Exploration and mining in the Northwest Region, British Columbia

Gordon Clarke[1, a]

[1] British Columbia Geological Survey, Ministry of Energy, Mines and Low Carbon Innovation, 300-865 Hornby Street, Vancouver, BC, V6Z 2G3
[a] corresponding author: Gordon.Clarke@gov.bc.ca

Recommended citation: Clarke, G., 2022. Exploration and mining in the Northwest Region, British Columbia. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Information Circular 2022-01, pp. 43-65.

1. Introduction

The Northwest Region includes about 263,000 km^2 of British Columbia, approximately 25% of the province (Fig. 1). The region has a long history of mining and is prospective for a wide range of commodities including precious metals, base metals, and coal. Exploration in the region is concentrated in a loosely defined area in the northern part of the region popularly known as the 'Golden Triangle'; several other projects were underway to the southeast. High metal prices in 2021 encouraged financing of many projects.

Estimates for exploration expenditures, drilling programs, and other metrics were captured in the British Columbia Mineral and Coal Exploration Survey, a joint initiative of the Province of British Columbia Ministry of Energy, Mines and Low Carbon Innovation, the Association for Mineral Exploration in British Columbia, and EY LLP. For the Northwest Region, exploration expenditures were estimated at $365.9 million and exploration drilling was estimated at 662,200 m (Clarke et al., 2022; EY LLP, 2022).

The Northwest Region contains two operating metal mines (**Brucejack** and **Red Chris**). The region also contains four proposed metal mines (**Dome Mountain**, **Galore Creek**, **KSM**, **Kutcho** and **Red Mountain**), and one proposed coal mine (**Tenas**). There is one mine development project (**Premier Gold**). Numerous early- to advanced-stage projects were tracked, and selected projects are discussed herein. Large industrial projects in the region are driving demand for aggregate, and placer gold mining continues throughout the region. Small-scale jade mining, both in situ and placer, has a long history in the region. However, in 2021 a provincial government Order in Council was announced restricting jade mining until at least May 11, 2023.

Noteworthy acquisitions, earn ins and proposed mergers were announced in 2021. The most significant was the offer by Newcrest Mining Limited to purchase Pretium Resources Inc. for approximately $3.5 billion. Newmont Corporation purchased GT Gold Corp. for an estimated $456 million. Assets included the Tatogga project's **Saddle North** deposit. Hochschild Mining PLC announced their intent to earn a 60% interest in the **Snip Gold** project from Skeena Resources Limited by spending approximately $100 million during the option period. Scottie Resources Corp. and AUX Resources Corporation amalgamated, which consolidated their advanced projects in the Stewart mining camp. Because of staffing shortages and protocols related to the Covid pandemic, laboratories had difficulty keeping up with the high volume of samples submitted by exploration companies, causing delays in the release of analytical results.

2. Geological overview

Metallogeny in British Columbia is intimately linked to the tectonic evolution of the Canadian Cordillera, first as an accretionary orogen consisting of allochthonous terranes that were welded to, and deformed with, the western margin of ancestral North America primarily during the Jurassic and then as the site of post-accretionary tectonism and magmatism (e.g., Nelson et al., 2013). The Northwest Region provides a transect across the Cordilleran orogen (Fig. 1) and from east to west it is underlain by: 1) autochthonous and parautochthonous carbonate and siliciclastic strata deposited on the flank of Ancestral North America (Laurentia); 2) the Intermontane terranes, including the Slide Mountain terrane (back-arc basin); the Yukon-Tanana terrane (a rifted Devonian pericratonic arc); the Quesnel and Stikine volcanic arc terranes (formed outboard of Ancestral North America starting in the Late Paleozoic and accreted in the Middle Jurassic); and the Cache Creek oceanic terrane, which intervenes between Quesnellia and Stikinia; 3) the Alexander terrane; 4) post-accretionary rocks; and 5) younger cover rocks. All of the allochthonous terranes initially accreted to each other and to western North America in the Jurassic. Since then, the mosaic has been intruded by post accretion plutonic suites and covered, in part, by Jurassic and younger syn- and post-accretionary siliciclastic deposits. For details about the geology, metallogeny, and tectonics of the Northwest Region see Nelson et al. (2013).

3. Mines and quarries

In 2021, two metal mines operated in the Northwest Region (**Brucejack** and **Red Chris)**. One industrial mineral mine and numerous aggregate operations supplied large-scale industrial

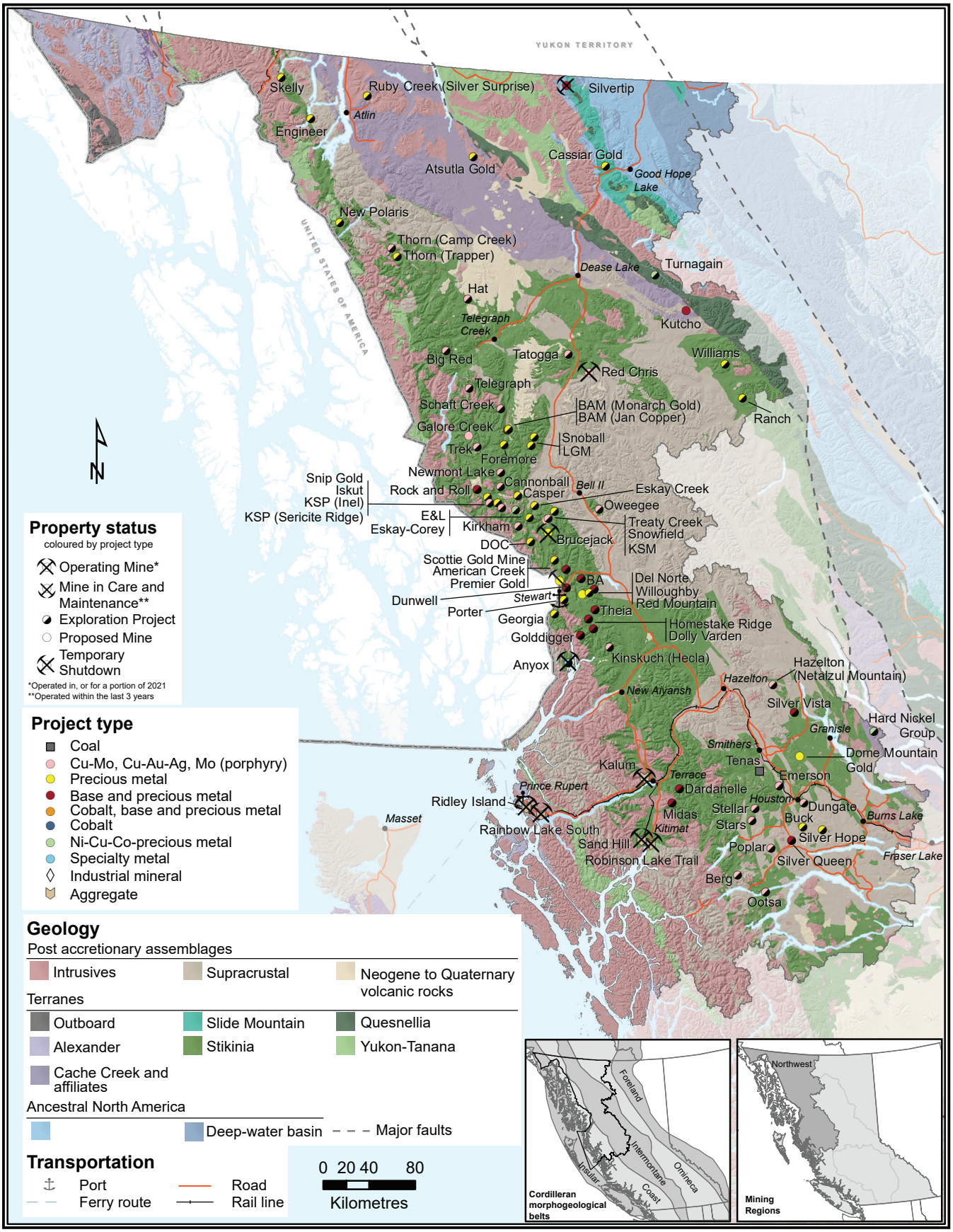

Fig. 1. Mines, proposed mines, and selected exploration projects, Northwest Region, 2021. Terranes after Nelson et al. (2013).

projects and local townships throughout the region (Fig. 1; Tables 1-2). Placer gold mining is ongoing, predominantly in the Atlin and Turnagain areas.

3.1. Metal mines

The **Brucejack** and **Red Chris** mines operated in 2021 (Fig. 1; Table 1).

3.1.1. Brucejack (Pretium Resources Inc.)

The **Brucejack** gold-silver mine operated throughout 2021. Access to the underground mine is via a 75 km all-season mining road off of Highway 37; the last 16 km is across a glacier. Power is supplied by a 57 km-long transmission line that was built specifically for the mine. Production for the first three quarters totalled 259,551 oz of Au at a head grade of 8.4 g/t Au and 347,956 oz Ag. The mill throughput in the first nine months of the year totalled 3735 tpd for a total of 1,019,563 t milled. As of January 1, 2021, Pretium reported Indicated and Measured mineral resources totalling 22.5 Mt grading 10.0 g/t Au and 67.5 g/t Ag, and Proven and Probable mineral reserves totalling 14.4 Mt grading 8.3 g/t Au and 63.8 g/t Ag.

The Brucejack ore body incorporates the Valley of the Kings (VOK) and West zones. Several other mineralized zones in phyllic-altered rocks extend across an area 5 by 1.5 km (from south to north: Bridge, Waterloo, Shore, SG, Gossan Hill, Golden Marmot, and Hanging Glacier). Interpreted as an intermediate-sulphidation epithermal gold-silver deposit, mineralized sheeted veins, breccia veins, and vein stockworks cut Lower Jurassic metasedimentary and volcanic rocks of the Hazelton Group. Gold and silver at both the VOK and West zones are mainly in electrum and lesser sulphosalts. Chalcopyrite, galena, and sphalerite are also common. Resource expansion underground diamond drilling was carried out north of the Valley of the Kings deposit in a new area referred to as the North Block zone. Numerous high-grade intersections were reported including: 1 m grading 2100.0 g/t Au; 12.0 m grading 80.7 g/t Au with a 1.0 m intersection grading 941.0 g/t Au; and 15.0 m grading 493.2 g/t Au, with a 1.0 m intersection

Table 1. Metal mines, Northwest Region.

Mine	Operator (partner)	Commodity; deposit type; MINFILE	Forecast 2021 Production (based on Q1-Q3)	Reserves	Resources	Comments
Brucejack	**Pretium Resources Inc.**	Au, Ag; Epithermal; 104B 193	346,000 oz Au 464,000 oz Ag	P+Pr: 14.4 Mt 8.3 g/t Au, 63.8 g/t Ag	M+I: 22.5 Mt 10.0 g/t Au, 67.5 g/t Ag Inf: 9.4 Mt 10.3 g/t Au, 44.3 g/t Ag	Discovered the new high grade North Block and Marmot zones. Results for the North Block zone included 12.0 m grading 80.7 g/t Au with a 1.0 m intersection grading 941.0 g/t Au. Results for the Marmot zone included 53.5 m grading 72.5 g/t Au, including 6700 g/t Au along 0.5 m. Newcrest Mining Limited makes an offer to purchase Pretium for approximately $3.5 billion.
Red Chris	**Newcrest Mining Ltd. (70%)**, Imperial Metals Corp. (30%)	Cu, Au, Ag; Hybrid calc-alkalic to alkalic porphyry; 104H 005	67.6 Mlbs Cu 62,100 oz Au	P+Pr: 301.5 Mt 0.36% Cu, 0.27 g/t Au	M+I: 980 Mt 0.38% Cu, 0.41 g/t Au Inf: 190 Mt 0.30% Cu, 0.31 g.t Au	Infill drilling beneath East Zone continued to intersect high-grade mineralization. Results included 198 m grading 0.89 g/t Au and 0.83% Cu, and 254 m grading 1.0 g/t Au and 1.1% Cu. A Prefeasibility Study confirmed a low cost, long life for a proposed block cave mining operation.

P = Proven; Pr = Probable; M = Measured; I = Indicated; Inf = Inferred

Table 2. Selected industrial mineral and aggregate mines and quarries, Northwest Region.

