



MINFILE Detail Report  
BC Geological Survey  
Ministry of Energy, Mines and Petroleum Resources

### Location/Identification

**MINFILE Number:** 092F 105 **National Mineral Inventory Number:** 092F15 Cu3

**Name(s):** LITTLE BILLIE  
LITTLE BILLY, MCLEOD NO. 1 FRACTION (L.521), MCLEOD NO. 2 FRACTION (L.522), VAN ANDA, VANANDA

**Status:** Past Producer **Mining Division:** Nanaimo

**Mining Method:** Underground **Electoral District:** Powell River-Sunshine Coast

**Regions:** British Columbia, Texada Island, Vancouver Island **Resource District:** Sunshine Coast Forest District

**BCGS Map:** 092F078

**NTS Map:** 092F15E **UTM Zone:** 10 (NAD 83)

**Latitude:** 49 45 30 N **Northing:** 5512910

**Longitude:** 124 32 49 W **Easting:** 388583

**Elevation:** 32 metres

**Location Accuracy:** Within 500M

**Comments:** Shaft, on Lot 522 close to the boundary with Lot 521, just east of Vananda on Texada Island (Minister of Mines Annual Report 1944).

### Mineral Occurrence

**Commodities:** Gold, Copper, Wollastonite, Silver, Molybdenum, Zinc, Lead, Tungsten, Bismuth, T

**Minerals**

**Significant:** Chalcopyrite, Bornite, Wollastonite, Molybdenite, Sphalerite, Galena, Scheelite, Silver, Hesseite, Petzite, Wehrlite, Pyrrhotite

**Associated:** Quartz, Pyroxene, Epidote, Pyrite, Magnetite, Vesuvianite

**Alteration:** Garnet, Wollastonite, Diopside, Tremolite, Feldspar, Magnetite, Grossularite, Andradite

**Alteration Comments:** Also epidote.

**Alteration Type:** Skarn

**Mineralization Age:** Unknown

**Deposit**

**Character:** Disseminated, Massive

**Classification:** Skarn, Industrial Min.

**Type:** K01: Cu skarn, K05: W skarn

**Shape:** Irregular **Modifier:** Folded, Faulted

### Host Rock

**Dominant Host Rock:** Sedimentary

| Stratigraphic Age | Group     | Formation | Igneous/Metamorphic/Other |
|-------------------|-----------|-----------|---------------------------|
| Upper Triassic    | Vancouver | Quatsino  | -----                     |
| Cretaceous        | -----     | -----     | Little Billy Stock        |

| Isotopic Age | Dating Method | Material Dated |
|--------------|---------------|----------------|
| -----        | -----         | -----          |
| 120 Ma       | Unknown       | U/Pb           |

**Lithology:** Limestone, Tonalite, Amphibole Mafic Dike, Skarn, Basalt, Gabbro, Diorite, Quartz Monzonite

**Comments:** Age date from J.E. Gabites, pers. comm. 1992; see EMPR Bull 101, p. 159.

### Geological Setting

**Tectonic Belt:** Insular **Physiographic Area:** Georgia Depression

**Terrane:** Wrangell

**Inventory****Ore Zone:** LITTLE BILLIE**Year:** 1992**Category:** Inferred**Report On:** Y**Quantity:** 181,420 tonnes**NI 43-101:** N

| Commodity | Grade                   |
|-----------|-------------------------|
| Silver    | 34.2800 grams per tonne |
| Gold      | 11.6500 grams per tonne |
| Copper    | 2.0000 per cent         |

**Comments:** Geological reserves.**Reference:** George Cross News Letter No.202 (October 20), 1992.**Summary Production**

|                 |        | Metric            | Imperial         |
|-----------------|--------|-------------------|------------------|
| <b>Mined:</b>   |        | 63,713 tonnes     | 70,231 tons      |
| <b>Milled:</b>  |        | 63,713 tonnes     | 70,231 tons      |
| <b>Recovery</b> | Silver | 1,198,553 grams   | 38,534 ounces    |
|                 | Gold   | 363,199 grams     | 11,677 ounces    |
|                 | Copper | 819,225 kilograms | 1,806,082 pounds |

**Capsule Geology**

The Little Billie mine is located just outside the town of Vananda on the northeast coast of Texada Island, 120 kilometres northwest of Vancouver. Historic work at the Little Billie mine has included moderate underground development. The shaft collar is situated on Lots 521 and 522, 0.5 kilometre east-southeast of Vananda Cove.

Northern Texada Island is underlain by Karmutsen Formation pillowed and massive basaltic flows with thick units of pillowed breccia conformably overlain by massive limestone of the Quatsino Formation, both of the Upper Triassic Vancouver Group. Various Middle Jurassic stocks and minor intrusions, ranging in composition from gabbro through diorite to quartz monzonite, intrude the volcanics and limestones. These intrusions are locally associated with iron and copper-gold skarn mineralization. A major episode of folding (F1) has resulted in the limestones and, to a lesser extent, the underlying volcanics, being deformed into a series of broad, northwest trending open folds that plunge northwards. Three subparallel northwest striking lineaments are also recognized and coincide with the Ideal, Holly and Marble Bay faults. These faults cut a set of northeast striking faults. The Marble Bay fault, and to a lesser extent the Ideal fault, have apparently controlled the emplacement of some of the Jurassic intrusions and their associated skarn mineralization.

