1. Location of the Ni-Cu-Co-PGE Eureka Zone

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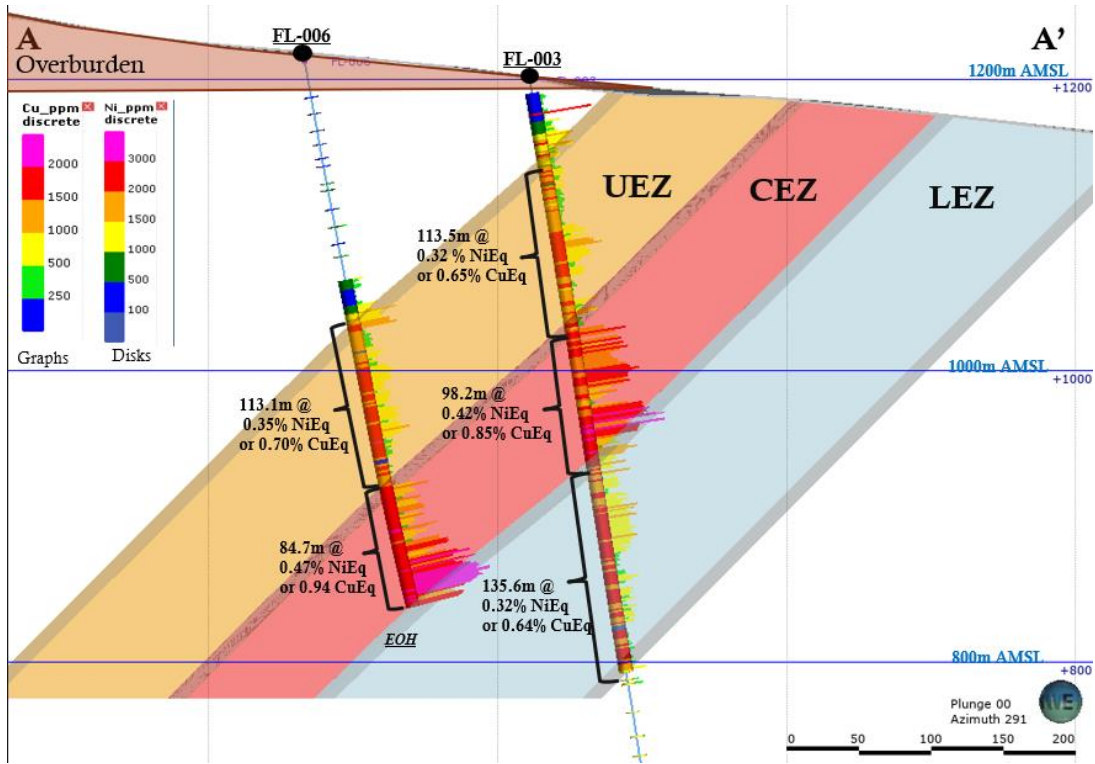


Figure 2. Cross Sectional view of INCO drillholes FL-003 and FL-006 through the Upper, Core and Lower Eureka Zone

The Whistler gold-rich copper porphyry deposit, West Susitna Mineral District, Alaska Range

Tim Smith, MSc, P.Geo, CEO, U.S. GoldMining Inc.

The Whistler gold-copper exploration project (“Whistler project”, or “Whistler”) is located in the Yentna Mining District of south central Alaska, approximately 100 miles northwest of Anchorage. The Whistler project comprises 377 State of Alaska mining claims covering an aggregate area of approximately 53,700 acres (217.5 square kilometers). Whistler was first explored by Cominco from 1986-1989, and then by Kennecott, Geoinformatics and Kiska Metals Corporation from 2004-2011, producing a combined total of 257 diamond core drill holes for 70,247 meters. GoldMining Inc. acquired the Whistler project in 2015, subsequently creating subsidiary U.S. GoldMining Inc. in 2022 which completed a successful IPO in April 2023, listing on the Nasdaq (ticker: USGO) and raising US\$20M to recommence exploration at Whistler for the first time since 2011. U.S. GoldMining Inc.’s field work and studies commenced with diamond drilling in August 2023, part of an initial two-year work program over 2023-2024 with the objective to initiate a preliminary economic assessment (“PEA”) in late 2024. From the Whisky Bravo airstrip and Whistler base camp, located adjacent to the upper Skwentna River, the Raintree and Whistler deposits are accessed via a 3.5 mile long road and trail network, allowing year-round exploration. The State of Alaska ‘Roads to Resources’ initiative includes the proposed ‘West Susitna Access Road’ which in the future could connect Whistler with existing highway, rail, power and port infrastructure.

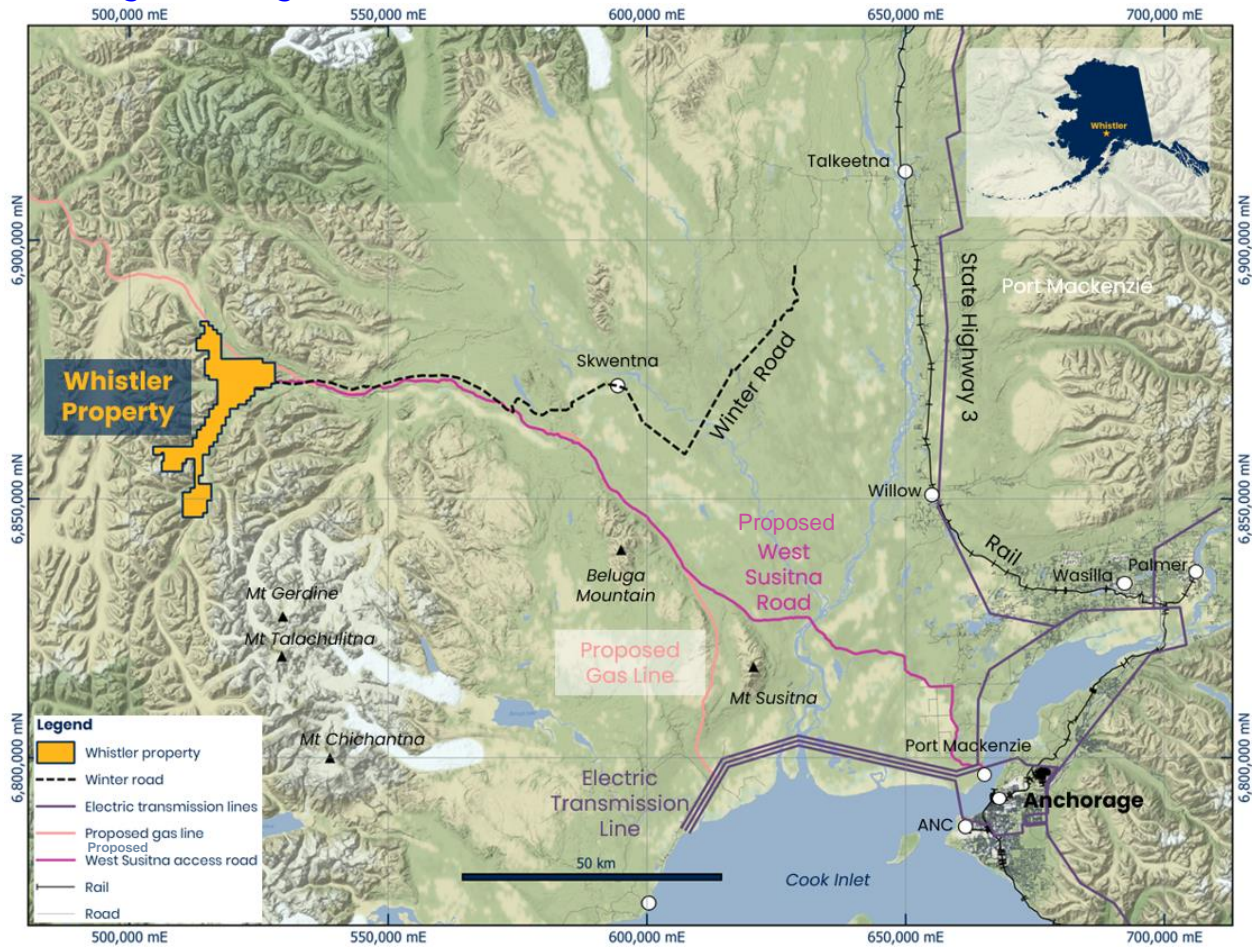
The Whistler project is situated within the Wrangellia Composite Terrane (“WCT”), which was accreted to the North America Cordilleran margin during the Mesozoic-Cenozoic and which includes widespread continental arc magmatism. The Whistler project claims are predominantly underlain by Jurassic-Cretaceous flysch sediments of the Kahiltna Assemblage, which are intruded by the Whistler Igneous Suite (“WIS”) comprising diorite and monzonite intrusive rocks dated at approximately 76 Ma and overlain by associated equivalent extrusive assemblages consisting of alkali-calcic basalt-andesite localized in paleo-basins and fault bound inliers. The WIS intrusive complex comprises discrete stocks and dyke swarms which are the primary host to magmatic hydrothermal gold-copper mineralization. Previous exploration on the Whistler project has to date identified three gold-copper mineral deposits which comprise of the Whistler deposit, the Raintree West deposit and the Island Mountain deposit. These mineral deposits and additional exploration prospects identified to date, share similar styles of alteration, mineralization, veining and cross-cutting relationships, including cores of potassic alteration with A- and B-type quartz vein stockwork and chalcopyrite-pyrite mineralization, and peripheral phyllic alteration zones. The total Whistler project mineral resource estimate (combining all three deposits) comprises 118 Mt at 0.79g/t AuEq for 2.99 million gold equivalent ounces in the Indicated category and 317 Mt at 0.63g/t AuEq for 6.45 million gold equivalent ounces in the Inferred category (see S-K 1300 Technical Report*).

The Whistler and Island Mountain areas are interpreted to represent classic porphyry clusters, each hosting multiple high level diorite porphyry apophyses (stocks and

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dykes) spawned by a deep seated source intrusive batholith. Multiple additional porphyry prospects and targets are defined by airborne magnetic anomalies, anomalous soil and rock samples, induced polarization chargeability/resistivity anomalies and airborne electromagnetic anomalies, and limited previous drilling which intersected alteration, veining and mineralization. The Whistler project thus has excellent exploration upside for the discovery of additional new gold-rich porphyry mineral systems.

*S-K 1300 Technical Report Summary Initial Assessment for the Whistler Project, South Central Alaska, effective date September 22, 2022. Available at www.usgoldmining.us



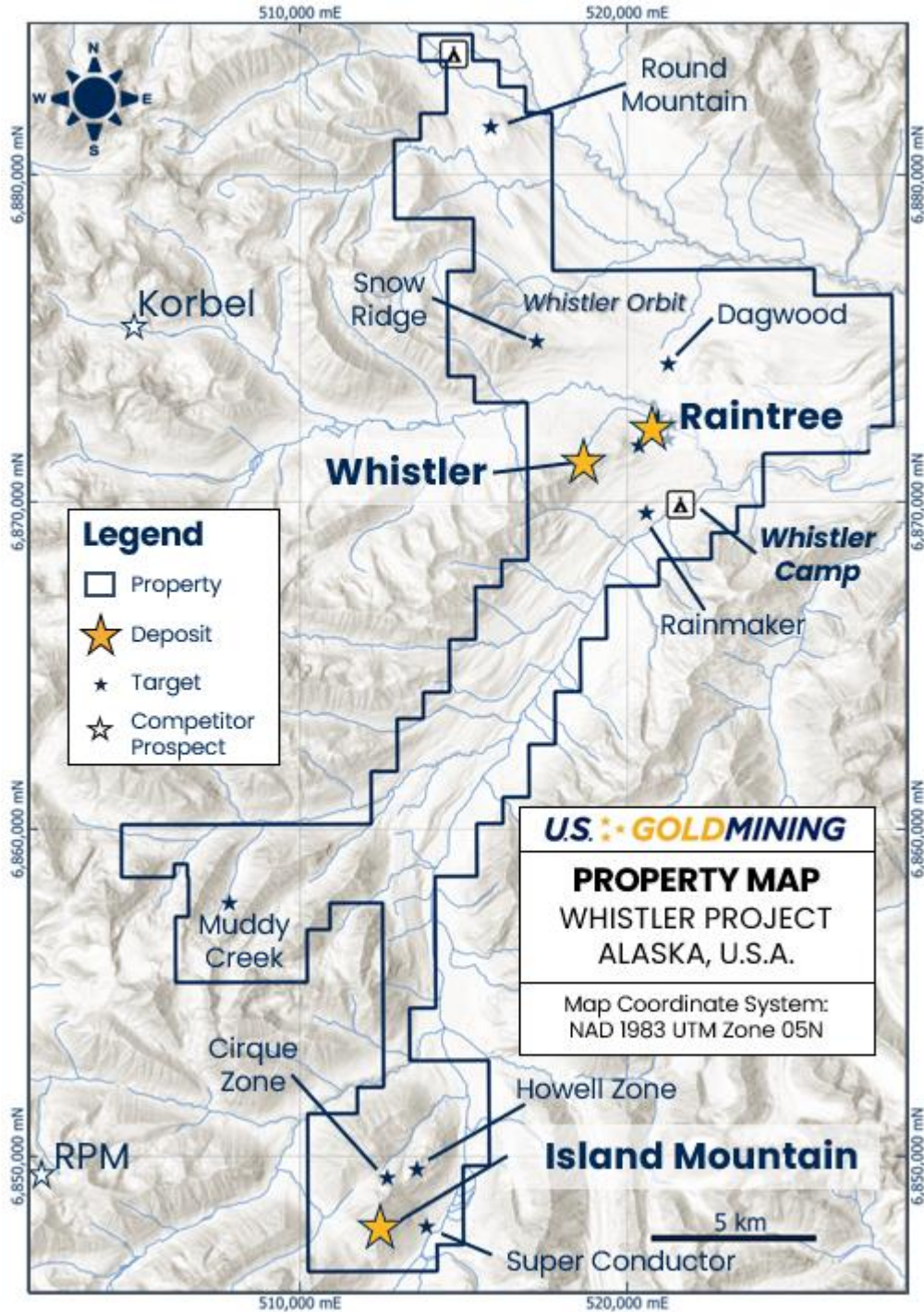


Figure 2 Whistler project – claims boundary, deposits and exploration prospects.