Mine	Operator (partner)	Commodity; deposit type; MINFILE	Forecast 2021 Production (based on Q1-Q3)	Reserves	Resources	Comments
Anyox	**Tru-Grit Abrasives**	Slag Steel	unknown	na	na	Slag is mined, cleaned, and barged for roofing and sand for sand blasting.
Kalum	**Kalum Quarry Ltd.**	Industrial rock; Crushed rock	unknown	na	na	Drilling, blasting, crushing, production for CN Railway and others.
Rainbow Lake South	**Spring Creek Aggregates Ltd.**	Industrial rock; Crushed rock	unknown	na	na	Drilling, blasting, crushing, production for CN Railway and LNG projects.
Ridley Island	**Terus Construction Ltd.**	Industrial rock; Crushed rock	unknown	na	na	Drilling, blasting, crushing, production for CN Railway and LNG projects.
Robinson Lake Trail	**Haisla & Progressive Ventures Construction Ltd.**	Industrial rock; Crushed rock	unknown	na	na	Drilling, blasting, crushing, production for CN Railway and LNG projects.
Sand Hill	**Terus Construction Ltd.**	Industrial rock; Crushed rock	unknown	na	na	Crushing for CN Railway and LNG projects.

P = Proven; Pr = Probable; M = Measured; I = Indicated; Inf = Inferred

grading 7360 g/t Au. A new high-grade discovery was made in exploration drilling 3.5 km north of the mine at the Marmot zone. Highlights included intersections of 53.5 m grading 72.5 g/t Au, including 6700 g/t Au along 0.5 m, 5.8 m grading 46.1 g/t Au, and 38.0 m grading 22.8 g/t Au.

3.1.2. Red Chris (Newcrest Mining Ltd. 70% and Imperial Metals Ltd. 30%)

The **Red Chris** open-pit copper-gold mine is 17 km east-southeast of the community of Iskut. The Northwest Transmission Line powers the site, and access is from Highway 37. Production to the end of the third quarter of 2021 totalled 46,550 oz Au and 50.7 Mlbs Cu. A new mineral resource estimate was released with 980 Mt of Measured and Indicated, grading 0.41 g/t Au, 0.38% Cu, and 190 Mt of Inferred, grading 0.31 g/t Au, 0.30% Cu.

The deposit is hosted by the Red stock (U-Pb zircon 203.8 Ma; Rees et al., 2015), which intrudes and alters Upper Triassic Stuhini Group rocks, and is faulted against Middle Jurassic rocks of the Bowser Lake Group. Rees et al. (2015) described multiple igneous phases, alteration, and controls on mineralization.

A Prefeasibility Study confirmed a low cost, long life for a proposed block cave mining operation. Diamond drilling near the ore body discovered new zones of high-grade mineralization. Results included 198 m grading 0.89 g/t Au, and 0.83% Cu, and 254 m grading 1.0 g/t Au and 1.1% Cu. Further studies were ongoing to assess opportunities close to the mine.

3.2. Coal mines

In 2021, no coal mines operated in the Northwest Region; the **Tenas** project is listed below as a proposed mine.

3.3. Industrial mineral mines and quarries

Tru-Grit Abrasives (Fig. 1; Table 2) is recycling the slagheap at the historic **Anyox** site, where slag was created from smelting copper. The slag is mined, cleaned, separated, and barged south for roof shingles and sand blasting; the material is also used to add iron into Portland cement. The operation has been active for more than 30 years and more than 2.5 Mt has been reclaimed from the 4.5 Mt abandoned by smelting operations in the 1930s.

3.4. Aggregate and industrial rock quarries

Numerous aggregate and quarry operations supply sand and gravel and blasted stone for large-scale industrial projects and towns throughout the region (Fig. 1; Table 2). Several large aggregate pits operate near Kitimat (**Robinson Lake Trail**

and **Sand Hill**) and others operate near Prince Rupert (**Ridley Island** and **Rainbow Lake South**). Owned by the Kitsumkalum First Nation's, **Kalum** is an industrial rock quarry. It is the only pit in the region with a rail spur, and it supplies the Canadian National Railway Company with ballast.

4. Placer operations

Placer gold mining operations have been ongoing for more than a century in the Northwest Region and continue today with a focus in the Atlin and Turnagain areas and, to a lesser extent, north of Dease Lake and near Cassiar. Due to the large number of operations and difficulty in obtaining information, these projects are not tracked.

5. Mine development

When a project acquires the necessary permits (Mines Act permit from the Ministry of Energy, Mines and Low Carbon Innovation and an Environmental Management Act permit from the Ministry of Environment) and secures the working capital to begin mine construction, the mine development stage is reached. The Northwest Region has one mine development project (Fig. 1; Table 3).

5.1. Premier Gold (Ascot Resources Ltd.)

In early December, Ascot Resources Ltd. received a Mines Act permit for construction and operation of their **Premier Gold** mine project. Ascot reported planning for the transition from early works to full-scale construction. The target date for initial gold production is Q1 2023. Ascot also carried out 18,074 m of exploration drilling near existing defined resources. The proposed mine is considered a precious metal project, but the company reported discovering new high-grade copper, gold, silver, lead, and zinc mineralization. Highlight intersections included 4.0 m grading 0.17 g/t Au, 137.8 g/t Ag, 3.62% Cu, and 0.65% Zn, and 7 .0 m grading 21.13 g/t Au, 110.61 g/t Ag, 2.76% Pb, and >17.14% Zn, and 7.1 m grading 36.2 g/t Au.

The **Premier** underground mine operated between 1918 and 1952 and was one of the largest gold mines in North America, producing 2 Moz Au and 45 Moz Ag. Mineralization is hosted by andesitic tuffs, lapilli tuffs, and andesitic flows of the Unuk River Formation (Hazelton Group) that are cut by early Jurassic calc-alkaline plutons of the Texas Creek suite. Electrum is the principal gold-bearing mineral and is in quartz breccias, veins, and stockworks generally surrounded by an alteration envelope of quartz-sericite-pyrite. Base metal mineralization, as sphalerite and galena associated with argentite and freibergite, is also in quartz veins. The nature of mineralization and metal composition suggest an intermediate-sulphidation epithermal genesis.

6. Proposed mines or quarries

Proposed mines are feasibility-stage projects for which proponents have begun or completed the environmental certification process (generally for late-stage projects) or have submitted or received approvals for Mines Act permits (for

Table 3. Mine development projects, Northwest Region.

Project	Operator (partner)	Commodity; deposit type; MINFILE	Reserves	Resources	Comments
Premier Gold	**Ascot Resources Ltd.**	Au, Ag; Epithermal; 104B 054	P+Pr: 3.63 Mt 5.45 g/t Au, 19.11 g/t Ag	I: 4.14 Mt 8.01 g/t Au, 35.1 g/t Ag Inf: 5.06 Mt 7.25 g/t Au, 28.7 g/t Ag	Received a Mines Act permit for construction and operation in December. Plan to transition from early works to full-scale construction. The target date for initial gold production is Q1 2023. Carried out 18,074 m of exploration drilling near existing defined resources. The proposed mine is considered a precious metal project, but the company reported discovering new high-grade copper, gold, silver, lead, and zinc mineralization. Highlight intersections included 4.0 m grading 0.17 g/t Au, 137.8 g/t Ag, 3.62% Cu, and 0.65% Zn, and 7.0 m grading 21.13 g/t Au, 110.61 g/t Ag, 2.76% Pb, and >17.14% Zn, and 7.1 m grading 36.2 g/t Au.

P = Proven; Pr = Probable; M = Measured; I = Indicated; Inf = Inferred

projects below British Columbia Environmental Assessment Act thresholds). The Northwest Region contains five proposed metal mines and one proposed coal mine (Fig. 1; Table 4).

6.1. Proposed metal mines

The Northwest Region contains five proposed metal mines. **Galore Creek**, **KSM** and **Red Mountain** have been granted an Environmental Assessment Certificate and the **Kutcho** project has begun the environmental assessment process with the Environmental Assessment Office. The **Dome Mountain Gold** project has both an Environmental Management Act Permit and a Mining Permit, providing for an annual production of up to 75,000 t.

6.1.1. Dome Mountain Gold (Blue Lagoon Resources Inc.)

The **Dome Mountain Gold** project contains an Indicated resource of 175,980 t grading 12.45 g/t Au, 60.41 g/t Ag and an Inferred resource of 408,105 t grading 8.32 g/t Au, 36.12 g/t Ag

Table 4. Selected proposed mines, Northwest Region.

Project	Operator (partner)	Commodity; deposit type; MINFILE	Reserves	Resources	Comments
Dome Mountain	**Blue Lagoon Resources Inc.**	Au, Ag; Au-quartz veins; 093L 276	na	I: 176,000 t 12.45 g/t Au, 60.41 g/t Ag Inf: 408,000 t 8.32 g/t Au, 36.12 g/t Ag (resource based on cut and fill method at 3.42 g/t Au cut-off)	20,000 m of drilling. Highlights include 3.0 m grading 24.07 g/t Au and 127.92 g/t Ag, and 4.13 m grading 11.08 g/t Au and 34.39 g/t Ag.
Galore Creek	**Galore Creek Mining Corp. (Teck Resources Ltd. 50%, Newmont Corporation 50%)**	Cu, Au, Ag; Alkaline porphyry; 104G 090	P+Pr: 528 Mt 0.59% Cu, 0.32 g/t Au, 6.02 g/t Ag	M+I: 1.103 Bt 0.47% Cu, 0.26 g/t Au, 4.2 g/t Ag Inf: 198 Mt 0.27% Cu, 0.21 g/t Au, 2.7 g/t Ag	8000 m, 31-hole diamond drilling.
KSM	**Seabridge Gold Inc.**	Cu, Au, Ag, Mo; Porphyry Cu±Mo±Au; 104B 191	P+Pr: 2.20 Bt 0.55 g/t Au, 0.21% Cu, 2.6 g/t Ag, 42.6 g/t Mo	M+I: 3.04 Bt 0.52 g/t Au, 0.21% Cu, 2.8 g/t Ag, 48 g/t Mo Inf: 4.60 Bt 0.38 g/t Au, 0.32% Cu, 2.2 g/t Ag, 29 g/t Mo (Total for KSM deposits)	9450 m of drilling including 3484 m at Snowfield and Mitchell deposits. In late 2020, Snowfield acquired from Pretium Resources Inc. Results from Snowfield confirm prior drilling results; Snowfield might be incorporated in a new mining plan.
Kutcho	**Kutcho Copper Corp.**	Cu, Pb, Zn; Noranda/Kuroko VMS; 104I 060	Pr: 17.3 Mt 1.58% Cu, 2.31% Zn, 27.9 g/t Ag, 0.39 g/t Au	M+I: 22.8 Mt 1.52% Cu, 2.18% Zn, 0.39 g/t Au, 28.1 g/t Ag Inf: 12.9 Mt 1.10% Cu, 1.58% Zn, 0.25 g/t Au, 20.0 g/t Ag	Favourable feasibility study released. The project would have an eleven-year open pit and underground mine life.
Red Mountain	**Ascot Resources Ltd.**	Au, Ag; Subvolcanic and precious metal veins; 103P 086	P+Pr: 2.54 Mt 6.52 g/t Au, 20.60 g/t Ag	M+I: 3.19 Mt 7.63 g/t Au, 21.02 g/t Ag Inf: 0.41 Mt 5.32 g/t Au, 7.33 g/t Ag	Environmental baseline monitoring.
Tenas	**Allegiance Coal Ltd. 95%**, Itochu Corp. 5%	PCI; Bituminous coal; 093L 156	P+Pr: 62.9 Mt coal	na	Geotechnical drilling, continued finalizing Environmental Assessment Certificate application. Proposed production 775-825 kt of steelmaking coal annually with a mine-life of 22 years.

P = Proven; Pr = Probable; M = Measured; I = Indicated; Inf = Inferred
HCC = hard coking coal; PCI = pulverized coal injection; TC = thermal coal

(with a cut and fill method at 3.42 g/t Au cut-off). The company entered into a milling agreement with Nicola Mining Inc. in which ore will be trucked for processing at a mill west of Merritt.

Orogenic gold-silver mineralization is mainly in two zones (the Boulder vein and Argillite vein systems) in fragmental volcanic rocks of the Telkwa Formation and basalts and altered volcanic rocks of the Nilkitkwa Formation. In addition to the larger vein systems, more than a dozen other mineralized veins are on the property, mostly striking east-west and northwest-southeast. Veins (0.7 to 4.5 m wide) contain quartz±calcite±ankerite with lesser sulphide mineralization. Alteration, consisting of abundant carbonate-sericite-pyrite, envelopes veins and is positively correlated with gold.

Blue Lagoon carried out a 20,000 m diamond drilling program. The first phase tested deep targets and results included 3.0 m grading 24.07 g/t Au and 127.92 g/t Ag, and 4.13 m grading 11.08 g/t Au and 34.39 g/t Ag. The second phase targeted geophysical and geochemical anomalies. Results included 0.65 m grading 40 g/t Au, and 441 g/t Ag.

