Location/Identification

MINFILE Number: 092JNE068
National Mineral Inventory Number: 092J15 Co1
Name(s): **LITTLE GEM (L.7567)**
NORTHERN GEM, GEM, GUN CREEK
Status: Developed Prospect
Mining Division: Lillooet
Electoral District: Fraser-Nicola
Regions: British Columbia
Resource District: Cascades Natural Resource District
BCGS Map: 092J086
NTS Map: 092J15W
UTM Zone: 10 (NAD 83)
Latitude: 50 53 47 N
Northing: 5638304
Longitude: 122 57 17 W
Easting: 503184
Elevation: 1897 metres
Location Accuracy: Within 500M
Comments: On southeast slope, approximately 215 metres above Roxy Creek, a tributary off Gun Creek, north of Mount Penrose and west of Gun Lake.

Mineral Occurrence

Commodities: Cobalt, Gold, Uranium, Molybdenum, Arsenic

Minerals
Significant: Danaite, Lollingite, Safflorite, Arsenopyrite, Molybdenite, Gold, Skutterudite, Uraninite, Cobaltite, Scheelite
Significant Comments: Both arsenopyrite and lollingite contain some cobalt; gold is present as the native metal.
Associated: Biotite, Hornblende, Apatite, Allanite, Monazite, Orthoclase, Quartz, Bastnaesite
Associated Comments: Both metallic and gangue mineral assemblages are of the type commonly associated with high temperature, or 'hypotherm
Alteration: Quartz, Erythrite, Sericite, Chlorite, Calcite, Limonite, Kaolinite
Alteration Type: Sericitic, Oxidation, Argillic, Chloritic, Carbonate
Mineralization Age: Unknown

Deposit
Character: Vein
Classification: Hydrothermal, Epigenetic
Type: I14: Five-element veins Ni-Co-As-Ag+/-(Bi, U), I01: Au-quartz veins
Shape: Irregular
Dimension: 365x120x0 metres
Comments: Lenses a few centimetres to 2 metres wide strike easterly and dip steeply south.

Host Rock

Dominant Host Rock: Plutonic

Stratigraphic Age	Group	Formation	Igneous/Metamorphic/Other
Cretaceous-Tertiary	Coast Plutonic Complex	------	------
Paleozoic-Mesozoic	Bridge River	Noel	------
Paleozoic-Mesozoic	------	Fergusson	------

Isotopic Age	Dating Method	Material Dated
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Lithology: Quartz Diorite, Diorite, Gabbro, Vein, Feldspar Dike, Biotite Hornblende Granodiorite

Comments: The Penrose Stock is a lobe of the Coast Plutonic Complex with Noel Formation black argillite, calcareous rocks and tuffs and serpentinized peridotites to east and Fergusson Series cherts, argillites and limestones on the southwest.

Geological Setting

Tectonic Belt: Coast Crystalline
Physiographic Area: Pacific Ranges
Terrane: Bridge River, Cadwallader

Metamorphic Type: Contact

Inventory

Ore Zone: DRILLHOLE
Category: Assay/analysis
Year: 2019
Report On: Y
NI 43-101: N

Sample Type: Drill Core

Commodity	Grade
Gold	44 grams per tonne
Cobalt	3 per cent

Comments: DDH LGD17-001R: 1.07 metre intersection within a larger 5.46 metre intersection of 15.6 grams per tonne gold and 0.85 per cent cobalt

Reference: Assessment Report 38537

Ore Zone: DRILLHOLE
Category: Assay/analysis
Year: 2019
Report On: Y
NI 43-101: N

Sample Type: Drill Core

Commodity	Grade
Gold	5.19 grams per tonne
Cobalt	1.15 per cent

Comments: DDH LGD18-002: 1 metre intersection within a larger 12.02 metre intersection of 1.45 grams per tonne gold and 0.25 per cent cobalt

Reference: Assessment Report 38537

Ore Zone: DRILLHOLE
Category: Assay/analysis
Year: 2019
Report On: Y
NI 43-101: N

Sample Type: Drill Core

Commodity	Grade
Gold	8.7 grams per tonne
Cobalt	0.61 per cent

Comments: DDH LGD18-005: 0.82 metre intersection within a larger 2.7 metre intersection of 3.09 grams per tonne gold and 0.23 per cent cobalt

Reference: Assessment Report 38537

Ore Zone: SAMPLE
Category: Assay/analysis
Year: 2007
Report On: N
NI 43-101: N

Sample Type: Rock

Commodity	Grade
Gold	130.90 grams per tonne
Cobalt	2.126 per cent

Comments: A rock sample (JTSUG-4) of quartz-rich rock hosting pyrite from the No.3 level underground workings.