The Cantoo Property: Exploring the Plumbing of The Epithermal Au-Ag Premier Mine System, Stewart, BC

By Beau Haag, Exploration Geologist, Blackwolf Copper and Gold LTD

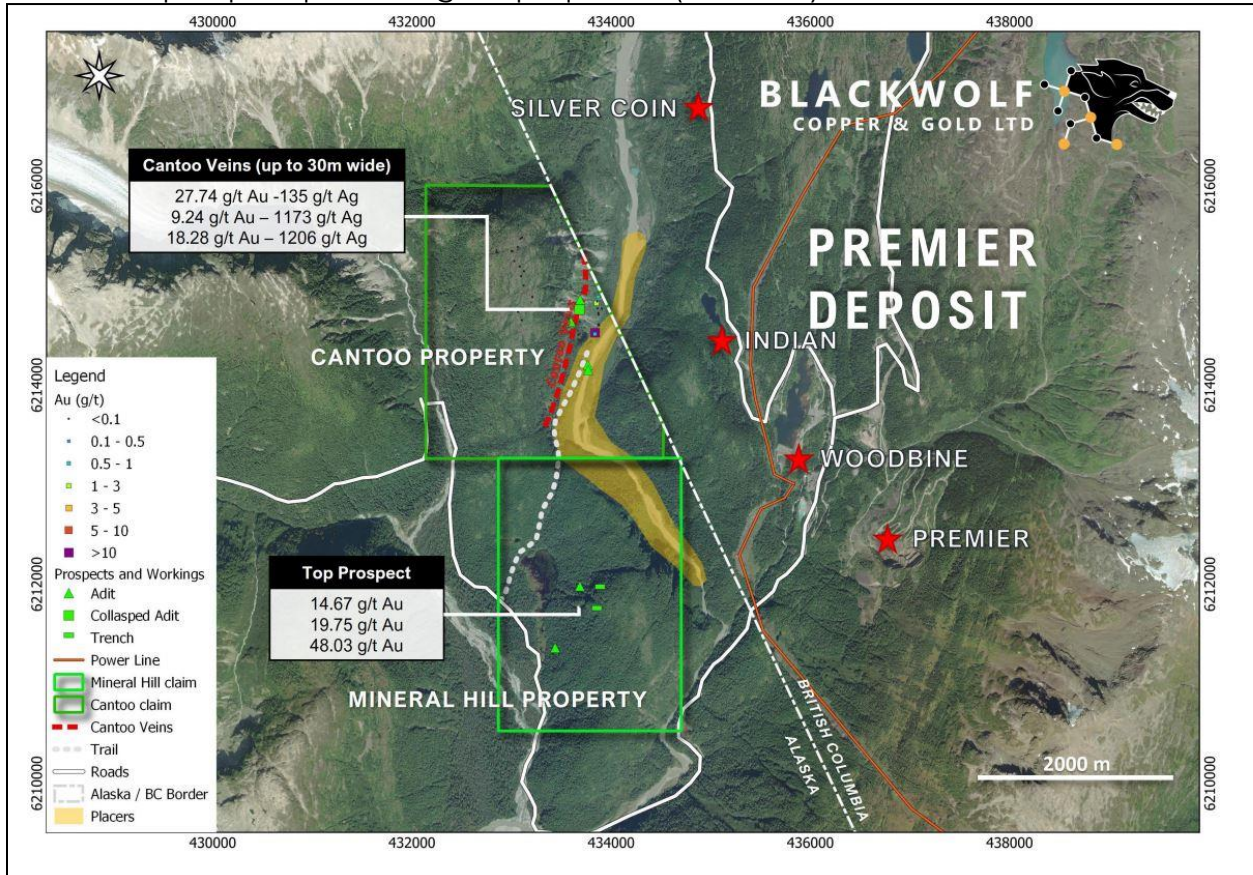
The Cantoo Property, located ~18km North of the town of Hyder, AK and 2km West of the historic Premier Mine, Silver Coin, and Big Missouri deposits, is a 513-hectare area property which straddles the US-CA border and Western edge of the Golden Triangle. The Property hosts a series of shallow, southwesterly-dipping breccias, stockworks and vein structures up to 30 meters in thickness, which are exposed in cliffs on the Eastern flank of Cantoo Mountain. Most exploratory work on the property was completed in the late 1920s into the early 1930s by several shallow adits and an arial tramline, of which the adits and tram cable remnants are still visible on the cliff-face today. In 1925, a 20-ton test shipment of hand-sorted ore was shipped to a smelter and reported returned values averaging 0.175-0.30 Oz/ton Au, 13.80-31.05 Oz/ton Ag, 37.20-44.1% Pb and 5.60-12.2% Zn. However, ambitious development work abruptly ceased after the stock market crash of 1929. Since then, the only recorded work on the property to date was limited reconnaissance work by the United States Bureau of Mines in the early 1990s, prior to the termination of the agency in 1996. A single historic sample of the upper, gold-rich vein collected by the USBM in 1995 assayed 27.7 g/ton Au. Between staking of the property in May 2021 and present, seasonal work has been conducted by Blackwolf Copper and Gold to delineate, expand and understand the mineralization and geology of the Cantoo Property through mapping, surface sampling, and an inaugural diamond drilling program.

The geology of the Cantoo property is dominated by several phases of the Early Jurassic Texas Creek Plutonic Suite with lesser, cross-cutting dikes of the Eocene Hyder Plutonic Suite. Both intrusive suites are associated with metallogenic mineralization events, with many of the regionally productive deposits (Ex. Premier, Granduc, Brucejack, Eskay Creek) being contemporaneous with earlier, Jurassic island-arc magmatism. Pb-Pb age dating of sulfide mineralization from the property suggests that mineralization from both events is present at Cantoo, but that the larger, Au-rich vein is Jurassic in age. In 2022, experienced climbing technicians accessed the upper, Au-rich vein and retrieved a composite chip sample assaying 37.6 g/ton Au. The mineralization was associated with intense silicification, stockwork style quartz-pyrite veining, and up to 25% disseminated pyrite mineralization. Grab samples of intensely altered rock from the peripheral portion of the vein returned values of 0.74 and 0.38 g/ton Au as well, suggesting bleed-out of mineralization into the altered wall-rock. Additional zones of veining and alteration were noted on the cliff below this upper vein but were not sampled due to safety concerns. In 2023, the first diamond drilling program on the property was completed targeting the upper, Au-rich vein. Drilling intercepted several zones of intensely altered intrusive rocks and associated structural zones which appear to have been major conduits for fluid movement. For the first time ever, exploratory diamond drilling at the Cantoo Property has provided detailed geological context for the Cantoo veins which, when considered in their regional geological context, suggests the upper Au-rich structure represents a deep-seated feeder conduit for the epithermal Au-Ag mineralization found at the Premier

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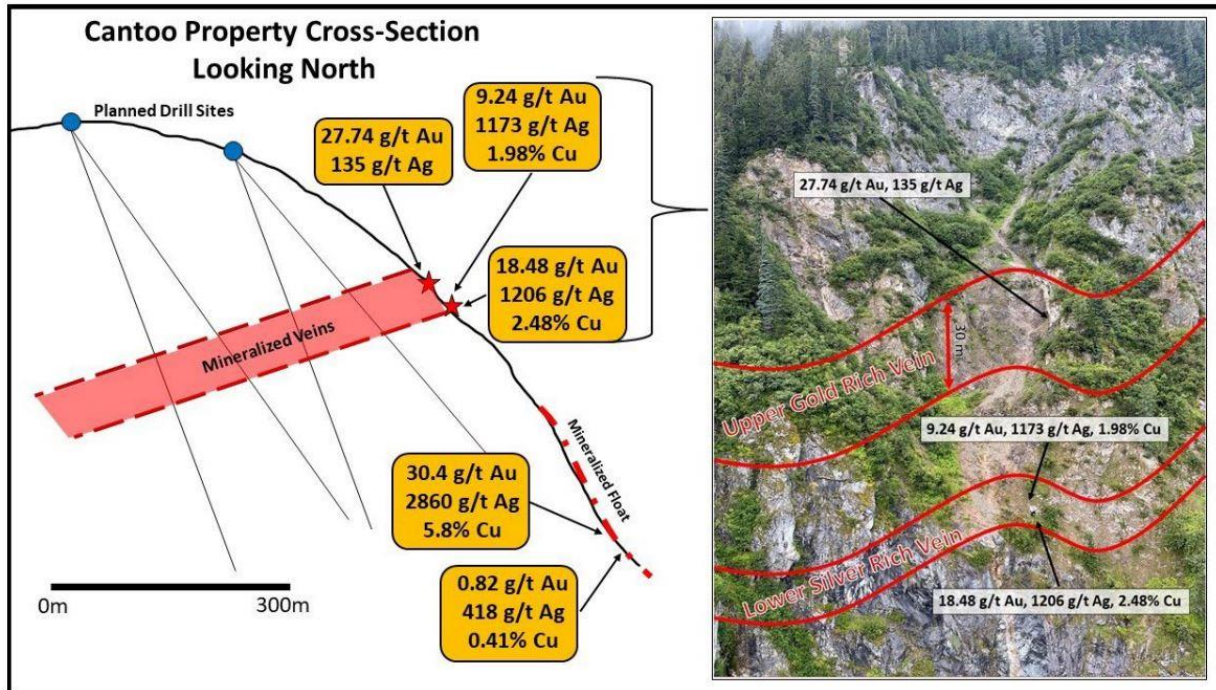
Mine and associated Big Missouri and Silver Coin deposits across the border in British Columbia.

Figure 2. Map depicting extents of Blackwolf's Cantoo and Mineral Hill Properties and spatial relationship to past-producing BC properties (red stars).



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Figure 3. Schematic cross-section of the Eastern flank of the Cantoo Property displaying proposed 2023 drill sites along with locations and grades of historic grab samples and preliminary BWCG float samples from 2021.



The Flat Gold Project

Trent Newkirk, Senior Exploration Geologist, Tectonic Metals Inc.

Flat is located in southwestern Alaska, just 40km north of the Donlin Gold Project, in the Kuskokwim Mineral Belt. The project consists of 92,160 acres of Alaska Native-owned land belonging to Doyon, Limited, one of Alaska's largest Regional Corporations and private landholders under the Alaska Native Claims Settlement Acts (ANCSA). The property hosts intrusion-related gold mineralization similar to that found at the Fort Knox (Alaska) and Eagle (Yukon) gold mines. Since 1908, when gold was first discovered at Flat, the immediate vicinity has been notable as an area of significant placer gold mining activity, with an estimated 1.4 million ounces of placer gold produced from streams draining the Chicken Mountain – Black Creek complex.

The Flat Gold Project occurs within the Iditarod Quadrangle, where the dominant structural feature is the regionally extensive right-lateral, strike-slip Iditarod-Nixon Fork Fault, which extends from the southwest to northeast corners of the quadrangle.

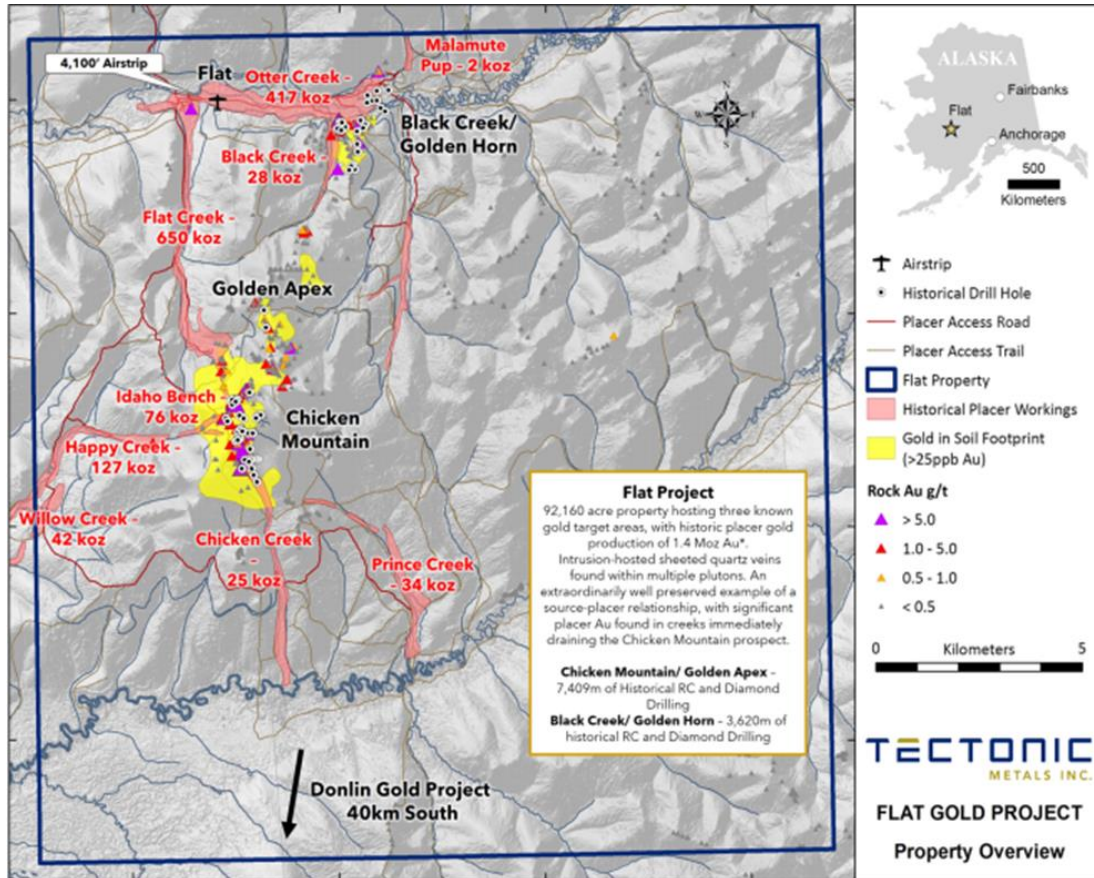
North of the fault-zoned multiphase stocks of Chicken Mountain, Black Creek (68.3 to 73.2 Ma), and Swinging Dome (59.4 to 63.4 Ma) intrude a sequence of Kuskokwim sedimentary, volcanoclastic, and volcanic rocks. Hornfelsing occurs within both the sedimentary and volcanic rocks adjacent to the intrusion margins. At Chicken Mountain, three major compositional phases are present: monzodiorite and gabbro comprise the outer margin and initial phases, biotite monzonite forms a relatively homogeneous central transitional phase, and leucocratic quartz monzonite forms the central phase.

Bedrock gold mineralization at Flat has been recognized in at least two geological settings. Primarily, low-grade intrusion related within altered, fractured, and veined late-stage phases in the Chicken Mountain- Black Creek stocks. Notably, the most significant gold mineralization is hosted within the late-stage quartz monzonite at Chicken Mountain. Contact-related veins and disseminated bulk tonnage mineralization are also hosted within sedimentary and volcanic rocks. Most notable are the Golden Apex zone between the Chicken Mountain and Black Creek Stocks and the Golden Hornfels zone along the eastern contact of the Black Creek stock.

In 2022, exploration efforts focused on confirming surface mineralization, a relog campaign of historic drillholes, and collecting core samples for scoping level metallurgical test work and petrographic analysis. From these efforts, Tectonic confirmed mineralization and collected additional structural data to help better understand the structural framework of the Flat area, detailed petrographic analysis coupled with micro-XRF scans from core samples added to the understanding and differentiation of igneous phases and the mineralized system, and gained critical insight on Flat metallurgy with sample and composite head feed characterization, grind calibration, cyanide kinetic leaching, rougher flotation, and gravity testing. The knowledge gained from the 2022 program helped guide the 2023 exploration program.

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The 2023 Flat exploration program consisted of constructing a seasonal exploration camp, three diamond drillholes to test the depth and continuity mineralization below historic mineralized drill intercepts, and sixteen reverse-circulation drillholes to test the extent and breadth of the mineralized system. A subset of surface and core samples were collected for additional lithogeochemistry studies, and sulphide material was collected to date the age of mineralization. Targeted mapping was also conducted in the project area to confirm and update the existing geologic map.



* Placer production figures from "Mineral Occurrence and Development Potential Report, Locatable and Salable Minerals, Bering Sea-Western Interior Resource Management Plan, BLM-Alaska Technical Report 60", prepared by the U.S. Department of the Interior, Bureau of Land Management, November 2010"

MINING AND THE ENVIRONMENT

Aquatic Baselines and Biomonitoring

Audra Brase, ADF&G

Aquatic life is found in virtually every flowing waterbody in Alaska, therefore documenting aquatic baseline conditions during exploration is an essential early step in the development of mine plans. A good aquatic baseline study is simple and cost effective, yet comprehensive – documenting and evaluating the surrounding watershed from water quality and primary production to aquatic invertebrates and fish. Because every location is unique, the study should be tailored to the site, yet adaptive to change as information is gathered and the mine plan evolves. An aquatic baseline program should be repeated for at least 3-5 years to account for environmental variables and fish life cycles. A well designed and executed baseline program can lead to faster permit review and approval.

Once a program moves past exploration and into development, instituting a long term aquatic monitoring program can aid environmental staff and agencies in monitoring the success of required or voluntary mitigation measures (Fort Knox developed wetlands will be discussed). Long term biomonitoring programs are also essential to quickly identify and quantify changes to local conditions, and develop solutions that minimize impacts to aquatic life yet maintain mine operations (Red Dog discharge and Wulik River Dolly Varden will be discussed).

Thoughts on Baseline Data Collection: A Data Collector's Perspective

Brian Hoefler, PE, Boreal Environmental Services

Before launching an ambient air quality, meteorological, or hydrologic baseline data collection program, it is important to define the purpose and need for the program. Generally project needs are regulatory, engineering design, and/or long-term operations. Project needs of all types are driven by the end-user of the data – the end-user should define the parameters required and the length of the data collection program. The purpose and need should be documented in a memo for management of change.

Regulatory data must meet spatial and temporal representativeness requirements plus strict EPA/ADEC data quality objectives known as “PSD quality” data. Engineering data is not held to PSD-quality standards, but should still be of known data quality. Similarly, long-term data collection programs should have defined data quality objectives often determined in conjunction with budget considerations.

When are you done collecting data? For regulatory purposes, one year of PSD-quality data is almost always sufficient for use in permitting. Longer datasets may have benefits, but are not required. Engineering data collection typically starts early in the design process and normally continues through mine startup – a period that could be several years. Oftentimes, regulatory or engineering data collection programs continue past the minimum and turn into long-term discretionary data collection programs, which can run for many years if not decades.

Baseline Data Collection for the Graphite Creek Project

Ed Fogels, Permitting Manager, Graphite One (Alaska) Inc.