6.1.2. Galore Creek (Galore Creek Mining Corporation)

The **Galore Creek** Cu-Au project is operated by the Galore Creek Mining Corporation and is jointly owned by Teck Resources Limited and Newmont Corporation. The project is 70 km west of the Bob Quinn airstrip adjacent to Highway 37, where a mine access road has been partially constructed.

The Galore Creek alkalic complex includes multiphase syenite, monzonite, and monzodiorite dikes and stocks that cut volcanic and sedimentary rocks of the Stuhini Group. Mineralization is thought to be at the endmember of the silica-undersaturated porphyry Cu-Au deposit type. At the Central zone (the principal economic resource) initial potassic alteration and gold-copper and sulphide mineralization formed from highly oxidized fluids. Hydrothermal processes during the second period generated calcic alteration and brecciation, followed by potassic alteration and mineralization of bornite and chalcopyrite (Micko et al., 2014).

The Galore Creek project contains a Proven and Probable reserve of 528 Mt grading 0.59% Cu, 0.32 g/t Au, and 6.02 g/t Ag and a Measured plus Indicated resource of 1.103 Bt grading 0.47% Cu, 0.26 g/t Au, and 4.2 g/t Ag, with an additional Inferred resource of 198 Mt grading 0.27% Cu, 0.21 g/t Au, and 2.7 g/t Ag. An 8000 m, 31-hole diamond drilling program was carried out in 2021.

6.1.3. KSM (Seabridge Gold Inc.)

The **KSM** project consists of four porphyry Cu-Au deposits: Kerr, Sulphurets, Mitchell, and Iron Cap. It is the largest undeveloped gold project in the world by resources: Measured and Indicated resources 3.04 Bt grading 0.52 g/t Au, 0.21% Cu, 2.8 g/t Ag, and 0.0048% Mo and an Inferred resource of 4.59 Bt grading 0.38 g/t Au, 0.32% Cu, 2.4 g/t Ag, and 0.0029% Mo. The total KSM Proven and Probable reserves are 2.198 Bt grading 0.55 g/t Au, 0.21% Cu, 2.6 g/t Ag and 0.0043% Mo. A Preliminary Economic Assessment (April, 2020) proposed a mine life of 44 years producing 27.6 Moz Au and 17.0 Blbs Cu. The initial capital for mine construction and development is $5.2 billion, with a four-year payback period. In late 2020, Seabridge acquired the **Snowfield** property from Pretium Resources Inc. Seabridge has announced plans to integrate Snowfield into the KSM project. In 2021, Seabridge carried out 9450 m of drilling, including 3484 m at Snowfield and Mitchell. Drilling results at Snowfield matched grades previously reported by Pretium, suggesting that blending Snowfield ore with Mitchell production could lead to extension of open pit mining before underground block-cave mining is needed. A new KSM Preliminary Feasibility Study is scheduled for completion mid-2022.

KSM is part of the Sulphurets district, which contains abundant porphyry Cu-Au and related systems along a 200 km-long north-northwest trending corridor in northwestern Stikinia (Febbo et al., 2019). Four phases of calc-alkaline porphyry Cu-Au-Mo mineralization at KSM are genetically related to dioritic intrusions of the Sulphurets suite (Febbo et al., 2015), with the deposits distributed along a 12 km-long north-striking linear array. The intrusions cut volcanosedimentary rocks of the Stuhini Group (Upper Triassic) and sandstones, conglomerates, and andesitic rocks of the Jack Formation, a basal unit of the Hazelton Group (Upper Triassic to Lower Jurassic). Mineralization is disseminated in sheeted quartz veinlets and clustered quartz-vein stockworks and is open at depth.

6.1.4. Kutcho (Kutcho Copper Corp.)

The **Kutcho** project is accessible by a 100 km-long seasonal gravel road and an airstrip 10 km from the deposit. Kutcho Copper Corp. entered the environmental assessment process late in 2019 and has received a Section 11 Order that defines the scope of the assessment and the Indigenous Nations that the company will engage with. The project is not required to undertake a federal environmental assessment.

The project includes three main zones: Main, Esso, and Sumac. Considered to be Kuroko-type volcanic massive sulphides, the Cu-Zn-Au-Ag deposits are in felsic and largely fragmental volcanic rocks in the upper part of the Kutcho Formation, a Permian-Triassic unit of bimodal volcanic rocks.

A 2021 Feasibility Study announced favourable economics using US$3.50/lb Cu and US$1.15/lb Zn. The project would have an eleven-year open pit and underground mine life. Reported Proven and Probable mineral reserves are 17.3 Mt grading 1.58% Cu, 2.31% Zn, 27.9 g/t Ag, 0.39 g/t Au. Mineral resources Measured and Indicated (inclusive of reserves) are reported as 22.8 Mt grading 1.52% Cu, 2.18% Zn, 28.1 g/t Ag, 0.39 g/t Au.

6.1.5. Red Mountain (Ascot Resources Ltd.)

Red Mountain is a proposed underground mine 18 km east-northeast of Stewart. The deposit was first discovered in 1989 and has been extensively explored since, with 466 diamond-drill holes and more than 2000 m of underground

development. A provincial and federal Environmental Assessment Certificate was received in 2018. The project was purchased by Ascot Resources from IDM Mining in 2019 for $45 million. A Feasibility Study was completed in 2020. Red Mountain is estimated to contain Measured and Indicated resources of 3.19 Mt grading 7.63 g/t Au and 21.02 g/t Ag and an additional Inferred resource of 405,000 t grading 5.32 g/t Au and 7.33 g/t Ag (reported at 3.0 g/t Au cut-off for long hole stoping).

The property is underlain by Upper Triassic-Lower Jurassic metasedimentary and volcanic rocks that were intruded by a multi-phased intermediate intrusive complex. Gold is in pyrite-rich brecciated bodies and stockworks along the margins of the intrusive rocks, with low-temperature quartz-sericite-pyrite (phyllic) alteration containing high-grade gold and high-temperature K-feldspar alteration.

Environmental baseline monitoring continued this year, although no exploration work was done as Ascot concentrated on developing their Premier Gold project.

6.2. Proposed coal mines

There is currently one proposed coal mine, Allegiance Coal Limited's **Tenas** project.

6.2.1. Tenas (Allegiance Coal Ltd. 90%, Itochu Corp. 10%)

Telkwa Coal Ltd., a subsidiary of Allegiance Coal Ltd., is proposing to develop the **Tenas** project, which is road accessible, approximately 17 km south of Smithers. The project entered the provincial environmental assessment process in 2018 and the project proposes to produce approximately 775,000-825,000 t of steelmaking coal annually with a mine-life of 22 years. In 2017, Allegiance Coal Ltd. released a reserve estimate of Proven plus Probable reserves of 62.9 Mt of coal.

At least 14 coal seams have been recognized in the Skeena Group (Lower-Upper Cretaceous) with individual seams up to 7.6 m thick. Currently there are four conceptual pits (from south to north: Tenas, Goathorn West, Goathorn East, and Telkwa North) on approximately 1050 ha. The current environmental assessment application is only for production of metallurgical coal from the Tenas pit. Proven plus Probable reserves for Tenas are 29.1 Mt. In 2021, Telkwa carried out geotechnical drilling to support the planned management ponds and continued finalizing their environmental assessment certificate application.

7. Selected exploration activities and highlights

Exploration projects are described on a continuum from early to advanced stages. The earliest stages are considered grassroots. Typically, where the collection of rock and soil samples are collected for geochemical analysis, commonly in conjunction with regional mapping and geophysical surveys. This preliminary work is predominantly benign and is used to generate targets to test, usually by drilling. At these early stages it is a common practice to establish base-line environmental testing and engage with communities and First Nations. As a project progresses, drilling may delineate a mineral resource and establish baseline economics. Later stages of exploration generally coincide with mine evaluation, feasibility, and economic studies, which include environmental, social, engineering, and financial considerations.

7.1. Selected precious metal projects

The Northwest Region has numerous precious metal projects (Fig. 1; Table 5), many of which are in the area popularly known as the Golden Triangle.

7.1.1. Atsutla Gold (Trailbreaker Resources Ltd.)

The **Atsutla Gold** project is 70 km south of the British Columbia-Yukon border and 120 km northwest of Dease Lake. Sampling identified multiple high-grade gold zones and drilling is planned for 2022. Rock sample results include 222.05 g/t Au and 165.4 g/t Au with 1894 g/t Ag.

7.1.2. BAM (Monarch Gold) (P2 Gold Inc.)

P2 Gold Inc. drilled six holes totalling 835.9 m at their **BAM** project about 150 km northwest of Stewart. Four of the six holes were drilled at the **Monarch Gold** zone. Results included 45.85 m grading 2.63 g/t gold, including 9.2 m grading 7.3 g/t Au. A 2022 exploration program is financed, and planned work includes a ZTEM airborne survey and 8000 to 10,000 m of diamond drilling.

7.1.3. Buck (Sun Summit Minerals Corp.)

Sun Summit Minerals Corp. is exploring the 15,000 ha **Buck** property, which lies on an all-season access road 12 km south of Houston. The property is underlain by andesitic to rhyolitic tuffs, flows, and breccias of the Hazelton Group (Upper Triassic to Lower Jurassic). Sulphides are in veinlets, disseminations, or coarse fracture fillings, mainly in rhyolitic breccias. Sun Summit carried out more than 10,000 m of drilling in 50 holes targeting high-grade and bulk tonnage gold mineralization across an area of more than 500 by 500 m. The drilling was to follow up on a 2020 discovery hole that intersected 17 m grading 5.86 g/t Au. Initial assay results indicated both high-grade and bulk tonnage mineralization. Results included 4.0 m grading 31.6 g/t Au and 109 m grading 1.07 g/t Au.

7.1.4. Casper (Garibaldi Resources Corp.)

Garibaldi Resources Corp.'s **Casper** target is a quartz vein gold system. Initial drilling results in 2020 included 0.72 m grading 9.1 g/t Au and 4.0 m grading 8.89 g/t Au. This year, Garibaldi followed up with a fall drilling program totalling 1152 m in five holes.

7.1.5. Cassiar Gold (Cassiar Gold Corp.)

Cassiar Gold Corp. expected to complete up to 14,000 m of diamond drilling at their **Cassiar Gold** project. At the Taurus deposit 4000 m of drilling was completed; at the Cassiar South target drilling was ongoing. Results from the Taurus deposit included 23.2 m grading 3.56 g/t Au, 13.1 m grading

Table 5. Selected Exploration projects, Northwest Region.

Project	Operator (partner)	Commodity; Deposit type; MINFILE	Resources (NI 43-101 compliant unless indicated otherwise)	Comments
American Creek	**Mountain Boy Minerals Ltd.**	Ag, Pb, Zn, Au; Polymetallic veins; 104A 011	na	866 m of drilling at High-Grade zone. Results included 3.9 m grading 24.61 g/t Ag, 0.020 g/t Au, 0.085% Cu, 2.15% Pb, and 2.19% Zn.
Atsutla Gold	**Trailbreaker Resources Ltd.**	Au, Ag; Polymetallic veins; 104O 007	na	Sampling identified high-grade zones. Rock sample results include 222.05 g/t Au and 165.4 g/t Au with 1894 g/t Ag.
BA	**Mountain Boy Minerals Ltd.**	Ag, Cu, Pb, Zn; Subaqueous hot spring Ag-Au; 104A 180	na	650 m of drilling tested northern extension of Barbara zone. Results included 7.67 m grading 38.06 g/t Ag, 0.013% Cu, 0.86% Pb, 2.67% Zn, and 1.09 m grading 84.66 g/t Ag, 0.017% Cu, 3.76% Pb, 6.30% Zn.
BAM (Jan Copper)	**P2 Gold Inc.**	Cu, Au; Epithermal Au-Ag-Cu	na	Two holes drilled. Results included 39.25 m grading 0.01 g/t Au, 1.10% Cu including 9.15 m grading 0.04 g/t Au, and 3.23% Cu.
BAM (Monarch Gold)	**P2 Gold Inc.**	Au; Epithermal Au-Ag-Cu	na	Four holes drilled. Results included 45.85 m grading 2.63 g/t Au, including 9.2 m grading 7.3 g/t Au.
Berg	**Surge Copper Corp.**	Cu, Mo, Ag; Porphyry Cu±Mo±Au; 093E 046	M+I: 610 Mt 0.27% Cu, 0.03% Mo, 3.0 g/t Ag Inf: 28.1 Mt 0.22% Cu, 0.02% Mo, 3.8 g/t Ag	Released an updated NI 43-101 resource estimate. Fall diamond drilling was expected to total 4500 m.
Big Red	**Libero Copper & Gold Corp.**	Cu, Au; Alkalic porphyry; 104G 208	na	4571 m of drilling at Terry porphyry target. Results included 118.7 m grading 0.26% Cu, 0.06 g/t Au, and 1.83 g/t Ag within 510.0 m grading 0.18% Cu, 0.04 g/t Au, and 1.23 g/t Ag.
Buck	**Sun Summit Minerals Corp.**	Au, Ag, Zn, Pb, Cu; Polymetallic veins; 093L 009	na	17,464 m of drilling. Results included 4.0 m grading 31.6 g/t Au and 109 m grading 1.07 g/t Au.
Cannonball	**Goldrea Resources Corp.**	Cu, Au; Alkalic porphyry	na	IP survey and prospecting.
Casper	**Garibaldi Resources Corp.**	Au; Precious metal veins		1152 m of drilling.
Cassiar Gold	**Cassiar Gold Corp.**	Au; Precious metal veins; 104P 012, 19	Inf: 21.83 Mt 1.43 g/t Au (0.7 g/t Au cut-off)	14,000 m of drilling. Results from Taurus included 23.2 m grading 3.56 g/t Au, 13.1 m grading 3.53 g/t Au, and 37.8 m grading 1.8 g/t Au. Results from Cassiar South included 4.8 m grading 35.1 g/t Au and 6.4 m grading 12.6 g/t Au.