Reference: Shearer, J.T. (2008-05-02): Technical Report on the Little Gem Cobalt-Gold Property, Gold Bridge/Bralorne Area, South-Central British Columbia, Lillooet Mining Division

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Ore Zone: LITTLE GEM **Year:** 1979-B
Category: Indicated **Report On:** Y
Quantity: 4,740 tonnes **NI 43-101:** N

Commodity	Grade
Gold	23.0400 grams per tonne
Cobalt	2.9740 per cent
Uranium	0.2120 per cent

Comments: U3O8 0.2499 per cent.

Reference: Allen 1955.

Ore Zone: LITTLE GEM **Year:** 1979-A
Category: Indicated **Report On:** Y
Quantity: 27,705 tonnes **NI 43-101:** N

Commodity	Grade
Gold	21.7400 grams per tonne
Cobalt	2.0450 per cent

Comments: Calculated from 1219 metres of diamond drilling over 1.5 metres width.

Reference: George Cross News Letter No.87, 1979.

Ore Zone: LITTLE GEM **Year:** 1975
Category: Unclassified **Report On:** Y
Quantity: 18,140 tonnes **NI 43-101:** N

Commodity	Grade
Gold	22.6400 grams per tonne
Cobalt	3.0000 per cent
Uranium	0.2000 per cent

Comments:

Reference: Canadian Mines Handbook 1974-75, page 251.

Capsule Geology

The LITTLE GEM prospect, is located in the Dickson Range on a northeast-trending ridge above Roxey Creek, 2.3 kilometres east of Dickson Peak, 5 kilometres northwest of Gun Lake and 9.5 kilometres northwest of the village of Gold Bridge.

Hypothermal cobalt-sulpharsenide gold veins lay within the margin of the Jurassic to Eocene Coast Plutonic Complex (Cretaceous Penrose Stock). Host rocks consist of granodiorite, minor hornblende-biotite-quartz diorite, diorite and gabbro, which are intruded by feldspar porphyry dikes. A broad, east trending and steeply south-dipping fault zone cuts the granodiorite near the eastern contact with older sedimentary and volcanic rocks of the Mississippian to Jurassic Bridge River Complex (Noel Formation black argillite, calcareous rocks and tuffs and serpentinized peridotites). To the southwest, the Penrose Stock intrudes Late Paleozoic to Mesozoic Ferguson Series cherts, argillites and limestones.

Shears in the zone contain two parallel ore shoots ranging in width from a few centimetres to a few metres. Irregular lenses of almost solid sulphides contain cobalt and gold values in association with danaite, loellingite, safflorite, arsenopyrite, scheelite and minor molybdenum. Uranium, in the form of uraninite, occurs in the gangue along with coarse-grained allanite, apatite, feldspar, quartz, chlorite, sericite, calcite, erythrite and limonite. Gold occurs mainly as microscopic veinlets of the native metal within and adjacent to the sulpharsenide minerals. Surrounding the ore, strongly bleached and sericitized granodiorite containing disseminated sulphides, residual quartz, feldspar and kaolin grades into unaltered granodiorite. The metallic minerals occur with the gangue in coarsely crystalline masses but are in general younger than most of the gangue minerals. The combination of the

batholithic host rocks and the association of uraninite with hornblende, biotite, apatite, allanite, monazite, orthoclase, cobalt sulpharsenides, arsenopyrite and molybdenite is indicative of high temperature, possibly magma-derived, hydrothermal fluids.