Graphite One has been conducting baseline environmental studies on the project area since 2014. The early studies were primarily surface water investigations. In 2019, Graphite One began wetlands mapping, aquatic resource surveys, permafrost monitoring, geochemical characterization, hydrogeology investigations, and meteorological monitoring. In 2022, raptor surveys were conducted. Also in 2022, Graphite One started a series of investigations to characterize Imuruk Basin, a large body of tidally influenced water adjacent to the project area. These investigations consist of aquatic resource surveys, water quality sampling, bathymetry, and current measurements. During the 2023 season, all these investigations continued, along with cultural resource surveys. For the 2024 season, Graphite One will continue these investigations, and will also initiate subsistence and socioeconomic information gathering, noise and visual impact evaluations, and a wildlife analysis. Graphite One's baseline data collection program has been designed to provide information for the permitting process and the upcoming NEPA process which we hope will be initiated in late 2024 or early 2025.

Baseline for Permitting from an Owner's Perspective

Bartly Kleven, Director Environmental Affairs, Kinross Alaska

Collection of baseline for permitting includes many facets that go far beyond the finer details of data collection, lab methods and QA/QC. An owner must provide a good initial project concept, the scope of data collection, a permit application submittal schedule and an internal and external permitting communications plan.

The conceptual project plan will drive the scope of the baseline collection effort. The baseline scope (depth and breadth) must be more than sufficient to answer all questions that may arise from the state and federal regulatory team or a member of the public. Moreover, the data collected must be unimpeachable. Owners must seek out recognized subject matter experts with proficiency *in the area of the project*. The scope *and the timing* of the data collection effort drives the permitting application schedule.

Communicating internally and externally is critically important. Some baseline will be used by the design team and in fact should drive the mine plan. It important to ensure the regulatory team is kept apprised of baseline data collection results and how these results are driving the project plans and application submittal schedule.

Last but not least - the owner's environmental compliance record "baseline" is vital. The importance of an excellent environmental compliance record as an owner cannot be overstated.

ALASKA ADVANCED EXPLORATION PROJECTS

Estelle Gold Project: Developing North America's next major gold trend in Alaska to become a tier one gold producer

Chris Gerteisen, Nova Minerals

Summary

Nova's flagship [Estelle Gold Project](#) is district in scale with multiple resource centers across a 35 km long mineralized corridor of over 20 identified gold prospects, including two already defined multi-million ounce resources across four deposits containing a combined 9.9 Moz Au. The project is situated on the Estelle Gold Trend in Alaska's prolific Tintina Gold Belt, a province which hosts a 220 million ounce (Moz) documented gold endowment and some of the world's largest gold mines and discoveries including Victoria Gold's Eagle Mine and Kinross Gold Corporation's Fort Knox Gold Mine.

Nova is advancing project and economic studies based on a development scenario involving a low cost, low strip ratio, open pit with truck and shovel mining operation with a centralized processing plant.

To find out more about the Estelle Gold Project and to view today's 3D presentation please refer to Nova's website www.novaminerals.com.au

Location and Infrastructure Solutions in Place

The Estelle Gold Project is located approximately 90 miles northwest of Anchorage and is a year-round operation, near a large labour force and all essential services. The base site hosts a fully winterized 80-person camp, including an on-site sample processing facility and the 4,000-foot Whiskey Bravo airstrip, which can facilitate large capacity DC3 type aircraft. While easy access is currently available to the project via a winter road and by air, recently the proposed West Susitna Access Road has progress to permitting with construction set to start in 2025.

District Scale with a Fast Growing Gold Resource

The Estelle Gold Project comprises of 450km² of unpatented mining claims located on State of Alaska public lands and contains a number of near-surface Intrusion Related Gold Systems (IRGS). Since 2018, Nova has been systematically exploring the multiple prospects within the project area with ~90,000m drilled to date and ongoing drill programs continuing to grow both the size and confidence of the resource base. Currently the project comprises of 4 large, mineralized areas.

1. RPM – 1.24 Moz @ 0.6 g/t Au Resource, including 0.34 Moz M&I at 2.3g/t Au
RPM is located in the south of the project area and comprises of 2 deposits – RPM North and South.

- 3 of the best thick gold intercepts in the last 10 years globally were drilled at RPM, including;
 - RPM-005 132m @ 10.1g/t Au, within a wider 400m @ 3.5g/t Au (1,400 gram meters)

- RPM-015 117m @ 11.1g/t Au, within a wider 258m @ 5.1g/t Au (1,316 gram meters)
- RPM-008 87m @10.1g/t Au, within a wider 260m @ 3.6g/t Au (936 gram meters)
- RPM North – High grade with a 450m strike length and 150m width, defined by close spaced resource drilling, and remains open. It also includes a high-grade M&I core of 100m long x 50m wide x 300m deep. Significant potential remains to further extend the mineralization.
- RPM South- Strike length of 400m and 250m width. Initial drilling shows a potential genetic link to RPM North with over 600m of perspective strike length between the 2 drilled in 2023, awaiting assay results.

2. Train – High priority targets

Geological observations indicate another massive IRGS 7km North of RPM with 2 high priority targets.

- Train – High grade rock chip samples drill tested in 2023, with assay results pending. Exposed at surface target with 1 km strike length and 500m width showing high grade sheeted vein style gold mineralization
- Trumpet – Located 1.5 km northwest of Train, with more high grade sheeted vein style gold mineralization indicating the 2 systems are genetically linked

3. Korbelt – Bulk tonnage 8.65 Moz @ 0.3 g/t Au, including 3.09 Moz Indicated

Korbelt is located in the North of the project area and comprises of 2 deposits – Korbelt Main and Cathedral

- Korbelt Main - Confirmed strike length of over 2.5km and up to 500m depth, and remains open with significant potential to further extend the mineralization.
- Cathedral - Maiden Inferred resource has confirmed a strike length of at least 800m and 350m wide. Remains wide open in all directions with the potential for high grade zones, with up to 114 g/t Au in surface rock chip samples.
- Site for the processed 6mtpa Estelle central processing plant

4. Stoney and Other Exploration Targets

Significant untested potential from a number of identified mineralized future targets to expand the exploration pipeline for longer term opportunity across the central area of the Estelle Gold Project.

Not just gold. Polymetallic veins with copper, silver and antimony discovered across the project area.

Robust Scoping Study

Scoping study completed in May 2023 confirms the potential for a robust mining operation at the Estelle Gold Project. The Study represents a snapshot in time utilizing only 23% of the defined resources and is based a mining scenario using a conventional flow sheet which focused on mining high-grade RPM ore in the early years for a quick payback, and bulk tonnage mining from Korbelt at a low strip ratio in the later years, using a 6mtpa central processing plant located in the Korbelt area.

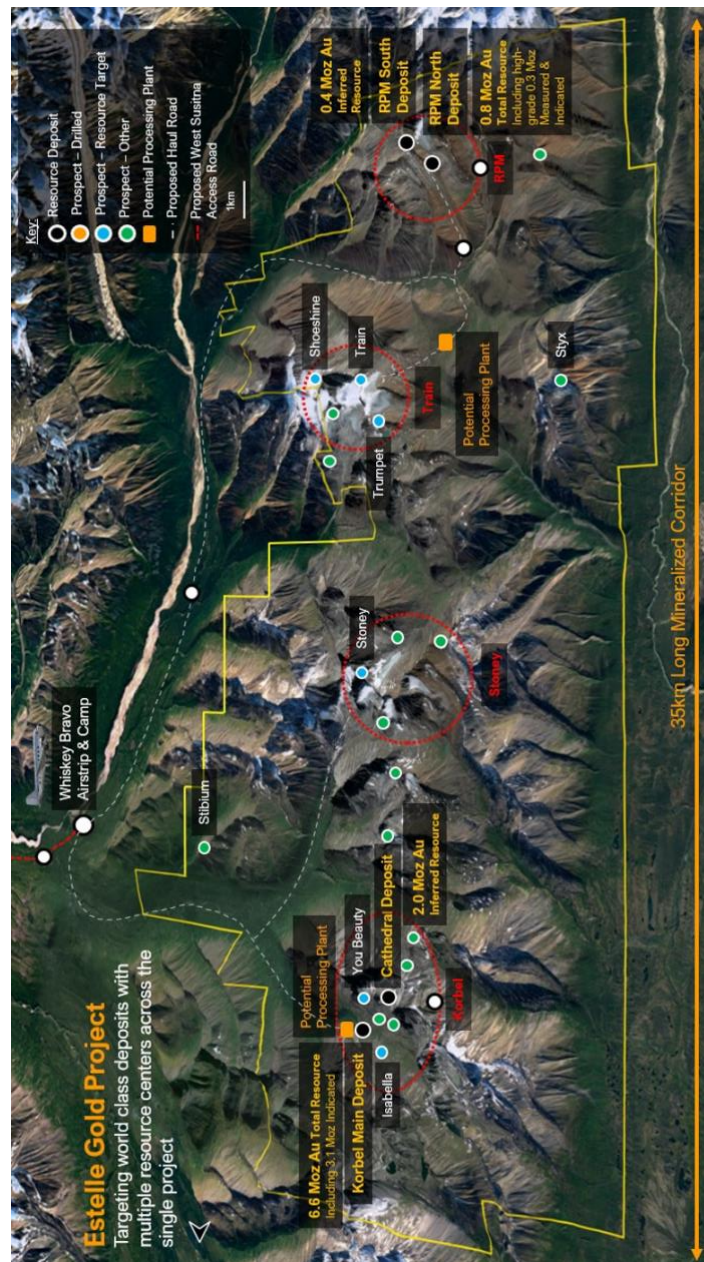
Metrics from the scoping study included:

- Fast payback of 11 months
- NPV_{5%} USD\$654M
- IRR 53%

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- Net free cashflow (undiscounted) ~USD\$1B
- ASIC USD\$510 oz 1st year and USD\$1,148 oz LOM
- Total production 2.25 Moz Au over 17+ years with annual production of 132 koz LOM
- Metallurgical recovery 88.3%
- Pre-production capital USD\$385M

The sensitivity analysis showed the Project's overall economics are highly sensitive to mill feed grade, with just a 10% increase in the LOM mill feed grade from the current 0.73 g/t Au to 0.8 g/t Au potentially increasing the Project's NPV by USD\$277M to USD\$931M.



Lucky Shot Mine – A Mine through the Generations

Dave Larimer, Contango Ore

The Lucky Shot mine with its long history and even brighter future is a mine of generations. This presentation looks to briefly highlight the history of the mine, summarize the current exploration/development progress, and highlight the future generational potential!

“The Greatest Generation” -Gold in the Willow Creek district was first discovery is hand placer operations in Grubstake gulch in 1897 with minor small placer production from creeks through 1906. Initial lode-gold quartz vein discovered in 1906 by Bob Hatcher, named “Skyscraper” vein then later independence Mine. By 1912, three hard rock mines were in operation: Gold bullion, Alaska Free Gold, and Gold quartz in the Willow Creek – Hatcher pass area. Mining operations and developments were frequently slow and hampered by a short working season (3-4 months), lack of water at higher elevations, and long arduous supply chains often using wagon trails from the head of the Knik Arm to the district. On the western side of the Willow Creek District, Luck Shot was not discovered until 1918. Two prospectors out hunting for dinner, shot a ptarmigan which fell on ground by a prominent outcropping. With this “Lucky Shot” the prospectors got gold and dinner...in one shot! Production commenced in 1919 mining the War Baby area, followed by the lucky shot area.

“Silent Generation” - Operations consolidated into the Willow Creek Mines, Inc in 1938 focusing on exploration and development. Discoveries of the wester faulted off set of Lucky shot discovered the Coleman area. Mining continued until 1942 with the halt of gold mining in the US...President Rosevelt...World War II...Order L-208. Since 1942, only 4 companies have completed drilling programs on the Lucky Shot project.

“Gen-X” -Enserch Exploration drilled 18 holes from 1978 to 1985 and completed 1,400 ft of underground development. The “Enserch” driven below the historic Lucky Shot workings facilitated drilling of 11 underground drill holes. The company established 100-ton-per day mill on ridge opposite of portals. Mill processed ~ 10,000 to bulk sample of material from various sources and shut down in 1986. No further production from Lucky Shot since.

“Generation Z” - Between 2005 and 2021, several companies have option the property and advanced the geological understand through core drilling, surface sampling, soil sampling, and geological modeling. Highlighted drilling includes Full Metal Minerals who drilled 180 holes Lucky Shot, Coleman, War Baby, Murphy, and Nippon segments of the vein structure. Most of the drilling focused on delineation and expansion of the Coleman vein block.

Generation “C” Contango Ore - Since 2021, Contango ore has taken a multi-staged exploration method in developing the potential Resource of Lucky Shot. In 2022, Contango rehabilitated the Enserch portal and tunnel (1,380 ft). This included establishing a portal shed and “hardening” surface infrastructure from avalanche potentials. The Enserch tunnel was driven an additional 1,640ft, punching through the Lucky Shot #2 Vein. The Enserch tunnel was additionally expanded 757 ft with a

Track 1. Alaska Advanced Exploration Projects

western crosscut paralleling the footwall contact of the Lucy Shot #2 vein. During the advancement of the Western drift, an unknown Lucky Shot vein was encountered. This vein appears to be a conjugate vein to the Lucky Shot Vein system and strikes N/S and dips to the East. Underground mapping of this vein shows a mineralized thickness between 1-3 ft and channel samples averaging 59 g/t Au. Underground drilling from the Enserch tunnel commenced in mid-2022. This drill program completed 12,500 ft in 29 drill holes from both the main Enserch Tunnel and West Drift. With these drill results and the historic drilling, Contango Ore looked to recalculate the Lucky Shot Resource Estimate. In June 2023, the Initial S-K1300 Resource Technical report Summary for the Lucky Shot Project was completed, showing 226,963 tonnes grading at 14.5 g/t Au for 105,620 ounces Au in an Indicated category. Resource expansion and infill drilling continued through the fall of 2023 and is planned to continue in 2024 from both the surface and underground. This program is designed to extend known mineralization on the Coleman segment to upgrade resources to a measured category as well as augment resources on the Lusk Shot segment. This drilling is expected to substantially expand current resources with closer spaced fan drilling. Contango Ore's objective over the next year is to complete both surface and underground drilling seeking to identify 400,000 to 500,000 oz Au of resource that can then develop a mine plan around!



"Lucky Shot" Gold Mine North of Palmer, Alaska 1935 or 1936

Colsether Collection



Western Alaska Minerals: Waterpump Creek and Last Hurrah Project: Ongoing exploration of bonanza-grade silver, lead, zinc carbonate replacement mineralization in west central Alaska

Sage Langston-Stewart

Waterpump Creek (WPC) is a Ag-Pb-Zn carbonate replacement deposit (CRD) located within the Illinois Creek District in west-central Alaska, located approximately 250 miles west of Fairbanks, Alaska. The Illinois Creek (IC) District, originally discovered in the 1980's by Anaconda, is home to five evolving mineral projects containing gold, silver, copper, lead, and zinc. Over the past 10 years, the district was consolidated by the Western Alaska Minerals (WAM) management team with the recent exploration focus on the Waterpump Creek high-grade sulfide mineralization and expanding exploration to the district-wide CRD system.

The 2023 drilling season set out to accomplish two primary drilling goals: 1) Infill and extension drilling at Waterpump Creek (WPC), and 2) Finding the sulfide along the same trend to the south at Anaconda's Last Hurrah. Five holes (1706.27m) were drilled at WPC and nine holes (3412.23m) were drilled at Last Hurrah, totaling 5118.5m. Three of the five infill drill holes at WPC intercepted sulfides. These infill and extension drill holes provided insights into two stages of mineralization, an early stage stacked manto mineralization and a later cross-cutting vertical pyrite stage mineralization. All five drill holes provided information useful for understanding the mineralizing system at WPC, which will aid in targeting future holes as we continue to explore at Last Hurrah and the greater Illinois Creek district and will allow the estimation of a mineral resource for WPC. None of the nine drill holes intercepted sulfide mineralization on the 7104275 N section at Last Hurrah; however, the drill hole profile intercepted impressive alteration including ultraviolet fluorescence of fugitive calcite, sanding, bleaching, and "tan" alteration, and provided alteration and geochemical vectors to hone in on CRD mineralization in continuing exploration.