Table 5. Continued.

Dardanelle	**Decade Resources Ltd.**	Au, Ag, Pb; Polymetallic veins; 103I 107	na	Grab samples returned high-grade results including 695.6 g/t Au, 206 g/t Ag, 2.3% Pb and 102.9 g/t Au, 112.0 g/t Ag, 3.42% Pb.
Del Norte	**Decade Resources Corp.**	Au, Ag; Polymetallic veins; 103P 301	na	4147 m of drilling. Partial assay highlight results included 3.05 m grading 13.77 g/t Au, and 2661 g/t Ag within 9.91 m grading 4.28 g/t Au, and 1091.6 g/t Ag.
DOC	**Hanstone Gold Corp.**	Au, Ag; Intrusion-related, mesothermal; 104B 014	na	2700 m drilling. Two shallow small diameter backpack holes returned gold grades of 12 g/t Au in one hole and 10 g/t Au in the other along 1 m of core. Bulk sampling: 1 t from Q19 vein; 1 t sample from TRJC vein.
Dolly Varden	**Dolly Varden Silver Corporation**	Cu, Pb, Zn, Ag, Au; Kuroko VMS with polymetallic veins; 103P 188	I: 3.42 Mt 299.8 g/t Ag Inf: 1.29 Mt 277.0 g/t Ag	10,506 m of drilling. Early results included 1532 g/t Ag, 0.44 g/t Au, 2.11% Pb, and 1.07% Zn along 1.22 m core length in a brecciated sulphide-rich quartz vein hosted in a broader pyrite stockwork breccia zone of 17.50 m grading 214 g/t Ag, and 0.47% Pb.
Dungate	**Edgemont Gold Corp.**	Cu, Au; Porphyry Cu±Mo±Au; 093L 010	na	3429 m of drilling. Six of the seven holes intersected sulphide-mineralized porphyry.
Dunwell	**Stinger Resources Inc.**	Au, Ag; Polymetallic veins; 103P 052	na	Diamond drilling, reported assays included 0.35 m grading 12.7 g/t Au, and 35.7 g/t Ag, 2.21 m grading 4.0 g/t Au, and 38.1 g/t Ag, and 1.64 m grading 2.3 g/t Au, and 60.3 g/t Ag.
E&L	**Garibaldi Resources Corp.**	Ni, Cu, Co, Pt, Pd, Au; Tholeiitic intrusion hosted; 104B 006	na	Planned drilling cancelled because of weather.
Emerson	**Harvest Gold Corporation**	Cu, Au, Mo; Porphyry Cu±Mo±Au	na	Airborne magnetic survey, near surface Rotary Air Blast (RAB) drilling, and a ground 3D IP survey. The IP survey outlined a chargeability high anomaly 1000 by 1800 m in plan and 300 m thick, dipping gently to the south. The IP anomaly coincides with quartz-sericite pyrite alteration identified in the RAB drilling.
Engineer	**Engineer Gold Mines Ltd.**	Au, Ag; Epithermal; 104M 014	Inf: 41,000 t 19.0 g/t Au	Began drilling water monitoring wells to support an application to complete a 10,000 t bulk sample.

Table 5. Continued.

Eskay Creek	**Skeena Resources Limited**	Au, Ag, Cu, Pb, Zn; VMS and precious metal veins; 104B 008	I: 12.7 Mt 4.3 g/t Au, 110 g/t Ag (pit constrained) Inf: 14.4 Mt 2.3 g/t Au, 47 g/t Ag (pit constrained) I: 819,000 t 6.4 g/t Au, 139 g/t Ag (underground) Inf: 295,000 t 7.1 g/t Au, 82 g/t Ag (underground)	4375 m of drilling in the spring. Results included 8.20 m grading 3.99 g/t Au and 71 g/t Ag. 35,000 m drill program started in late summer. 116 km of soil sampling. Positive Prefeasibility Study released. Drilling of historic waste pile returned results including 22.80 m grading 4.16 g/t Au, and 204 g/t Ag and 16.77 m grading 5.90 g/t Au and 317 g/t Ag.
Eskay-Corey	**Eskay Mining Corp. (80%)** and Kirkland Lake Gold Ltd. (20%)	Au, Ag, Cu, Zn; Noranda/ Kuroko massive sulphide; 104B 385	na	Property wide SkyTEM helicopter-borne electromagnetic survey and completed 23,500 m of diamond drilling. Highlight intersections included 92.29 m grading 1.1 g/t Au, and 124.0 g/t Ag including 24.09 m grading 2.2 g/t Au, and 374.0 g/t Ag, and 35.5 m grading 2.2 g/t Au, and 28.2 g/t Ag including 3.39 m grading 12.6 g/t Au, 50.8 g/t Ag.
Foremore	**Sassy Resources Corporation**	Au, Ag, Pb, Cu; Polymetallic veins	na	1684 line-km of VTEM, ground truthing of anomalies, diamond drilling (2691 m) began at the Westmore Discovery zone.
Georgia	**Scottie Resources Corp.**	Au, Ag, Pb, Zn, Cu; Intrusion-related Au pyrrhotite veins; 103O 013	na	Scottie Resources amalgamates with AUX Resources Corporation, assets include Georgia project. Diamond drilling carried out.
Golddigger	**Goliath Resources Limited**	Au, Cu, Pb, Zn; Polymetallic veins	na	6000 m of diamond drilling planned at Surebet target. Reported results included 35.7 m grading 4.46 g/t Au, and 122.13 g/t Ag, along with base metal mineralization.
Hard Nickel Group	**Nickel Rock Resources Inc.**	Ni, Fe; Podiform chromite; 093K 038	na	Rock sampling and soil geochemical surveys.
Hat	**Doubleview Gold Corp.**	Cu, Au; Alkalic porphyry; 104J 021	na	2476 m of diamond drilling. Drilling results included 907.8 m grading 0.31 g/t Ag, 0.12 g/t Au, 4.74 g/t Co, 0.15% Cu, 0.03 g/t Pd, and 28.64 g/t Sc.
Hazelton (Netalzul Mountain)	**Jaxon Mining Inc.**	Cu, Au; Sediment-hosted Cu; 094D 104	I: 5.0 Mt 0.5% Cu, 11.9 g/t Ag (non NI 43-101)	2483 m of diamond drilling. Volterra IP and MT surveys, lidar survey, petrological studies, rock dating studies, and structural mapping. Highlight drill results included 14.2 m in sulphide breccia grading 0.10 g/t Au, 50 g/t Ag, 0.1281% Cu, 0.01% Pb, 0.045% Sb, 0.05% Zn and 7.4 m in monzonite dikes grading 0.45% Cu, 12 g/t Ag, 0.019% Mo and 0.026% Zn.

Table 5. Continued.

Homestake Ridge	**Dolly Varden Silver Corporation**	Au, Ag, Cu, Pb, Zn; Epithermal; 103P 216	I: 0.736 Mt 7.02 g/t Au, 74.8 g/t Ag, 0.18% Cu, 0.077% Pb Inf: 5.55 Mt 4.58 g/t Au, 100 g/t Ag, 0.13% Cu, 0.142% Pb.	Definitive agreement announced, Dolley Varden Silver Corporation would acquire the project from Fury Gold Mines Ltd.
Iskut	**Seabridge Gold Inc.**	Cu, Au; Porphyry; 104B 694	na	MT geophysical survey.
Kinskuch (Hecla)	**Hecla Mining Company**	Cu, Ag, Au; Porphyry; 103P 016	na	4311 m of diamond drilling.
Kirkham	**Metallis Resources Inc.**	Cu, Au; Porphyry; 104B 209	na	4785 m of diamond drilling, high-resolution IP survey. Drilling reported to have intersected stockwork and disseminated sulphide mineralization, including chalcopyrite.
KSP (Inel)	**QuestEx Gold&Copper Exploration Ltd.**	Au, Ag; Au-quartz veins	na	4000 m of diamond drilling planned. IP survey.
KSP (Sericite ridge)	**QuestEx Gold&Copper Exploration Ltd.**	Cu, Au; Porphyry	na	IP survey outlined a 1500 by 1000 m high chargeability and high resistivity anomaly with a signature consistent with a porphyry system. The anomaly is below part of an 8 by 3.5 km alteration zone (Sericite Ridge).
LGM	**Origen Resources Ltd.**	Au, Ag; Epithermal; 104G 447	na	Modelling of magnetic and VTEM data identified magnetic and electromagnetic anomalies coincident with a gold and silver geochemical anomaly known as the Hidden Gold zone.
Midas	**Juggernaut Exploration Ltd.**	Au, Ag, Cu, Zn; Skarn; 103I 131	na	New mineralized outcrop discovered. A 1 m chip sample assayed 9.34 g/t Au, 117 g/t Ag, 1.58% Cu, and 1.77% Zn.
New Polaris	**Canagold Resources Ltd.**	Au; Au-quartz veins; 104K 003	I: 1.69 Mt 10.8 g/t Au Inf: 1.48 Mt 10.2 g/t Au	28,000 m of diamond drilling started. Results included 6.6 m grading 24.2 g/t Au, 3.9 m grading 30.8 g/t Au, 17.8 m grading 11.1 g/t Au, and 8.4 m grading 17.1 g/t Au.
Newmont Lake	**Enduro Metals Corporation**	Au, Cu, Ag; Intrusion-related Au pyrrhotite veins; 104B 126	na	10,000 m of diamond drilling planned. IP and MT surveys. Drill results from Burgundy ridge target included 331.43 m grading 0.35 g/t Au, 5.5 g/t Ag, 0.29% Cu, and 0.49% Zn.

Table 5. Continued.