The Little Billie occurrence, near the Marble Bay fault, is underlain by massive, recrystallized limestone of the Quatsino Formation intruded by the Cretaceous Little Billy stock comprised of a light grey, fine to medium-grained equigranular tonalite. A suite of amphibole rich mafic dykes also occur and appear to pre- and postdate the Little Billy stock. The limestone is gently folded and bedding is poorly defined. Skarn mineralization is spatially associated with the dykes and stock. Mineralization often forms irregular pipe-like bodies that plunge moderately, subparallel to the contacts between limestone and intrusive rocks. The mafic dykes appear to be of two generations. The older, and commonly altered northeast striking dykes cut only the limestone and are cut off along strike by the Little Billy stock. They contain abundant veinlets and lenses of garnet-diopside skarn which locally have completely replaced the dyke rock. The younger, "fresher looking" dykes strike east and cut the older dykes, the Little Billy stock and skarn developed along the intrusive/limestone contacts. Several, west-dipping, quartz-feldspar porphyry and hornblende-feldspar porphyry dykes are locally present in the mine area but are not exposed in the mine workings. Numerous minor faults are exposed underground. At the Little Billie mine, irregularly distributed skarn and related mineralization is developed in limestone near the tonalitic Little Billy stock where amphibole-rich mafic dykes cut the limestone. The skarn also extends into dyke material. The shape of the skarns are determined by the tonalite/limestone contacts or by the attitude of the mafic dykes. The skarns are comprised of coarse, light tan grossularite and light green and dark brown andradite garnet as well as wollastonite, clinopyroxene (diopside), tremolite, quartz and feldspar.

Two types of skarn ore are recognized; one is characterized by a gangue of coarse granular brown garnet and abundant magnetite that is loosely held together and the second by a gangue of green garnet, wollastonite and diopside which is dense and hard. The main ore minerals are chalcopyrite and bornite with variable but minor amounts of molybdenite, pyrite, magnetite and sphalerite. Bornite sometimes occurs as coarse euhedral crystals intergrown with garnet, and the higher gold values are commonly found with the higher copper concentrations. Chalcopyrite and bornite are interstitial

to bladed wollastonite. Although chalcopyrite and bornite occur together in both the green and brown garnet skarn bodies, the chalcopyrite favours the brown garnet (andradite)-magnetite bodies and the bornite favours the green garnet (andradite)-wollastonite-diopside bodies. The light tan grossularite garnet is associated with diopside and wollastonite and clusters of quartz, epidote and feldspar but is typically not mineralized with sulphides.

Other minerals identified at the Little Billie mine include galena, scheelite and native silver as well as the tellurides hessite, petzite and wehrlite (Fieldwork, 1989). Small amounts of pyrrhotite are found along joints in some altered mafic dykes.

Inferred reserves are 181,420 tonnes of ore grading 11.65 grams per tonne gold, 2 per cent copper and 34.28 grams per tonne silver (George Cross News Letter No. 202 (October 20), 1992)). A recent diamond-drill hole intersection of skarn mineralization below the 6th level graded 7.26 grams per tonne gold, 29.13 grams per tonne silver and 1.6 per cent copper across 5.8 metres of skarn (Northern Miner - January 2, 1989).

Wollastonite, at the Little Billie, is common in green exoskarn which commonly occurs with green andradite in layers 0.6 to 5 centimetres thick.

A 38.7 kilogram sample of massive, white wollastonite-rich skarn was sent to CANMET for processing and the results were as follows (Open File 1991-17):

|       |                                |        |
|-------|--------------------------------|--------|
| ----- |                                |        |
|       | SiO <sub>2</sub>               | 44.5 % |
|       | Al <sub>2</sub> O <sub>3</sub> | 1.10%  |
|       | Fe <sub>2</sub> O <sub>3</sub> | 4.21%  |
|       | CaCO <sub>3</sub>              | 14.3 % |
|       | MgO                            | 1.20%  |
|       | L.O.I.                         | 5.72   |
|       | Brightness                     | 62.78  |
|       | Lightness                      | 80.30  |
|       | -----                          |        |

Recent interest in the wollastonite potential of the Little Billie mine has resulted in unclassified reserves of 100,000 tonnes of wollastonite skarn material in the old mine workings. The reserve figure is based on Stevenson's report in the Minister of Mines Annual Report 1944 (Fieldwork, 1988). Recent drilling has cut intercepts of up to 24 metres comprised essentially of wollastonite (Open File 1991-17).

Production from 1896 to 1952 totalled 63,713 tonnes yielding 1,198,533 grams of silver, 363,199 grams of gold and 819,225 kilograms of copper.

The property is held by Consolidated Van Anda Gold Ltd.

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|                      |            |                    |                             |                     |   |
|----------------------|------------|--------------------|-----------------------------|---------------------|---|
| <b>Date Coded:</b>   | 1985/07/24 | <b>Coded By:</b>   | BC Geological Survey (BCGS) | <b>Field Check:</b> | N |
| <b>Date Revised:</b> | 2008/04/18 | <b>Revised By:</b> | Mandy N. Desautels (MND)    | <b>Field Check:</b> | N |