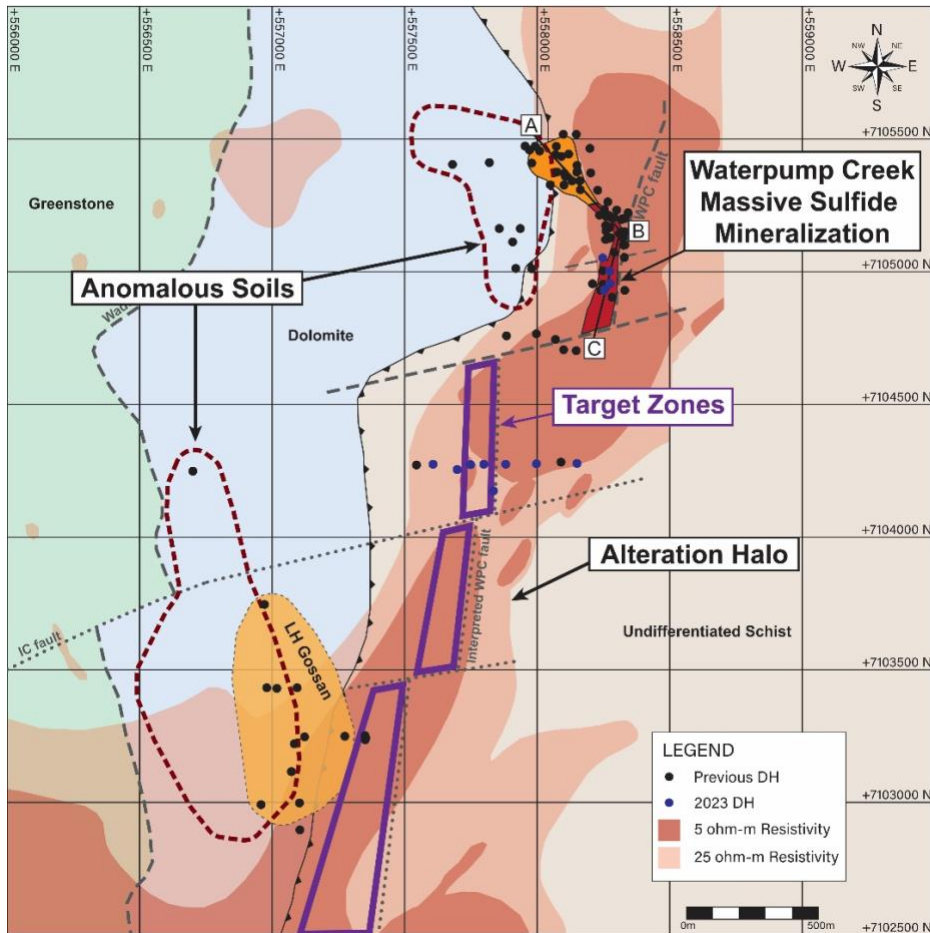
The mineralization at WPC is hosted in a thick package of Ordovician dolostone that is capped by the Kaiyuh Schist sequence, providing a trap for the hydrothermal fluids. An interbedded schist unit within the dolostone also acts as a fluid trap and separates the upper dolostone sequence from the lower dolostone sequence. Of importance is the fossiliferous dolostone (within the lower dolostone sequence) which hosts the mineralization as the system moves south to Last Hurrah. Below the thick dolostone package is a thrust greenstone which caps the West Block stratigraphy containing permissive quartzites and calcareous quartzites which host the Illinois Creek manto-style mineralization. Understanding the stratigraphic and structural controls are key to understanding mineralization in the district.

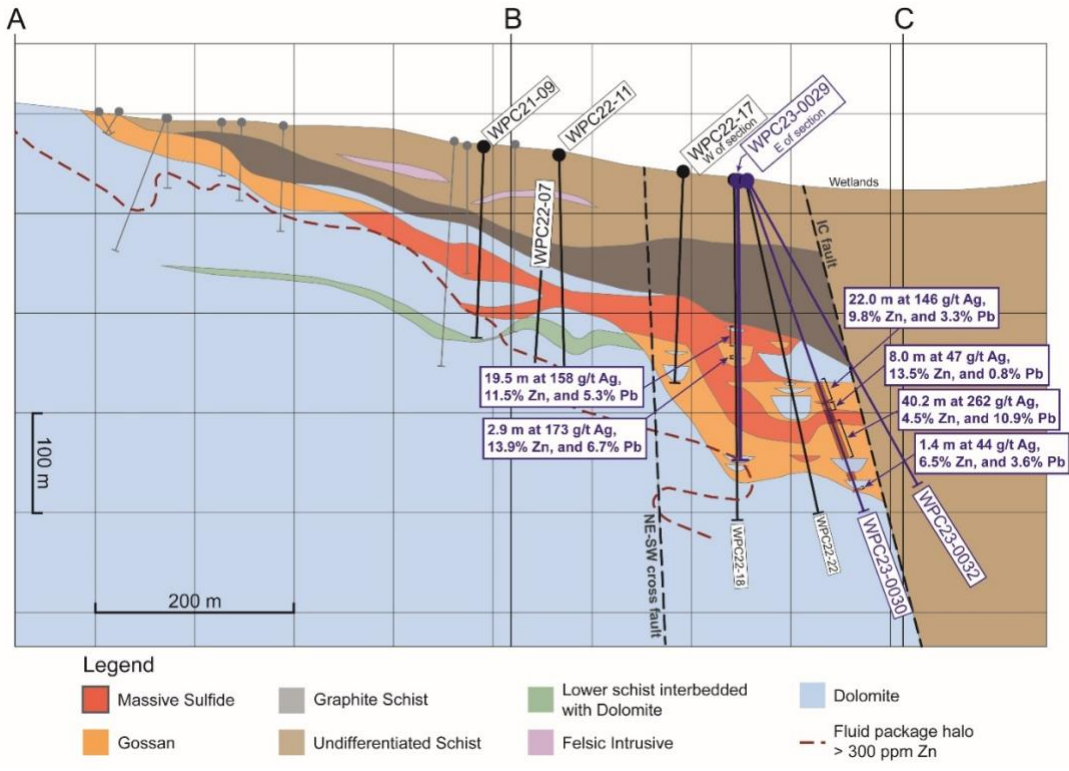
In addition to drilling, a 3-D resistivity and induced polarization (IP) survey was completed in 2023. This survey was conducted to follow up on the historical IP anomalies which showed a 1.4km untested anomaly linking WPC to Last Hurrah. This survey is incredibly useful in identifying major structures, alteration halos, and new targets. A northeast-southwest low resistivity anomaly ties together the continued

Track 1. Alaska Advanced Exploration Projects

mineralization from WPC to Last Hurrah and shows the expansive sanding alteration halo.

With 2023 drill results and a new geophysical survey, the geological understanding for the district is coming together with new insights and information, delineating exciting targets for a successful 2024 drilling season.





Graphite One Strategy for Success

Mike Schaffner, Graphite One

The demand for CO₂ emission reductions has provided great opportunity in the critical minerals sector. This opportunity is associated with a high level of risk for junior mining companies. This presentation will review Graphite One's strategy for taking advantage of the opportunity while limiting the risks associated with creating a domestic graphite supply chain to produce active anode materials for electric vehicle (EV) batteries.

China has established itself as the primary source for graphite anodes, supplying 96% of all EV anodes. As the U.S. transitions to a greater number of EVs, National Security mandates that the United States start developing high quality EV batteries. This fact has provided a great amount of opportunity for lithium and graphite miners in the United States. Changing the current market dynamics will be challenging and China will undoubtedly continue to allow the U.S. to defer the tough decisions of permitting mines and installing billions of dollars of infrastructure.

Graphite One's business model is to develop an integrated graphite supply chain that takes graphite mined from the Graphite Creek Deposit in Alaska through to the active anode material. This strategy requires the development of four facilities, a mine/concentrator at Graphite Creek, a graphite purification and graphitization plant, a finished product facility, and a battery recycling plant.

By constructing the finishing plant first and utilizing available Government support to assist in financing, Graphite One will be able to prove the quality of the final product and generate revenue while permitting and constructing the mine. Purchasing graphite on the open market while the mine is being permitted will reduce graphite supply and drive the price higher, reducing the risks associated with graphite price manipulation that has been seen in the past.

MINES AND ADVANCED PROJECTS

Closure Of The Grant Mine Tailings Impoundment Dam, Fairbanks, Alaska

Mark S. Lockwood, C.P.G., Senior Consultant, Shannon & Wilson, Inc.

Summary

This talk presents the efforts undertaken by the claim holder, Mr. Roger Burggraf, to close the contaminated site surrounding a cyanide release and abandon the jurisdictional tailings impoundment dam at the Grant Mine in Fairbanks, Alaska. His efforts required coordination between the Alaska Department of Natural Resources Dam Safety Program (Dam Safety), the Division of Mining, Land, and Water Statewide Abatement of Impaired Lands (SAIL), and the Department of Environmental Conservation (DEC).

Background

Roger Burggraf has held the claims since 1972. A mill and tailings impoundment were constructed in 1985. The tailings impoundment was designed to hold approximately 130,000 cubic yards and comprised a 40-foot earthen berm, lined with compacted silt. The mill operated from 1985 to 1989 using a cyanide process for gold extraction which involved mixing crushed ore with sodium cyanide solution and then extracting the gold, generating a tailings slurry containing waste rock, lime, and cyanide-laden water.

Cyanide Release

In 1988, the pipeline used to transfer the tailing slurry to the impoundment separated resulting in release of cyanide to the groundwater. This led to the involvement of DEC and the United States Environmental Protection Agency. Monitoring wells were installed, and cyanide was detected in groundwater down gradient from the release. In 1994, EPA collected soil and water samples. Arsenic exceeded regulatory levels in soil and water samples; however, groundwater arsenic values did not exceed background concentrations. The level of cyanide in the groundwater has decreased with time and is now below the DEC cleanup levels.

Impoundment Closure

Operations ceased in 1989 and the former operator prepared a closure plan that proposed constructing a compacted silt cap to isolate the mine tailings from potential receptors and limit infiltration. The former operator never carried through with plan.

In coordination with Mr. Burggraf, Dam Safety, SAIL, and DEC, Shannon & Wilson teamed with Stutzmann Engineering and AWR Engineering to develop an abandonment plan. Dam Safety required a revised stability evaluation as the earthquake zone had changed since the dam was designed. The abandonment plan to reconfigure the dam by lowering the downslope side and distributing the soil from the berm over the tailings was approved by Dam Safety and DEC. The tailings and silt cap were graded to drain radially at a moderate slope. A drainage ditch was constructed along the upstream side to capture and direct surface runoff around the capped area. To avoid disturbance of the capped area, SAIL established a restricted

use authorization (RUA) that has become part of the land record documents and limits further intrusive activities.

Conclusion

Closure of the contaminated site is pending the results of an additional round of groundwater samples. Dam Safety inspected the work completed at the Grant Mine tailings impoundment dam and removed it from their list of jurisdictional dam structures.

A Dry Stack in a Temperate Rainforest: Learning to reduce Fugitive Dust Emissions at an Active Lead and Zinc Mine's Tailings Stack

Paula Lillesve, Chief Environmental Engineer, Hecla Greens Creek Mine

Hecla Greens Creek Mine is a polymetallic underground mine located on Admiralty Island 18 miles southwest of Juneau Alaska. It has been operating since 1989 with facilities that include the underground mine, mill operations, port facilities, waste rock storage locations, roads, and a dry stack tailings disposal facility. In 2019 Greens Creek began permitting with the US Forest Service to expand its tailings facility thus beginning the National Environmental Policy Act (NEPA) review.

Congress enacted NEPA (National Environmental Policy Act) in 1969 and it was signed into law in 1970. It was the first major environmental law in the United States. It establishes the national policies that require agencies to undertake an assessment of the environmental effects of proposed actions prior to making decisions. The review process allows for better informed decisions and allows public involvement in a project.

Greens Creek has gone through the NEPA process a handful of times since its conception with each iteration growing in number of pages and total length of process time as science and policies have developed. The current North Tailings Expansion project is targeted to expand the tailings disposal facility life around 12 to 40 years depending on the alternative selected. The process has been ongoing for 3 years and will hopefully wrap up in 2024.

As we near the end of the review process it has been identified that fugitive dust leaving the tailings disposal facility is a concern for the environment, especially Tributary Creek that begins just south of the tailings storage facility. This is not new information as Greens Creek has been working for many years to ensure that fugitive dust does not leave the tailings stack. Great strides have been taken in the last three years.

The tailings consist of leftover rock from the milling operation which means lead and zinc are present. Lead and zinc in the environment are a cause for concern and it has been shown that this fugitive dust has created water quality standard lead exceedances in nearby Tributary Creek. As part of the NEPA approval process, the US Forest Service is requiring Greens Creek to put together a Fugitive Dust Mitigation and Monitoring Plan which dictates the steps to take to prevent fugitive dust from leaving the facility. It also deploys many monitoring instruments to track trends and show progress. Long term monitoring in the form of Lichen studies will also be conducted in the future.

Managing dust in a rainforest does have unique challenges. "An ounce of prevention is worth a pound of cure" really speaks to Greens Creek's approach to minimizing fugitive dust. Simple, easy, and timely tasks that include reducing open acreage during winter months (when the dust potential is highest), utilizing sequencing in tailings placement to avoid high potential dust areas when possible, and using wind

fences to help stop the wind from picking up the dust particles have been a top priority. To track progress a monitoring network is utilized which includes dust monitoring instrumentation around the site. Instruments ranging from very advanced real-time monitors to simple dust buckets are being used to monitor for dusting. In addition to technology, the best monitor, our people, are being utilized to forecast, deploy controls, and monitor any generated dust. Today, additional technologies and products are being utilized or considered as we are moving into the potentially high dusting season.

Critical Minerals and Rare Earth Elements Extraction from Alaska's Coal and Coal Ash

Justin Seavey, Usibelli Coal Mine

Usibelli Coal Mine is working to identify the critical minerals and rare earth elements that can be extracted from Alaska's coal and coal ash. The US Department of Energy (DOE) has identified numerous minerals that the country is wholly or mostly dependent on from foreign nations, and in some cases unstable nations, with national security implications. These minerals are referred to as Critical Minerals (CM) and include elements of the periodic table referred to as Rare Earth Elements (REE). Usibelli is studying which CM exist in Alaskan coal and coal by products, and how they might be processed for economic recovery. Usibelli is focusing on waste streams of its mining operation, such as low-grade zones within coal seams that are not suitable for customer use, as well as coal ash from power plants. This summary of UCM's activities to date will share how the state's only operating coal mine is supporting the larger national effort in support of continued responsible use of State resources to the benefit of Alaska, its economy, and national security.

Pebble – Why We Are Still Fighting

John Shively, CEO Pebble Partnership

Summary – John Shively will provide an update about current issues facing the Pebble Project along with some thoughts about how Pebble fits into state and federal public policy matters.

Most in AMA are familiar with the Pebble Project. PLP filed for its first federal permits with the U.S. Army Corps of Engineers in late 2017. In the summer of 2020, the USACE published the Final Environmental Impact Statement for the proposed mine at the Pebble site and associated infrastructure. The FEIS stated that mining could happen without harm to the Bristol Bay fishery and could provide needed jobs to the communities closest to the project. Despite this fact based document clearly showing no harm to the area fishery, the USACE issued a negative Record of Decision in November of 2020. PLP filed an appeal of this decision in January of 2021 and over two years later the USACE Pacific Ocean Division agreed with many of the issues in PLP's appeal.

Several months before the USACE made this announcement, the United States Environmental Protection Agency issued a preemptive veto of the Pebble Project. This action was an extraordinary step by the EPA and caused great concern across the entire resource development community in Alaska and the nation. Alaska's governor filed suit against the EPA directly with the U.S. Supreme Court. The National Mining Association filed an amicus brief in support of the state's action and was joined by resource and trade associations from across Alaska.

Shively will talk about the implications of both federal agency actions for Pebble and put the Pebble potential in context with other matters facing the state and nation.

Pogo Mine: Optimizing Extraction with Modern Mining Techniques

Alan Lipka, Northern Star Resources

The Pogo Gold Mine is located approximately 90 miles southeast of Fairbanks, Alaska and is situated in Tintina Gold Province. The operation, which commenced production in 2006, has significant underground working, a carbon-in-pulp processing plant and dry-stack tailing storage facility. Pogo has mined over 4.8 million ounces of gold to date.

Northern Star acquired Pogo Mine in September 2018. At that the time the mine had aging infrastructure, a decreasing reserve base, increasing operating costs and a declining mine life. Over the next 4 years, Northern Star refurbished and expanded the operation. This involved replacement of the mining fleet, transitioning mining methods to high-speed jumbo development and long hole open stoping, expanding the mill to 1.45M ton per annum, and numerous infrastructure upgrades to support the expanded operation. Pogo now has a 7.3Moz Mineral Resource and a 1.6Moz Ore Reserve and is set up for production into the next decade. This presentation will focus on some of the ways the mine is optimizing production using new technologies and methods now that the major mine refurbishment and expansion is complete.