Ootsa	**Surge Copper Corp.**	Cu, Au, Ag, Mo; Calc-alkaline porphyry; 093E 105	M+I: 224 Mt 0.22% Cu, 0.15g/t Au, 0.021% Mo, 2.8 g/t Ag Inf: 5.2 Mt 0.18% Cu, 0.09 g/t Au, 0.019% Mo, 2.6 g/t Ag (2016 Prefeasibility Study)	26,556 m of diamond drilling at West Seel deposit. Highlights included 495 m grading 0.25% Cu, 0.21 g/t Au, 3.4 g/t Ag, and 0.021% Mo.
Oweegee	**Sanatana Resources Inc.**	Cu, Au; Subvolcanic Cu-Ag-Au (As-Sb); 104A 165	na	Property-wide sampling and IP survey over the Molly zone and Glacier, Delta, and Skowill prospects.
Poplar	**Universal Copper Ltd.**	Cu, Au, Ag, Mo; Porphyry Cu±Mo±Au	na	3000 m of diamond drilling.
Porter	**Strikepoint Gold Inc.**	Au, Ag, Zn, Pb; Polymetallic veins; 103P 089	na	Diamond drilling started in late summer.
Ranch	**Thesis Gold Inc.**	Au, Ag; Epithermal; 094E 267	na	16,139 m of diamond drilling. Initial drilling results included 34 m grading 19.56 g/t Au, including 7 m grading 82.48 g/t Au, and 25 m grading 9.53 g/t Au.
Rock and Roll	**Etruscus Resources Corp.**	Cu, Zn, Pb, Au; Besshi VMS and intrusion related precious metal veins; 104B 377	Inf: 2.02 Mt 0.71 g/t Au, 87.1 g/t Ag, 0.23% Cu, 0.23% Pb, 0.98% Zn	Geological mapping and sampling (64 silt, 385 soil, 297 rock). Results outlined two high-priority targets.
Ruby Creek (Silver Surprise)	**Stuhini Exploration Ltd.**	Ag; Unknown	na	Soil sampling, IP surveys, mapping, and prospecting.
Schaft Creek	**Teck Resources Ltd. (75%),** Copper Fox Minerals Inc. (25%)	Cu, Mo, Au, Ag; Porphyry Cu±Mo±Au; 104G 015	M+I: 1.346 Bt 0.26% Cu, 0.16 g/t Au, 0.017% Mo, 1.25 g/t Ag Inf: 343.6 Mt 0.17% Cu, 0.11 g/t Au, 0.013% Mo, 0.84 g/t Ag	Updated Mineral Resource estimate released. Favourable Preliminary Economic Assessment released. Drilling of 835 m completed to collect samples for metallurgical testing. Environmental baseline studies caried out.
Scottie Gold Mine	**Scottie Resources Corp.**	Au, Ag, Cu; Intrusion-related and polymetallic veins; 104B 034	na	Diamond drilling at the Blueberry zone. Results included 10.0 m grading 16.5 g/t Au, 4.94 m grading 28.8 g/t Au, and 6.05 m grading 12.0 g/t Au. Drilling increased the zone's known strike length by 650 m.
Silvertip	**Coeur Mining Inc.**	Ag, Pb, Zn; Manto carbonate-replacement; 104O 038	M+I: 1.18 Mt at 222.73 g/t Ag, 4.09% Pb, 8.58% Zn Inf: 0.53 Mt at 271.04 g/t Ag, 5.02% Pb, 9.31% Zn	Exploration included 100,000 m of drilling; discovered manto mineralization at the Southern Silver zone. Highlight results included 20.0 m grading 92.5 g/t Ag, 16.9% Zn, and 0.5% Pb, and 10.8 m grading 445.7 g/t Ag, 19.4% Zn, and 7.5% Pb.
Silver Hope	**Finlay Minerals Ltd.**	Cu, Ag, Au, Zn, Pb, Mo; Subvolcanic Cu-Ag-Au (As-Sb); 093L 056	na	IP survey outlined two chargeability and resistivity anomalies. A planned 2000 m of diamond drilling started in the fall.

Table 5. Continued.

Silver Queen	**Equity Metals Corporation**	Ag, Pb, Zn, Au; Transitional porphyry-epithermal; 093L 002	I: 815,000 t 6.4% Zn, 3.2 g/t Au, 201.4 g/t Ag, 0.26% Cu, 1.0% Pb Inf: 801,000 t 5.2% Zn, 2.5 g/t Au, 184 g/t Ag, 0.31% Cu, 0.9% Pb (resources at NSR cut-off of C$100/t)	4991 m of diamond drilling in the winter-spring. Highlight results included 0.3 m grading 14,035 g/t Ag, 0.1 g/t Au, 0.5% Cu, 1.3% Pb, and 3.3% Zn within a 7.7 m interval grading 919 g/t Ag, 0.1 g/t Au, 0.1% Cu, 1.3% Pb, and 1.8% Zn. Drilling resumed in the fall with 4500 m planned. Initial results included 1.4 m grading 1097 g/t Ag, 0.1 g/t Au, 0.2% Cu, 0.5% Pb, 2.2% Zn, and 3.7 m grading 1143g/t Ag, 0.1% Zn.
Silver Vista	**Norseman Silver Inc.**	Cu, Ag; Cu±Ag quartz veins; 093M 195	na	1507 m of diamond drilling. Results included 47.82 m grading 37 g/t Ag and 0.21% Cu and 46 m grading 48 g/t Ag and 0.62% Cu.
Skelly	**Trailbreaker Resources Ltd.**	Au, Ag; Au-quartz veins	na	Soil sampling; 1.5 m chip sample returned 25.4 g/t Au and 882 g/t Ag. Grab samples assayed up to 3.43 g/t Au and 78.3 g/t Ag.
Snip Gold	**Hochschild Mining PLC**	Au, Ag; Intrusion-related Au pyrrhotite veins; 104B 250	I: 539,000 t 14.0 g/t Au Inf: 942,000 t 13.3 g/t Au	High-grade intersections from drilling included 3.22 m grading 155.76 g/t Au, 4.41 m grading 110.22 g/t Au, and 12.5 m grading 27.04 g/t Au. In October, it was announced that Hochschild Mining PLC intended to take over as operator, earning a 60% interest from Skeena Resources Limited by spending approximately $100 million during the option period.
Snoball	**Evergold Corp.**	Au, Ag; Intrusion-related Au pyrrhotite veins; 104G 143	na	400 m of diamond drilling. Assay results included 2.4 m grading 6.2 g/t Au, 11.9 g/t Ag.
Snowfield	**Seabridge Gold Inc.**	Cu, Au, Ag, Mo, Re; Porphyry Cu±Mo±Au; 104B 179	M+I: 1.37 Bt 0.59 g/t Au, 1.72 g/t Ag, 0.10% Cu, 85.5 ppm Mo, 0.57 ppm Re Inf: 833 Mt 0.34 g/t Au, 1.90 g/t Ag, 0.06% Cu, 69.5 ppm Mo, 0.43 ppm Re (2011 Pretium Technical Report)	Diamond drilling. Results matched grades previously reported by Pretium Resources Inc. suggesting that blending Snowfield ore with Mitchell production could lead to extension of open pit mining before underground block-cave mining is needed.
Stars	**Aurwest Resources Corporation**	Cu, Au, Ag, Mo; Porphyry Cu±Mo±Au; 093L 367	na	Mapping, sampling, stream-sediment sampling, and a deep penetrating IP surveying.
Stellar	**Aurwest Resources Corporation**	Cu, Au, Ag, Mo; Porphyry Cu±Mo±Au	na	Mapping, sampling, stream-sediment sampling, and a deep penetrating IP surveying.

Table 5. Continued.

Tatogga (Saddle North)	**Newmont Corporation**	Cu, Au, Ag; Porphyry Cu-Au (alkalic); 104G 432	I: 298 Mt 0.28% Cu, 0.36 g/t Au, 0.8 g/t Ag Inf: 543 Mt 0.25% Cu, 0.31 g/t Au, 0.7 g/t Ag	Asset included in purchase of GT Gold Corp. for estimated $456 million. Newmont worked with the Tahltan Heritage Resources Environmental Assessment Team on a Tahltan land use study and with Tahltan Environmental Management to begin environmental studies.
Telegraph	**Mountain Boy Minerals Ltd.**	Cu; Porphyry Cu-Au (alkalic)	na	268 soil samples, and 141 rock samples. Many (30%) of the rock samples graded 0.5% Cu or higher, including 17.9% Cu. Three new zones of mineralization were discovered.
Theia	**Mountain Boy Minerals Ltd.**	Ag, Au, Pb, Cu, Zn; Polymetallic veins	na	Grab sampling. Results included 9676 g/t Ag, 1.59 g/t Au, 13.4% Pb, 0.64% Cu, and 2.75% Zn.
Thorn (Camp Creek)	**Brixton Metals Corporation**	Cu, Ag, Au; Porphyry Cu±Mo±Au	na	Diamond drilling. Results included 821.25 m grading 0.24% Cu, 0.10 g/t Au, 2.44 g/t Ag, and 174 ppm Mo, with a 318.25 m interval grading 0.42% Cu, 0.17 g/t Au, 3.87 g/t Ag, and 294 ppm Mo.
Thorn (Trapper)	**Brixton Metals Corporation**	Au; Epithermal	na	3107 m diamond drilling. Initial results: one hole 139 m grading 2.14 g/t Au, with 11.0 m interval grading 19.25 g/t Au; second hole 146 m grading 0.74 g/t Au with 31 m interval grading 2.0 g/t Au.
Treaty Creek	**Tudor Gold Corp. (60%),** Teuton Resources Corp. (20%), American Creek Resources Ltd. (20%)	Cu, Au; Porphyry; 104A 004	na	30,108 m of diamond drilling. Results included 556.5 grading 0.73 g/t Au, 6.27 g/t Ag, and 0.489% Cu and 1320 m grading 0.67 g/t Au, 3.70 g/t Ag, and 0.216% Cu.
Trek	**Romios Gold Resources Inc.**	Cu, Au; Porphyry Cu-Au (alkalic); 104G 022	na	Mapping and sampling. New zone called Trek South located. The zone contains porphyry-style epidote alteration with a coincident >800 m wide zone of quartz-pyrite ±chalcopyrite veinlets. Veinlets returned assay values from trace up to 1.83% Cu, 2.3 g/t Au, and 257 g/t Ag. Veinlets are 1-10 cm wide and locally form dense stockworks.
Turnagain	**Giga Metals Corporation**	Ni, Co, Pt, Cu, Mo; Alaskan-type, magmatic; 104I 014	M+I: 1.073 Bt 0.220% Ni and 0.013% Co Inf: 1.142 Bt 0.217% Ni and 0.013% Co	Archaeological surveys, wildlife surveys, resource infill drilling (6295 m), geotechnical drilling, seismic refraction surveys, test pits excavated. Work was to collect exploration, geotechnical, and other data to advance project engineering to the Pre-Feasibility level.

Table 5. Continued.

Williams	**CopAur Minerals Inc.**	Au; Epithermal; 094E 028	na	3150 m of diamond drilling. Property-wide VTEM airborne survey. Soil sampling and rock sampling. Soil samples typically assayed up to 320 ppb Au; with one sample assaying up to 6.88 g/t Au. Rock samples assayed up to 79.7 g/t Au. Drilling results included 41.57 m grading 1.38 g/t Au and 0.70 m grading 22.00 g/t Au.
Willoughby	**Strikepoint Gold Inc.**	Au, Ag, Zn, Pb; Precious and polymetallic veins; 103P 006	na	4050 m of diamond drilling. Surface chip sampling, mapping. Drill results included 6.16 m grading 7.34 g/t Au, 202.84 g/t Ag.

M = Measured; I = Indicated; Inf = Inferred

3.53 g/t Au, and 37.8 m grading 1.8 g/t Au. Results from Cassiar South included 4.8 m grading 35.1 g/t Au and 6.4 m grading 12.6 g/t Au.

7.1.6. DOC (Hanstone Gold Corp.)

The **DOC** project is underlain by deformed and metamorphosed Upper Triassic volcanic rocks of the Stuhini Group that are locally cut by coeval intrusions of the Bronson stock. The most significant gold and silver grades are in sulphide-bearing quartz veins. Hanstone completed 2700 m of diamond drilling. They also drilled two small diameter, shallow core holes on the Q19 vein with a portable backpack drill. These near-surface holes returned gold grades of 12 g/t Au in one hole and 10 g/t Au in the other along 1 m of core length. Hanstone collected a 1 t bulk sample from the Q19 vein and a 1 t bulk sample from the TRJC vein.

7.1.7. Engineer Gold Mine (Engineer Gold Mines Ltd.)

Engineer Gold Mines Ltd.'s **Engineer Gold Mine** project is centered on the historic Engineer Gold mine 32 km southwest of Atlin. Engineer began drilling water monitoring wells to support an application to complete a 10,000 t bulk sample.

7.1.8. Eskay Creek (Skeena Resources Ltd.)

Since 1932, **Eskay Creek** has been the focus of considerable exploration. In 1988, the news of drilling intersecting stratiform stibnite-realgar rich mineralization (Roth, 1989) in 21A zone sparked a staking rush throughout the region. An underground mine operated from 1994 to 2008 and produced 3.3 Moz of Au and 160 Moz of Ag (average grades of 45 g/t Au and 2224 g/t Ag).

In the spring, 4375 m of drilling was carried out and results included an 8.20 m intersection grading 3.99 g/t Au and 71 g/t Ag. In late summer, a planned 35,000 m of regional and near-mine drilling began. Soil sampling included 116 line-km on 100 m line spacing and 25 m sample intervals. In parallel with the soil sampling, regional mapping and lithogeochemical sampling was also completed. Skeena released a positive Prefeasibility Study for the project.

Air rotary drilling was used to sample the historic "Albino Waste Facility". Former operators deposited mineralized footwall rocks (estimated 2 Mt) considered uneconomic due to high cut-off grades required at the time. Highlight results included 22.80 m grading 4.16 g/t Au, and 204 g/t Ag and 16.77 m grading 5.90 g/t Au and 317 g/t Ag.