Two adits follow the ore shoots. The upper adit (#1 Adit), sampled over 36 metres and 90 centimetres width, graded 26.2 grams per tonne gold, 0.39 per cent uranium and 3.1 per cent cobalt; the lower adit, sampled over 1.8 metres, graded 54.8 grams per tonne gold, 0.3 per cent uranium, and 3.2 per cent cobalt (Rutherford, 1952 - Property File). Allen (1955), in Property File, reports an indicated resource of 4740 tonnes, grading 23.04 grams per tonne gold, 2.974 per cent cobalt and 0.212 per cent uranium (0.2499 per cent U3O8). In 1979, reserves were calculated at 27,705 tonnes grading 21.74 grams per tonne gold, and 2.045 per cent cobalt (George Cross News Letter No. 87, 1979). Stevenson, in 1948, estimated probable ore of 894 tonnes grading 0.18 per cent uranium (Property File). The Canadian Mines Handbook 1974-75 records 18,140 tonnes averaging 22.64 grams per tonne gold, 3.0 per cent cobalt and 0.2 per cent uranium (Canadian Mines Handbook 1974-75, page 251). Arsenic grades 25 to 27 per cent (Assessment Report 15451).

In 2007, a rock sample (JTSUG-4) of quartz-rich rock hosting pyrite from the No.3 level underground workings yielded 130.90 grams per tonne gold and 2.126 per cent cobalt (Shearer, J.T. [2008-05-02]: Technical Report on the Little Gem Cobalt-Gold Property, Gold Bridge/Bralorne Area, South-Central British Columbia, Lillooet Mining Division).

Of the 12 holes (3278 metres) drilled in the Little Gem area in 2017 and 2018, major cobalt supharsenide mineralized intervals were intersected in three holes: LDG17-001R returned 1.07 metres of 44 grams per tonne gold and 3 per cent cobalt within a larger 5.46 metre zone of 15.6 grams per tonne gold and 0.85 per cent cobalt. LGD18-002 returned 1 metre of 5.19 grams per tonne gold and 1.15 per cent cobalt within a larger 12.02 metre zone of 1.45 grams per tonne gold and 0.25 per cent cobalt. LGD18-005 returned 0.82 metres of 8.70 grams per tonne gold and 0.61 per cent cobalt.

Work History

The deposits were discovered and staked by William Haylmore and W.H. Ball in 1934. Their interests were bought by J.M. and R.R. Taylor in 1937. The United States Vanadium Corporation optioned the property in 1937 and drove the upper tunnel (#1 Adit). All work in Canada was terminated in 1939 by the above-named company and the exploratory program on the Northern Gem was not completed. During the winter of 1939 the lower tunnel (#2 Adit) was driven by contractors for J.M. and R.R. Taylor.

In 1940 the property was optioned for a short time by Bralorne Mines and the two short raises were driven from the lower tunnel (#2Adit). The lack of a treatment process, and indefinite marketing possibilities at that time, resulted in the option being dropped by Bralorne Mines.

In 1952 Estella Mines optioned the property. A switchback road was completed from Gun Creek bridge to the camp and twelve holes were diamond drilled from the lower tunnel. Estella Mines were forced to drop the option when they were unable to meet the due payment in November 1953 and it was not possible to secure an extension from the owners. Northern Gem Mining Corporation was formed in December 1955 for the purpose of acquiring and developing the property. Work was commenced on the road in June, on the camp in August and on the showings shortly thereafter. In 1957, 119 metres of drifting and 16.4 metres of crosscutting was completed on the #1 Adit. The 33 adit was driven for 142.7 metres and 23 metres of crosscutting and 853 metres of drilling was completed.

Major Resources Ltd. held the property in 1979 and conducted airborne magnetometer, VLF-EM and radiometric surveys. The radiometric surveys outlined three large zones, the most interesting being the east-west trending Anomaly A, correlating with mineralization within a magnetic low, reflecting sheared and altered granodiorite. Anvil Resources Ltd. held the property in 1986 and drilled 2 holes totaling 373.8 metres.

Ownership of the eight Little Gem claims reverted to the Crown in 2004. The property was acquired by B.N. Church and R.H. McMillan in 2007. Geological, geochemical, and rock sampling evaluations were completed between 2007 and 2009. A structural analysis of the area, including the Little Gem, Jewel and Mount Penrose occurrences, was conducted for Goldbridge Holdings Ltd. in 2013, determining three cross-structural exploration potential locations.

Cobalt One Energy Corporation Inc. acquired the property in 2017 and subsequently conducted stream sediment, rock and soil sampling, prospecting and mapping, electromagnetic and IP survey, petrophysics studies and diamond drilling through to 2022.

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Date Coded:	1985/07/24	**Coded By:**	BC Geological Survey (BCGS)	**Field Check:**	N
Date Revised:	2024/12/30	**Revised By:**	Del Ferguson (DF)	**Field Check:**	N