TRACK TWO

REGULATORY AND POLICY UPDATES

Does Alaska do it better? Comparing how leading extractive jurisdictions regulate their industries

Brett Watson, University of Alaska Anchorage Institute of Social and Economic Research

Leading mining and petroleum-producing jurisdictions all regulate their extractive industries to promote better environmental and human health outcomes, but the stringency of these rules and their enforcement differs by location. This study applies a mixed-methods approach to estimate the stringency of environmental regulations in a selection of 16 of the top resource-producing countries. A quantitative estimation strategy is used to assess greenhouse gas emissions intensity and occupational health and safety. A qualitative survey approach is employed to gather expertise from industry professionals in the domains of water, air, and wetland regulation, monitoring, tailings dam safety, spill containment, financial assurance, and public information.

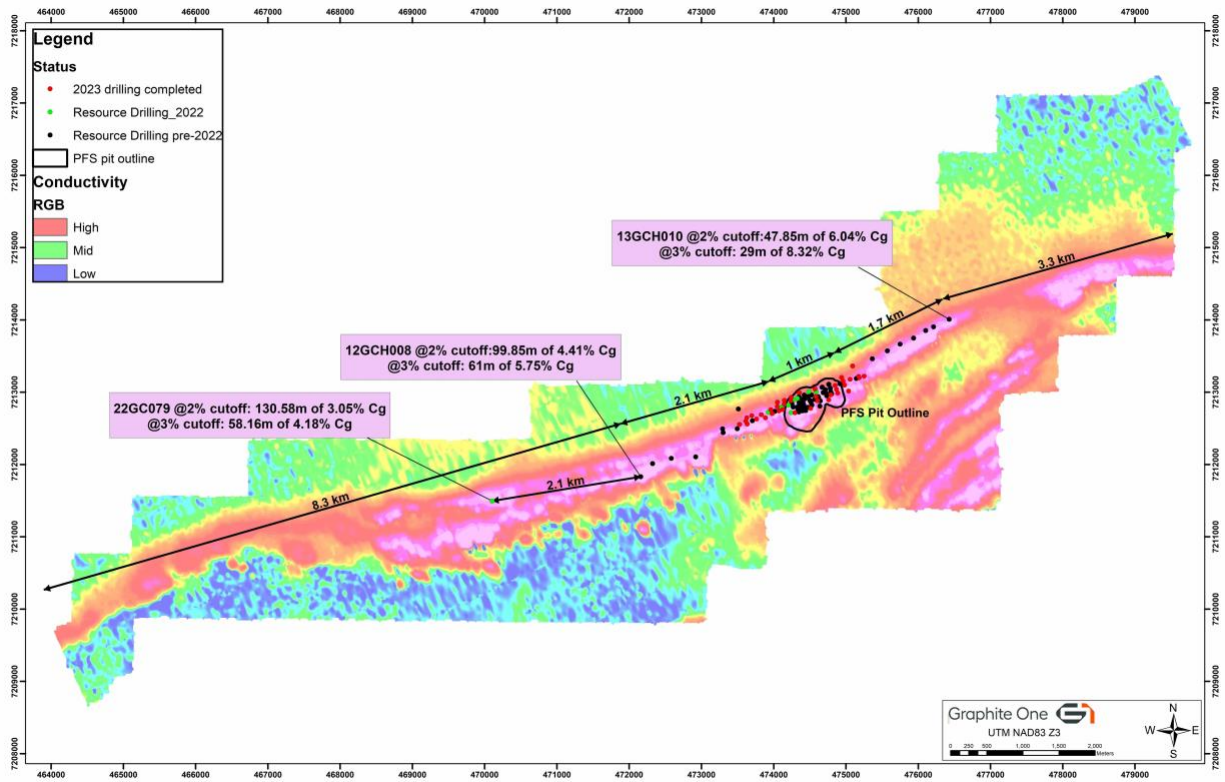
CORE SHACK

GRAPHITE CREEK PROJECT

Contributors: B. Flanigan, J. Anderson, E. Literski, K. Dooley, M. Zerilli, B. Campbell, and B. McCrum

The Graphite Creek Property is located on the north flank of the Kigluaik Mountains about 1.6 miles (3 km) from intertidal water of the Imuruk Basin, and approximately 37 miles (60 km) north of Nome, Alaska. The property consists of 176 State of Alaska ¼-section (160 acre) mining claims. The Project is owned by Graphite One (Alaska), Inc. a subsidiary of Graphite One Inc.

The graphite-bearing schists are well-exposed and reasonably coherent for a strike length of at least 3.1 miles (5 km) along the north flank of the Kigluaik Mountains gneiss dome, south of the range-bounding Kigluaik fault. The metamorphic stratigraphy strikes roughly parallel to the flank of the Kigluaik Mountains and locally forms a dip slope. Incised creek drainages crosscut the metamorphic stratigraphy and provide good exposure of bedrock. The schists dip north between 25° and 75°. Ore-grade graphite occurs as high-grade massive to semi-massive segregations and as disseminations in quartz-biotite-garnet-sillimanite schist, and mostly as lower grade disseminations within other lithologies, within a package of granulite facies metamorphic rocks. The graphitic rocks are coincident with a > 9.9 mile (16 km) long electromagnetic anomaly. As of 2023, the trend is drill tested to a 4.2-mile (6.8 km) strike length.



Graphite One has been awarded US Department of Defense (DoD) Technology Investment Agreement valued at \$37.5 million to complete an accelerated Feasibility Study to modernize and expand domestic production capacity and supply for graphite battery anodes necessary for electric vehicles and alternative energy batteries as an essential national defense technology.

Additionally, Graphite One, in partnership with Vorbeck Materials Corp. was awarded a \$4.7 million DoD Defense Logistics Agency (DLA) contract to supply graphite ore for the development of graphite and graphene-based foam fire suppressant as an alternative to incumbent PFAS fire-suppression materials.

In April 2023, a bulldozer and excavator were mobilized to the project via winter trail. The equipment was used to build a 6-mile (9.7 km) network of drill access trails within the primary deposit area. This equipment was also used to extract a ~22,000 lb. bulk sample from the central area of the 2022 Prefeasibility Study pit shell in support of DoD DLA contract.

The 2023 Field Program's primary focus was on resource drilling. Additional core drilling was completed for geotechnical evaluation of facility areas and hydrology studies. A total of 28,661 ft (8,736 meters) from 57 holes were drilled, of which 28,135 ft (8,576 meters) from 52 holes was resource, including infill drilling and exploration drilling on the geophysical anomaly. Core drilling in the deposit area continued to encounter visible graphitic mineralization over wide intervals consistent with previous drilling. To date, 71,367 ft (21,753 meters) of drilling has been conducted, spanning a lateral distance of 4.2 miles (6.8 km).

Multi-Year Exploration Drilling at Kensington Mine

Robert Callaghan, Richard Halvorsen, Sam Kilfoyle, Trevor Nelson, and Alejandro Razo, Coeur Alaska - Kensington Mine

Coeur Alaska's Kensington Mine is located approximately 45 miles northwest of Juneau, Alaska. The property sits within the Berners Bay Mining District, at the northernmost edge of the Juneau Gold Belt. The Juneau Gold Belt is a 120-mile long, 10-mile-wide structural zone hosting several major gold producers. Coeur Alaska has mined over 1,000,000 ounces from the property since beginning commercial production at Kensington in 2010. Gold is currently produced from two deposits: Kensington and Elmira. The Kensington exploration program comprises a multi-year drilling program focused on infilling and expanding these producing deposits to further extend mine life. Drilling also continues expansion and scout targets including upper Raven and Johnson East, among others. By year-end 2022, this drill program had successfully added a year and a half of mine life. These successes demonstrate the continuing exploration potential to grow producing deposits and advance additional deposits within the district.

The property lies to the west of the Coastal Megalinalment, situated between the Wrangellia terrane and the Treadwell formation of the Gravina belt. The deposits are modeled as low-sulfide, mesothermal, gold-quartz veins with strict structural controls. The deposits have reportedly been restricted to a Cretaceous diorite intrusion, known as the Jualin diorite, which intrudes the Triassic basalts of the Wrangellia terrane and lies unconformably against the Gravina belt.

The vein systems are generally shear-hosted veins or vein packages composed of extensional vein arrays, sheeted extensional veins, and stacked, en-echelon, shear veins. The main deposits of the Kensington Mine strike to the north-northwest and dip moderately to the east. The mineralogy of the deposits varies between gold tellurides, most commonly calavarite (AuTe_2) and petzite (Ag_3AuTe_2), associated with pyrite-rich zones at Kensington, and coarse-free gold (Au) commonly associated with galena, sphalerite, tennantite, and pyrite at Jualin.

The Elmira vein system shares similar vein style and mineralization characteristics with the Kensington deposit, lying 2,500 feet east of Kensington. Coeur Alaska's exploration team is expected to complete this year's planned drilling targeting Elmira, to further define the deposit. The Johnson vein system, lying 500 feet east of Elmira, continues to be intercepted, adding extension along strike to the south, and feeding the model. Other near-mine prospects drill targeted this year include the upper Raven and Johnson East zones.

The current multi-year drill program builds upon previous drill programs, surface and underground geochemistry, surface and underground mapping, geophysical surveys, oriented core, and compilation of historic data. The program is focused on developing a stronger geological interpretation of the district, growing producing deposits, and outlining potential economic zones. This rigorous approach is driving new interest in known prospects and is focused on driving the additional discovery necessary to unlock the potential of underexplored areas of the Berners Bay Mining district.

Kinross Alaska Core Shack Exhibit Abstract

Selected core and rock sample displays to characterize host rock, alteration, and mineralization of the three Kinross Alaska Mines.

- **Fort Knox:** accompanying plan and long sections of the deposit, and project timeline. Shawn Colburn and David Poole, 2018
- **Gil – Sourdough:** interpretive cross sections of the Main and North Deposits. Bryan Babb, 2021
- **Manh Choh:** interpretive cross sections of the Main and North Deposits. Shawn Colburn, 2022

Fort Knox

Pit is 1.5 mi E-W, 1 mile N-S, 1900 ft deep.

9Moz produced, Oct 2023.

Mine ~200,000 tons/day using 36 trucks (250 ton), 4 shovels and two loaders.

1996-2022: 1,300,000,000 tons mined; 360,000,000 tons milled; 374,000,000 tons on Walter Creek Heap Leach; over 100,000,000 tons on Barnes Creek Heap Leach to date.

Gil

14-mile haul to Fort Knox

Fort Knox/Gil-Sourdough

- 2022 Production – 221,248 oz Fort Knox; ~70,000 oz Gil
 - 1.9 Moz P&P Reserves, including 0.145 Moz Gil
 - 1.1 Moz M&I Resources, including 0.233 Moz Gil
- 2023 H1 Production – 134,825 oz / \$1,166 oz
 - ~12.5% of Kinross' global production

Manh Choh

At the 70%-owned Manh Choh project, activities remain on schedule and on budget, and the mine's key operating permits were received in May. Construction activities have commenced on the mill modifications at Fort Knox, where the Manh Choh ore will be processed. Initial production from Manh Choh is expected in the second half of 2024 and is expected to add approximately 640,000 attributable Au eq. oz. to the Company's production profile over its approximately 4.5-year life-of-mine.

- 2023 – Construction Complete, Mining commences
 - 0.7 Moz Au, 1.2 Moz Ag P&P Reserves
 - 0.05 Moz Au, 0.1 Moz Ag M&I Resources

Including Manh Choh, the Company expects to produce an average of approximately 400,000 attributable Au eq. oz. per year, ~19% of Kinross' global production, during 2024 to 2027 from its Alaskan assets.

Developing North America's next major gold trend in Alaska to become a tier one gold producer.

Estelle Gold Project

Summary

Nova's Estelle Gold Project is an expansive, district-scale venture, showcasing over 20 promising gold prospects within a 35km mineralized corridor. The project is strategically nestled in Alaska's Estelle Gold Trend, a region renowned for its gold treasures, such as the Eagle Mine and Fort Knox Gold Mine.

Nova is fast-tracking project and economic studies, with a focus on an efficient, low-cost open-pit mining operation and a centralized processing plant.

To dive deeper into the Estelle Gold Project, explore Nova's 3D presentation on their website: www.novaminerals.com.au.

Prime Location and Infrastructure

Situated just 150km northwest of Anchorage, the Estelle Gold Project operates year-round and enjoys the benefits of a nearby labor force and essential services. The project site boasts an 80-person winterized camp, complete with a sample processing facility and a 1,000m Whiskey Bravo airstrip. Excitingly, the proposed West Susitna Access Road is making headway and is set to commence construction in 2025.

District Scale with Expanding Gold Resources

Covering 450km² of unpatented mining claims on Alaska's public lands, the Estelle Gold Project encompasses multiple near-surface Intrusion Related Gold Systems (IRGS). Nova's relentless exploration efforts have resulted in nearly 90,000m of drilling and the discovery of four major mineralized areas.

1. RPM - Resource: 1.24 Moz @ 0.6 g/t Au, including 0.34 Moz M&I at 2.3g/t Au

RPM has yielded three of the most significant gold intercepts globally in the past decade, which include:

- RPM-005: 132m @ 10.1g/t Au within 400m @ 3.5g/t Au
- RPM-015: 117m @ 11.1g/t Au within 258m @ 5.1g/t Au, featuring 16m @ 43.5g/t Au
- RPM-008 87m @10.1g/t Au, within a wider 260m @ 3.6g/t Au

- RPM North and RPM South are teeming with potential, awaiting further exploration.

2. Train

- This area harbors high-priority targets, with evidence of high-grade sheeted vein-style gold mineralization. Recent drilling assays are pending.
- Trumpet, located 1.5 km NW of Train, appears to be genetically linked, further heightening interest.

3. Korbelt

- Bulk tonnage resource: 8.65 Moz @ 0.3 g/t Au, including 3.09 Moz Indicated
- Korbelt Main and Cathedral deposits offer ample opportunities for expansion, with open strike lengths and significant potential for high-grade zones.

4. Stoney and Exploration Targets

- Various mineralized targets await exploration, promising long-term opportunities. Notably, polymetallic veins with copper, silver, and antimony have been identified.

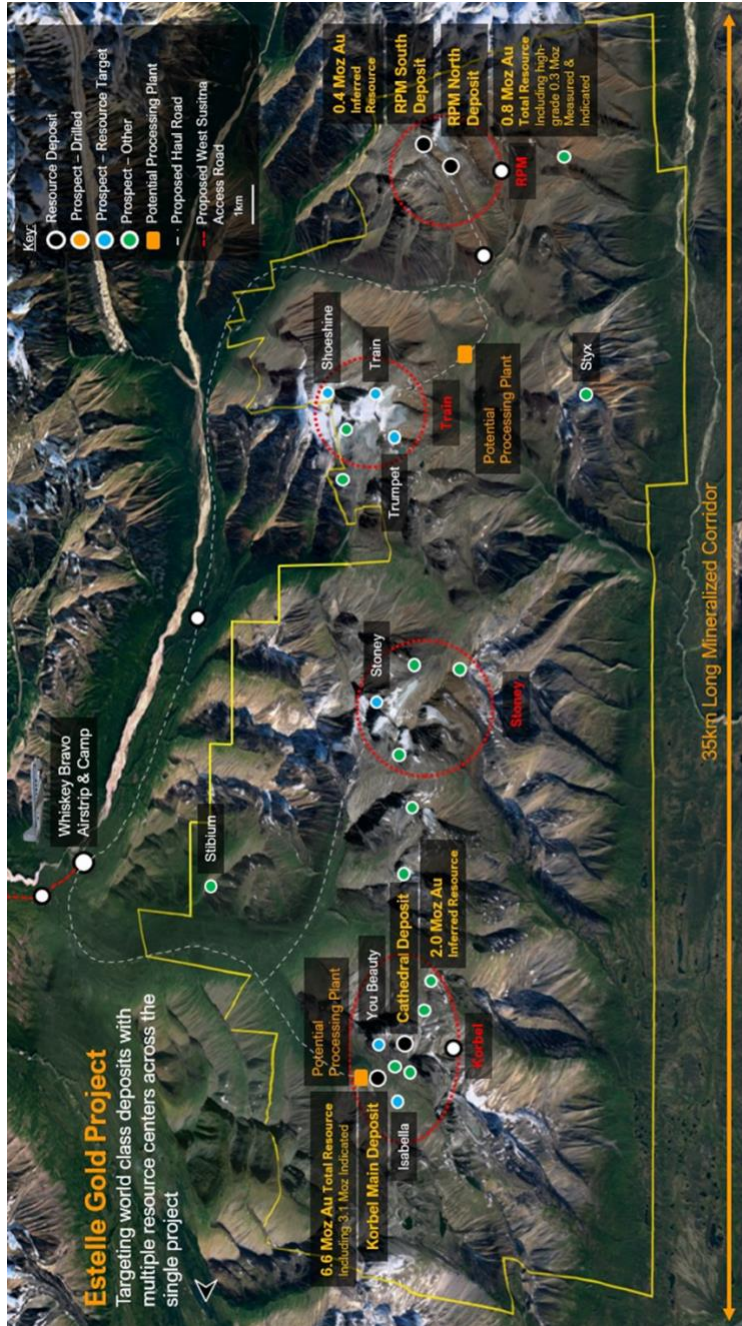
Robust Scoping Study

A scoping study, conducted in May 2023, underscores the potential of the Estelle Gold Project. It focuses on a phased approach, initially mining high-grade RPM ore and later transitioning to bulk tonnage mining at Korbel. The establishment of a 6mtpa central processing plant in the Korbel area is integral to this plan.