7.1.9. Eskay-Corey (Eskay Mining Corp.)

At their **Eskay-Corey** property, Eskay Mining carried out a property wide SkyTEM helicopter-borne electromagnetic survey and completed 23,500 m of diamond drilling. Drilling was reported to have intersected massive sulphide mineralization at the TV and Jeff deposits. The deposits are interpreted as precious metal rich VMS systems. Highlight intersections included 92.29 m grading 1.1 g/t Au, and 124.0 g/t Ag including 24.09 m grading 2.2 g/t Au, and 374.0 g/t Ag, and 35.5 m grading 2.2 g/t Au, and 28.2 g/t Ag including 3.39 m grading 12.6 g/t Au, 50.8 g/t Ag.

7.1.10. Foremore (Sassy Resources Corporation)

Sassy Resources Corporation carried out a 1684 line-km VTEM survey over their **Foremore** property and examined anomalies identified by the survey on the ground. In the fall, 2691 m of diamond drilling was completed at the Westmore Discovery zone.

7.1.11. Georgia (Scottie Resources Corporation)

Scottie Resources Corporation's **Georgia** project is at tidewater, approximately 16 km south of Stewart. The property is prospective for intrusion-related gold deposits because several areas are close to rocks of the Texas Creek plutonic suite. Scottie acquired the project by amalgamating with AUX Resources Corporation. Scottie carried out diamond drilling.

7.1.12. KSP (Inel) (QuestEx Gold & Copper Exploration Ltd.)

In late August, QuestEx Gold & Copper Exploration Ltd.

began 4000 m of diamond drilling at the Inel gold prospect on their **KSP** property to support an initial NI 43-101 mineral resource estimate. In addition, IP surveys were conducted over the Sericite Ridge and Tami showings.

7.1.13. LGM (Origen Resources Ltd.)

Origen's **LGM** property totals 26,771 ha and has multiple target areas. Modelling of magnetic and VTEM data identified magnetic and electromagnetic anomalies coincident with a gold and silver geochemical anomaly known as the Hidden Gold zone.

7.1.14. New Polaris (Canagold Resources Ltd.)

Canagold Resources Ltd. began 28,000 m of diamond drilling at their **New Polaris** gold project. Drilling was designed to upgrade Inferred resources to Indicated and target gold mineralization down plunge. Results included 6.6 m grading 24.2 g/t Au, 3.9 m grading 30.8 g/t Au, 17.8 m grading 11.1 g/t Au, and 8.4 m grading 17.1 g/t Au.

7.1.15. Porter (Strikepoint Gold Inc.)

Strikepoint Gold's **Porter** project hosts two past-producing silver-rich vein systems 2 km apart: Silverado and Prosperity/Porter Idaho. Strikepoint announced that drilling at the project started in late summer.

7.1.16. Ranch (Thesis Gold Inc.)

Thesis completed 16,139 m of diamond drilling in 106 holes, geochemical sampling, mapping, airborne VTEM, and ground magnetic and IP surveys at their **Ranch** project. Initial drilling results included 34 m grading 19.56 g/t Au, including 7 m grading 82.48 g/t Au, and 25 m grading 9.53 g/t Au.

7.1.17. Ruby Creek (Silver Surprise) (Stuhini Exploration Ltd.)

Stuhini Exploration Ltd. followed up on the 2020 discovery of new gold and silver zones with soil sampling, IP surveys, mapping, and prospecting at their **Ruby Creek** project.

7.1.18. Scottie Gold Mine (Scottie Resources Corp.)

The **Scottie Gold** Mine project, 35 km north of Stewart, is centred on the past-producing Scottie Gold mine, which operated from 1981 to 1985, producing 95,426 oz of Au at 16.2 g/t Au. The property is transected by north-striking and locally abundant east-striking faults. Stanley and Nelson (2022) recognized Stuhini Group and a Hazelton Group stratigraphy in the area that is comparable to that in the McTagg anticlinorium. Gold is in steeply dipping pyrrhotite-pyrite-quartz-calcite veins. Scottie Resources carried out drilling at the Blueberry zone. Results included 10.0 m grading 16.5 g/t Au, 4.94 m grading 28.8 g/t Au, and 6.05 m grading 12.0 g/t Au. Drilling increased the zone's known strike length by 650 m.

7.1.19. Silver Hope (Finlay Minerals Ltd.)

The **Silver Hope** mineral claims surround the past-producing Equity Silver mine, which operated from 1980 to 1994, processing 33.8 Mt grading 0.4% Cu, 64.9 g/t Ag, and 0.46 g/t Au. Finlay completed an IP survey that outlined two chargeability and resistivity anomalies, Equity East (1.0 by 2.0 km) and Allin (2.0 by 1.5 km). In the fall the company started 2000 m of drilling.

7.1.20. Skelly (Trailbreaker Resources Ltd.)

At Trailbreaker's **Skelly** property in 2021, a 2500 by 800 m soil geochemical survey outlined a gold-in-soil anomaly immediately west of the main quartz-sulphide vein showings, suggesting potential for additional auriferous quartz veins. A 1.5 m chip sample across a quartz vein returned 25.4 g/t Au and 882 g/t Ag. Prospecting 200 m to the east of veins identified a new zone with grab samples assaying up to 3.43 g/t Au and 78.3 g/t Ag.

7.1.21. Snip Gold (Hochschild Mining PLC)

The **Snip** deposit is another past-producing mine with renewed interest. Between 1991 and 1999 the mine produced at an average grade of 27.5 g/t Au. The deposit is a southwest-dipping vein system in Upper Triassic metasedimentary rocks of the Stuhini Group that are cut by Early Jurassic stocks and plutons. High-grade intersections from drilling included 3.22 m grading 155.76 g/t Au, 4.41 m grading 110.22 g/t Au, and 12.5 m grading 27.04 g/t Au. In October, it was announced that Hochschild Mining PLC intended to take over as operator, earning a 60% interest from Skeena Resources Limited by spending approximately $100 million during the option period.

7.1.22. Snoball (Evergold Corp.)

Evergold Corp. completed 400 m of diamond drilling at their **Snoball** project. Quartz veins with pyrrhotite, pyrite, arsenopyrite, and chalcopyrite was reported. Drill contractor crew shortages resulted in a late start to the program and only about a fifth of the planned drilling was completed. Assay results included 2.4 m grading 6.2 g/t Au, 11.9 g/t Ag.

7.1.23. Thorn (Trapper) (Brixton Metals Corporation)

Brixton completed 3107 m of diamond drilling in 12 holes at the Trapper gold target of their **Thorn** project. Initial results from one hole included 139 m grading 2.14 g/t Au, with a 11.0 m interval grading 19.25 g/t Au that included 0.50 m of 160 g/t Au. Results from a second hole included 146 m grading 0.74 g/t Au within which a 31 m intersection graded 2.0 g/t Au.

7.1.24. Treaty Creek (Tudor Gold Corp. 60%, Teuton Resources Corp. 20%, American Creek Resources Ltd. 20%)

Tudor Gold Corp. released an initial mineral resource estimate for the **Treaty Creek** project of 815.7 Mt Measured and Indicated, grading 0.66 g/t Au, 3.6 g/t Ag, and 0.06% Cu, and 311.7 Mt Inferred, grading 0.72 g/t Au, 4.0 g/t Ag, and 0.05% Cu. The project is in Jurassic volcanic and intrusive rocks that also host the KSM deposits 5 km to the southwest.

The project is defined by its bulk tonnage resource. In 2021, 30,108 m of resource expansion and definition drilling was carried out. Results included 556.5 m grading 0.73 g/t Au, 6.27 g/t Ag, and 0.489% Cu and 1320 m grading 0.67 g/t Au, 3.70 g/t Ag, and 0.216% Cu.

7.1.25. Williams (CopAur Minerals Inc.)

Previous exploration at CopAur's **Williams** copper-gold project identified the T-Bill Gold zone and the GIC copper gold zone. This year a property-wide VTEM airborne geophysical survey was completed. Soil sampling was done over the T-Bill Gold zone and reconnaissance soil and rock sampling was done in surrounding prospective areas. The reconnaissance sampling discovered a new north-trending zone of surface mineralization, 1.1 km west of historic gold-in-soil anomalies, that extends 1000 m along strike. Soil samples typically assayed up to 320 ppb Au; with one sample assaying up to 6.88 g/t gold. Rock samples southeast of the T-Bill Gold zone assayed up to 79.7 g/t Au. Diamond drilling totalled 3150 m in 7 holes and results included 41.57 m grading 1.38 g/t Au and 0.70 m grading 22.00 g/t Au.

7.1.26. Willoughby (Strikepoint Gold Inc.)

The **Willoughby** project is 25 km northeast of Stewart. Between 1989 and 1996, more than 12,000 m of drilling was completed, and 110 m of underground workings excavated. Strikepoint completed 4050 m of drilling in 17 holes, surface chip-channel sampling, and mapping of well-exposed, gold-silver mineralization. Results included 6.16 m grading 7.34 g/t Au, 202.84 g/t Ag.

7.2. Selected porphyry projects

The Northwest Region hosts many significant porphyry deposits (Fig. 1; Table 5), and the region is highly prospective for Au-Cu-Mo bulk-tonnage mineralization related to Triassic-Jurassic island arc assembly and post accretionary intrusive complexes.

7.2.1. Berg (Surge Copper Corp.)

Surge has an option to earn a 70% interest in the **Berg** project from Centerra Gold Inc. Surge released an updated NI 43-101 resource estimate of total Measured and Indicated 610 Mt grading 0.27% Cu, 0.03% Mo, and 3.0 g/t Ag, and Inferred 28.1 Mt grading 0.22% Cu, 0.02% Mo, and 3.8 g/t Ag. Fall diamond drilling was expected to total 4500 m.

7.2.2. Big Red (Libero Copper & Gold Corporation)

At the **Big Red** project, porphyry Cu-Au-Mo, epithermal Au-Ag, and VMS-style mineralization have been recognized. Libero carried out a 4571 m, 10-hole drill program. The primary target was the Terry porphyry, which was discovered in 2020. Results included 118.7 m grading 0.26% Cu, 0.06 g/t Au, and 1.83 g/t Ag within 510.0 m grading 0.18% Cu, 0.04 g/t Au, and 1.23 g/t Ag.

7.2.3. Cannonball (Goldrea Resources Corp.)

Goldrea carried out an IP survey at their **Cannonball** project and located visible surface mineralization. Glacial retreat revealed surface mineralization consisting of widespread narrow quartz- carbonate veins containing pyrite and chalcopyrite. The mineralized zone exposure is 300 by 300 m and is referred to as the Juice Box zone. The IP survey defined a chargeability anomaly coincident with the Juice Box zone.

7.2.4. Dungate (Edgemont Gold Corp.)

Edgemont's **Dungate** project is 6 km southeast of Houston. Edgemont targeted IP and magnetic anomalies with seven diamond-drill holes totalling 3429 m. Six of the seven holes intersected sulphide-mineralized porphyry.

7.2.5. Emerson (Harvest Gold Corporation)

Harvest Gold's **Emerson** project is 15 km west of Houston. The company completed an airborne magnetic survey, near surface Rotary Air Blast (RAB) drilling, and a ground 3D IP survey. The IP survey outlined a chargeability high anomaly 1000 by 1800 m in plan and 300 m thick, dipping gently to the south. The IP anomaly coincides with quartz-sericite pyrite alteration identified in the RAB drilling.

7.2.6. Hat (Doubleview Gold Corp.)

Doubleview describes their **Hat** project as a gold-rich copper porphyry with additional critical metals including cobalt, silver, palladium, and scandium. This year, 2476 m total was drilled in four holes. Drilling results included 907.8 m grading 0.31 g/t Ag, 0.12 g/t Au, 4.74 g/t Co, 0.15% Cu, 0.03 g/t Pd, and 28.64 g/t Sc.

7.2.7. Hazelton (Netalzul Mountain) (Jaxon Mining Inc.)

Jaxon drilled nine holes totalling 2483 m at the **Netalzul Mountain** project. Other work included a Volterra IP and MT survey, a high-resolution lidar survey, petrological studies, rock dating studies, and structural mapping. Drilling intersected multiple styles of mineralization interpreted to be related to a deeper porphyry system. Highlight drill results included 14.2 m in sulphide breccia grading 0.10 g/t Au, 50 g/t Ag, 0.1281% Cu, 0.01% Pb, 0.045% Sb, 0.05% Zn and 7.4 m in monzonite dikes grading 0.45% Cu, 12 g/t Ag, 0.019% Mo and 0.026% Zn.