Key study metrics include:

- Rapid 11-month payback
- NPV5% USD\$654M
- IRR of 53%
- Unprecedented net free cashflow of ~USD\$1B
- Competitive ASIC of USD\$510/oz (1st year) and USD\$1,148/oz (LOM)
- Estimated total production of 2.25 Moz Au over a 17+ year span
- Strong metallurgical recovery rate of 88.3%
- Initial pre-production capital of USD\$385M

Moreover, sensitivity analysis highlights the project's receptivity to variations in mill feed grade, suggesting a 10% increase could boost the NPV by a substantial USD\$277M, reaching USD\$931M.



Discovery of the Star Shear Vein at Pogo

Northern Star Resources Limited

The Star prospect is located 1.3km southeast of the Pogo mine development and consists of a quartz-sulphide-gold vein system developed in the hangingwall of the moderately northwest-dipping Star Shear Zone. The mineralized shear zone was discovered during the end of the 2022 summer drilling exploration program. The mineralized quartz vein structures are characterized by quartz-bismuth-telluride-arsenopyrite-gold infill assemblage. The host rock consists of sheared paragneiss of the Lake George Subterrane.

The discovery hole (22-036) intercepted a 9.7m (estimated true width) quartz-sulphide-gold vein at a downhole depth of 520m and returned a composite grade of 52.9 g/t gold. Portions of the intercept are on display at the core shack exhibit. Visible gold is fine but abundant throughout the vein.

Drill hole 22-036 was designed to target a prominent LiDAR lineament that wrapped around topography revealing a shallow northwest dip that was consistent with large veins at the mine. Surface geochemistry along the lineament did not disclose any significant gold or pathfinder anomalism. The mineralized shear zone was a conceptual target, and hole 22-036 was the first hole drilled into the shear zone.

Follow-up drilling in the fall/winter of 2022 intercepted the Star Shear Zone in all 7 holes. DDH 22-044, the last hole drilled in 2022, intercepted a 6.9m (estimated true width) quartz-sulphide shear vein with a composite grade of 13.2 g/t gold. Portions of the intercept are on display at the core shack exhibit.

Drilling in 2023 at the Star prospect intercepted the Star Shear Zone in all 16 holes at their target depths. Highlights of the program will hopefully be on display at next year's AMA for everyone to see.

The Flat Gold Project

Tectonic Metals Inc.

Flat is located in southwestern Alaska, just 40km north of the Donlin Gold Project. in the Kuskokwim Mineral Belt. The project consists of 92,160 acres of Native-owned land belonging to Doyon, Limited, one of Alaska's largest Native Regional Corporations and private landholders. The property hosts intrusion-related gold mineralization similar to that found at the Fort Knox (Alaska) and Eagle (Yukon) gold mines. Since 1908, when gold was first discovered at Flat, the immediate vicinity has been notable as an area of significant placer gold mining activity with an estimated 1.4 million ounces of placer gold produced from streams draining the Chicken Mountain – Black Creek complex.

The multiphase stocks of Chicken Mountain and Black Creek (68.3 to 73.2 Ma) intrude Kuskokwim sediments and are genetically related to accumulations of intermediate and felsic volcanics. Hornfelsing occurs within both the sedimentary and volcanic rocks adjacent to the intrusion margins. At Chicken Mountain three major compositional phases are present: monzodiorite and gabbro comprise the outer margin and initial phases, biotite monzonite forms a relatively homogeneous central transitional phase and leucocratic quartz monzonite forms the central phase.

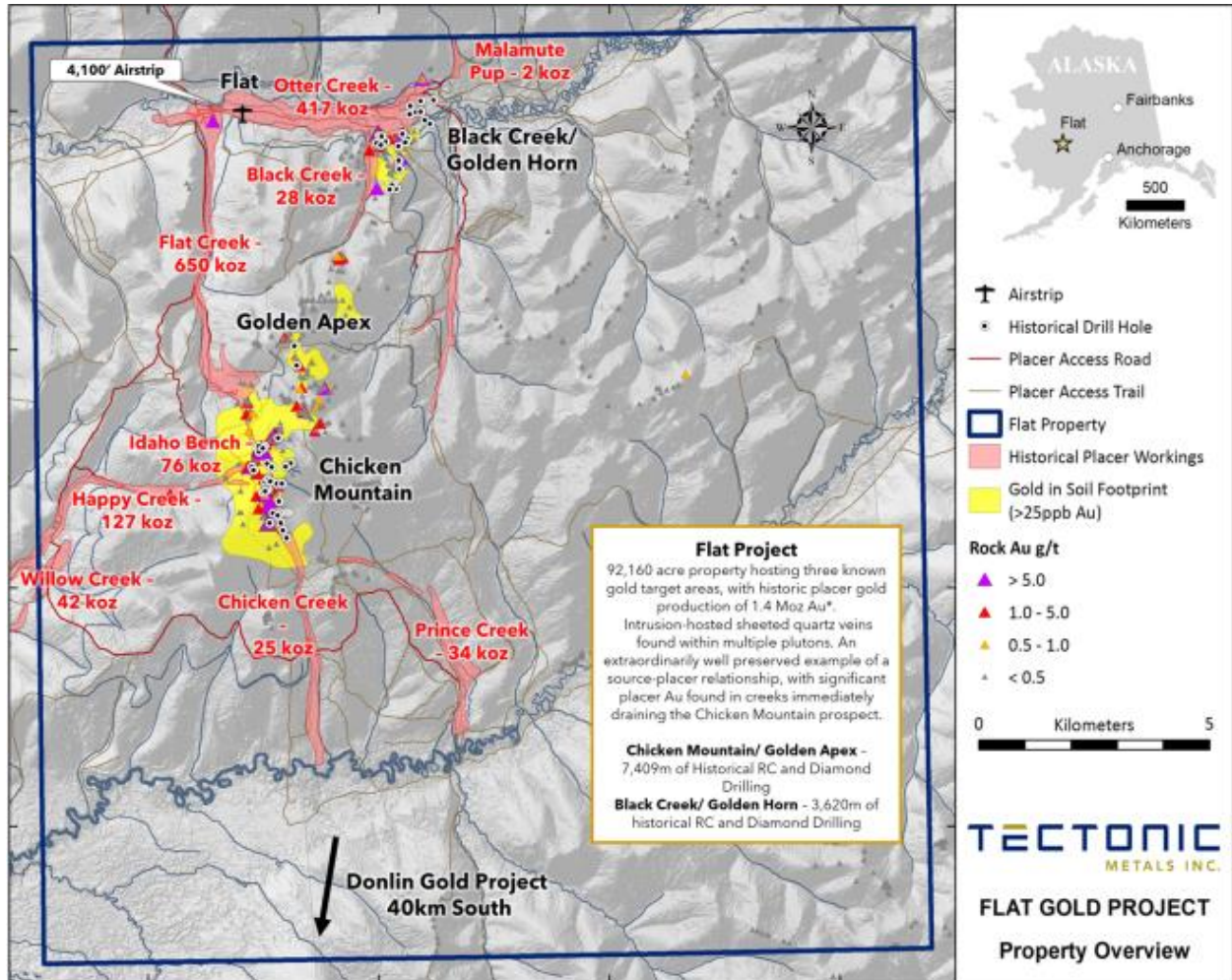
Bedrock gold mineralization at Flat has been recognized in at least two geological settings.

1. Low-grade intrusion related within altered, fractured and veined late-stage phases in the Chicken Mountain- Black Creek stocks. Notably, the most significant gold mineralization is hosted within the late-stage quartz monzonite at Chicken Mountain.
2. Contact-related vein and disseminated bulk tonnage mineralization hosted within sedimentary and volcanic rocks. Most notable are the Golden Apex zone which occurs between the Chicken Mountain and Black Creek Stocks and Golden Hornfels zone which occurs along the eastern contact of the Black Creek stock.

Historic exploration work between 1977 and 2003 including 87 core and reverse circulation drillholes for 11,040 metres, resulted in an extensive surface and subsurface geochemical database on the project. Significant surficial gold in soil and rock anomalies generated by the historic exploration efforts remain untested by drilling,

Initial efforts by Tectonic are focused on the central portion of the Chicken Mountain stock where gold occurs as veinlet and fracture-controlled gold mineralization in the pervasively altered, late stage leucocratic quartz monzonite, which appears to have been a major source of the placer gold in the Flat district.

In 2023 Tectonic completed an inaugural diamond drill program within the core of the Chicken Mountain trend to further augment the historic data through the collection of oriented core data and high quality multi-element geochemistry to provide for an updated structural and geochemical framework for ongoing exploration vectoring at Flat.



* Placer production figures from "Mineral Occurrence and Development Potential Report, Locatable and Salable Minerals, Bering Sea-Western Interior Resource Management Plan, BLM-Alaska Technical Report 60", prepared by the U.S. Department of the Interior, Bureau of Land Management, November 2010"

Heading to Valhalla – with Sun as our Focus, Ambler Mining District, Alaska

Bonnie Broman, Sorin Posescu, Valhalla Metals Inc.

Mineralization was discovered at the Sun deposit over 50 years ago, and since that time the project has gone through several periods of intense exploration followed by periods of dormancy – the most recent of which ended when Valhalla Metals Inc. acquired 100% ownership of the Sun deposit in 2018. In September 2022, the project took another significant step forward when Valhalla began trading on the Toronto Stock Exchange (TSX) and raised over \$C10 million to advance the project and welcome Marubeni, a well-established Japanese copper producer, as a strategic investor. Sun is the eastern-most deposit known within the highly prospective Ambler Mining District and is characterized as a volcanogenic massive sulfide (VMS) deposit containing high grade zinc, copper, lead, silver and gold mineralization. On a worldwide comparison basis, Sun ranks in the second quartile for size and the second quartile for metal value.

Valhalla completed an updated Canadian NI 43-101 compliant resource in May 2022 with Sun estimated to contain an Indicated resource of **1.71 million tonnes (MT)** grading **4.32% Zn, 1.48% Cu, 1.11% Pb, 60.0 g/t Ag, and 0.21 g/t Au (4.09% CuEq)**; and an Inferred resource grading **9.02 MT of 4.18% Zn, 1.21% Cu, 1.46% Pb, 81.7 g/t Ag, and 0.25 g/t Au (4.10% CuEq)***. A total of 97 holes (19,123m) have been drilled since the deposit was first discovered in 1966 and are used to define the current resources at Sun and SW Sun. These holes have only been extended to ~200m below surface within the Main Sun prospect, so the potential to upgrade and increase the overall size of Sun is highly prospective down-dip and along strike. Mineralization at Sun is hosted by at least two polymetallic massive and semi-massive sulfide horizons containing primarily pyrite, sphalerite, chalcopyrite, galena, and tetrahedrite-tennantite with other accessory sulfide minerals.

Helicopter supported Lidar and orthophotographic studies in addition to a ground gravity survey, diamond drill program, historic drill hole relogging program, and new camp construction were completed in 2023. Four diamond drill holes totaling 1,104m were completed using two EF-75 drill rigs operated by Major Drilling. Six holes totaling 1,416m and located in and around the planned drilling were relogged with the intent to standardize the logging codes resulting from several drill campaigns.

Forward progress is being made on the Ambler Mining District Industrial Access Project (AMDIAP) with the BLM recently releasing the draft supplemental EIS. Valhalla intends to continue to advance the Sun deposit by drilling down dip and along strike of the current resource area to confirm, upgrade and expand the existing resource base, as well as to obtain representative samples for metallurgical testing. In addition, exploration efforts including drilling and downhole geophysics in other areas of the property will continue, both to further refine existing prospects and to generate new ones.

Note: *The following metal prices were used to calculate CuEq: copper - \$3.00/lb; zinc - \$1.10/lb; lead - \$1.00/lb; silver - \$18/oz; and gold - \$1,300/oz

Western Alaska Minerals: Waterpump Creek and Last Hurrah Project: Ongoing exploration of bonanza-grade silver, lead, zinc carbonate replacement mineralization in west central Alaska

Sage Langston-Stewart

Waterpump Creek (WPC) is a Ag-Pb-Zn carbonate replacement deposit (CRD) located within the Illinois Creek District in west-central Alaska, located approximately 250 miles west of Fairbanks, Alaska. The Illinois Creek (IC) District, originally discovered in the 1980's by Anaconda, is home to five evolving mineral projects containing gold, silver, copper, lead, and zinc. Over the past 10 years, the district was consolidated by the Western Alaska Minerals (WAM) management team with the recent exploration focus on the Waterpump Creek high-grade sulfide mineralization and expanding exploration to the district-wide CRD system.

The 2023 drilling season set out to accomplish two primary drilling goals: 1) Infill and extension drilling at Waterpump Creek (WPC), and 2) Finding the sulfide along the same trend to the south at Anaconda's Last Hurrah. Five holes (1706.27m) were drilled at WPC and nine holes (3412.23m) were drilled at Last Hurrah, totaling 5118.5m. Three of the five infill drill holes at WPC intercepted sulfides. These infill and extension drill holes provided insights into two stages of mineralization, an early stage stacked manto mineralization and a later cross-cutting vertical pyrite stage mineralization. All five drill holes provided information useful for understanding the mineralizing system at WPC, which will aid in targeting future holes as we continue to explore at Last Hurrah and the greater Illinois Creek district and will allow the estimation of a mineral resource for WPC. None of the nine drill holes intercepted sulfide mineralization on the 7104275 N section at Last Hurrah; however, the drill hole profile intercepted impressive alteration including ultraviolet fluorescence of fugitive calcite, sanding, bleaching, and "tan" alteration, and provided alteration and geochemical vectors to hone in on CRD mineralization in continuing exploration.

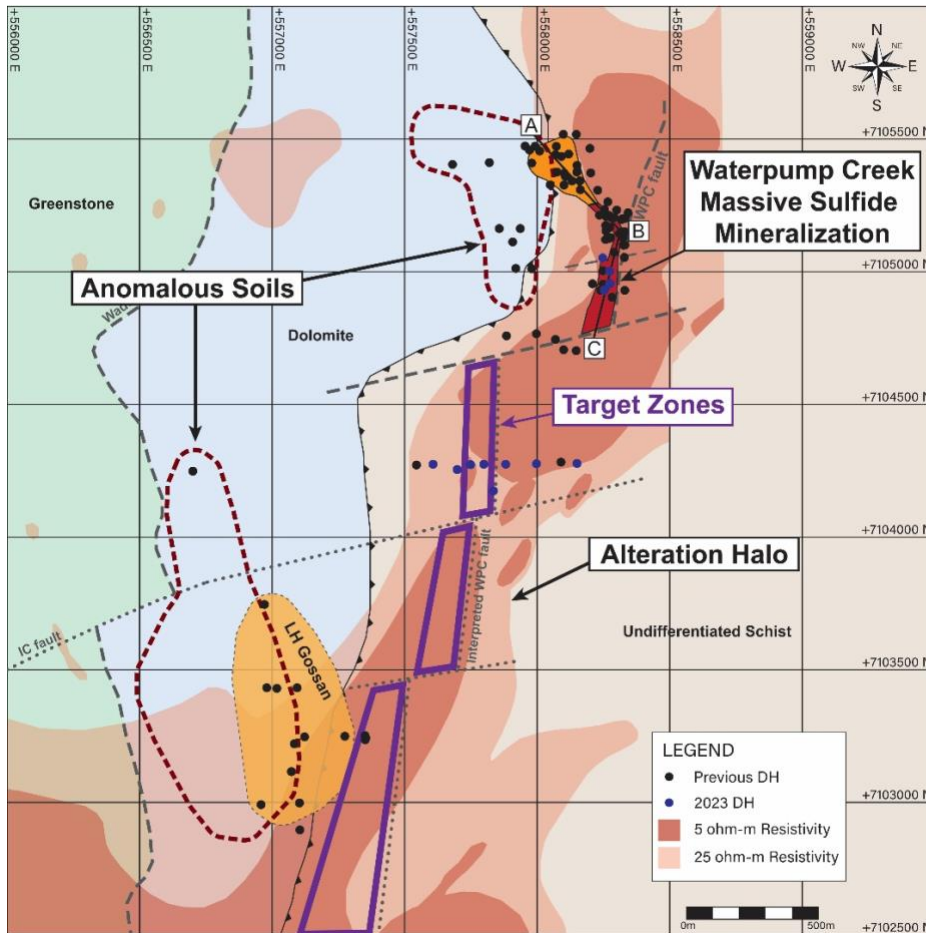
The mineralization at WPC is hosted in a thick package of Ordovician dolostone that is capped by the Kaiyuh Schist sequence, providing a trap for the hydrothermal fluids. An interbedded schist unit within the dolostone also acts as a fluid trap and separates the upper dolostone sequence from the lower dolostone sequence. Of importance is the fossiliferous dolostone (within the lower dolostone sequence) which hosts the mineralization as the system moves south to Last Hurrah. Below the thick dolostone package is a thrust greenstone which caps the West Block stratigraphy containing permissive quartzites and calcareous quartzites which host the Illinois Creek manto-style mineralization. Understanding the stratigraphic and structural controls are key to understanding mineralization in the district.

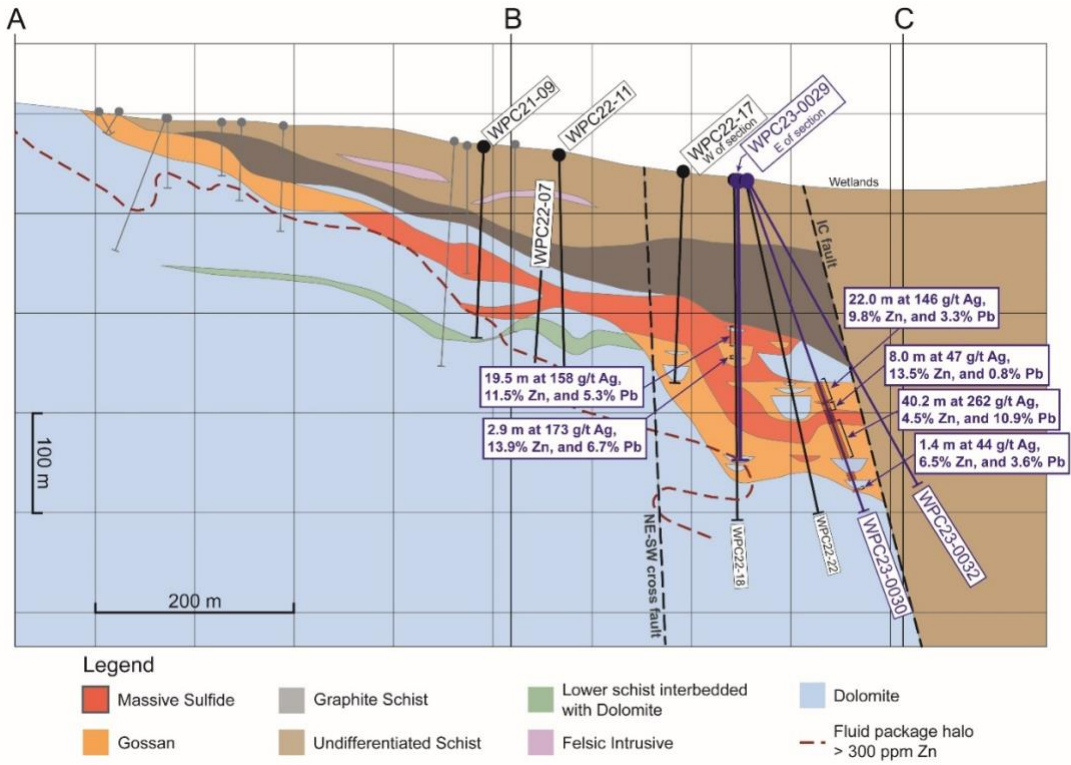
In addition to drilling, a 3-D resistivity and induced polarization (IP) survey was completed in 2023. This survey was conducted to follow up on the historical IP anomalies which showed a 1.4km untested anomaly linking WPC to Last Hurrah. This survey is incredibly useful in identifying major structures, alteration halos, and new targets. A northeast-southwest low resistivity anomaly ties together the continued

Core Shack

mineralization from WPC to Last Hurrah and shows the expansive sanding alteration halo.

With 2023 drill results and a new geophysical survey, the geological understanding for the district is coming together with new insights and information, delineating exciting targets for a successful 2024 drilling season.





PROSPECTORS TENT

Elliott Creek Progress Highlights 2023

Nick Begich, President, Wrangell Saint Elias at Elliott Creek Incorporated

The Property: Wrangell Saint Elias at Elliott Creek Incorporated (WSEECI) holds, in fee, 812 acres of **patented federal** claims inclusive of the mineral and surface estate in South Central Alaska. We enjoy a strong working relationship with the Native corporations who are our boundary neighbors.

WSEECI has consolidated the properties within the Elliott Creek valley, bringing together all privately held land under a single entity. Access agreements and road permitting is completed with road construction being planned for 2024 to facilitate multiuse of the property.

Assays and Field Work: Preliminary investigation of the WSEECI property was conducted by SRK in 2009, and additional sampling has been conducted by the owners through the summer of 2023. As part of its continuing work on the property original monuments have been located along with trenches, tunnels and adits. Approximately 1,500 feet of underground workings have been explored. A bulk sample was collected for use in testing the material for multi sensor initial sorting by Steinert KSS technology followed by conventional separation technology in 2023.

Over 200 grab samples and continuous chip samples have been collected by WSEECI since 2008, and have assayed **between 2% and 18% copper** with additional **silver**, and **gold** as further CuEq drivers.

Geology: The mineralization at Elliot Creek has been identified as basaltic, hydrothermal copper. These deposits include native Cu-Ag and copper-sulfide mineralization occurring as veins and disseminations in amygdaloidal flows, tuffs, breccias, conglomerates and in places sandstones. Mineralization is found in the Nikolai Greenstone below the Chitistone Limestone. Mineralization is described by Moffet et al., (1923) as structurally controlled occurring along fracture planes and faults. Copper minerals also occur as disseminations proximal to fractures and faults. Copper minerals include bornite, chalcopyrite, cuprite, covellite and chalcocite.

The geology of Elliott Creek provides the ingredients for a remarkably environmentally friendly mining operation, should one be engaged. Extensive limestone deposits as well as concomitant calcite complement an ore profile exceptionally low in deleterious elements.

Next Steps: WSEECI is developing a strategy to optimize the value its property holdings. These possibilities include mining, tourism, and other land use strategies. In addition to a number of government agency permits and clearances, the company has engaged with the National Park Service and gained the necessary approvals to advance surficial infrastructure improvement. As a next step, WSEECI is seeking

Prospectors Tent

partners capable of contributing toward efforts advancing these holdings to their highest and best use. WSEECI is moving forward with surface estate improvements including road construction, driveways, camp structures, historical artifacts removal and preservation and property sampling.

We are seeking a strategic partner to work with us in advancing the opportunities present at Elliott Creek, Alaska.

Intrusion Related Gold in Nyac Mining District, Tintina Gold Province, Southwest Alaska

Varina Zinno, Senior Geologist & Mike Bethe, Exploration Geologist, Calista Corporation

Calista Corporation (“Calista” or “Calista Corp”) is one of 13 Alaska Native Regional Corporations created under the Alaska Native Claims Settlement Act of 1971 (ANCSA) in settlement of aboriginal land claims. The Donlin Gold deposit (39M oz Au) is Calista’s most well-known partnered project situated on subsurface mineral rights leased to Donlin Gold LLC. The Calista Region has over 264,000 acres designated to resource development opportunities with much located in the southwest extension of the Tintina Gold Province, also known as the Kuskokwim Gold Belt (Figure 1, below). This region has significant discovery potential with many Calista prospects at earlier exploration stages (Figure 2).

Nyac, in the Nyac mining district, has been actively mined since discovery in 1908. Approximately 900,000 oz of placer gold has been recovered. The Calista mineral estate at Nyac is 69,924 acres comprising 354 square kilometers (137 square miles) of land. The search for a lode source of placer gold has been ongoing since the 1970’s, by Resource Associates, Placer Dome, Tonogold Resources, Nyac Gold LLC, and Calista Corp. Exploration history includes a total of 14,339.2 meters (47,044.7 feet) of drilling, geologic mapping, prospecting, surface sampling, geophysical surveys, and trenching. Mineralization, likely late Cretaceous in age, is situated over prominent magnetic anomalies which indicate potential for additional occurrences throughout the district (Flanders, 2013).

The 2023 exploration program consisted of core relogging and resampling; and soil, stream sediment, and rock sampling in previously unsampled areas as a follow up on previous anomalous samples. Geochemical assay results for the 2023 summer exploration program are pending. Two discoveries of significant mineralized area were made at Nyac this season. East Bonanza displays pervasive quartz stockwork veins in diorite outcrops, extending the known mineralization east. Some of these veins displayed mineralogy similar to the nearby high-grade Wallace Au-Te-Bi prospect. This area is upstream of and within 2000 m of Spruce Creek, where ~25,000 ounces placer gold has already been mined.

Blueberry, a prospect defined by a distinct Mo-Cu geochemical anomaly, was extended in size through prospecting which included discovery and sampling of a molybdenite vein in two sites. Blueberry is an intriguing porphyry target; an incomplete IP survey from 2011 indicates subsurface chargeability targets coincident with surface geochemical anomalies, indicating that the mineralization has depth. Preliminary observations from selective core relogging and resampling of 2006 drill core are yielding interesting results detailing conditions of gold mineralization. Calista Corporation is seeking partners to enter into an Exploration and Mining Lease Agreement for Nyac, and has other properties available as well (Figure 3).

Prospectors Tent

Figure 1

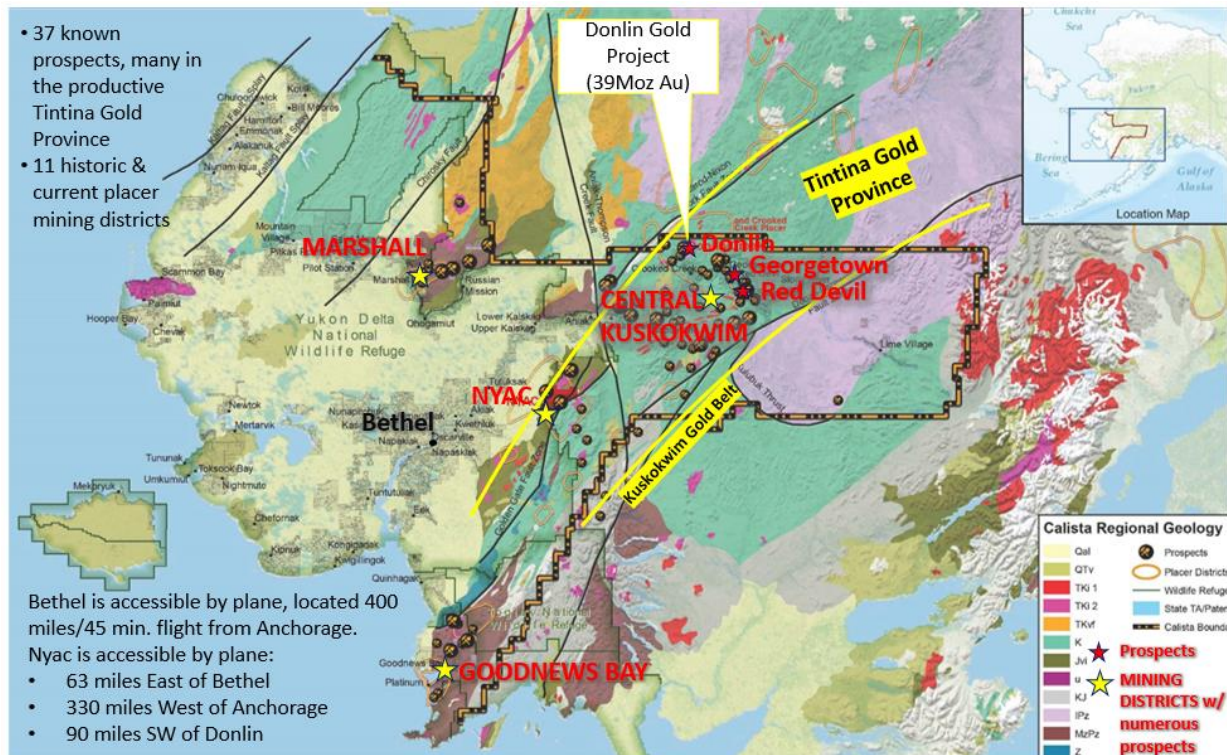


Figure 2

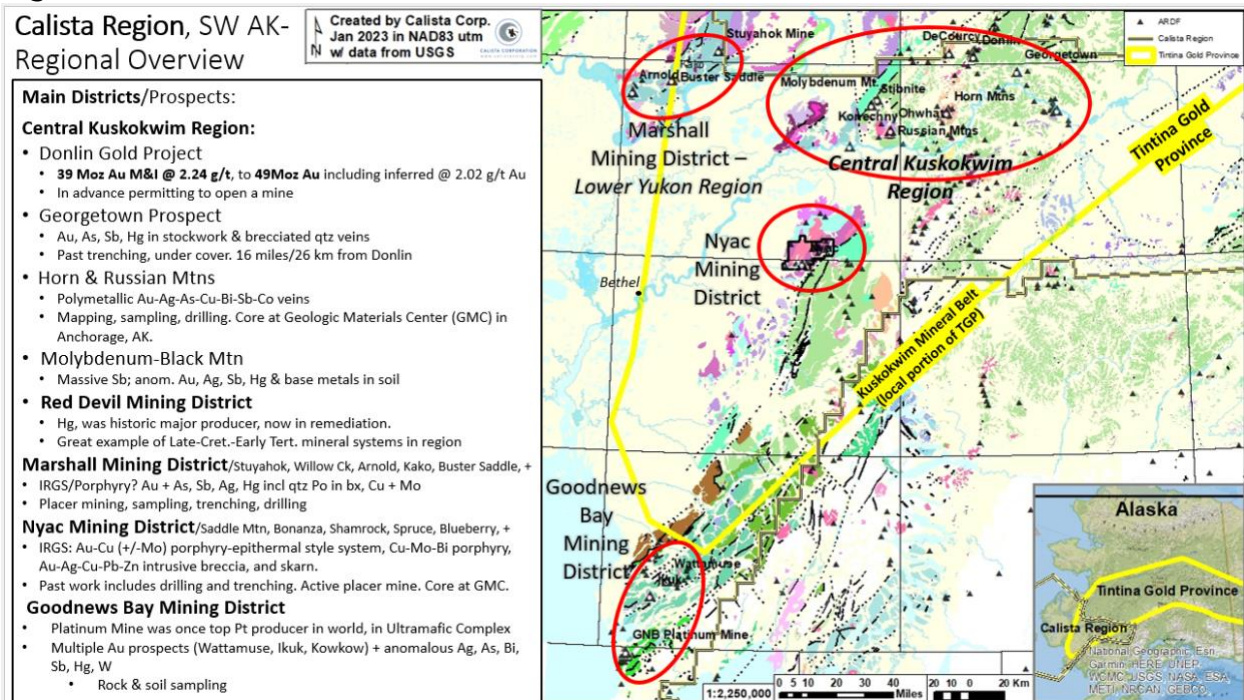


Figure 3

Endless “Blue Sky” in the Calista Region, Kuskokwim Mineral Belt of Tintina Gold Province

- Multiple Districts & Prospects for various commodities, many in current or historic placer mining districts in mining friendly jurisdictions.
- Underexplored regionally for lode sources- *where is the next Donlin?*
- Stable ANCSA land ownership with clear title.
- Rich source of historic data compiled in master database.
- Calista Corp. is an experienced, reasonable, low-risk lessee seeking partners for forming Exploration & Mining Lease Agreements.