7.2.8. Iskut (Seabridge Gold Inc.)

The **Iskut** project includes the former Johnny Mountain mine and the Bronson Slope copper-gold deposit. Previous drilling below the Quartz Rise lithocap discovered a mineralized diatreme containing clasts of veined diorite porphyry with copper-gold mineralization. Drilling below and west of the lithocap returned intervals up to 158 m grading 0.16 g/t Au and 0.16% Cu. This year Seabridge carried out a MT geophysical survey.

7.2.9. Kinskuch (Hecla) (Hecla Mining Company)

At their **Kinskuch** project, Hecla drilled 4311 m total in 16 holes.

7.2.10. Kirkham (Metallis Resources Inc.)

The **Kirkham** property is on the western margin and adjacent to the Eskay rift. Metallis acquired the project in 2013 and has since conducted regional mapping and sampling, geophysics (IP, EM, Magnetics, Radiometric, VTEM), and greater than 10,000 m of drilling. Metallis completed 4785 m of diamond drilling in seven holes. Drilling was reported to have intersected stockwork and disseminated sulphide mineralization, including chalcopyrite. High-resolution IP surveys were also carried out.

7.2.11. KSP (Sericite Ridge) (QuestEx Gold & Copper Exploration Ltd.)

QuestEx's **KSP** project is 15 km southeast of the past-producing Snip mine. The project has both high-grade gold vein and bulk tonnage porphyry copper-gold targets. QuestEx reported that an IP survey outlined a 1500 by 1000 m high chargeability and high resistivity anomaly with a signature consistent with a porphyry system. The anomaly is below part of an 8 by 3.5 km alteration zone known as Sericite Ridge .

7.2.12. Newmont Lake (Enduro Metals Corporation)

Enduro Metals Corporation discovered new porphyry copper-gold at their **Newmont Lake** project. Results from the Burgundy ridge target area included 331.43 m grading 0.35 g/t Au, 5.5 g/t Ag, 0.29% Cu, and 0.49% Zn. A total of 10,000 m of diamond drilling was planned, along with deep penetrating IP and MT geophysical surveys.

7.2.13. Ootsa (Surge Copper Corp.)

The **Ootsa** project is at the southeast end of a southeast-trending belt of porphyry Cu-Au deposits and prospects including (from northwest-southeast) the Lucky Ship, Berg, Whiting Creek, Huckleberry, Ox, and Seel deposits. Similar to other deposits in the region, mineralization at Ootsa is temporally associated with the Bulkley suite intrusive rocks (Cretaceous). Calc-alkaline mineralization is reported as mineral resources for three separate deposits: Ox, East Seel, and West Seel. This year, Surge completed 41,088 m of diamond drilling. Results have the potential to expand the deposit and to improve grade within existing volumes. Drilling consistently intersected broad, continuous zones of mineralization within and outside of a 2016 resource-constraining pit. Highlights for West Seel included 495 m grading 0.25% Cu, 0.21 g/t Au, 3.4 g/t Ag, and 0.021% Mo.

7.2.14. Oweegee (Sanatana Resources Inc.)

Sanatana's **Oweegee** project is transected by Highway 37 and the NW transmission line. This year, Sanatana carried out property-wide sampling and IP surveying over the Molly zone and Glacier, Delta, and Skowill prospects.

7.2.15. Poplar (Universal Copper Ltd.)

In the fall, Universal Copper Ltd. completed 3000 m of diamond drilling in six holes at their **Poplar** project. The drilling was designed to expand known copper mineralization to depth and expand the limits of higher-grade mineralization within the current mineral resource.

7.2.16. Schaft Creek (Teck Resources Limited 75%, Copper Fox Metals Inc. 25%)

Schaft Creek is an advanced-stage exploration project. In March, an updated Mineral Resource estimate was released. Measured and Indicated resources are 1.346 Bt grading 0.26% Cu, 0.16 g/t Au, 0.017% Mo, and 1.25 g/t Ag. Inferred resources are 343.6 Mt grading 0.17% Cu, 0.11 g/t Au, 0.013% Mo, and 0.84 g/t Ag. In September a favourable Preliminary Economic Assessment was released. A drilling program of 835 m was completed to collect samples for metallurgical testing and environmental baseline studies were caried out.

7.2.17. Stars and Stellar (Aurwest Resources Corporation)

Aurwest Resources Corporation carried out mapping, sampling, stream-sediment sampling, and a deep penetrating IP survey at their **Stellar** project. Aurwest also acquired a 50% interest in the **Stars** property.

7.2.18. Tatogga (Newmont Corporation)

Newmont Corporation purchased GT Gold Corp. for an estimated $456 million. Assets included the **Tatogga** project's Saddle North deposit. The deposit has an Indicated resource of 298 Mt grading 0.28% Cu, 0.36 g/t Au, and 0.8 g/t Ag and an Inferred Resource of 543 Mt grading 0.25% Cu, 0.31 g/t Au, and 0.7 g/t Ag. Newmont worked with the Tahltan Heritage Resources Environmental Assessment Team on a Tahltan land use study and with Tahltan Environmental Management to begin environmental studies.

7.2.19. Telegraph (Mountain Boy Minerals Ltd.)

Mountain Boy's **Telegraph** project consists of multiple properties. Mountain Boy has a 60% option on the DOK property, 100% interest in the DOKX-Yeti property, and 100% interest in ground that they staked. Mountain Boy collected 268 soil samples, and 141 rock samples. Many (30%) of the rock samples graded 0.5% Cu or higher, including 17.9% Cu. Three new zones of mineralization were discovered.

7.2.20. Thorn (Camp Creek) (Brixton Metals Corporation)

Brixton continued to drill the Camp Creek target of their **Thorn Project**. Results included 821.25 m grading 0.24% Cu, 0.10 g/t Au, 2.44 g/t Ag, and 174.27 ppm Mo, with a 318.25 m interval grading 0.42% Cu, 0.17 g/t Au, 3.87 g/t Ag, and 294.12 ppm Mo.

7.2.21. Trek (Romios Gold Resources Inc.)

Romios's **Trek** project consists of ten contiguous claims

approximately 10.0 km from the Galore Creek deposit. Romios carried out mapping and sampling and announced that they located a new zone called Trek South. The zone contains porphyry-style epidote alteration with a coincident >800 m wide zone of quartz-pyrite ±chalcopyrite veinlets. Veinlets returned assay values from trace up to 1.83% Cu, 2.3 g/t Au, and 257 g/t Ag. Veinlets are 1-10 cm wide and locally form dense stockworks.

7.3. Selected polymetallic base and precious metal projects

Many polymetallic base and precious metal projects are active throughout the Northwest Region (Fig. 1; Table 5). Base metals are explored for primarily as polymetallic vein and VMS deposits and, to lesser extent, SEDEX and manto replacement deposits.

7.3.1. American Creek (Mountain Boy Minerals Ltd.)

The **American Creek** project is approximately 22 km north of Stewart, immediately adjacent to the past-producing Premier mine. Mountain Boy completed surface sampling and began diamond drilling in July to follow up on surface samples from an interpreted extension of the High-Grade zone. Surface sample results included 949 g/t Ag, 0.3% Cu, and 2.7% Pb. Drilling consisted of 866 m total in eight holes. Highlight results included 3.9 m grading 24.61 g/t Ag, 0.020 g/t Au, 0.085% Cu, 2.15% Pb, and 2.19% Zn.

7.3.2. BA (Mountain Boy Minerals Ltd.)

Mountain Boy's **BA** project is located 18 km northeast of Stewart, and Highway 37A and the Northwest transmission line run through the property. This year, six diamond-drill holes totalling 650 m were completed. Holes tested the northern extension of the Barbara zone. Results included 7.67 m grading 38.06 g/t Ag, 0.013% Cu, 0.86% Pb, 2.67% Zn, and 1.09 m grading 84.66 g/t Ag, 0.017% Cu, 3.76% Pb, 6.30% Zn.

7.3.3. BAM (Jan Copper) (P2 Gold Inc.)

P2 Gold drilled six holes totalling 835.9 m at their **BAM** project Two of the six holes were drilled at the **Jan Copper** zone. Results included 39.25 m grading 0.01 g/t Au, 1.10% Cu including 9.15 m grading 0.04 g/t Au, and 3.23% Cu.

7.3.4. Dardanelle (Decade Resources Ltd.)

The **Dardanelle** project is part of Decade's Terrace properties. The Dardanelle showing consists of two quartz veins 0.3 to 2.0 m wide that occur intermittently along both contacts of a rhyolite dike for 700 m and to a depth of 180 m. Sulphides in the veins include pyrite, sphalerite, chalcopyrite, argentite, galena, arsenopyrite, bornite, covellite, and gold. Grab samples returned high-grade results including 695.6 g/t Au, 206 g/t Ag, 2.3% Pb and 102.9 g/t Au, 112.0 g/t Ag, 3.42% Pb.

7.3.5. Del Norte (Decade Resources Ltd.)

Decade has an option to earn up to a 55% interest in the **Del Norte** property and can earn an additional 20% interest by carrying the property to commercial production. Decade carried out 4147 m of diamond drilling. Drilling targeted the Argo/LG zones. Decade reported visible gold, silver minerals, and strong base metal mineralization. Partial assay highlight results included 3.05 m grading 13.77 g/t Au, and 2661 g/t Ag within 9.91 m grading 4.28 g/t Au, and 1091.6 g/t Ag. Base metal assays were not reported.

7.3.6. Dolly Varden (Dolly Varden Silver Corporation)

The immediate area of the Dolly Varden property has a long history of mining. The Dolly Varden mine produced more than 20 Moz of silver between 1910 and 1959. The property is underlain by Hazelton Group volcanic and volcaniclastic rocks and historic and recent exploration suggest the potential for epithermal precious metal and volcanogenic massive sulphide deposits. This year Dolly Varden completed 10,506 m of diamond drilling in 31 holes. Drilling is the start of a two-year goal to expand and upgrade the Torbrit Silver deposit and multiple silver-rich satellite zones and deposits including the Wolf. Early results included a hole testing 94 m down plunge from known resources at the Wolf deposit. The hole returned 1532 g/t Ag, 0.44 g/t Au, 2.11% Pb, and 1.07% Zn along 1.22 m in a brecciated sulphide-rich quartz vein hosted within a broader pyrite stockwork breccia zone of 17.50 m averaging 214 g/t Ag, and 0.47% Pb.

7.3.7. Dunwell (Stinger Resources Inc.)

Stinger's **Dunwell** project includes about two dozen showings of high-grade gold, silver, lead, zinc and copper. Of these, more half have been historically explored underground and seven or eight have shipped ore, the most significant of which is the Dunwell Mine. Stinger carried out diamond drilling and reported assays including 0.35 m grading 12.7 g/t Au, and 35.7 g/t Ag, 2.21 m grading 4.0 g/t Au, and 38.1 g/t Ag, and 1.64 m grading 2.3 g/t Au, and 60.3 g/t Ag.

7.3.8. Golddigger (Goliath Resources Ltd.)

The **Golddigger** property is 7 km west of the Dolly Varden mine access road. At the Sure Bet and Main zone, stratabound massive sulphide mineralization (galena-sphalerite-pyrite) and silica alteration are in highly folded Hazelton Group sedimentary rocks along northwest-trending faults. Goliath planned 6000 m of diamond drilling at the Surebet target. Reported results included 35.7 m grading 4.46 g/t Au, and 122.13 g/t Ag, along with base metal mineralization.

7.3.9. Homestake Ridge (Dolly Varden Silver Corporation)

The **Homestake Ridge** project has a total Indicated resource of 0.736 Mt grading 7.02 g/t Au, 74.8 g/t Ag, 0.18% Cu and 0.077% Pb and a total Inferred resource of 5.55 Mt grading 4.58 g/t Au, 100 g/t Ag, 0.13% Cu and 0.142% Pb. The project is adjacent to Dolly Varden Silver Corporation's Dolly Varden project. In December, Fury Gold Mines Ltd. announced that it had entered into a definitive agreement with Dolly Varden whereby Dolly Varden would acquire a 100% interest in the

project from Fury's wholly-owned subsidiary, Homestake Resource Corporation. Terms include a $5 million cash payment and the issuance of 76,504,590 common shares of Dolly Varden.

7.3.10. Midas (Juggernaut Exploration Ltd.)

Juggernaut reported discovering a new mineralized outcrop at their **Midas** project referred to as the Kokomo showing. Mineralization consists of pyrite, sphalerite, and chalcopyrite and coincides with a linear magnetic-high feature and a low-conductivity IP anomaly. A 1 m chip sample assayed 9.34 g/t Au, 117 g/t Ag, 1.58% Cu, and 1.77% Zn.

7.3.11. Rock and Roll (Etruscus Resources Corp.)

The **Rock and Roll** property is 7 km northwest of the past-producing Snip mine. The property includes the Black Dog VMS deposit and the SRV zone. Etruscus carried geological mapping and sampling (64 silt, 385 soil, 297 rock). Results outlined two high-priority targets.

7.3.12. Silver Queen (Equity Metals Corp.)

The **Silver Queen** project is on an all-season road 43 km south of Houston. Since its discovery in 1912, the property has seen more than 500 drill holes and 9 km of underground workings. Equity completed winter-spring diamond drilling of 4991 m. Highlight results included 0.3 m grading 14,035 g/t Ag, 0.1 g/t Au, 0.5% Cu, 1.3% Pb, and 3.3% Zn within a 7.7 m interval grading 919 g/t Ag, 0.1 g/t Au, 0.1% Cu, 1.3% Pb, and 1.8% Zn. Drilling renewed in the fall with 4500 m planned. Initial results included 1.4 m grading 1097 g/t Ag, 0.1 g/t Au, 0.2% Cu, 0.5% Pb, 2.2% Zn, and 3.7 m grading 1143 g/t Ag, 0.1% Zn.

7.3.13. Silver Vista (Norseman Silver Inc.)

At their **Silver Vista** property, Norseman completed 1507 m of diamond drilling to define the strike length and down-dip extensions of previously identified silver-copper mineralization. Results included 47.82 m grading 37 g/t Ag and 0.21% Cu and 46 m grading 48 g/t Ag and 0.62% Cu.

7.3.14. Silvertip (Coeur Mining Inc.)

Coeur announced that exploration diamond drilling (100,000 m) on their **Silvertip** mine property discovered manto mineralization at the Southern Silver zone. Highlight results included 20.0 m grading 92.5 g/t Ag, 16.9% Zn, and 0.5% Pb, and 10.8 m grading 445.7 g/t Ag, 19.4% Zn, and 7.5% Pb.

7.3.15. Theia (Mountain Boy Minerals Ltd.)

Mountain Boy reported high-grade silver from grab samples at the **Theia** project. Results included 9676 g/t Ag, 1.59 g/t Au, 13.4% Pb, 0.64% Cu, and 2.75% Zn.

7.4. Selected mafic- and ultramafic-hosted projects

The Northwest Region contains only a few mafic- and ultramafic-hosted prospects (Fig. 1; Table 5).

7.4.1. E&L (Garibaldi Resources Corp.)

The E&L property is one of only two known high-grade magmatic Ni-Cu-(PGE) massive sulphide projects in the Canadian Cordillera. The property is in the Eskay rift (Jurassic). The deposit contains pyrrhotite, pentlandite, and chalcopyrite in an olivine gabbro stock that intrudes Lower Jurassic sedimentary and volcanic rocks. Weather conditions resulted in cancelation of planned drilling.

7.4.2. Hard Nickel Group (Nickel Rock Resources Inc.)

Nickel Rock carried out rock sampling and soil geochemical surveys on the Nickel West and Nickel central blocks of their **Hard Nickel Group** project.

7.4.3. Turnagain (Giga Metals Corp.)

The **Turnagain** nickel-cobalt deposit is in an Alaskan- type Pt-(Os-Rh-Ir) ultramafic. The deposit has maximum dimensions of 3 by 8.2 km and displays a dunite core surrounded by peripheral peridotites, pyroxene- rich peridotite, wehrlite, and olivine pyroxene. Sulphide mineralization includes pyrrhotite, pentlandite, chalcopyrite, and trace bornite. Giga Metals carried out archaeological surveys, wildlife surveys, resource infill drilling (6295 m), geotechnical drilling, and seismic refraction surveys, and excavated test pits. Work was to collect exploration, geotechnical, and other data to advance project engineering to the Pre-Feasibility level.

8. Geological research

Colpron and Nelson (2021) published an updated review that summarized the physiography, neotectonics, crustal structure, geology, natural resources, and evolution of the northern Cordillera. George et al. (2021) used U-Pb zircon geochronology tied to Lu-Hf isotope analysis to consider the Triassic-Jurassic magmatic and accretionary history of Stikinia and evaluate the nature and origin of basement to Stikinia. Presenting field, U-Pb zircon, Lu-Hf, and whole rock and trace element geochemical data, Regan et al. (2001) established new piercing points for the Denali fault in Alaska, documenting significant along strike variations in rates of Eocene dextral strike-slip movement.

Nelson et al. (2021) provided raw U- Pb zircon datasets for 18 samples collected from between Dease Lake and Kitsault to constrain the age of intrusive and stratified protoliths, age and affinity of sedimentary sources, and timing of fault-related shearing. Hunter et al. (2022) continued a multi-year project in the Kitsault River area, south of Stewart, presenting a detailed facies analysis of the local Hazelton Group volcano-sedimentary depositional system, providing new U-Pb zircon geochronologic data, and evaluating the implications for mineralizing systems. Based on mapping, geochemistry, and U-Pb zircon geochronology, Stanley and Nelson (2022) recognized Stuhini Group rocks in the past-producing Scottie gold mine area and a Hazelton Group stratigraphy that is comparable to that in the McTagg anticlinorium. Bouzari et al. (2021) examined porphyry-related advanced argillic-

alteration in the Horn Mountain Formation (Hazelton Group) near Dease Lake.

Using 'non-deposit' training data, Lachaud et al. (2021) developed algorithm-based prospectivity maps for epithermal gold at the Iskut project. Schmidt et al. (2021) examined fluid inclusions in rocks from the Windy Craggy volcanogenic massive sulphide deposit (copper-cobalt-gold) using laser ablation ICP-MS and concluded that ore-forming fluids at Windy Craggy had a strong magmatic contribution Roberts et al. (2021) conducted fluid inclusion, microthermometry, and cathodoluminescence imaging work to conclude that the Deer Horn gold-silver-tellurium deposit is genetically related to Eocene granodiorites of the Nanika suite. Cutts et al. (2021) examined variations between the physical properties (density and magnetic susceptibility) and mineralogy and geochemistry of Cache Creek terrane serpentinized ultramafic ophiolites in the northwest part of the region to develop models for geophysical mapping. Jiang et al. (2021) characterized the petrology, mineralogy, and geochemistry of green nephrite from Kutcho.

9. Summary

The Northwest Region has producing mines and an abundance of proposed and advanced-stage projects. In 2021, the region saw numerous early- to advanced-stage projects that focussed mainly on precious, base metal, and porphyry deposits. Exploration activity increased for the fifth consecutive year in the region and expenditures this year represent more than half of British Columbia's total. Many companies reported positive exploration results, and many new targets were generated.

References cited

Bouzari, F., Lee, R.G., Hart, C.J.R., and van Straaten, B.I., 2021. Mineralogical and geochemical vectors within advanced argillic-altered rocks of north-central British Columbia (NTS 094E/02, 15, 104I/05). In: Geoscience BC Summary of Activities 2020: Minerals, Geoscience BC, Report 2021-01, pp. 91-104.

Clarke, G., Northcote, B., Corcoran N.L., and Hancock, K., 2022. Exploration and Mining in British Columbia, 2021: A summary. In: Provincial Overview of Exploration and Mining in British Columbia, 2021. British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Information Circular 2022-01, pp. 1-42.

Colpron, M., and Nelson, J.L., 2021. Northern Cordillera: Canada and Alaska. In: Elias, S., and Alderton, D., (Eds.), Encyclopedia of Geology, Second Edition. Academic Press, pp. 93-106.

Cutts, J.A., Steinthorsdottir, K., Turvey, C., Dipple, G.M., Enkin, R.J., and Peacock, S.M., 2021. Deducing mineralogy of serpentinized and carbonated ultramafic rocks using physical properties with implications for carbon sequestration and subduction zone dynamics. Geochemistry, Geophysics, Geosystems, 22, e2021GC009989. <https://doi.org/10.1029/2021GC009989>

EY LLP, 2022. British Columbia Mineral and Coal Exploration Survey 2021 Report.

Febbo, G.E., Kennedy, L.A., Savell, M., Creaser, R.A., and Friedman, R.M., 2015. Geology of the Mitchell Au-Cu-Ag-Mo porphyry deposit, northwestern British Columbia, Canada. In: Geological Fieldwork 2014, British Columbia Ministry of Energy and Mines, British Columbia Geological Survey, Paper 2015-1, pp. 59-86.

Febbo, G.E., Kennedy, L.A., Nelson, J.L., Savell, M.J., Campbell, M.E., Creaser, R.A., Friedman, R.M., van Straaten, B.I., and Stein, H.J., 2019. The evolution and structural modification of the supergiant Mitchell Au-Cu porphyry, northwestern British Columbia. Economic Geology, 114, 2, 303-324.

George, S.W.M., Nelson, J.L., Alberts, D., Greig, C.J., and Gehrels, G.E., 2021. Triassic-Jurassic accretionary history and tectonic origin of Stikinia from U-Pb geochronology and Lu-Hf isotope analysis, British Columbia. Tectonics, 40. <https://doi.org/10.1029/2020TC006505>

Hunter, R.C., Sebert, C.F.B., Friedman, R., and Wall, C., 2022. Revised stratigraphy and geochronology of the Hazelton Group, host rocks for volcanogenic mineralization in the Kitsault River area, northwest British Columbia. In Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 63-81.

Jiang, B., Bai, F., and Zhao, J., 2021. Mineralogical and geochemical characteristics of green nephrite from Kutcho, northern British Columbia, Canada. Lithos, 388-389, 106030. <https://doi.org/10.1016/j.lithos.2021.106030>

Lachaud, A., Adam, M., Vucetic, S., and Miškovic, I., 2021. Study of the influence of non-deposit locations in data-driven mineral prospectivity mapping: A case study on the Iskut project in northwestern British Columbia, Canada. Minerals 2021, 11,597. <https://doi.org/10.3390/min11060597>

Micko, J., Tosdal, R.M., Bissig, T., Chamberlain, C.M., and Simpson, K.A., 2014. Hydrothermal alteration and mineralization of the Galore Creek alkalic Cu-Au porphyry deposit, northwestern British Columbia, Canada. Economic Geology, 109, 891-914.

Nelson, J.L., Colpron, M., and Israel, S., 2013. The Cordillera of British Columbia, Yukon, and Alaska: Tectonics and Metallogeny. In: Colpron, M., Bissig, T., Rusk, B.G., and Thompson, J.F.H., (Eds.), Tectonics, Metallogeny, and Discovery-the North American Cordillera and similar accretionary settings. Society of Economic Geologists Special Publication 17, pp. 53-110.

Nelson, J.L., Friedman, R., and van Straaten, B., 2021. LA-ICP-MS and TIMS U-Pb data files from the Iskut project (Dease Lake to Kitsault). British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey GeoFile 2021-10, 13 p.

Rees, C., Riedell, K.B., Proffett, J.M., Macpherson, J., and Robertson, S., 2015. The Red Chris porphyry copper-gold deposit, Canada: Igneous phases, alteration, and controls on mineralization. Economic Geology, 110, 4, 857-888.

Regan, S.P., Benowitz, J.A., Waldien, T.S., Holland, M.E., Roeske, S.M., O'Sullivan, P., and Layer, P., 2021. Long distance plutonic relationships demonstrate 33 million years of strain partitioning along the Denali fault. Terra Nova, 00, 1-11. <https://doi.org/10.1111/ter.12555>

Roberts, J.A., Groat, L.A., Paul, G., Spry, P.G., and Cempírek, J., 2021. Telluride mineralogy of the Deer Horn Au-Ag-Te-(Bi-Pb-W) deposit, British Columbia: Implications for the generation of tellurides . The Canadian Mineralogist, canmin.1900103. <https://doi.org/10.3749/canmin.1900103>

Roth, T., 1989. Geology, alteration and mineralization in the 21A zone, Eskay Creek, northwestern British Columbia. Unpublished Master of Science thesis, University of Waterloo, Waterloo, Canada, 160 p.

Schmidt, M.A., Leybourne, M.I., Peter, J., Petts, D.C., Jaclson, S.E., and Layton-Matthews, S., 2021. Development of a laser ablation ICP-MS method for the analysis of fluid inclusions associated with volcanogenic massive sulfide deposits. Geochemistry: Exploration, Environment, Analysis, 21, geochem2020-043. <https://doi.org/10.1144/geochem2020-043>

Stanley, B., and Nelson, J., 2022. Revised stratigraphy of the Stuhini and Hazelton groups and LA-ICP MS zircon geochronology of the Scottie gold mine area, northwestern British Columbia. In: Geological Fieldwork 2021, British Columbia Ministry of Energy, Mines and Low Carbon Innovation, British Columbia Geological Survey Paper 2022-01, pp. 83-102.