For more information on partnership opportunities, please contact:

Varina Zinno, M.Sc., CPG , Senior Geologist at Calista Corp.

vzinno@calistacorp.com

More information on Calista’s mineral resources and available prospects is available at: <https://www.calistacorp.com/lands/maps-and-reports/>

The Oreo Mountain Porphyry Cu-Mo-Ag-Au Prospect, East-Central Alaska

David A. Hedderly-Smith, Ph.D., P.G., D.A. Hedderly-Smith & Associates

Introduction

The Oreo Mountain prospect is located about 25 kilometers (15 miles) northeast of the Alaska Highway (Alaska Highway 2) and about 55 kilometers (35 miles) east of Tok Junction, Alaska, on the southern side of the upper Ladue River at elevations ranging from about 600 to 950 meters (2000 feet to 3000 feet) (Figure 1). The prospect is entirely on State of Alaska land. The prospect's logistics are excellent; a road to the property down the upper Ladue River from the Alaska Highway would be about 20 miles (32 km) long, mostly along an existing and currently used right-of-way.

A Casino-analogue

Oreo Mountain is located about 320 kilometers (200 miles) northwest of the giant Casino porphyry deposit in the Yukon in very similar geologic terrain. Both Casino and Oreo sit astride strong local aeromagnetic highs which are part of a distinct northwesterly trend of aeromagnetics between the Denali and Tintina faults through the Yukon-Tanana Uplands. Both are also associated with strong northwesterly trending regional lineaments/faults identified in a UBC/MDRU metallogenic study. Both are associated with similar late Cretaceous calc-alkaline rocks intrusive into similar Paleozoic metamorphic country rocks.

The soil geochemistry of the two deposits is also very similar. While the soil surveys were conducted 50 years apart, both were sampled with hand augers. And although analytical techniques were different, anomaly levels are similar. The anomaly levels are slightly higher at Casino, but the Oreo Mountain soil anomaly area is twice as large. Both prospects are unglaciated and leached. Casino is unwooded and displays some outcrop; Oreo is totally covered by black spruce forested hills and tundra filled valleys with essentially no outcrop and only rare float.

Work by Kennecott in 2019 consisted of a six-week program with the drilling of six shallow HQ core holes stretching across 5 kilometers (3 miles) totaling 1061 meters (3481 feet). The holes were apparently located largely by copper soil geochemistry; the deepest T-D'd at 187 meters (618 feet). Copper and molybdenite mineralization were encountered in all six holes, but values were not overly impressive with significant intercepts only ranging up to 71 meters of 290 ppm Cu (Oreo 19-001), 66 meters of 190 ppm Mo & 12 meters of 391 ppm Mo (Oreo 19-003 & 003A) and 88 meters of 4 ppm Ag (Oreo 19-002). Oreo 19-001 was probably the best hole overall with analyses averaging 263 ppm Cu, 37 ppm Mo & 1.7 ppm Ag over its entire 166-meters. The lowest 47 meters of the hole averaged 322 ppm Cu & 44 ppm Mo, and the hole was T-D'd in a 477 ppm Cu & 57 ppm Mo sample. Kennecott dropped their Oreo option in late November 2019.

In 2021 the State published a 1:100,000-scale reconnaissance geologic map of the area surrounding the prospect.

Prospectors Tent

The property has never seen prospect-level geologic mapping or any ground geophysics (i.e., ground mag, IP/resistivity, CSAMT). Airborne geophysical surveys include fixed wing magnetic surveys by the State of Alaska in 1967 and by a private firm in 2008 and a helicopter-borne magnetometer/resistivity survey by the State in 2009. Work in 2023 focused on correlation among the airborne survey results, the geology as upgraded by the State in 2021, and the soil geochemistry (see Figures 2 & 3).

Summary

Oreo Mountain is a substantially underexplored very large Cu-Mo-Ag-Au porphyry system in a recognized porphyry terrain. The prospect has the potential to become a true world-class copper resource. It also has excellent logistics and local infrastructure and is situated in a very favorable jurisdiction.



Figure 1. Index map showing location of the Oreo Mountain prospect and several other prospects and mines in the Yukon-Tanana Uplands of Alaska and the Yukon.

Prospectors Tent

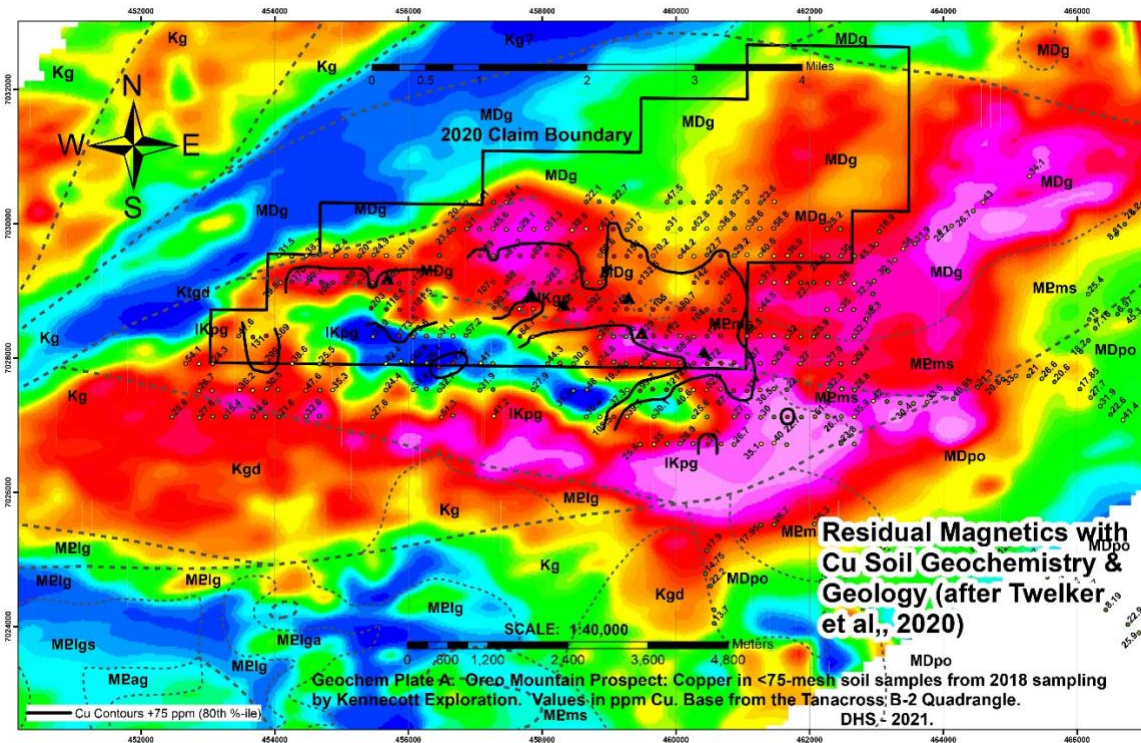


Figure 2. Oreo prospect area residual magnetics with +75 ppm soil Cu contour and DGGs geology.

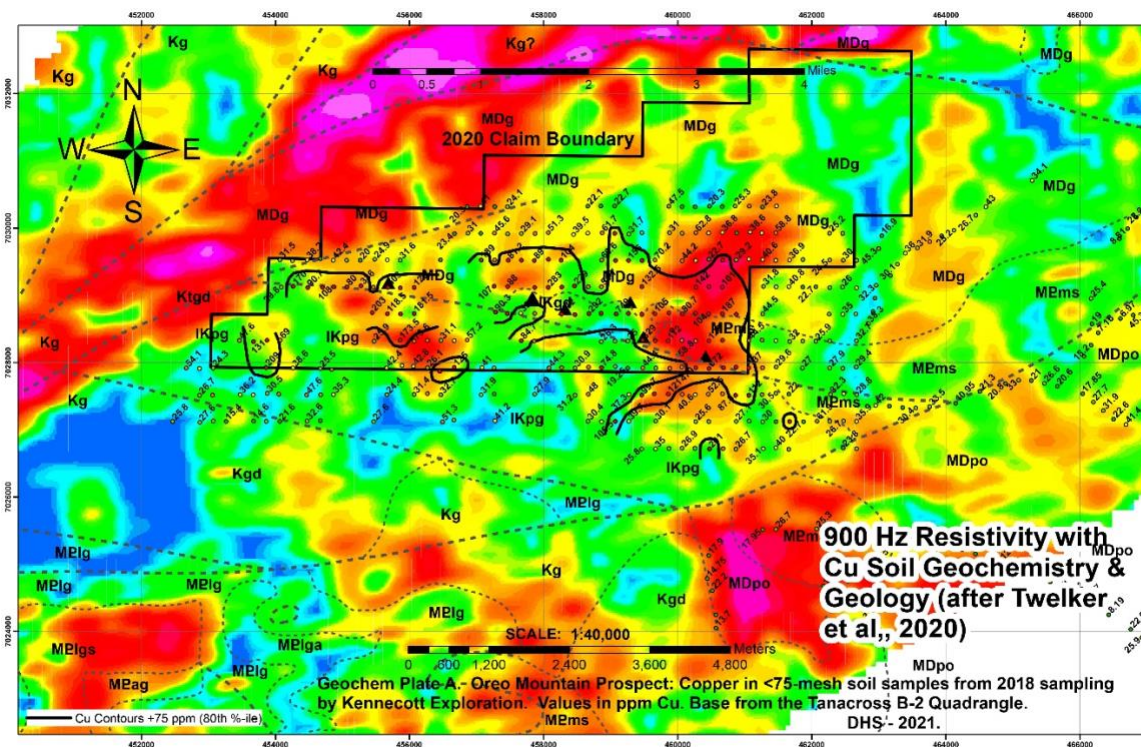


Figure 3. Oreo Mountain prospect area 900 Hz resistivity with +75 ppm soil Cu contours and DGGs geology.

POSTERS

Recovery of REEs From Coal Fly Ash Using Super Critical Fluid

Uthej Veerla, University of Alaska Fairbanks

The increasing demand for rare earth elements (REEs) as critical components in modern technologies has led to growing interest in their efficient recovery from alternative sources. Coal fly ash, a waste product generated from coal combustion, has been identified as a potential reservoir of valuable REEs with reported REE concentrations varying between 270 and 1480 ppm. In this research paper, we investigate the recovery of REEs from coal fly ash using environmentally benign supercritical fluid (SCF) carbon dioxide (CO₂). Additionally, the effect of tributyl phosphate (TBP) and nitric acid (HNO₃) as complexing agents is explored to enhance the extraction efficiency.

In recent years, Supercritical Fluid Extraction (SCFE) has become an increasingly popular method of metal extraction as a useful alternative to conventional solvent extraction methods. The advantage of this option over conventional solvent extraction methods includes minimization of liquid waste generation, solute separation, and rapid reaction rates. Supercritical fluids (SCFs) can penetrate and transport solutes from different matrices due to its high diffusivity, low viscosity, and liquid-like solvating. CO₂ provides a good option as an efficient solvent since it has the benefit of being easy to obtain and has a medium critical constant (T_c = 31.1°C and P_c = 7.38 MPa), as compared to other solvents. Additionally, CO₂ is inert and stable (chemically and radiochemically), inexpensive, easy to supply at high purity, and it is environmentally friendly and widely used.

The experimental work involved the optimization of process parameters, including temperature, pressure, and solvent-to-solid ratio, to ensure maximum REE recovery while minimizing environmental impact. The experimental results were compared with conventional extraction methods to evaluate the effectiveness of SCFs in REE recovery from coal fly ash. Moreover, the influence of TBP and HNO₃ on complex formation and separation efficiency was studied to devise a cost-effective and eco-friendly extraction process.

The findings of this study demonstrate that supercritical fluids, particularly CO₂ at different temperatures and pressure levels, exhibit promising capabilities in selectively extracting REEs from coal fly ash. The addition of TBP and HNO₃ further enhances the recovery efficiency and reduces the number of steps required to process the coal fly ash. The use of SCFs and green complexing agents reduces the generation of hazardous waste and ensures a more sustainable approach to REE extraction.

Posters

This research contributes valuable insights into the utilization of alternative resources for REE recovery, highlighting the potential of coal fly ash as a valuable source for these critical elements. The eco-friendly approach proposed in this study could significantly impact the REE extraction industry, paving the way for greener and more sustainable practices in the pursuit of rare earth element supply.

Fluid Inclusion Analysis of Auriferous Type 2 and Type 3 Veins Across the Estelle Pluton Complex

Elizabeth Freeman, and Dr. Claudia Cannatelli, University of Alaska Anchorage

The Estelle Gold Project is located approximately 150 km (93 miles) northwest of Anchorage in the Alaska Range and consists of twenty identified prospects. The current project is classified as a reduced intrusion-related gold system (RIRGS) which hosts primarily auriferous sheeted quartz veining. The north-south trending ore bodies consist of the Korbelt Main deposit which contains the bulk of the mineral resource with the higher-grade RPM deposit to the south. A 2011 ore characterization study conducted by Flagg (2014), suggests that two vein types are associated with mineralization, and three fluid inclusion assemblages (FIAs) were identified (Flagg, 2014). Fluid inclusions (FIs) are small droplets of fluid trapped in minerals during their growth or along fractures that develop and heal after the crystal has formed. (Randive et al., 2014). FIs represent an invaluable tool in mineral exploration due to their ability to provide constraints on temperature-pressure conditions and ore fluid genesis. The Crowe et al., (1991) study observed mineralized structures formed within the central portion of the pluton and formed during late magmatic or early hydrothermal stages as evident by the fluid inclusion assemblages that reflect high salinity (72.8-75.1 wt% NaCl+KCl) fluids (Crowe et al., 1991). In the most recent ore characterization study conducted on the Estelle property, Flagg (2014), concluded that the salinities observed in the samples of Korbelt (formally Oxide) and Discovery were much lower than reported by Crowe et al. (1991). The scope of this study aims to utilize FIAs to decipher and compare fluid compositions which will aid in defining the economic feasibility of additional prospects. The 2022-2023 Estelle drill program focused on increasing and proving the resource located on the Korbelt portion of the property and the further exploration of RPM South and Train. Using recently reported assay results, representative samples were selected for petrography, microthermometry, and geochemical analysis. These new drill cores offer a unique opportunity to continue vein analysis and characterization of associated fluid inclusion assemblages across the Estelle pluton complex.

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Adding Richer Mineral Industry Data To The Online Alaska Minerals Database

Chris Wyatt, Jen Athey, Mike Hendricks, Alaska Division of Geological & Geophysical Surveys

The Alaska Division of Geological & Geophysical Surveys (DGGs) is compiling more than 10 years of mineral industry reports, press releases, articles, images, and other digital data to be made available online through our now-published Alaska Minerals Database.

For more than one-third of a century, Alaska's Mineral Industry reports have been a primary source of information about Alaska's mineral resources. DGGs' annually published mineral industry-focused reports and presentations are important vehicles for demonstrating that Alaska has a diversity and significant quantity of mineral potential and a competitive investment climate. In 2023 the *Report of the Alaska Minerals Commission* again recognized DGGs' integral role in supporting and promoting the open-door policy of statewide minerals investment.

A recent addition to this effort, the Alaska Minerals Database provides access to information on all "significant" occurrences (mines, development projects, and exploration properties) in Alaska, including any known references to primary-commodity or by-product critical minerals. The significant occurrences were published by DGGs as an online map feature service in 2022, which marks the first authoritative Alaska geospatial dataset of this nature to become publicly available.

DGGs servers contain thousands of company reports, press releases, articles, images, and other files downloaded from company websites or donated by companies that describe Alaska's geologic resources. The files were compiled via DGGs' protocol to download important, ephemeral company documents in case the files become unavailable in the future, which frequently happens when companies drop or sell properties, go out of business, or simply update their website. DGGs is now working to tackle the organization of more than 10 years of digital files compiled in support of Alaska's Mineral Industry reports, with the critical goals of verifying file non-confidentiality, tying the files to occurrences in the now-published Alaska Minerals Database, and creating an application to make the files publicly accessible online.

Considerations for UAV-based Magnetometer Imaging in Alaska
Betsy Young & Bill Billmeier of Corax llc with cooperation from Alaska Range Resources LLC and Geometrics Inc.

Review of a 2023 UAV based magnetometer imaging project. We will include an overview of sensors on the market in terms of their capabilities in resolution and flight limits and capacities for exploration-specific imaging. Also included is comparison of datasets collected with different altitudes and flight patterns. Several Alaska-specific challenges and their cautions/solutions for this type of magnetometer data will be discussed as well as a review of costs and logistics.